EV CONTROL SYSTEM

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< SPEC CHANGE INFORMATION >

SPEC CHANGE INFORMATION MODIFICATION NOTICE

Major Modification Item

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- The broadened regeneration range of electric power and weight reduction improve the electrical efficiency, achieving increase in cruising distance.
- DC/DC-J/B has been abolished. PDM (Power Delivery Module) contains DC/DC converter instead.
- · Electric shift control module is incorporated into VCM.
- Water pump 2 has been abolished.
- SSOFF relay has been abolished.
- B mode control has been added to models with navigation system. Accordingly, ECO mode switch has been added to the steering switch.
- All charge modes allow the setting of Long Life Charge mode.
- A function allowing arbitrary target temperature setting has been added to the Climate Ctrl. Timer and remote climate control. (Models with navigation system only)

< PRECAUTION > PRECAUTION PRECAUTIONS Precaution for Technicians Using Medical Electric INFOID:00000009343247 OPERATION PROHIBITION WARNING: Parts with strong magnet is used in this vehicle. Technicians using a medical electric device such as pacemaker must never perform operation on the vehicle, as magnetic field can affect the device function by approaching to such parts. NORMAL CHARGE PRECAUTION WARNING: • If a technician uses a medical electric device such as an implantable cardiac pacemaker or an implantable cardioverter defibrillator, the possible effects on the devices must be checked with the device manufacturer before starting the charge operation. As radiated electromagnetic wave generated by PDM (Power Delivery Module) at normal charge operation may affect medical electric devices, a technician using a medical electric device such as implantable cardiac pacemaker or an implantable cardioverter defibrillator must not approach motor room [PDM (Power Delivery Module)] at the hood-opened condition during normal charge operation. PRECAUTION AT TELEMATICS SYSTEM OPERATION WARNING: If a technician uses implantable cardiac pacemaker or implantable cardioverter defibrillator (ICD), avoid the device implanted part from approaching within approximately 220 mm (8.66 in) from interior/exterior antenna. The electromagnetic wave of TCU might affect the function of the implantable cardiac pacemaker or the implantable cardioverter defibrillator (ICD), when using the service, etc. If a technician uses other medical electric devices than implantable cardiac pacemaker or implantable cardioverter defibrillator (ICD), the electromagnetic wave of TCU might affect the function of the device. The possible effects on the devices must be checked with the device manufacturer before TCU use. PRECAUTION AT INTELLIGENT KEY SYSTEM OPERATION WARNING: If a technician uses implantable cardiac pacemaker or implantable cardioverter defibrillator (ICD), avoid the device implanted part from approaching within approximately 220 mm (8.66 in) from interior/exterior antenna. The electromagnetic wave of Intelligent Key might affect the function of the implantable cardiac pacemaker or the implantable cardioverter defibrillator (ICD), at door operation, at each request switch operation, or at engine starting.

• If a technician uses other medical electric devices than implantable cardiac pacemaker or implantable cardioverter defibrillator (ICD), the electromagnetic wave of Intelligent Key might affect the function of the device. The possible effects on the devices must be checked with the device manufacturer before Intelligent Key use.

Point to Be Checked Before Starting Maintenance Work

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"

The Supplemental Restraint System such as "AIR BAG" and "SEAT BELT PRE-TENSIONER", used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS

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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 SR and SB section of this Service Manual.

WARNING:

- To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.
- Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SR section.
- Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.

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

WARNING:

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

Precaution for Procedure without Cowl Top Cover

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

Precautions for Removing of Battery Terminal

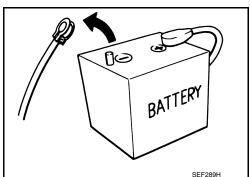
 When removing the 12V battery terminal, turn OFF the power switch and wait at least 5 minutes.
 NOTE:

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

- 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 \rightarrow ON \rightarrow OFF. Get out of the vehicle. Close all doors (including back door).
- 3. Check that the charge status indicator lamp does not blink and wait for 5 minutes or more. **NOTE:**



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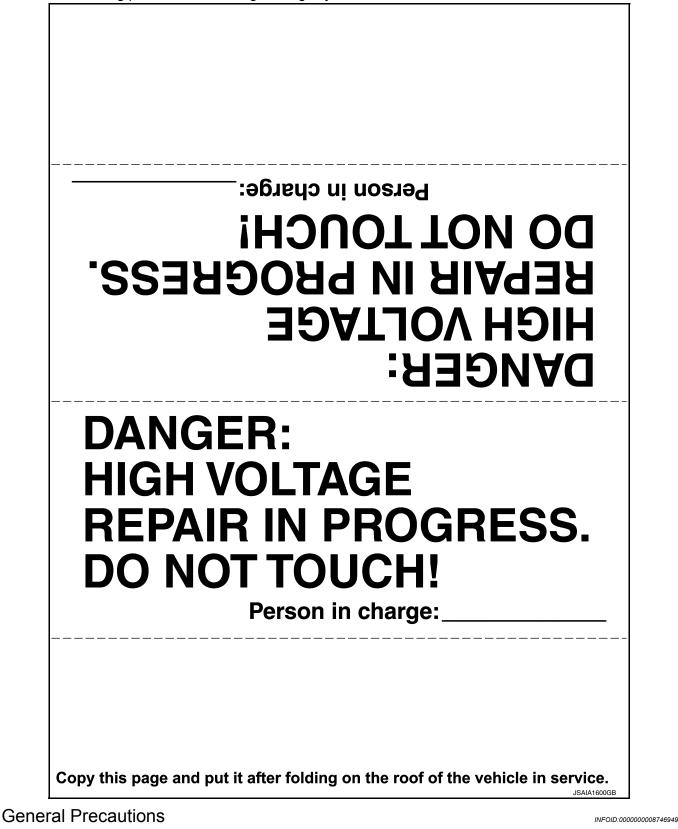
PRECAUTIONS

< PRECAUTION >

If the battery is removed within 5 minutes after the power switch is turned OFF, plural DTCs may be detected. А 4. Remove 12V battery terminal within 60 minutes after turning the power switch OFF \rightarrow ON \rightarrow OFF. **CAUTION:** After all doors (including back door) are closed, if a door (including back door) is opened before В 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. EVC NOTE: Once the power switch is turned ON \rightarrow 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 D the power switch. NOTE: If the power switch is turned ON with any one of the terminals of main battery and sub battery disconnected. F 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 INFOID:000000009343262 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 Н 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 J 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 insu-Κ lating 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 M 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. Ν 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. Ρ PROHIBITED ITEMS TO CARRY DURING THE WORK Hybrid vehicles and electric vehicles contain parts with high voltage and intense magnetic force. Never carry metal products and magnetic recording media (e.g. cash card, prepaid card) to repair/inspect high voltage parts. If this is not observed, the metal products may create a risk of short circuit and the magnetic recording media may lose their magnetic recording.

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

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



• Never disassemble VCM.

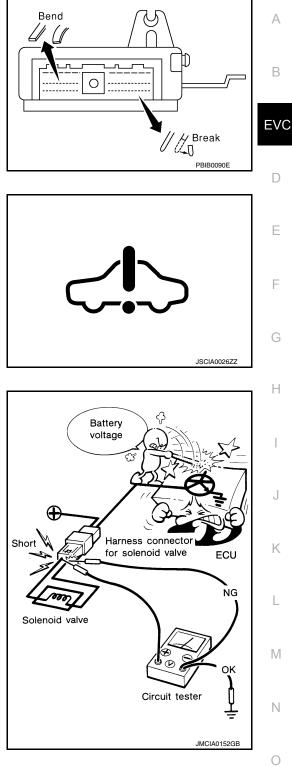
• If the 12V battery is disconnected, the diagnostic information will be lost within 3 minutes.

PRECAUTIONS

< PRECAUTION >

• When connecting or disconnecting harness connectors into or from VCM, take care not to damage pin terminals (bend or break).

Check that there are not any bends or breaks on VCM pin terminal, when connecting harness connectors.



• After performing each TROUBLE DIAGNOSIS, perform DTC confirmation procedure or Component Function Check. The DTC should not be displayed in the DTC Confirmation Procedure if the repair is completed. The Component Function Check should be a good result if the repair is completed.

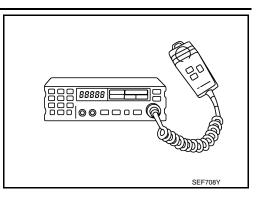
• When measuring ECU signals with a circuit tester, never allow the two tester probes to contact. Accidental contact of probes will cause a short circuit and damage the ECU power transistor.

Ρ

PRECAUTIONS

< PRECAUTION >

- When installing C.B. ham radio or a mobile phone, be sure to observe the following as it may adversely affect electronic control systems depending on installation location.
- Keep the antenna as far as possible from the electronic control units.
- Keep the antenna feeder line more than 20 cm (8 in) away from the harness of electronic controls.
- Do not let them run parallel for a long distance.
- Adjust the antenna and feeder line so that the standing-wave radio can be kept smaller.
- Be sure to ground the radio to vehicle body.



< PREPARATION >

PREPARATION

PREPARATION

Commercial Service Tools

INFOID:00000008746950 B

Тос	Tool name		
Insulated gloves	MUNICIA0149ZZ	Removing and installing high voltage com- ponents [Guaranteed insulation performance for 1000V/300A]	
Leather gloves	JPCIA0066ZZ	 Removing and installing high voltage components Protect insulated gloves [Use leather gloves that can fasten the wrist tight] 	
Insulated safety shoes	JPCIA0011ZZ	Removing and installing high voltage components	
Safety glasses	JPCIA0012ZZ	 Removing and installing high voltage components To protect eye from the spatter on the work to electric line [ANSI Z87.1] 	
Face shield	JPCIA0167ZZ	 Removing and installing high voltage components To protect face from the spatter on the work to electric line 	
Insulated helmet	JPCIA0013ZZ	Removing and installing high voltage components	

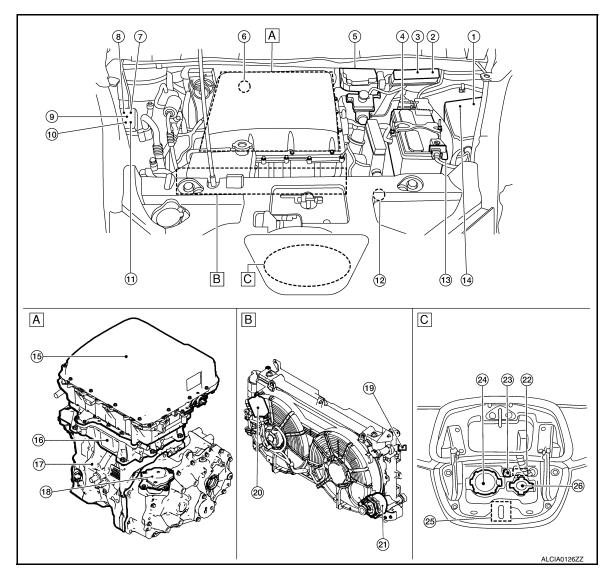
< SYSTEM DESCRIPTION >

SYSTEM DESCRIPTION COMPONENT PARTS

Component Parts Location

INFOID:000000008746951

MOTOR ROOM COMPARTMENT



A Electric power train

B Cooling fan assembly and radiator assembly

C Charge port

Component Parts Description

No.	Component parts	Function
1	F/S relay (IPDM E/R)	EVC-19, "F/S Relay"
2	M/C relay	EVC-19, "M/C Relay"
3	Reverse lamp relay	EVC-20, "Reverse Lamp Relay"
4	12V battery	PG-8, "12V Battery"
(5)	Electrically-driven intelligent brake unit	BR-13, "Electrically-driven Intelligent Brake Unit"
6	Refrigerant pressure sensor (with heat pump)	EVC-20, "Refrigerant Pressure Sensor"

Revision: October 2013

< SYSTEM DESCRIPTION >

No.	Component parts	Function	^
\bigcirc	Charge port lid opener actuator relay	EVC-19, "Charge Port Lid Opener Actuator Relay"	А
8	A/C relay	EVC-20, "A/C Relay"	
9	Cooling fan relay	The cooling fan relay supplies power to the cooling fan con- trol module.	В
10	F/S CHG relay	EVC-19, "F/S CHG Relay"	
(1)	Parking actuator relay A	TM-34, "Parking Actuator Relay A"	EV
(12)	Refrigerant pressure sensor (without heat pump)	EVC-20. "Refrigerant Pressure Sensor"	
(13)	Battery current sensor (with battery temperature sensor)	EVC-21. "Battery Current Sensor (With Battery Tempera- ture Sensor)"	D
14	Charge connector lock relay (IPDM E/R)	EVC-19, "Charge Connector Lock Relay"	_
(15)	PDM (Power Delivery Module)	VC-12, "PDM (Power Delivery Module)"	E
16	Traction motor inverter	TMS-13. "Traction Motor Inverter"	
17	Traction motor	TMS-13, "Traction Motor"	F
18	Parking actuator	TM-33. "Parking Actuator"	
(19)	Coolant temperature sensor	EVC-22, "Coolant Temperature Sensor"	G
20	Cooling fan control module	EVC-23, "Cooling Fan Control Module"	
21	Electric water pump	EVC-22. "Electric Water Pump"	Н
22	Charge connector lock actuator	VC-14, "Charge Connector Lock Actuator"	
23	Charge port light	VC-14, "Charge Port Light"	-
24	Quick charge port	VC-13, "Charge Port"	
25	Charge port lid opener actuator	DLK-21, "Charge Port Lid Opener Actuator"	
26	Normal charge port	VC-13, "Charge Port"	J

BODY COMPARTMENT

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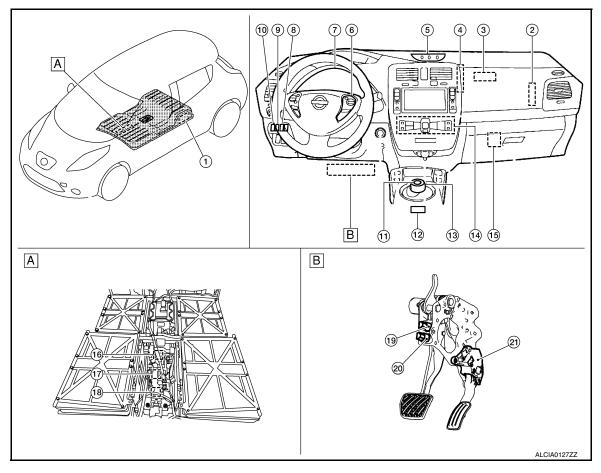
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Revision: October 2013

< SYSTEM DESCRIPTION >



- A Li-ion battery junction box
- B Accelerator pedal and brake pedal upper part

Component Parts Description

No.	Component parts	Function
1	Li-ion battery controller	EVB-16, "Li-ion Battery Controller"
2	TCU (telematics communication unit)	 <u>AV-98. "TCU"</u> (Navigation without BOSE) <u>AV-227. "TCU"</u> (Navigation with BOSE) <u>AV-400. "TCU"</u> (Telematics system)
3	VSP control unit	VSP-9. "Approaching Vehicle Sound For Pedestrians (VSP) Control Unit"
4	BCM (Body Control Module)	BCS-6, "BODY CONTROL SYSTEM : System Description"
5	Charge status indicator	VC-15, "Charging Status Indicator"
6	ASCD steering switch	EVC-21, "ASCD Steering Switch"
\overline{O}	Combination meter	EVC-23, "Combination Meter"
8	Charge port lid opener switch	DLK-21, "Charge Port Lid Opener Switch"
9	Charge connector lock switch	VC-14, "Charge Connector Lock Switch"
10	Immediate charging switch	VC-14, "Immediate Charging Switch"
(1)	P position switch	TM-35, "P Position Switch"
(12)	Selector indicator	TM-35. "Selector Indicator"
(13)	Electric shift selector	TM-34, "Electric Shift Selector"

VCM

< SYSTEM DESCRIPTION >

VCM (Vehicle control module) judges the vehicle status according to signals from various sensors and ECUs, and VCM controls EV system in a comprehensive manner. VCM also has a gateway function for EV system CAN communication and CAN communication, which enables communication between an ECU performing EV system CAN communication and an ECU performing CAN communication. In addition, VCM contains an electric shift control module and performs shift control.

For electric shift control module. Refer to <u>TM-31, "Description"</u>.

M/C	Relav	

The M/C (motor control) relay supplies the main power to the EV system. VCM activates the M/C relay and supplies power to the EV system when the EV system needs to be started.

F/S Relay

The F/S (fail-safe) relay supplies the driving power for the system main relay inside the Li-ion battery. VCM activates the F/S relay to make the system main relay controllable when the system is set to READY or when the battery is charged.

When VCM detects a malfunction in the EV system and judges that the system main relay must be deactivated, VCM deactivates the F/S relay to shut off the system main relay driving power.

F/S CHG Relay

The F/S CHG (fail-safe charge) relay supplies the driving power for the quick charge relay inside the PDM (Power Delivery Module). When VCM recognizes a quick charge start, VCM activates the F/S CHG relay to Ν make the quick charge relay operable. During driving, F/S CHG relay remains OFF so that the quick charge relay is not activated.

Charge Port Lid Opener Actuator Relay

The charge port lid opener actuator relay is controlled by VCM and supplies power to the charge port lid opener actuator.

Charge Connector Lock Relay

The charge connector lock relay is controlled by VCM and supplies power to the charge connector lock actuator.

EVC-19

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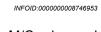
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No.	Component parts	Function	~
(14)	A/C auto amp.	 <u>HAC-25, "A/C Auto Amp."</u> [Auto A/C (with heat pump)] <u>HAC-231, "A/C Auto Amp."</u> [Auto A/C (without heat pump)] 	A
(15)	VCM (vehicle control module)	<u>EVC-19, "VCM"</u>	В
16	System main relay 2	EVC-20, "System Main Relay 2"	
17	Pre-charge relay	EVC-20, "Pre-charge Relay"	EVC
18	System main relay 1	EVC-20, "System Main Relay 1"	
(19)	(19) Stop lamp switch EVC-21, "Stop Lamp Switch"		D
20	Brake pedal position switch	EVC-21. "Brake Pedal Position Switch"	
21	Accelerator pedal position sensor	EVC-20, "Accelerator Pedal Position Sensor"	F

COMPONENT PARTS

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< SYSTEM DESCRIPTION >

A/C Relay

The A/C (air conditioner) relay supplies power to the air conditioner system. VCM activates the A/C relay to supply power to the air conditioner system when the power is turned on or an air conditioner operation request signal is received.

System Main Relay 1

The system main relay 1 is integrated in the Li-ion battery and controlled by VCM. The system main relay 1 connects and disconnects the high-voltage circuit (+) side and Li-ion battery.

If the pre-charge to the inverter condenser is complete while high voltage power is supplied, VCM activates the system main relay 1 to supply power from the Li-ion battery to the EV system. Also when charging, VCM activates the system main relay 1 to supply power from an external charger to the Li-ion battery.

System Main Relay 2

The system main relay 2 is integrated in the Li-ion battery and controlled by VCM. The system main relay 2 connects and disconnects the high-voltage circuit (-) side and Li-ion battery. When high voltage power is supplied, VCM activates the system main relay 2 to supply power from the Li-ion battery to the EV system. When charging, power from an external charger is supplied from the system main relay 2 to the Li-ion battery.

Pre-charge Relay

The pre-charge relay is integrated in the Li-ion battery and controlled by VCM. When high voltage power is required, VCM activates the pre-charge relay before activating the system main relay to prevent abrupt application of high voltage.

Reverse Lamp Relay

When VCM receives a reverse range information from the electric shift selector, VCM activates the reverse lamp relay to turn ON the reverse lamp.

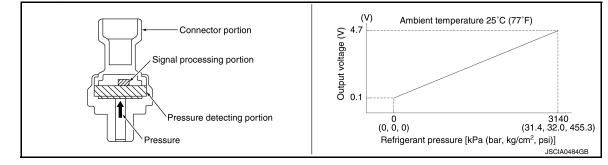
Accelerator Pedal Position Sensor

The accelerator pedal sensor is integrated with the accelerator pedal. This sensor is a potentiometer that detects the acceleration pedal stroke, converts it to a voltage signal, and transmits the signal to VCM. The sensor transmits its signals through dual lines, providing a minimum driving function even if either line malfunctions.

Upon a POWER ON cycle, VCM learns the fully closed position of the acceleration pedal from the accelerator pedal position sensor signal.

Refrigerant Pressure Sensor

The sensor uses an electrostatic volume pressure transducer to convert refrigerant pressure to voltage. VCM calculates refrigerant pressure based on the voltage and sends a refrigerant pressure signal to the A/C auto amp. via EV system CAN communication.







Accelerator pedal position sensor Accelerator pedal position 6.0 output voltage **7** Sensor 1 sensor Sensor 2 Depress Release -Accelerator pedal operation PBIB1741E INFOID:00000008746963

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INFOID:000000008746961

INFOID:00000008746959





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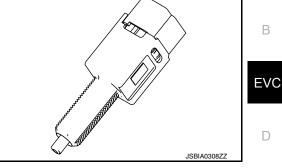
INFOID:00000008746962

< SYSTEM DESCRIPTION >

Stop Lamp Switch

The stop lamp switch is installed to the brake pedal bracket. The switch detects the state of the brake pedal and transmits an ON/OFF signal to VCM.

The contact of the stop lamp switch is usually open. When the brake pedal is depressed, it closes and the stop lamp switch signal is transmitted as a voltage signal.



ASCD Steering Switch

ASCD steering switch has various values of electrical resistance for each button. VCM reads voltage variation of switch, and determines which button is operated.

Brake Pedal Position Switch

The brake pedal position switch is installed to the brake pedal bracket. The switch detects the state of the brake pedal and transmits an ON/OFF signal to VCM.

The contact of the brake pedal position switch is usually closed. When the brake pedal is depressed, it opens to disconnect the circuit, and shut off the output voltage. This constitutes an brake pedal position switch signal.

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Battery Current Sensor (With Battery Temperature Sensor)

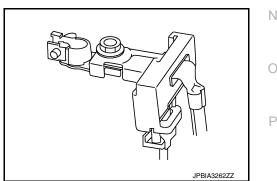
BATTERY CURRENT SENSOR

The battery current sensor is installed to the negative cable of the battery. The battery current sensor detects the battery charge/discharge current and transmits signals to VCM. VCM judges the battery load based on these signals and controls the power generation by converting the target generation voltage to a power generation command signal and transmitting it to the DC/DC converter. **CAUTION:**

Never connect the electrical component or the ground wire directly to the battery terminal. The connection causes the malfunction of the power voltage variable control, and may cause the battery to discharge.

BATTERY TEMPERATURE SENSOR

Battery temperature sensor is integrated in battery current sensor. The sensor measures temperature around the battery.



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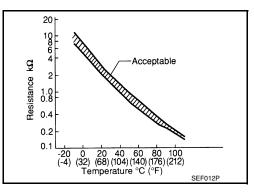
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< SYSTEM DESCRIPTION >

This sensor uses a thermistor and its electrical resistance varies as the temperature varies. VCM detects a voltage change caused by the change in electrical resistance.

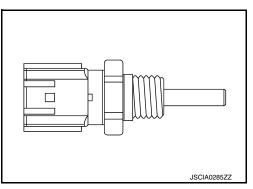
<Reference data>

Temperature [°C (°F)]	Voltage (V)	Resistance (k Ω)
25 (77)	3.333	1.9 - 2.1
90 (194)	0.969	0.222 - 0.258



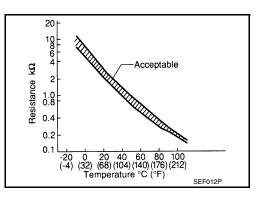
Coolant Temperature Sensor

The coolant temperature sensor is detects the coolant temperature. This sensor uses a thermistor that changes its electrical resistance according to the temperature. VCM detects a voltage change according to electrical resistance change.



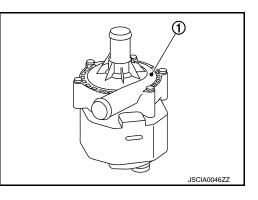
<Reference value>

Coolant temperature [°C (°F)]	Voltage (V)	Resistance (k Ω)
-10 (14)	4.4	7.0 - 11.4
20 (68)	3.5	2.35 - 2.73
50 (122)	2.2	0.68 - 1.00
90 (194)	0.9	0.236 - 0.260



Electric Water Pump

The electric water pump ① feeds coolant by pressure, which circulates in the high voltage system cooling circuit. They are controlled by VCM independently so that the amount of pressure feed is adjusted according to the vehicle speed and water temperature. The electric water pump also integrates an interface circuit that monitors the pump function for any malfunction, and it transmits a malfunction signal to VCM if necessary.



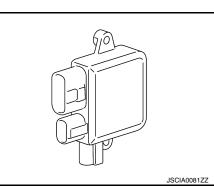
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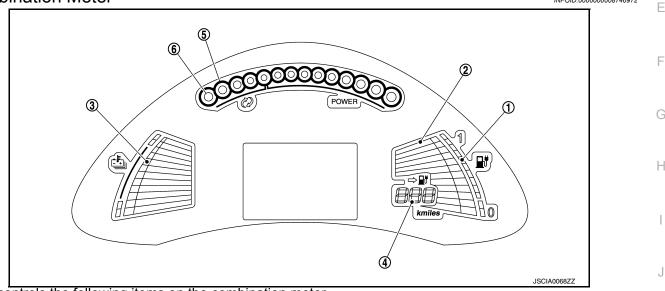
Cooling Fan Control Module

The cooling fan control module is mounted on the cooling fan and drives the cooling fan motor.

The cooling fan control module conducts communication between VCM via the PWM communication. The cooling fan control module drives the cooling fan motor so that the cooling fan speed is controlled in accordance with the control signal from VCM.



Combination Meter



VCM controls the following items on the combination meter.

LI-ION BATTERY INFORMATION

Li-ion Battery Capacity Level Gauge ①

VCM receives the Li-ion battery capacity signal from the Li-ion battery controller, and VCM transmits the signal to the combination meter to display the maximum capacity of the Li-ion battery. When the capacity of the Li-ion battery decreases with age and usage, the level of the gauge is also decreased.

Li-ion Battery Available Charge Gauge (2)

VCM receives the Li-ion battery available charge signal from the Li-ion battery controller, and VCM transmits Μ the signal to the combination meter to display the available Li-ion battery charge to run the vehicle.

Li-ion Battery Temperature Gauge (3)

Ν VCM receives the Li-ion battery temperature signal from the Li-ion battery controller, and VCM transmits the signal to the combination meter to display the Li-ion battery temperature.

Distance Range (4)

The driving range (km or miles) provides an estimated distance that the vehicle can be driven before recharging is necessary. The driving range is constantly being calculated, based on the amount of available Li-ion battery charge and the actual power consumption average.

VCM calculates average electricity consumption at a specified travel distance, according to total power con-Ρ sumption of the vehicle. Based on the average electricity consumption and the Li-ion battery available charge signal received from the Li-ion battery, VCM calculates driving range and transmits a driving range signal to the combination meter.

POWER METER

Maximum Power (5)

INFOID:0000000874697

INFOID:000000008746972

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EVC-23

< SYSTEM DESCRIPTION >

VCM receives a maximum motor output power signal from the traction motor inverter and a maximum regenerative power signal from the Li-ion battery controller. VCM transmits these signals to the combination meter and displays the upper limit of available output power and regenerative electric power.

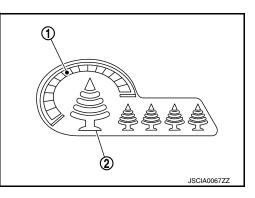
Current Motor Power 6

VCM receives the current motor power signal from the traction motor inverter, and VCM transmits the signal to the combination meter to display the power currently being output.

ECO Indicator

INFOID:000000008746974

The ECO indicator shows the instantaneous ECO drivability in the instant ECO indicator ①, and shows the cumulative ECO drivability, during 1 trip in the ECO tree ②. For information regarding control, refer to EVC-66, "ECO INDICA-TOR CONTROL : System Description".



Approaching Vehicle Sound for Pedestrians (VSP)

VSP informs the user of various information by electronic sounds. In the following cases, VCM transmits a operation signal to VSP.

Condition	Operation status	
EVSE is connected to the normal charge port	Short beep (once)	
When normal charging starts	Short beeps in sequence (twice)	
When timer charge goes into standby mode		
Press the charge port lid opener switch or the charge port lid open- er button of intelligent key (Hazard and buzzer reminder)	Three short beeps	
When EVSE is not connected correctly	Three short beeps continue repeatedly for 30 seconds	

For details of the charge sound system of VSP, Refer to <u>VSP-19</u>, <u>"CHARGE SOUND SYSTEM : System</u> <u>Description"</u>.

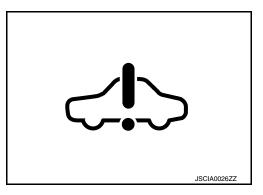
WARNING LAMPS/INDICATOR LAMPS

WARNING LAMPS/INDICATOR LAMPS : EV System Warning Lamp

INFOID:000000009315488

DESIGN/PURPOSE

The EV system warning lamp turns ON if a malfunction occurs with the EV system.



BULB CHECK

For approximately 2 seconds after the power switch is turned ON.

SYNCHRONIZATION WITH MASTER WARNING LAMP

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< SYSTEM DESCRIPTION >

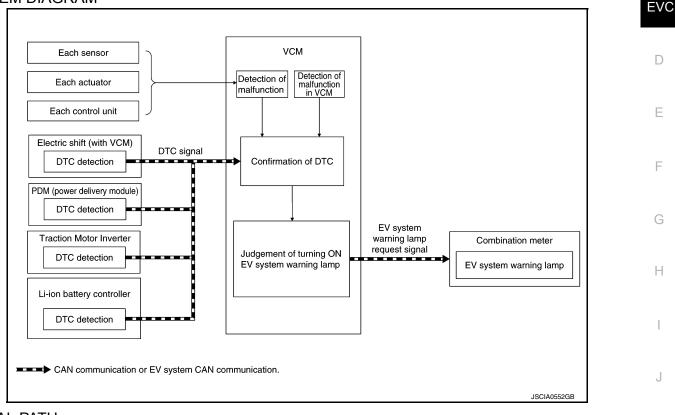
Synchronization is applied.

For master warning lamp, refer to MWI-31, "MASTER WARNING LAMP : System Description".

OPERATION AT COMBINATION METER CAN COMMUNICATION CUT-OFF OR UNUSUAL SIGNAL

For actions on CAN communications blackout in the combination meter, refer to <u>MWI-15, "METER SYSTEM :</u> ^B <u>Fail-Safe"</u>.

SYSTEM DIAGRAM



SIGNAL PATH

If VCM detects a malfunction or receives an EV system warning lamp request signal from any other ECUs,	K
VCM transmits an EV system warning lamp request signal to the combination meter via CAN communica-	
tion.	
Combination meter illuminates EV system warning lamp according to the input signal.	
	If VCM detects a malfunction or receives an EV system warning lamp request signal from any other ECUs, VCM transmits an EV system warning lamp request signal to the combination meter via CAN communica- tion.

LIGHTING CONDITION

When all of the following conditions are satisfied:

- Power switch: ON or READY
- EV system-related DTC is confirmed.
 - NOTE:

For DTCs that the EV system warning lamp turns ON, refer to EVC-102. "DTC Index".

SHUTOFF CONDITION

When any of the following conditions are satisfied:

Power switch: OFF
 OFF
 DTC is erased.
 NOTE:

• The warning lamp may turn ON even after the power switch is turned OFF, depending on a detected DTC.

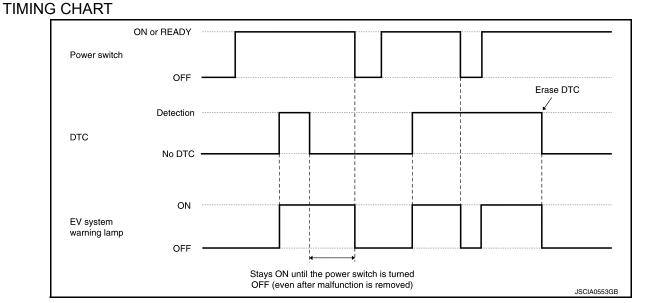
• For DTC erasing method, refer to EVC-73, "CONSULT Function".

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< SYSTEM DESCRIPTION >

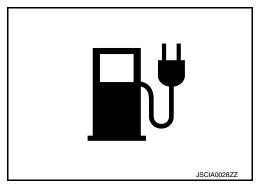


WARNING LAMPS/INDICATOR LAMPS : Low Battery Charge Warning Lamp

INFOID:000000009315489

DESIGN/PURPOSE

The low battery charge warning lamp turns ON when the Li-ion battery remaining energy is lowered.



BULB CHECK Not applicable

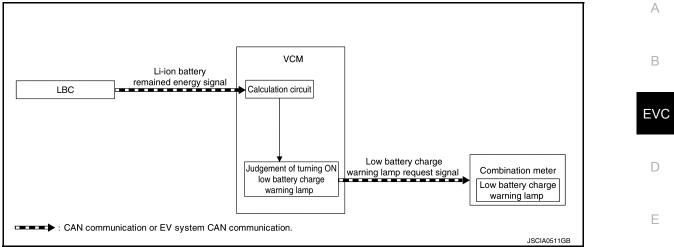
SYNCHRONIZATION WITH MASTER WARNING LAMP Synchronization is applied. For master warning lamp, refer to <u>MWI-31, "MASTER WARNING LAMP : System Description"</u>.

OPERATION AT COMBINATION METER CAN COMMUNICATION CUT-OFF OR UNUSUAL SIGNAL

For actions on CAN communications blackout in the combination meter, refer to <u>MWI-15</u>, <u>"METER SYSTEM :</u> <u>Fail-Safe"</u>.

< SYSTEM DESCRIPTION >

SYSTEM DIAGRAM



SIGNAL PATH

- LBC transmits a Li-ion battery remained energy signal to VCM.
- VCM calculates a remaining Li-ion battery power according to a signal received from LBC. When judging low remaining battery power, VCM transmits a low battery charge warning lamp request signal to the combination meter.

LIGHTING CONDITION

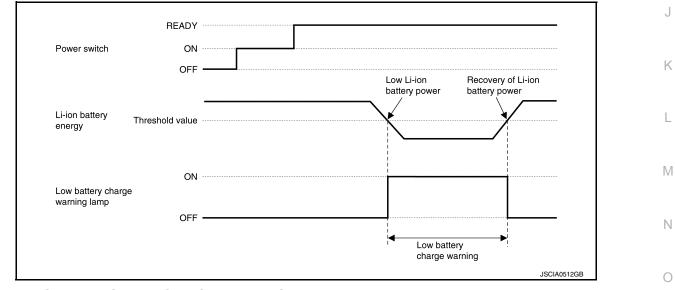
When all of the following conditions are satisfied:

- Power switch: ON or READY
- · When Li-ion battery remaining energy is Approx. 4 kWh or less.

SHUTOFF CONDITION

When Li-ion battery remaining energy recovers to 4.5 kWh or more.

TIMING CHART



WARNING LAMPS/INDICATOR LAMPS : Plug In Indicator Lamp

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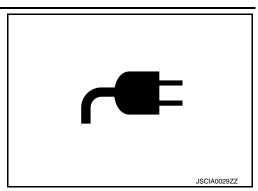
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DESIGN/PURPOSE

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< SYSTEM DESCRIPTION >

The plug in indicator lamp turns ON when a charge connector is connected to the normal charge port or the quick charge port.

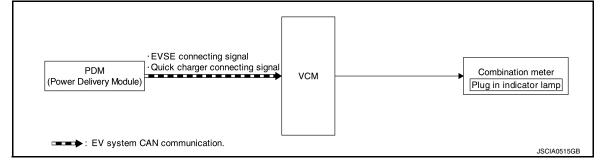


BULB CHECK

For approximately 2 seconds after the power switch is turned ON.

SYNCHRONIZATION WITH MASTER WARNING LAMP Not applicable

SYSTEM DIAGRAM



SIGNAL PATH

- When the charge connector is connected to the normal charge port, PDM (Power Delivery Module) transmits an EVSE connecting signal to VCM.
- When the charge connector is connected to the quick charge port, PDM (Power Delivery Module) transmits a quick charger connecting signal to VCM.
- When receiving an EVSE connecting signal or quick charger connecting signal, VCM supplies power to the plug in indicator lamp located in the combination meter and turns ON the plug in indicator lamp.
 NOTE:

When EVSE is connected to the normal charge port, the indicator lamp turns OFF if no operation is performed for ten consecutive seconds or more.

LIGHTING CONDITION

The charge connector is connected to the normal charge port or the quick charge port.

BLINKING CONDITION

While charging

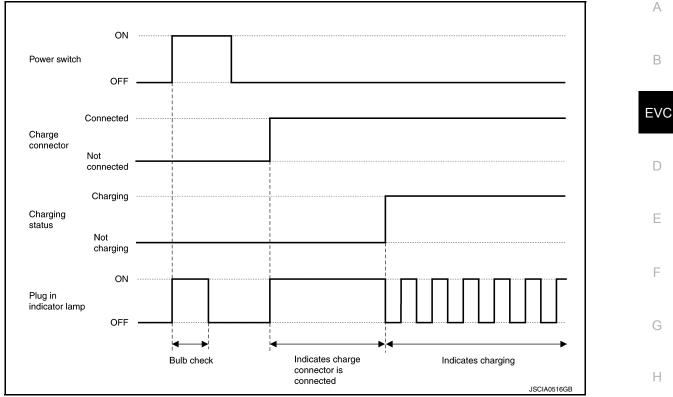
SHUTOFF CONDITION

When any of the following conditions are satisfied:

- No operation for 10 seconds or more after connecting EVSE
- Disconnect charge connector.

< SYSTEM DESCRIPTION >

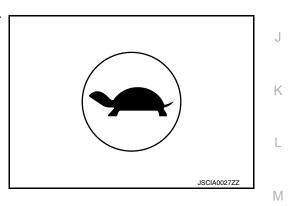
TIMING CHART



WARNING LAMPS/INDICATOR LAMPS : Power Limitation Indicator Lamp INFOID:00000003315491

DESIGN/PURPOSE

The power limitation indicator lamp turns ON when the traction motor output is limited.



BULB CHECK

For approximately 2 seconds after the power switch is turned ON.

SYNCHRONIZATION WITH MASTER WARNING LAMP

Synchronization is applied.

For master warning lamp, refer to MWI-31, "MASTER WARNING LAMP : System Description".

OPERATION AT COMBINATION METER CAN COMMUNICATION CUT-OFF OR UNUSUAL SIG- ONAL

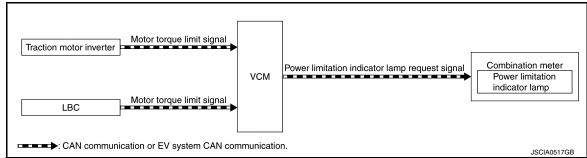
For actions on CAN communications blackout in the combination meter, refer to <u>MWI-15, "METER SYSTEM :</u> <u>Fail-Safe"</u>.

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< SYSTEM DESCRIPTION >

SYSTEM DIAGRAM



SIGNAL PATH

- The traction motor inverter transmits a motor torque limit signal to VCM when the traction motor needs to be protected.
- LBC transmits a motor torque limit signal to VCM when Li-ion battery cannot output power normally.
- When receiving a motor torque limit signal from the traction motor inverter or LBC, VCM transmits a power limitation indicator lamp request signal to the combination meter.
- The combination meter turns ON the power limitation indicator lamp according to the signal.

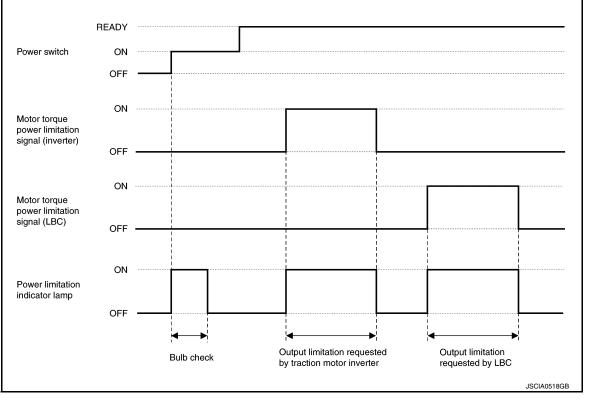
LIGHTING CONDITION

For lighting condition, refer to EVC-50, "MOTOR POWER CONTROL : System Description".

SHUTOFF CONDITION

The traction motor or Li-ion battery returns from the output limiting state.

TIMING CHART

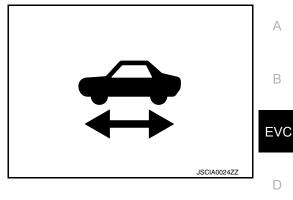


WARNING LAMPS/INDICATOR LAMPS : Ready To Drive Indicator Lamp INFOLD:0000000315492

DESIGN/PURPOSE

< SYSTEM DESCRIPTION >

The READY to drive indicator lamp indicates that the vehicle is in a state allowing vehicle travel.



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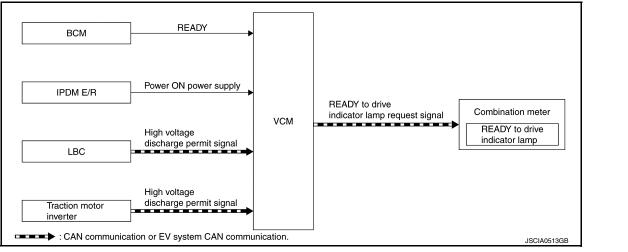
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BULB CHECK Not applicable

SYNCHRONIZATION WITH MASTER WARNING LAMP Not applicable

SYSTEM DIAGRAM



SIGNAL PATH

- BCM transmits a READY signal to VCM when the driver operates the power switch to READY.
- The high voltage circuit is connected when VCM receives a READY signal. When the high voltage circuit is connected normally, LBC and the traction motor inverter transmit a high voltage discharge permit signal to VCM.
- When receiving a high voltage discharge permit signal, VCM judges that the vehicle is in a drivable condition and transmits a READY to drive indicator lamp request signal to the combination meter for turning ON the READY to drive indicator lamp.

LIGHTING CONDITION

Vehicle: READY state.

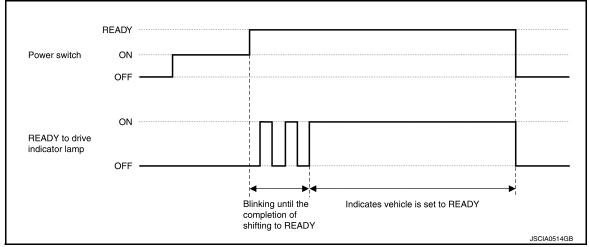
- SHUTOFF CONDITION
- Power switch: OFF
- When a malfunction occurs in EV system.

BLINKING CONDITION

When operating from power switch ON to READY

< SYSTEM DESCRIPTION >

TIMING CHART

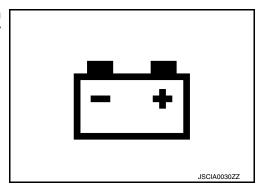


WARNING LAMPS/INDICATOR LAMPS : 12V Battery Charge Warning Lamp

INFOID:000000009315493

DESIGN/PURPOSE

The 12V battery charge warning lamp turns ON when a malfunction occurs in the DC/DC converter simultaneously with a 12V battery voltage drop.



BULB CHECK

For approximately 2 seconds after the power switch is turned ON.

SYNCHRONIZATION WITH MASTER WARNING LAMP

Synchronization is applied.

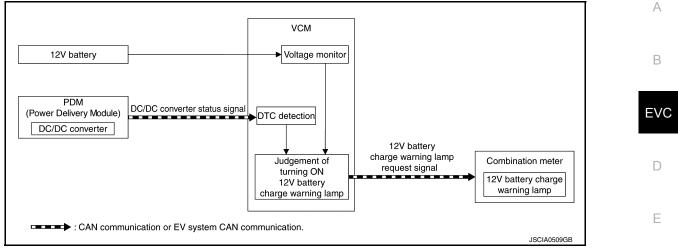
For master warning lamp, refer to MWI-31, "MASTER WARNING LAMP : System Description".

OPERATION AT COMBINATION METER CAN COMMUNICATION CUT-OFF OR UNUSUAL SIGNAL

For actions on CAN communications blackout in the combination meter, refer to <u>MWI-15. "METER SYSTEM :</u> <u>Fail-Safe"</u>.

< SYSTEM DESCRIPTION >

SYSTEM DIAGRAM



SIGNAL PATH

- VCM monitors the status of DC/DC converter by receiving a DC/DC converter status signal from PDM (Power Delivery Module).
- When detecting a malfunction in the DC/DC converter simultaneously with a 12V battery voltage drop, VCM transmits a 12V battery charge warning lamp request signal to the combination meter for turning on the 12V G battery charge warning lamp.

LIGHTING CONDITION

When any of the following conditions are satisfied:

- Power switch: ON
- When VCM detects a malfunction in the DC/DC converter during the READY state simultaneously with a 12V battery voltage drop (approximately 12.5 V or less) for a few seconds.
 NOTE:
 - When 12V battery voltage drops sharply while in READY state, the READY state is also cancelled.
 - When 12V battery voltage becomes low, the 12V battery charge warning lamp turns ON and the buzzer sounds if the shift position is not in P position.

SHUTOFF CONDITION

When all of the following conditions are satisfied:

- When 12V battery voltage returns to normal, the 12V battery charge warning lamp turns OFF.
- The DC/DC converter operates normally.

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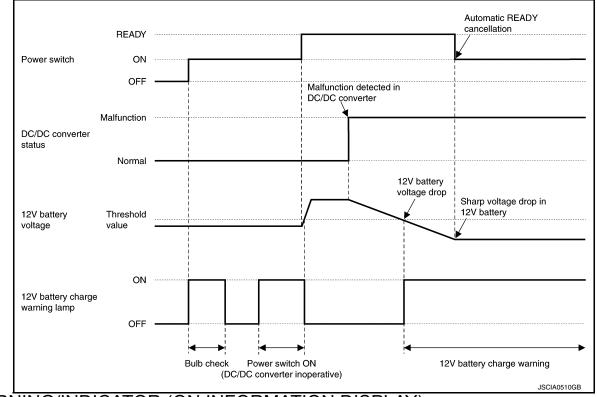
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< SYSTEM DESCRIPTION >

TIMING CHART



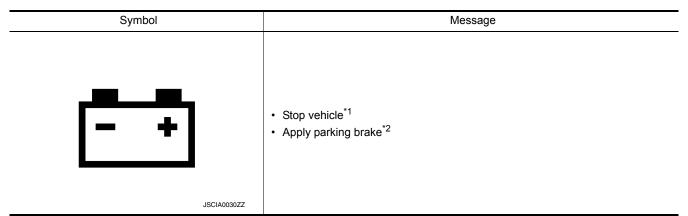
WARNING/INDICATOR (ON INFORMATION DISPLAY)

WARNING/INDICATOR (ON INFORMATION DISPLAY) : DC/DC Converter Warning

INFOID:000000009315494

DESIGN/PURPOSE

DC/DC converter warning warns the driver of 12V battery voltage drop.



*1: When 12V battery voltage drops while driving.

*2: When 12V battery voltage drops with the shift position not in P position.

SYNCHRONIZATION WITH MASTER WARNING LAMP

Synchronization is applied.

For master warning lamp, refer to MWI-31, "MASTER WARNING LAMP : System Description".

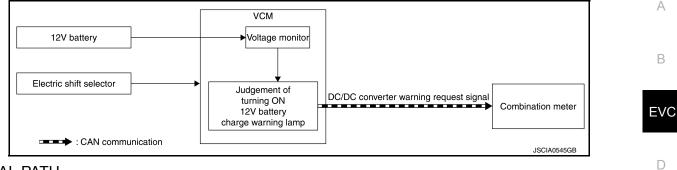
SYNCHRONIZATION WITH WARNING CHIME

Synchronization is applied.

For warning chime, refer to EVC-39, "WARNING CHIME : DC/DC Converter Warning Chime".

< SYSTEM DESCRIPTION >

SYSTEM DIAGRAM



SIGNAL PATH

- VCM monitors 12V battery voltage, and if the voltage drops, then VCM transmits a DC/DC converter warning request signal to the combination meter to display a DC/DC converter warning.
- When receiving a P range signal from the electric shift selector, VCM cancels a DC/DC converter warning.

WARNING/INDICATOR OPERATING CONDITION

When all of the following conditions are satisfied:

Shift position: Except P range

12V battery voltage stays low (approximately 10 – 12 V or less)^{*} for a few consecutive seconds.
 *: Threshold voltage depends on vehicle speeds.

NOTE:

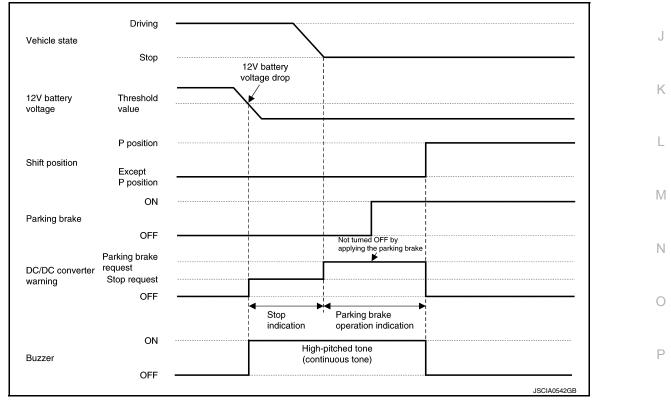
When 12V battery voltage drops sharply while in READY state, the READY state is also cancelled.

WARNING/INDICATOR CANCEL CONDITION

When any of the following conditions are satisfied:

- Shift position: P range
- The 12V battery voltage returns to approximately 12.5 V or more.

TIMING CHART



WARNING/INDICATOR (ON INFORMATION DISPLAY) : Low Battery Charge Warning

DESIGN/PURPOSE

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< SYSTEM DESCRIPTION >

Low battery charge warning is displayed when Li-ion battery power becomes low.

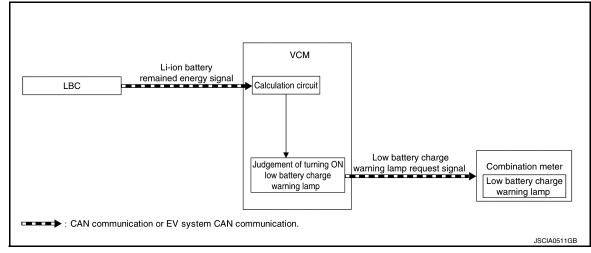
Symbol	Message
_	Battery level is low

SYNCHRONIZATION WITH MASTER WARNING LAMP

Synchronization is applied.

For master warning lamp, refer to MWI-31, "MASTER WARNING LAMP : System Description".

SYSTEM DIAGRAM



SIGNAL PATH

- LBC transmits a Li-ion battery remaind energy signal to VCM.
- VCM calculates a remaining Li-ion battery power according to a signal received from LBC. When judging low remaining battery power, VCM transmits a low battery charge warning lamp request signal to the combination meter.

WARNING/INDICATOR OPERATING CONDITION

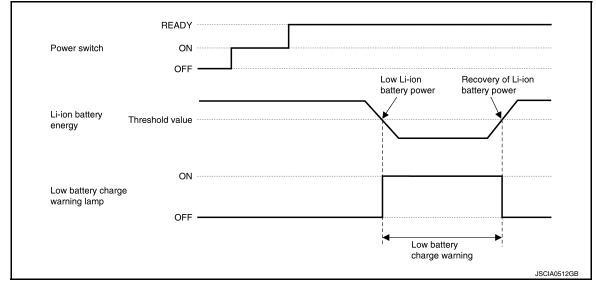
- When all of the following conditions are satisfied:
- · Power switch: ON or READY
- When Li-ion battery power is 4 kWh or less.

WARNING/INDICATOR CANCEL CONDITION

When Li-ion battery power returns to 4.5 kWh or more.

TIMING CHART

Low battery charge warning is displayed in synchronization with the low battery charge warning lamp.



< SYSTEM DESCRIPTION >

WARNING/INDICATOR (ON INFORMATION DISPLAY) : Power Limitation Warning

DESIGN/PURPOSE

Power limitation warning shows that traction motor output is limited.

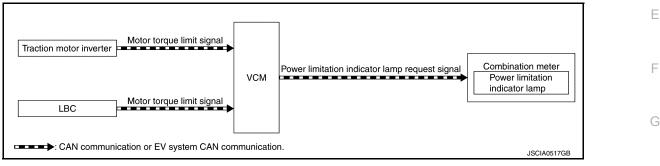
Symbol	Message	
	Motor power is limited	EVC

SYNCHRONIZATION WITH MASTER WARNING LAMP

Synchronization is applied.

For master warning lamp, refer to MWI-31, "MASTER WARNING LAMP : System Description".

SYSTEM DIAGRAM



SIGNAL PATH

- The traction motor inverter transmits a motor torque limit signal to VCM when the traction motor needs to be protected.
- When Li-ion battery cannot output power normally, a motor torque limit signal is transmitted to VCM.

WARNING/INDICATOR OPERATING CONDITION

For warning/indicator operating condition, refer to EVC-50, "MOTOR POWER CONTROL : System Descrip	<u>) –</u>
tion".	L.

WARNING/INDICATOR CANCEL CONDITION

The traction motor or Li-ion battery returns from the output limiting state.

TIMING CHART

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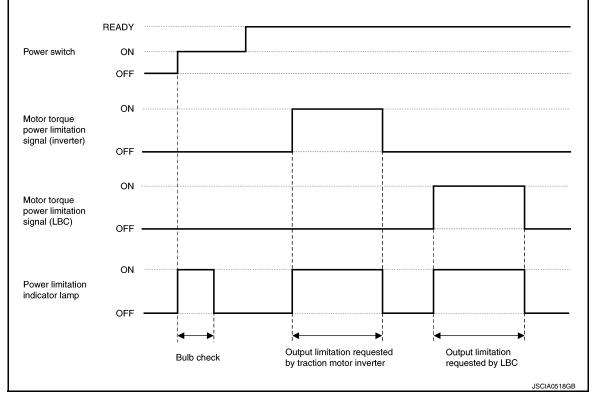
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INFOID:000000009315496

< SYSTEM DESCRIPTION >

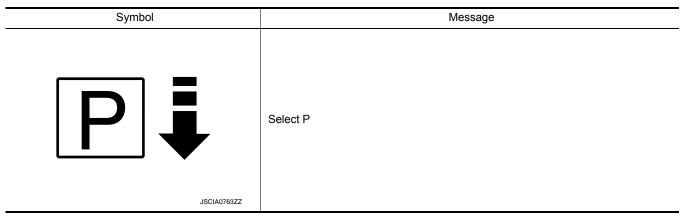
Power limitation warning is displayed in synchronization with the power limitation indicator lamp.



WARNING/INDICATOR (ON INFORMATION DISPLAY) : Shift P Warning INFOID:00000003315497

DESIGN/PURPOSE

Shift P warning warns that the driver is getting off the vehicle with the shift position not in P position.



SYNCHRONIZATION WITH MASTER WARNING LAMP

Synchronization is applied.

For master warning lamp, refer to MWI-31, "MASTER WARNING LAMP : System Description".

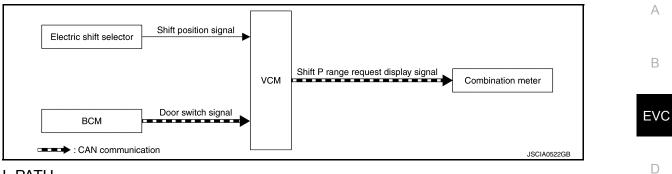
SYNCHRONIZATION WITH WARNING CHIME

Synchronization is applied.

For warning chime, refer to EVC-41, "WARNING CHIME : Shift P Warning Chime".

< SYSTEM DESCRIPTION >

SYSTEM DIAGRAM



SIGNAL PATH

- The electric shift selector sends shift position information to VCM.
- BCM transmits a door switch signal to VCM.
- VCM judges the vehicle condition according to shift position information and a door switch signal. VCM transmits a shift P range request display signal to the combination meter if the driver's door is opened with the shift position not in P position.

WARNING/INDICATOR OPERATING CONDITION

When all of the following conditions are satisfied:

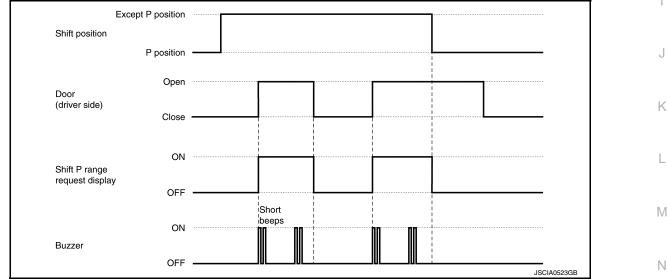
- Shift position: Except P range
- Front door (driver side): Open

WARNING/INDICATOR CANCEL CONDITION

The indication is cancelled when any of the following conditions are satisfied:

- The shift position is changed to P position.
- The driver's door is closed.

TIMING CHART



WARNING CHIME

WARNING CHIME : DC/DC Converter Warning Chime

INFOID:000000009315498

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PURPOSE

The DC/DC converter warning chime warns the driver that 12V battery voltage is low.

SYNCHRONIZATION WITH WARNING LAMP/INDICATOR LAMP

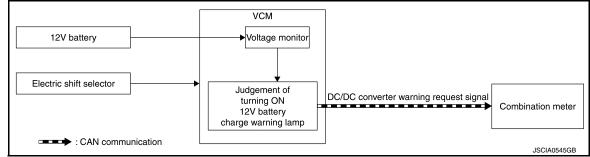
Not applicable

SYNCHRONIZATION WITH WARNING/INDICATOR (INFORMATION DISPLAY)

Synchronization is applied. For information display, refer to <u>EVC-34</u>, <u>"WARNING/INDICATOR (ON INFORMATION DISPLAY)</u> : <u>DC/DC</u> <u>Converter Warning"</u>.

< SYSTEM DESCRIPTION >

SYSTEM DIAGRAM



SIGNAL PATH

- VCM monitors 12V battery voltage, and if the voltage drops, then VCM transmits a DC/DC converter warning request signal to the combination meter to operate a DC/DC converter warning chime.
- When VCM receives a P position signal from the electric shift selector, the operation of DC/DC converter warning chime is cancelled.

WARNING OPERATING CONDITION

When all of the following conditions are satisfied:

- Shift position: Except P range
- 12V battery voltage stays low (approximately 10 12 V or less)^{*} for a few consecutive seconds.
 *: Threshold voltage depends on vehicle speeds.
 NOTE:

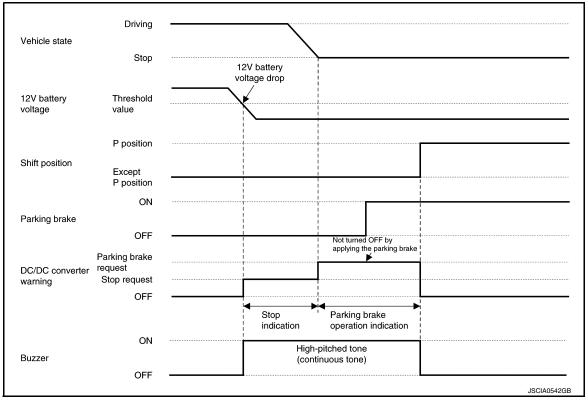
When 12V battery voltage drops sharply while in READY state, the READY state is also cancelled.

WARNING CANCEL CONDITION

When any of the following conditions are satisfied:

- Shift position: P range
- The 12V battery voltage returns to approximately 12.5 V or more.

TIMING CHART



WARNING CHIME : Power Switch Reminder Chime

INFOID:000000009315499

PURPOSE

< SYSTEM DESCRIPTION >

The power switch reminder chime warns the driver that the driver's door is opened with power switch ON or in READY state.

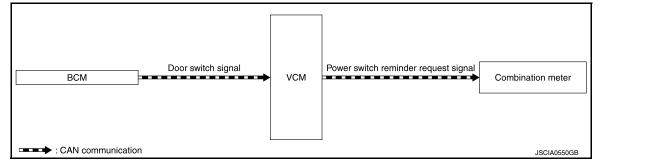
SYNCHRONIZATION WITH WARNING LAMP/INDICATOR LAMP Not applicable

SYNCHRONIZATION WITH WARNING/INDICATOR (INFORMATION DISPLAY)

Synchronization is applied.

For information display, refer to <u>MWI-35</u>, "INFORMATION DISPLAY : System Description".

SYSTEM DIAGRAM



SIGNAL PATH

- · BCM transmits a door switch signal to VCM.
- VCM judges the vehicle condition according to a door switch signal and power supply condition. VCM transmits a power switch reminder request signal to the combination meter if the driver's door is opened with the power switch ON or in READY state.

WARNING OPERATING CONDITION

When all of the following conditions are satisfied:

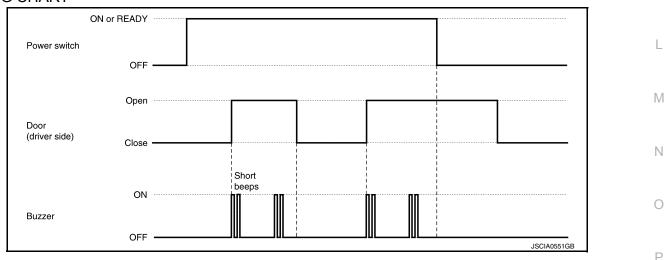
- Power switch: ON or READY
- Door switch: ON (Door is open)

WARNING CANCEL CONDITION

When any of the following conditions are satisfied:

- Power switch: Except ON or READY
- Door switch: OFF (Door is closed)

TIMING CHART



WARNING CHIME : Shift P Warning Chime

INFOID:000000009315500

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PURPOSE

The shift P warning chime warns that the drive is getting off the vehicle with the shift position not in P position. SYNCHRONIZATION WITH WARNING LAMP/INDICATOR LAMP Not applicable

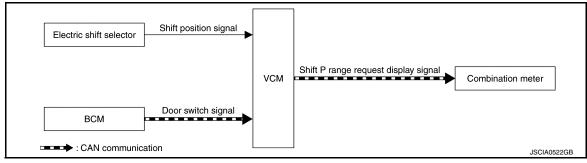
< SYSTEM DESCRIPTION >

SYNCHRONIZATION WITH WARNING/INDICATOR (INFORMATION DISPLAY)

Synchronization is applied.

For information display, refer to EVC-38, "WARNING/INDICATOR (ON INFORMATION DISPLAY) : Shift P Warning".

SYSTEM DIAGRAM



SIGNAL PATH

- · The electric shift selector sends shift position information to VCM.
- BCM transmits a door switch signal to VCM.
- VCM judges the vehicle condition according to shift position information and a door switch signal. VCM transmits a shift P range request display signal to the combination meter if the driver's door is opened with the shift position not in P position.

WARNING OPERATING CONDITION

When all of the following conditions are satisfied:

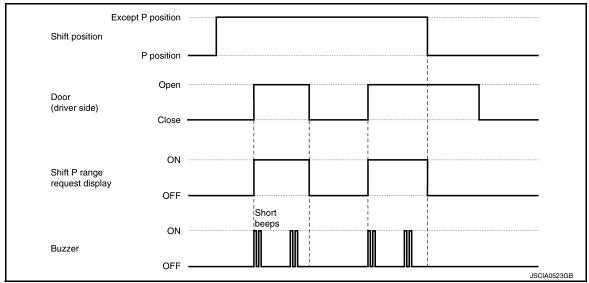
- Shift position: Except P range
- Front door (driver side): Open

WARNING CANCEL CONDITION

The indication is cancelled when any of the following conditions are satisfied:

- The shift position is changed to P position.
- The driver's door is closed.

TIMING CHART



SYSTEM ELECTRIC POWER TRAIN SYSTEM ELECTRIC POWER TRAIN SYSTEM : System Description

INFOID:000000008746978

CONTROL OUTLINE

EV requires electric power for the operation of all its systems.

The power stored in the Li-ion battery is supplied as high-voltage direct current to the high-voltage system while also being converted to 13-15 V by the DC/DC converter and supplied to the 12 V power system. VCM judges the vehicle status from various information and performs various EV system controls in a comprehensive manner.

Main Control Contents of EV

Control	Reference
EV system start-up control	EVC-46, "EV SYSTEM START UP CONTROL : System Descrip- tion"
High voltage power supply control	EVC-49, "HIGH VOLTAGE POWER SUPPLY CONTROL : System Description"
Motor power control	EVC-50, "MOTOR POWER CONTROL : System Description"
Motor regeneration control	EVC-51, "MOTOR REGENERATION CONTROL : System De- scription"
ECO mode / B mode	EVC-52, "ECO MODE/B MODE SYSTEM : System Description"
Electric shift control	TM-42, "ELECTRIC SHIFT SYSTEM : System Description"
Li-ion battery charge control	EVC-53. "LI-ION BATTERY CHARGE CONTROL : System De- scription"
Cooperative Regenerative brake control	BR-15, "System Description"
High voltage system cooling control	EVC-55, "HIGH VOLTAGE SYSTEM COOLING CONTROL : Sys- tem Description"
Air conditioner control	EVC-58, "AIR CONDITIONER CONTROL : System Description"
Power voltage variable control	EVC-60. "POWER VOLTAGE VARIABLE CONTROL SYSTEM : System Description"
Automatic 12V battery charge control	EVC-61, "AUTOMATIC 12V BATTERY CHARGE CONTROL : System Description"
Power cut off control	EVC-62, "POWER CUT OFF CONTROL : System Description"
Charge port control	EVC-63, "CHARGE PORT CONTROL : System Description"
ASCD (automatic speed control device)	EVC-65, "AUTOMATIC SPEED CONTROL DEVICE (ASCD) : System Description"
ECO indicator control	EVC-66, "ECO INDICATOR CONTROL : System Description"

ELECTRIC POWER TRAIN SYSTEM : Fail-Safe

FAIL-SAFE PATTERN

- · Pattern A: Quick charge prohibited
- Pattern B: Normal charge prohibited
- Pattern C: READY OFF
- Pattern D: High-voltage power supply stop

FAIL-SAFE LIST

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×:Applicable

INFOID:000000009314521

DTC			Pat	tern		Others
		А	В	С	D	Others
11010	TYPE 1			×		
U1010	TYPE 2	×	×	×	×	

Revision: October 2013

2013 LEAF

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< SYSTEM DESCRIPTION >

	DTO		Pat	ttern		Others
	DTC	А	В	С	D	Others
P0A8D		×	×	×	×	
P0A8E		×	×	×	×	
P0AA0		×	×	×	×	Start not possible
P0AA1		×	×	×	×	Start not possible
P0AA2		×	×	×	×	
P0AA4		×	×	×	×	Start not possible
P0AA5		×	×	×	×	
P0AA6		×	×			Doing READY again is prohibited.
P1564						ASCD operation prohibited
P1572						ASCD operation prohibited
P1574						ASCD operation prohibited
P1610		×	×	×	×	Start not possible
P1611		×	×	×	×	Start not possible
P1612		×	×	×	×	Start not possible
P2122 P2123 P2127 P2128						 Traction motor output is limited. Reduced responsiveness during accelerator operation
	TYPE 1			×		
P2138	TYPE 2					Traction motor output is limited.Reduced responsiveness during accelerator operation
P3100		×	×	×	×	
	TYPE 1			×		
P3101	TYPE 2	×	×	×	×	Start not possible
	TYPE 3					No fail-safe.
P3102						Traction motor output is limited.
P3117						 VCM inhibits the operation of the electric compressor. VCM inhibits the operation of the PTC heater.
P312B		×	×	×	×	
P312C		×	×	×	×	
P312D		×	×	×	×	
P312E		×	×	×	×	
P312F		×	×	×	×	
P3130		×	×	×	×	
P3131	TYPE 1	×	×	×	×	
F3131	TYPE 2					No fail-safe.
P3137		×	×	×	×	Start not possible
P3141			×			
P315C		×	×	×	×	
P316A				×		
P316C		×				
P316D				×		
P316F	TYPE 1 TYPE 2	×	×	×	×	
P3170	ITPE 2	×	×			
F31/U			×			

< SYSTEM DESCRIPTION >

	DTC		Pa	ttern		Others	
	DIC	Α	В	С	D	Others	A
P3173		×	×			Traction motor output is limited.	
P3175				×			E
P3176		×	×	×	×		
P3177		×	×	×	×		
P3178		×	×	×	×		E١
P317A				×			
P317B		×	×	×	×		Г
P317D				×			
P317E		×	×				
P3182		×	×	×	×		E
P3183		×	×				
P3187				×			г
50.400	TYPE 1	×	×			Traction motor output is limited.	F
P3188	TYPE 2					No fail-safe.	
50405	TYPE 1			×		Put the gear position in neutral.	0
P318B	TYPE 2	×	×	×	×		
50404	TYPE 1			×			
P3191	TYPE 2					No fail-safe.	ŀ
50400	TYPE 1	×	×			Only driving in creep is possible.	
P3193	TYPE 2					No fail-safe.	
D 0400	TYPE 1	×					
P3196	TYPE 2	×	×			Traction motor output is limited.	
P3197				×			U
P319C				×			
P319E		×	×			Only driving in creep is possible.	k
D24A4	TYPE 1	×					
P31A1	TYPE 2	×	×			Traction motor output is limited.	
P31A2				×			
P31A7				×			
P31A9		×	×			Only driving in creep is possible.	Ν
P31AD				×			I.
	TYPE 1	×					
P31AE	TYPE 2	×	×			Traction motor output is limited.	Ν
	TYPE 1					VCM inhibits the timer charge.	
P31B0	TYPE 2					VCM inhibits the timer charge and the remote climate control.	
	TYPE 3					No fail-safe.	C
P31B3	TYPE 1					When the power is turned on and the vehicle is charging, the cooling fan is operated at a constant speed.	F
	TYPE 2					No fail-safe.	F
	TYPE 1					VCM inhibits the timer charge.	
P31B4	TYPE 2					VCM inhibits the remote climate control.	
	TYPE 3					No fail-safe.	

< SYSTEM DESCRIPTION >

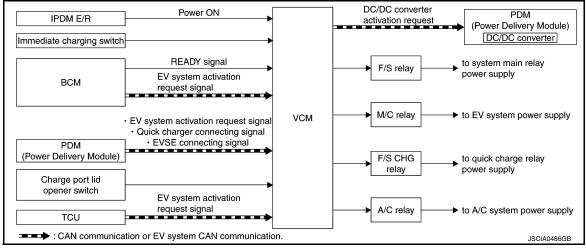
	DTC		Pa	ttern		-	
		Α	В	С	D		
P31B5	TYPE 1					ASCD operation prohibited NOTE: The ECO indicator value also becomes extremely poor.	
	TYPE 2					No fail-safe.	
P31B6						VCM sets the DC/DC converter output power to a constant 14 V.	
P31C5						 VCM inhibits the timer charge and the remote climate control. VCM inhibits the automatic 12V battery charge control. 	
P31C6						 VCM inhibits the timer charge and the remote climate control. VCM inhibits the automatic 12V battery charge control. 	
P31C7						 VCM inhibits the timer charge and the remote climate control. VCM inhibits the automatic 12V battery charge control. 	
P31CA		×				Traction motor output is limited.	
P31CB		×				Traction motor output is limited.	
P31D5						Traction motor output is limited.Vehicle speed is limited. [Approx. 40 km/h (25 MPH)]	
P31DB		×	×	×	×		
P31DC		×	×	×	×		
P31DE	TYPE 1					Traction motor output is limited.	
FUL	TYPE 2	×	×	×	×	Start not possible	
P31E0	TYPE 1	×	×	×	×		
	TYPE 2					No fail-safe.	
P31E1	TYPE 1	×	×	×	×		
	TYPE 2					No fail-safe.	
P31E7						Doing READY again is prohibited.	
P31F2						VCM inhibits the timer charge and the remote climate control.	

EV SYSTEM START UP CONTROL

EV SYSTEM START UP CONTROL : System Description

INFOID:000000008746980

SYSTEM DIAGRAM

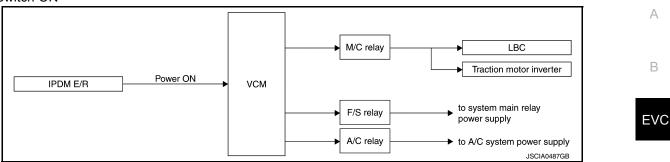


CONTROL DESCRIPTION

VCM judges the operation mode from signals sent by various sensors, switches, and ECUs, and controls the start/stop of the EV system by activating the relays accordingly.

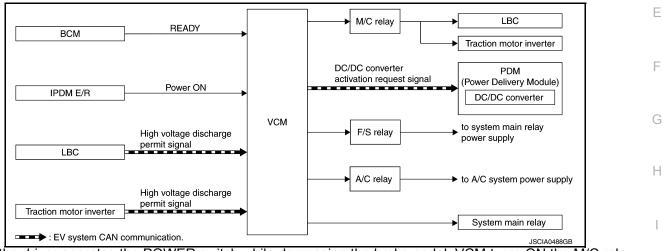
< SYSTEM DESCRIPTION >

Power Switch ON



When the power ON power supply from the IPDM E/R enters VCM, VCM turns ON the M/C relay to supply power to each ECU in the EV system.

READY



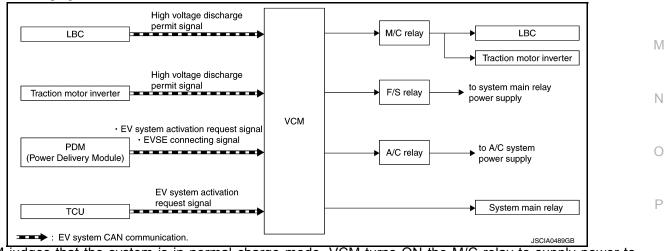
When the driver operates the POWER switch while depressing the brake pedal, VCM turns ON the M/C relay to supply power to each ECU in the EV system. Furthermore, VCM activates the F/S relay to start the power supply to the system main relay.

NOTE:

VCM inhibits the vehicle is set to READY in following conditions:

- · Charge connector is connected
- · Li-ion battery remaining energy is too low.
- Li-ion battery temperature is too low. [Approximately -25°C (-13°F)]

In Normal Charging



If VCM judges that the system is in normal charge mode, VCM turns ON the M/C relay to supply power to each ECU in the EV system. Furthermore, VCM activates the F/S relay to start the power supply to the system main relay.

NOTE:

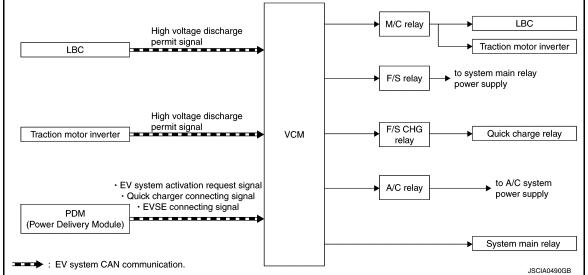
Normal charging does not start with the power switch ON.

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< SYSTEM DESCRIPTION >

In Quick Charging



When VCM judges that the system is in quick charge mode, VCM turns ON the M/C relay to supply power to each ECU in the EV system. VCM also activates the F/S CHG relay to supply power to the quick charge relay inside PDM (Power Delivery Module). Furthermore, VCM activates the F/S relay to start the power supply to the system main relay.

When Air Conditioner Is Operating (Power OFF)

When air conditioner is activated (e.g. remote climate control and Climate Ctrl. Timer), VCM turns ON the M/C relay to start the EV system. VCM also activates the A/C relay to supply power to the air conditioner system. Furthermore, VCM activates the F/S relay to start the power supply to the system main relay.

When Automatic 12V Battery Charge Control is Operating

When VCM judges that the 12V battery requires automatic charging, VCM turns ON the M/C relay to start the EV system. Furthermore, VCM activates the F/S relay to start the power supply to the system main relay.

Relay Activation Matrix

POWER ON

	Condition								
Relay	POWER ON	READY	Cha	rging	When 12V bat- tery is charged	Climate Ctrl.			
	POWERON	READT	Normal charge	Quick charge		Timer			
F/S relay	ON	ON	ON	ON	ON	ON			
M/C relay	ON	ON	ON	ON	ON	ON			
A/C relay	ON	ON	ON	ON	ON	ON			
F/S CHG relay	OFF	OFF	OFF	ON	OFF	OFF			

POWER OFF

	Condition								
Relay	Cha	rging	When 12V battery	Climate Ctrl. Timer	Remote cli-				
	Normal charge	Quick charge	is charged		mate control				
F/S relay	ON	ON	ON	ON	ON				
M/C relay	ON	ON	ON	ON	ON				
A/C relay	OFF	OFF	OFF	ON	ON				
F/S CHG relay	OFF	ON	OFF	OFF	ON [*]				

*: Only during quick charging HIGH VOLTAGE POWER SUPPLY CONTROL

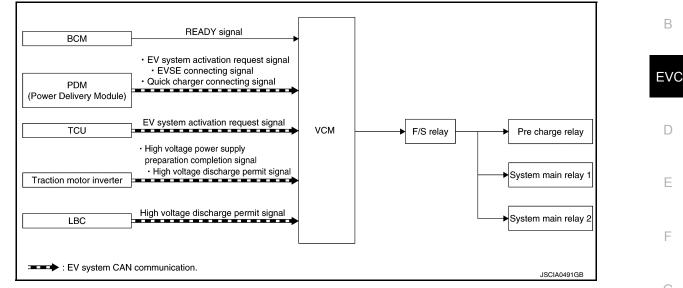
< SYSTEM DESCRIPTION >

HIGH VOLTAGE POWER SUPPLY CONTROL : System Description

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SYSTEM DIAGRAM



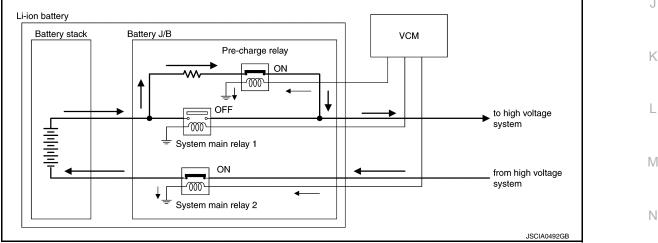
DESCRIPTION

When the driver performs the READY operation or connects the charge cable to a charging port or when VCM starts according to the timer control and judges the necessity of connecting the high voltage circuit to Li-ion battery, VCM activates system main relay 1, system main relay 2, and the pre-charge relay located inside the Li-ion battery to establish the circuit.

Moreover, the high voltage circuit of the EV system has a pre-charge circuit to protect the high voltage circuit from sudden application of high voltage current.

CONTROL FLOW

To connect the high voltage circuit, VCM first activates the system main relay 2 and pre-charge relay.



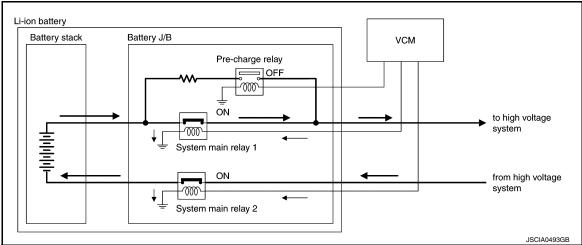
As a result, the high voltage power is supplied to the respective systems via the pre-charge resistor in the precharge circuit. When the condenser inside the traction motor inverter is fully charged by the applied power, the traction motor inverter transmits a high voltage power supply preparation completion signal to VCM. Receiving

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< SYSTEM DESCRIPTION >

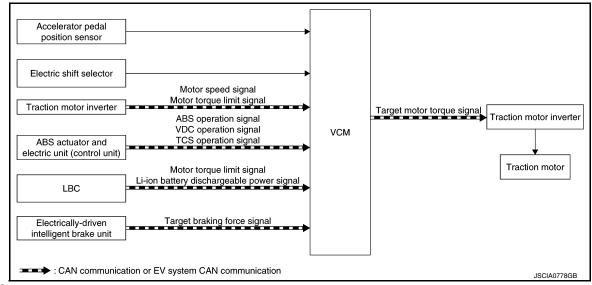
the signal, VCM activates the system main relay 1 and deactivates the pre-charge relay. Then, normal power is supplied to the respective systems.



MOTOR POWER CONTROL

MOTOR POWER CONTROL : System Description

SYSTEM DIAGRAM



NOTE:

VCM calculates vehicle speed, based on a motor speed.

DESCRIPTION

The EV system generates traction force by converting the direct current from the Li-ion battery to an alternating current by the traction motor inverter and operating the traction motor with the alternating current.

VCM calculates target traction force, based on an accelerator pedal position, vehicle speed, and shift position. After this, VCM adds creep force to the calculated target traction force.

Subsequently, VCM adds torque limitations to the calculated driving force, based on torque down signals received from each system, to decide a motor torque request signal.

This motor torque request signal is transmitted to the traction motor inverter via EV system CAN communication.

For the operation principle of the motor, refer to TMS-19, "MOTOR POWER CONTROL : Operating Principle".

OUTPUT LIMIT AND OUTPUT STOP REQUEST LIST

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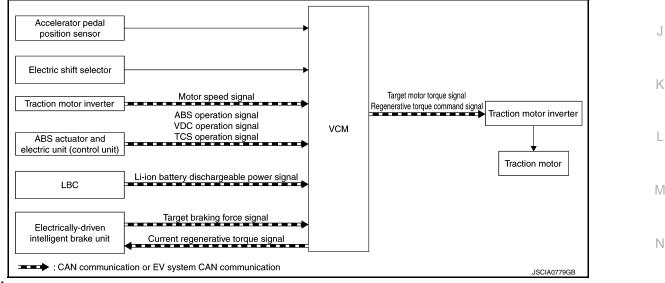
< SYSTEM DESCRIPTION >

Request ECU	Output limit cause	Power limitation indicator lamp	Condition	А
	Traction motor tempera- ture high	ON	When the traction motor or traction motor inverter reaches an abnormally high temperature	В
Traction Motor In- verter	Input power low	ON	When the high voltage power input to the traction motor inverter is 240 V or less	
	DTC detected	OFF	Refer to TMS-25, "Fail-safe".	EV
Li-ion battery controller	Li-ion battery remained energy low	ON	When the Li-ion battery cell voltage is low	
	Li-ion battery tempera- ture high	ON	When the Li-ion battery reaches an abnormally high tem- perature [Reference value: Approx. 55°C (131°F) or more]	D
	Li-ion battery tempera- ture low	ON	When the Li-ion battery reaches an abnormally low temper- ature. [Reference value: Approx. –10°C (14°F) or less]	Ε
	DTC detected	OFF	Refer to EVB-40, "Fail-safe".	_
	Acceleration/brakesignal plausibility error	OFF	When the accelerator pedal position sensor signal and stop lamp switch signal are input at the same time	F
VCM	Power train system pro- tection function	OFF	_	G
	DTC detected	OFF	Refer to EVC-97, "Fail-Safe".	

MOTOR REGENERATION CONTROL

MOTOR REGENERATION CONTROL : System Description

SYSTEM DIAGRAM



NOTE:

VCM calculates vehicle speed, based on a motor speed.

DESCRIPTION

The regenerative brake system is a function that operates the traction motor as a generator during deceleration, not for generating traction force as in normal driving, and converts the kinetic energy from the vehicle wheels to electric energy that is used to charge the Li-ion battery. At the same time, it utilizes the rotational resistance from the power generation as a part of the braking force.

For the operation principle, refer to TMS-20, "MOTOR REGENERATION CONTROL : Operating Principle".

REGENERATIVE BRAKE CONTROL

When the driver depresses the brake pedal during driving, Electrically-driven Intelligent Brake Unit transmits a target braking force signal to VCM. VCM calculates a target regenerative torque based on the signal and

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< SYSTEM DESCRIPTION >

transmits a target motor torque signal to the traction motor inverter. Moreover, VCM transmits the current regenerative torque signal to Electrically-driven Intelligent Brake Unit so that the Electrically-driven Intelligent Brake Unit can control the overall braking force.

For information on the Electrically-driven Intelligent Brake collaborative control, refer to <u>BR-20</u>, <u>"COOPERA-TIVE REGENERATIVE BRAKE FUNCTION : System Description"</u>.

REGENERATION CHARGE CONTROL

VCM determines the regenerative charging amount from the Li-ion battery maximum chargeable power signal sent from the Li-ion battery. Moreover, VCM determines the energy recovery amount while performing a collaborative control with the electrically-driven intelligent brake system so that a suitable braking force is provided according to the brake pedal operation amount.

After determining the energy recovery amount, VCM transmits a target motor torque signal to the traction motor inverter and starts regeneration charge.

If the Li-ion battery remaining energy is sufficient, VCM stops the regeneration charge control. **NOTICE:**

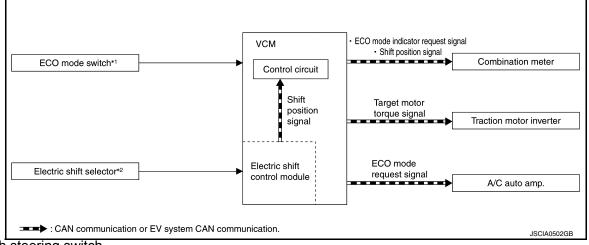
VCM performs the regenerative charge control constantly at deceleration. However, when the Li-ion battery is in the fully charged state, VCM stops the regenerative charge control. Accordingly, deceleration may be felt weak when the accelerator pedal is released during driving.

ECO MODE/B MODE SYSTEM

ECO MODE/B MODE SYSTEM : System Description

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SYSTEM DIAGRAM



*1: With steering switch

*2: Without steering switch

DESCRIPTION

ECO mode and B mode provide support for reducing the electricity consumption in actual traffic by reducing power consumption of the drive motor and air conditioner and by increasing the regenerative power from the drive motor.

NOTE:

ECO mode and B mode performs the control according to the normal characteristics when in reverse range.

ECO MODE

When the driver selects ECO mode by operating the shift lever (without steering switch models) or the ECO mode switch (with steering switch models), VCM controls to a gentle acceleration (compared to normal mode) and reduces electricity consumption by reducing waste in acceleration and deceleration. In addition, VCM transmits an ECO mode request signal to the A/C auto amp. and reduces the electricity consumption of A/C compressor by turning down the air conditioner.

VCM transmits an ECO mode indication request signal to the combination meter via CAN communication to turn ON the ECO mode indicator lamp.

B MODE (REGENERATIVE BRAKE MODE)

When the driver selects B mode by operating the shift lever, VCM controls to a strong regeneration (compared to normal mode) and collects more energy.

< SYSTEM DESCRIPTION >

LIST OF DRIVE FORCE CHARACTERISTICS BY MODE

Mode	Power output	Regeneration
Normal	Normal control	Normal control
ECO mode	Gentle acceleration	Strongish
B mode	Normal control	Strong
B mode + ECO mode	Gentle acceleration	Strong

LI-ION BATTERY CHARGE CONTROL

LI-ION BATTERY CHARGE CONTROL : System Description

CONTROL OUTLINE

VCM activates the EV system by connecting the charging connector, performing remote control, or using the built-in timer to start charging to the Li-ion battery. The following charge modes are available.

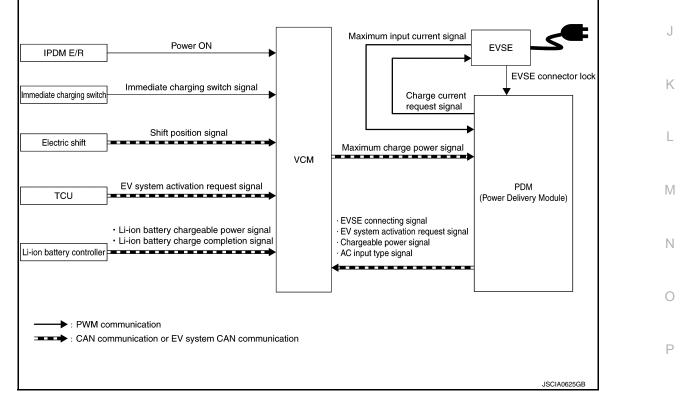
Methods of charging		Description	F		
Immediate charge					
Normal charge	Timer charge				
Rei	Remote charge	VC-17, "LI-ION BATTERY CHARGE CONTROL : System Description"	(
Quick charge					
Regeneration charge		EVC-51, "MOTOR REGENERATION CONTROL : System Description"	ŀ		

LI-ION BATTERY CHARGE CONTROL : Normal Charge Control

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SYSTEM DIAGRAM



BASIC CONTROL

When EVSE is connected under the power switch OFF condition, VCM judges that the system is in a charge mode and activates the F/S relay and M/C relay to allow charging operation.

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< SYSTEM DESCRIPTION >

Then, VCM determines the charge power based on the Li-ion battery chargeable power signal received from the Li-ion battery controller and the chargeable power signal received from the PDM (Power Delivery Module). VCM then sends the maximum charge power signal to the PDM (Power Delivery Module).

The PDM (Power Delivery Module) determines a charge power based on the maximum charge power signal and the maximum input current signal sent by the EVSE control box.

Concurrently, the VCM activates the system main relay 1 and system main relay 2. Consequently, Li-ion battery charge starts.

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.

IMMEDIATE CHARGE MODE

When EVSE is connected to the normal charge port, the PDM (Power Delivery Module) transmits an EV system activation signal to VCM. Li-ion battery charge then starts immediately.

When the timer charge is set, Li-ion battery charge does not start just after the PDM (Power Delivery Module) transmits an EV system activation signal to VCM. When VCM detects an ON signal from the immediate charging switch in that state, VCM judges that the immediate charge mode is selected and starts charging.

When the charge is finished and VCM receives a Li-ion battery charge completion signal from Li-ion battery controller, VCM stops the charge control.

TIMER CHARGE MODE

VCM starts up automatically and starts charging at the set time.

When VCM receives a Li-ion battery charge completion signal from Li-ion battery controller or at a set timer charge finish time, VCM stops the charge control.

NOTE:

- The timer setting method varies according to vehicle specifications.
- Models with navigation system: Refer to <u>AV-102, "MULTI AV SYSTEM : System Description"</u> (Navigation without BOSE) or <u>AV-232, "MULTI AV SYSTEM : System Description"</u> (Navigation with BOSE).
- Models without navigation system: Refer to <u>MWI-30</u>, "<u>TIMER CHARGE AND A/C-HEATER TIMER (CLI-MATE CTRL. TIMER) (WITHOUT NAVIGATION) : System Description</u>".
- When timer charge and the timer air conditioner operate simultaneously, VCM distributes power to the air conditioner system and the charge system according to the priority set on the navigation screen or combination meter.

REMOTE CHARGE MODE

When TCU transmits an EV system activation signal to VCM, VCM judges that the remote charge mode is selected and starts charge control.

When VCM receives a Li-ion battery charge completion signal from Li-ion battery controller, VCM stops the charge control.

CANCEL CONDITIONS

VCM stops the normal charging when VCM detects the EVSE is disconnected.

In addition, under the following conditions, VCM temporarily stops the normal charging and enters standby status.

- When the AC voltage and PWM communication from the EVSE are interrupted.
- When the EVSE connector release switch is pressed.
- When the Li-ion battery temperature reaches 60°C (140°F) or higher.

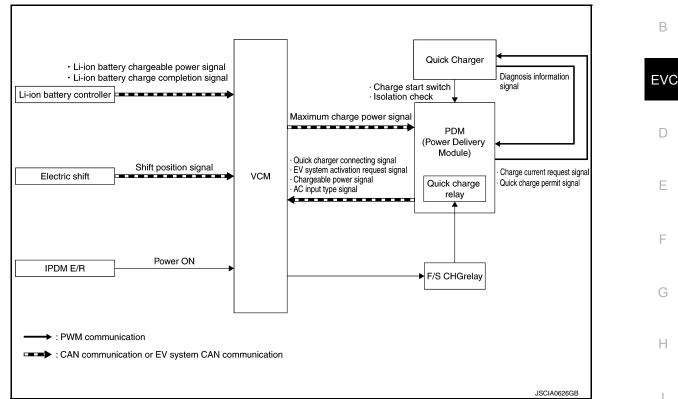
< SYSTEM DESCRIPTION >

LI-ION BATTERY CHARGE CONTROL : Quick Charge Control

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SYSTEM DIAGRAM



BASIC CONTROL

When the quick charge connector is connected to the quick charge port and the start switch of quick charger is pressed, the PDM (Power Delivery Module) transmits an EV system activation request signal to VCM. VCM then activates the F/S CHG relay.

Next, VCM determines the target charge power based on the Li-ion battery chargeable power signal received from the Li-ion battery controller and the chargeable power signal received from the PDM (Power Delivery Module). VCM then sends the maximum charge power signal to the PDM (Power Delivery Module).

The PDM (Power Delivery Module) converts the Maximum charge power signal to a charge current request signal and transmits it to the quick charger.

Simultaneously, the PDM (Power Delivery Module) activates the quick charge relay, and VCM activates system main relay 2. Consequently, the quick charge starts.

When the charge amount reaches the prescribed amount and VCM receives the Li-ion battery charge completion signal from the Li-ion battery controller, VCM stops the charging.

NOTE:

- Even if the Li-ion battery remaining energy does not reach the predetermined level, VCM may stop the charge control after a certain period of time.
- When the Li-ion battery temperature reaches 60°C (140°F) or higher, VCM temporarily stops quick charging N and enters standby status.

HIGH VOLTAGE SYSTEM COOLING CONTROL

HIGH VOLTAGE SYSTEM COOLING CONTROL : System Description

VCM controls water pump and cooling fan according to information from various sensors and ECUs.

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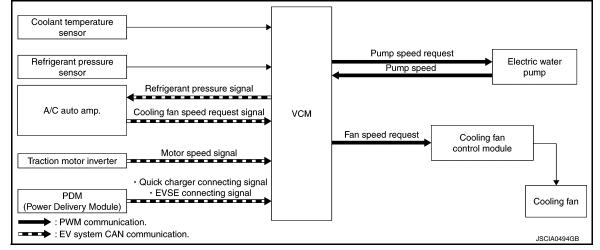
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< SYSTEM DESCRIPTION >

SYSTEM DIAGRAM

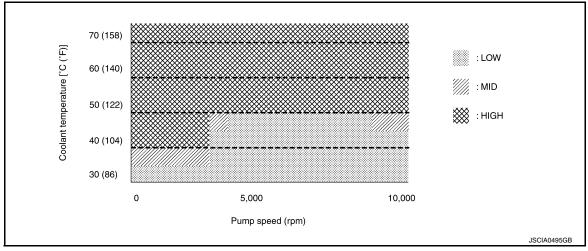


WATER PUMP CONTROL

Control Description

VCM controls the electric water pump to achieve the flow rate corresponding to water temperature and vehicle speed. The electric water pump contains an interface circuit. When a malfunction occurs in the pump, the electric water pump transmits an error signal to VCM and prevents the reduction in coolant flow rate. Since PDM (Power Delivery Module) needs to be cooled during charge, VCM activates the electric water pump to circulate coolant to PDM (Power Delivery Module).

Electric Water Pump Operation During Traveling



< Reference value of electric water pump duty>

Electric water pump operation	Electric water pump control duty (Approx.)
LOW	40%
MID	60%
HIGH	73%

NOTE:

The values listed above may slightly differ from actual measurement values depending on conditions.

Fail-Safe

When a malfunction occurs in the electric water pump, VCM controls the electric water pump as follows:

< SYSTEM DESCRIPTION >

Feedback to VCM	Control state	A
Malfunction in pump or abnormal power supply of pump	STOP	
 Abnormal feedback signal A break in communication line or short circuit 	Normal control NOTE: Water pump operates at a maximum velocity	В
Abnormal signal input from pump	Normal control	EVO
Speed fed back from pump differs largely from VCM-indicated speed.	Normal control	

COOLING FAN CONTROL

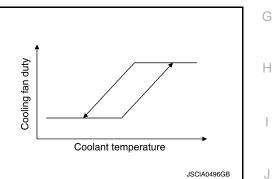
Control Description

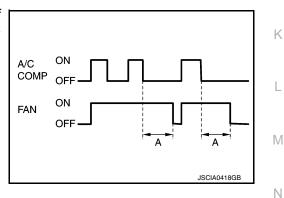
VCM calculates an appropriate speed according to coolant temperature, vehicle speed, and a cooling fan speed request signal received from A/C auto amplifier and transmits a duty signal to the cooling fan control module.VCM judges a maximum fan speed according to a cooling fan speed (calculated from coolant temperature and a vehicle speed) and that requested from the A/C auto amplifier and outputs drive duty.

NOTE:

The cooling fan may be activated during charge or deice system operation (only models with heat pump) even when the power switch is OFF.

The cooling fan speed control reduces variations in cooling fan speed by setting a range in operating conditions as shown in the figure.





VCM reduces the frequency of ON/OFF cycles by setting a period of time (A) in which the cooling fan continuously operates after the A/C compressor is turned OFF.

Cooling fan operation (During traveling or charging)

<With heat pump system>

Engine coolant temper-		Vehicle speed	d [km/h (MPH)]	
ature [°C (°F)]	0 (0) – 20 (12)	20 (12) – 50 (31)	50 (31) - 80 (50)	80 (50) or more
60 (140) or less	0	0	0	0
60 (140) - 62 (144)	30 – 75	30 – 75	30 – 75	0
62 (144) or more	100	100	100	100

<Without heat pump system>

Cooling fan duty (%)

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< SYSTEM DESCRIPTION >

				Cooling fan duty (%)
Engine coolant temper-		Vehicle speed	d [km/h (MPH)]	
ature [°C (°F)]	0 (0) – 20 (12)	20 (12) – 50 (31)	50 (31) - 80 (50)	80 (50) or more
60 (140) or less	0	0	0	0
60 (140) - 62 (144)	40 – 85	40 – 85	40 – 85	0
62 (144) or more	100	100	100	100

Cooling fan operation (Climate Ctrl. Timer ON or remote climate control ON)

<With heat pump system>

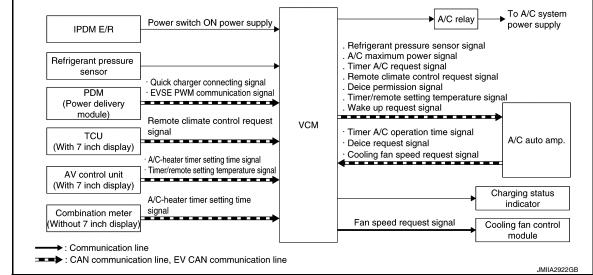
Engine coolant tem- perature [°C (°F)]	Cooling fan duty (%)
60 (140) or less	0
60 (140) - 62 (144)	35 – 100
62 (144) or more	100
<without heat="" pump="" system<="" td=""><td>m></td></without>	m>
Engine coolant tem- perature [°C (°F)]	Cooling fan duty (%)
60 (140) or less	0
60 (140) - 62 (144)	40 – 100
62 (144) or more	100

AIR CONDITIONER CONTROL

AIR CONDITIONER CONTROL : System Description

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SYSTEM DIAGRAM



NOTE:

TCU is included only in models with TELEMATICS system.

DESCRIPTION

In EV, VCM controls the A/C relay so that the air conditioner can operate even when power switch is OFF. The Climate Ctrl. Timer (A/C-heater timer), remote climate control (models with 7 inch display) and deice control (automatic air conditioning system with heat pump system) functions are enabled by this control.

When VCM recognizes a need for air conditioner activation due to driver operation, Climate Ctrl. Timer function, remote climate control function (models with 7 inch display), or deice control function (automatic air conditioning system with heat pump system), VCM activates the A/C relay to supply power to the air conditioning system.

In addition, VCM calculates the power that can be used by the air conditioning system based on the Li-ion battery status and vehicle status and sends it to the A/C auto amp.

< SYSTEM DESCRIPTION >

When ECO mode is selected, VCM sends the ECO mode signal to the A/C auto amp. to control the air conditioner at a lower rate than normal. For an overview of air conditioner types, refer to <u>HAC-30</u>, "<u>AUTOMATIC AIR CONDITIONING SYSTEM</u> : <u>Sys-</u>

tem Description" (automatic air conditioning system with heat pump system) or <u>HAC-235</u>, "<u>AUTOMATIC AIR</u> <u>CONDITIONING SYSTEM</u> : <u>System Description</u>" (automatic air conditioning system without heat pump system).

CONTROL DESCRIPTION

Cooling/heating Function Control During Power Supply Position ON

When the power supply position is ON (vehicle condition is not READY while power switch is ON), VCM allows the operation of cooling/heating function control in the status that EVSE is connected. However, start of cooling/heating function is allowed only while charging is in progress. Refer to <u>HAC-45</u>, "<u>Description</u>" (automatic air conditioning system with heat pump system) or <u>HAC-248</u>, "<u>Description</u>" (automatic air conditioning system) for details of cooling/heating function control during power supply position ON.

NOTE:

If the Li-ion battery available charge gauge level is lower than Level 2, the A/C does not operate during battery charge.

Climate Ctrl. Timer Control

When all of the following conditions are satisfied, VCM activates the timer air conditioner so that the in-vehicle temperature reaches in-vehicle setting temperature^{*1} before the scheduled departure time^{*2}.

- Timer of Climate Ctrl. Timer is ON
- There is AC power input during charging (or in a state where AC power input is possible).

VCM activates the EV system 2 hours before the scheduled departure time. The A/C auto amp. judges the necessary operating time of Climate Ctrl. Timer within the range between 0 and 2 hours according to the ambient temperature and interior temperature and sends the data to VCM. VCM calculates and judges the operating time required for activating the Climate Ctrl. Timer, according to the scheduled departure time and the received data.

NOTE:

- When turning ON the power switch during Climate Ctrl. Timer is activated, the air conditioning control switches to normal.
- When the timer charge and timer air conditioner operate simultaneously, perform air conditioner power distribution according to the following settings.
- Models with 7 inch display: timer priority setting that are set on the navigation screen
- Models without 7 inch display: Climate Ctrl. Timer priority
- *1: The in-vehicle setting temperature can be set as per the following.
- Models with 7 inch display: A/C temperature that are set on the navigation screen
- Models without 7 inch display: 25°C (unchangeable)
- *2: Set the scheduled departure time from the navigation screen (models with 7 inch display) or from the vehicle information display on the combination meter (models without 7 inch display).

Remote Climate Control

When VCM receives the remote climate control request signal from the TCU, the air conditioning is operated. Remote air-conditioning operates as follows.

Condition	Operating time (min)
Charge connector is not connected.	15
When connecting EVSE (with AC input)	15 – 120
During quick charge	15 – 120

NOTE:

When the power is turned ON during remote climate control is activated, the remote air conditioning is ended.

Deice Control (Automatic Air Conditioning System With Heat Pump System)

- When VCM receives a deice request signal from A/C auto amp. and it is in the normal charge mode or quick charge mode, VCM turns the A/C relay ON and sends a deice permission signal (permission) to A/C auto amp. A/C auto amp. operates the deice function due to receiving a deice permission signal
- When the charge mode is completed due to full charge or timer charge completion while the deice function is operating, the deice function continues to operate. The charge status indicator 3 blinks while the deice function operates after charge completion.

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< SYSTEM DESCRIPTION >

NOTE:

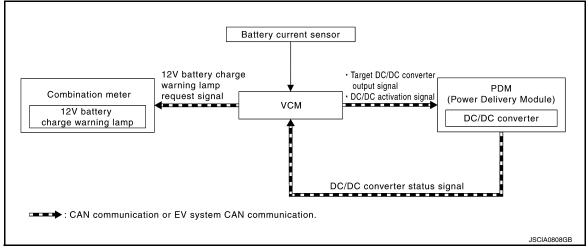
If the charge connector is disconnected from the charge port, VCM sends a deice permission signal (prohibition) and the deice function is stopped.

- After the compressor operation is stopped due to deice control function, VCM operates the cooling fan according to a cooling fan speed request signal that is received from the A/C auto amp.
- For detail of deice control function, refer to <u>HAC-37, "AUTOMATIC AIR CONDITIONING SYSTEM : Heat</u> <u>Pump System Control"</u>.

POWER VOLTAGE VARIABLE CONTROL SYSTEM

POWER VOLTAGE VARIABLE CONTROL SYSTEM : System Description INFOLD:00000008746989

SYSTEM DIAGRAM



DESCRIPTION

The power voltage variable control system changes the output from the DC/DC converter built-in PDM (Power Delivery Module) to 13-15 V to reduce the power consumption according to the status of use of electrical equipment and that of 12 V battery.

CONTROL DESCRIPTION

The battery current sensor (with battery temperature sensor) measures the battery charge/discharge current and the battery ambient temperature.

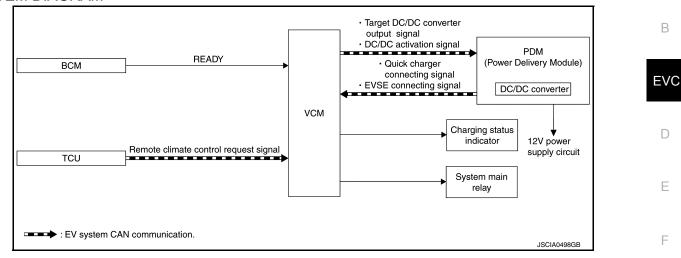
VCM judges the state of use of electric equipment and that of battery according to the measurement, decides target output voltage of the DC/DC converter, and transmits a target DC/DC converter output signal to PDM (Power Delivery Module). PDM (Power Delivery Module) changes the output voltage of the DC/DC converter according to the target DC/DC converter output signal. When an error occurs in the power voltage variable control system or when a target DC/DC converter output signal is not transmitted to the DC/DC converter due to error, the DC/DC converter outputs 14 V. VCM detects an error in the DC/DC converter according to a DC/DC converter status signal transmitted from PDM (Power Delivery Module).

AUTOMATIC 12V BATTERY CHARGE CONTROL

< SYSTEM DESCRIPTION >

AUTOMATIC 12V BATTERY CHARGE CONTROL : System Description

SYSTEM DIAGRAM



DESCRIPTION

The automatic 12V battery charge control is a control to reduce the frequency of battery discharge by automatically charging the 12V battery in case the 12V battery voltage is low when the key switch is turned to ON or the vehicle is left unattended for a long time.

When VCM judges a need for automatic charge, VCM controls the DC/DC converter and the system main relay and charges the 12V battery using the Li-ion battery power.

For 12V battery charge control during READY condition, refer to <u>EVC-60, "POWER VOLTAGE VARIABLE</u> <u>CONTROL SYSTEM : System Description"</u>.

Vehicle state	12V battery charge	Shift position	
READY		Any position	
Normal charge ON			
Quick charge ON	Always charged.		
Climate Ctrl. Timer or remote climate control ON		"P" position only	
Power switch ON	Automatically started when 12V battery voltage is low.		
Power switch OFF	Charge for 5 minutes when the vehicle is not used for a long time.		

NOTE:

When any of the following operations is performed, the 12V battery automatic charge control is canceled: 1) Vehicle to the READY state, 2) Normal charge, 3) Quick charge, 4) Climate Ctrl. Timer or remote climate control ON.

CONTROL DESCRIPTION

Power Switch ON

VCM monitors the 12V battery voltage during power switch ON cycle and immediately starts charging when VCM judges that the voltage is lowered.

NOTÉ:

VCM does not perform the automatic 12V battery charge control when the shift position is in a range other than "P" range.

When Vehicle is Not Used for A Long Time

VCM measures the time of no operation using its internal timer. If the time of no operation reaches 24 hours, VCM performs automatic charge for 4 minutes.

VCM resets the no operation status continuous time when the vehicle satisfies one of the following conditions.

- · READY continues for more than 4 minutes.
- Normal charge continues for more than 4 minutes.
- Quick charge continues for more than 4 minutes.
- Climate Ctrl. Timer or remote climate control continues for more than 4 minutes.
- Discharge current of 12 V battery is 1.5 A or more.

Revision: October 2013

EVC-61

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< SYSTEM DESCRIPTION >

NOTE:

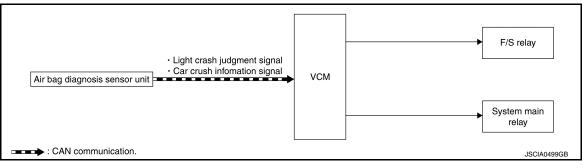
- During automatic 12V battery charge, the charging status indicator blinks.
- The automatic 12V battery charge control does not start within approximately one hour when the power switch is turned ON/OFF.

POWER CUT OFF CONTROL

POWER CUT OFF CONTROL : System Description

INFOID:000000008746991

SYSTEM DIAGRAM



DESCRIPTION

Because EV uses high voltage power, there is a risk of electric shock if the high voltage circuit is shorted to a body ground during a collision. To avoid such risks, if VCM detects a car crush information signal, VCM deactivates the system main relay to cut off the Li-ion battery from the high voltage circuit so that the risk of electric shock is reduced.

When detecting a serious collision

When receiving a car crash information signal from the air bag diagnosis sensor unit, VCM turns OFF the system main relay and quickly interrupts the high voltage circuit. In addition, VCM detects DTC P3137 and prohibits the READY operation until the DTC is erased.

NOTE:

The collision detection level of VCM may differ from an actual vehicle damage state.

When detection a minor collision

When receiving a light crash judgment signal from the air bag diagnosis sensor unit, VCM turns OFF the system main relay and quickly interrupts the high voltage circuit. The READY operation becomes possible after a lapse of 20 seconds or more (VCM performs self shutoff) after the power switch is turned OFF. **NOTE:**

- The collision detection level of VCM may differ from an actual vehicle damage state.
- When a collision occurs more than once during the same trip (no history of turning OFF the power switch), VCM judges "detection of serious collision" and prohibits the READY operation.

Vehicle behavior by collision status

Collision sta-	Detected DTC	CONSULT data mo	Reset			
tus		Item	Indication	Reset		
Serious	P3137	CLASH DETECT INFO	HEAVY	EVC-258, "DTC Logic"		
Senous	F 5157	CLASHIDETECTING	MID			
Minor	P3135	LIGHT CRASH JUDGMENT	On	After maintaining the power switch OFF state (self shutoff) for 20 sec- onds or more, perform the READY operation.		

CHARGE PORT CONTROL

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CHARGE PORT CONTROL : System Description

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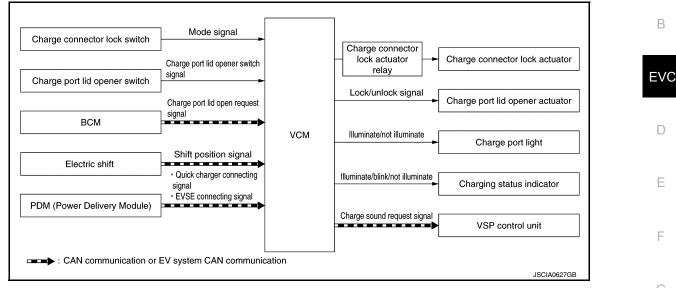
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SYSTEM DIAGRAM



SYSTEM DESCRIPTION

The following charge port controls related to charging are performed comprehensively by the VCM according to the vehicle conditions and signals from the switches.

- · Charge connector lock/unlock control
- · Charge port light control
- Charge port lid open control
- Answer-back control

CHARGE CONNECTOR LOCK/UNLOCK CONTROL

Control Outline

The VCM judges the lock operation conditions according to the mode signal from the charge connector lock switch, and the EVSE connection signal received from the PDM (Power Delivery Module) via CAN communication. If the conditions are met, VCM turns ON the charge connector lock actuator relay and operates the charge connector lock actuator in the close direction to lock the normal charge connector.

When the charge port lid opener switch signal from the charge port lid opener switch is received, or when the charge port lid open request signal for the charge port lid opener button is received from the BCM via CAN communication. If normal charging is stopped and other unlock conditions are met, the VCM turns ON the charge connector lock actuator relay and operates the charge connector lock actuator in the open direction to unlock the normal charge connector.

The lock modes are as per the following.

		1 V I
Lock mode	FUNCTION DESCRIPTION	
LOCK mode	Automatically locks when the normal charge connector is connected.	
AUTO mode	Locks only during normal charging. (Unlocks automatically when charging is completed.)	- IN
UNLOCK mode	Charging connector is not locked.	_

NOTE:

For details of the functions in each mode and the actuator operations, refer to <u>VC-19</u>, <u>"CHARGE PORT CON-</u><u>TROL : System Description"</u>.

Lock Operating Conditions

When all of the following conditions are met, the VCM locks the charge connector.

LOCK mode

- Charge connector lock switch: LOCK mode
- Shift position: P
- Normal charge connector: Connected (fully engaged)

AUTO mode

< SYSTEM DESCRIPTION >

- Charge connector lock switch: AUTO mode
- Shift position: P
- Normal charge connector: Connected (fully engaged)
- Normal charge start CAUTION:

Does not lock when only automatic charging of the 12V battery is operating.

Unlock Conditions

When any of the following conditions is met, the VCM releases the lock of the charge connector.

LOCK mode

- Charge port lid opener switch or charge port lid opener button is ON.
- Charge connector lock switch is moved to the neutral position (UNLOCK mode).
- Shift position is any position other than P position.
- Vehicle READY state is engaged.

AUTO mode

- · Charge port lid opener switch or charge port lid opener button is ON.
- Charge connector lock switch is moved to the neutral position (UNLOCK mode).
- Shift position is any position other than P position.
- · Vehicle READY state is engaged.
- Normal charging stops.

CAUTION:

After the charge port lid opener switch or charge port lid opener button is ON, the charge connector is automatically locked again after 30 seconds if it is not disconnected.

CHARGE PORT LIGHT CONTROL

Control Outline

When the charge port lid opener switch signal is input from the charge port lid opener switch, or the charge port lid open request signal for the charge port lid opener button is received from the BCM via CAN communication, then based on charge connector connected/disconnected and other vehicle conditions, the VCM outputs power supply to the charge port light to turn it ON.

For details of the function, refer to VC-19, "CHARGE PORT CONTROL : System Description".

ON Conditions

When all of the following conditions are met, the VCM turns ON the charge port light.

- Vehicle state: Other than READY
- Shift position: P position
- Any of the following conditions is met.
- Charge port lid opener switch or charge port lid opener button: ON
- Normal or quick charge connector: Disconnected (removed)

NOTE:

If the normal or quick charge connector is connected, then the light turns ON for approximately 5 seconds after the charge connector is disconnected.

OFF Conditions

When any of the following conditions is met, the VCM turns OFF the charge port light.

- Vehicle READY state is engaged.
- Shift position is any position other than P position.
- 5 seconds pass after the normal or quick charge connector is connected (inserted).
- 5 seconds pass after the normal or quick charge connector is disconnected (removed).
- 3 minutes pass after the charge port lid opener switch or charge port lid opener button is turned ON.
- 5 seconds pass after charge connector lock operation.

CHARGE PORT LID OPEN CONTROL

Control Outline

When the charge port lid opener switch signal is input from the charge port lid opener switch, or the charge port open request signal for the charge port lid opener button is received from the BCM via CAN communication, then according to the vehicle conditions, the VCM operates the charge port lid actuator to unlock the charge port lid.

Charge Port Lid Unlock Conditions

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- For charge connector unlock sound, refer to <u>VSP-19</u>, "CHARGE SOUND SYSTEM : System Description".
- · For charging status indicator, refer to VC-15, "Charging Status Indicator".

Answer-back Conditions

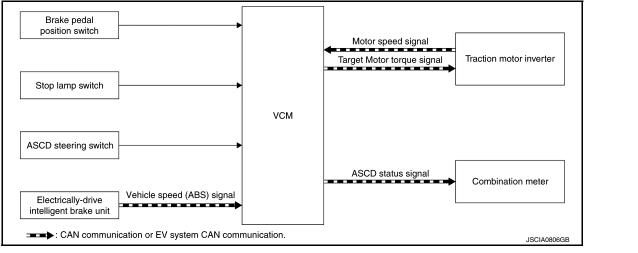
When all of the following conditions are met, the VCM performs answer-back control.

- Shift position: P position
- Vehicle state: Other than READY
- · Charge port lid opener switch or charge port lid opener button: ON

AUTOMATIC SPEED CONTROL DEVICE (ASCD)

AUTOMATIC SPEED CONTROL DEVICE (ASCD) : System Description

SYSTEM DIAGRAM



BASIC ASCD SYSTEM

Automatic Speed Control Device (ASCD) allows a driver to keep vehicle at a predetermined constant speed without depressing accelerator pedal. Driver can set vehicle speed in advance between approximately 40 km/ h (25 MPH) and 144 km/h (89 MPH).

VCM controls the traction motor to regulate vehicle speed.

Operation status of ASCD is indicated on the information display in the combination meter. If any malfunction occurs in ASCD system, it automatically deactivates control.

For the switch function, Refer to EVC-70, "AUTOMATIC SPEED CONTROL DEVICE (ASCD) : Switch Name and Function".

For the ASCD indicator, Refer to EVC-67, "WARNING/INDICATOR/CHIME LIST : Indicator/Information". CAUTION:

Always drive vehicle in a safe manner according to traffic conditions and obey all traffic laws.

CANCEL OPERATION

When any of following conditions exist, cruise operation is cancelled.

- CANCEL switch is pressed
- More than two switches on ASCD steering switch are pressed at the same time (Set speed is cleared)
- Brake pedal is depressed

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• Selector lever position is N, P or R position

· TCS system is operated

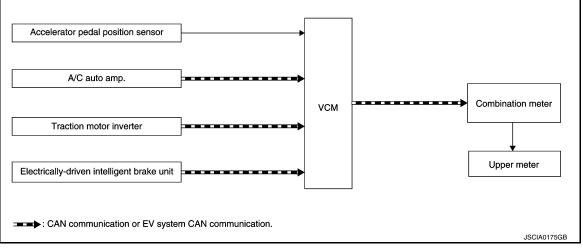
When VCM detects malfunction for some self-diagnoses regarding ASCD system, VCM cancels the cruise operation and informs the driver by blinking SET indicator lamp quickly.

If ASCD MAIN switch is turned to OFF while ASCD is activated, all of ASCD operations are cancelled and vehicle speed memory is erased.

ECO INDICATOR CONTROL

ECO INDICATOR CONTROL : System Description

SYSTEM DIAGRAM



INPUT/OUTPUT SIGNAL CHART

Output sensor/ECU	Signal name	Input ECU/actuator	Signal form	
Accelerator pedal position sen- sor	Accelerator pedal position		Voltage	
A/C auto amp.	Ambient temperature signal	_		
	Air conditioner ON signal	_		
	A/C maximum power signal	VCM		
	PTC maximum power signal		EV system CAN	
Traction motor inverter	Motor speed signal	_		
	Regeneration brake torque signal	_		
Electrically-driven intelligent brake unit	Target brake force signal	_		
VCM	ECO indicator signal Combination meter		CAN	
	ECO tree signal			

DESCRIPTION

VCM calculates the instantaneous ECO operability based on the driver accelerator operation, brake operation, vehicle idle time, and air conditioner operation status and displays this in the instant ECO indicator.

Furthermore, VCM samples the instantaneous ECO operability every second and compares it to the map stored by VCM to calculate the cumulative ECO drivability, and if this value exceeds the set value, then the ECO tree segment is illuminates.

NOTE:

Once the ECO tree segment is illuminated, it does not turn OFF (dim) during the current trip.

NOTICE:

The idle time is the status when not driving in the READY state.

For details regarding the ECO indicator functions, refer to <u>MWI-27, "ECO INDICATOR : System Description"</u>. WARNING/INDICATOR/CHIME LIST

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< SYSTEM DESCRIPTION >

WARNING/INDICATOR/CHIME LIST : Warning lamps/Indicator lamps

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Item	Design	Reference	
	•	For layout, refer to MWI-6, "METER SYSTEM : Combination Meter".	
EV system warning lamp	$\langle \cdot \rangle$	For function, refer to EVC-24, "WARNING LAMPS/INDICATOR LAMPS : EV System Warning Lamp".	
Low battery charge warning		For layout, refer to MWI-6, "METER SYSTEM : Combination Meter".	E
lamp		For function, refer to EVC-26, "WARNING LAMPS/INDICATOR LAMPS : Low Bat- tery Charge Warning Lamp".	
		For layout, refer to MWI-6, "METER SYSTEM : Combination Meter".	
Plug in indicator lamp		For function, refer to EVC-27, "WARNING LAMPS/INDICATOR LAMPS : Plug In In- dicator Lamp".	
	\frown	For layout, refer to MWI-6, "METER SYSTEM : Combination Meter".	
Power limitation indicator lamp		For function, refer to EVC-29, "WARNING LAMPS/INDICATOR LAMPS : Power Limitation Indicator Lamp".	
	$\mathbf{\Lambda}$	For layout, refer to MWI-6, "METER SYSTEM : Combination Meter".	
Ready to drive indicator lamp		For function, refer to EVC-30, "WARNING LAMPS/INDICATOR LAMPS : Ready To Drive Indicator Lamp".	
		For layout, refer to MWI-6, "METER SYSTEM : Combination Meter".	
12v battery charge warning lamp	- +	For function, refer to EVC-32, "WARNING LAMPS/INDICATOR LAMPS : 12V Bat- tery Charge Warning Lamp".	

WARNING/INDICATOR/CHIME LIST : Warning Chime

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Item	Reference	-
DC/DC converter warning chime	Refer to EVC-39, "WARNING CHIME : DC/DC Converter Warning Chime".	_
Power switch reminder chime	Refer to EVC-40, "WARNING CHIME : Power Switch Reminder Chime".	_
Shift P warning chime	Refer to EVC-41, "WARNING CHIME : Shift P Warning Chime".	_

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

INFOID:000000009314517

Item	Reference
DC/DC Converter Warning	Refer to EVC-34, "WARNING/INDICATOR (ON INFORMATION DISPLAY) : DC/DC Converter Warning".
Low Battery Charge Warning	Refer to EVC-35, "WARNING/INDICATOR (ON INFORMATION DISPLAY) : Low Battery Charge Warning".
Power Limitation Warning	Refer to EVC-37, "WARNING/INDICATOR (ON INFORMATION DISPLAY) : Power Limitation Warning".
Shift P Warning	Refer to EVC-38, "WARNING/INDICATOR (ON INFORMATION DISPLAY) : Shift P Warning".

WARNING/INDICATOR/CHIME LIST : Indicator/Information

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ASCD INDICATOR

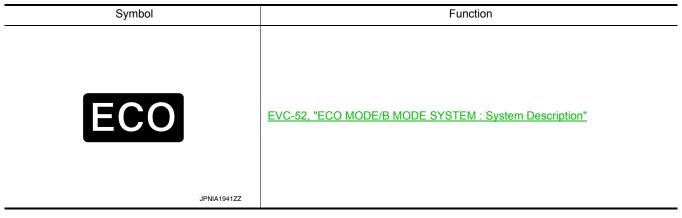
< SYSTEM DESCRIPTION >

Symbol	Function
CRUISE CRUISE SET 2	EVC-65, "AUTOMATIC SPEED CONTROL DEVICE (ASCD) : System Descrip- tion"
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①CRUISE indicator

②SET indicator

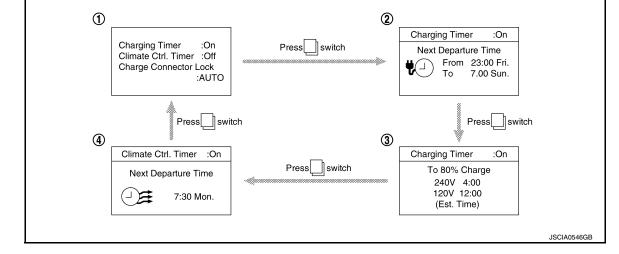
ECO MODE INDICATOR



TIMER SETTING STATUS

Design/Purpose

Various types of information on Climate Ctrl. Timer and timer charge is displayed.



No.	Name	Function
1	Timer setting (charging and Climate Ctrl.) and charge connector lock setting status	The timer settings status (On or Off) and the air conditioning/heater or climate con- trol and the charge connector lock setting status (AUTO, LOCK or UNLOCK)
2	Charging timer setting confirmation	The charging timer starting and ending (where fitted) hour, minute and day (where fitted) for the next charge time that has been set can be checked.

< SYSTEM DESCRIPTION >

No.	Name	Function	٨
3	Charging time	Displays the estimated time to charge the battery to the customer selected charge level (80% or 100%)	A
4	Climate Ctrl. Timer setting confirma- tion	The set time for ending hours and days (where fitted) of the Climate Ctrl. Timer is displayed.	В

Display condition

Timer setting status is displayed for ten seconds when the power switch is turned OFF and the indication switches every time when the switch is pressed. The indication can be shown for approximately 10 seconds by operating the switch.

Display cancel condition

When any of the following conditions is satisfied.

power switch ON

• A lapse of 10 seconds or more with no switch operation.

CAN COMMUNICATION

CAN COMMUNICATION : System Description

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DESCRIPTION

- 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.
- VCM includes a gateway function and communicates signals between the CAN communication circuit and EV system CAN circuit.

For CAN communication details, Refer to LAN-30, "CAN COMMUNICATION SYSTEM : System Description".

OPERATION

< SYSTEM DESCRIPTION >

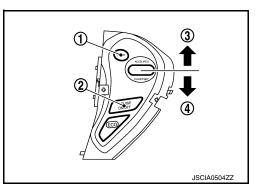
OPERATION AUTOMATIC SPEED CONTROL DEVICE (ASCD)

AUTOMATIC SPEED CONTROL DEVICE (ASCD) : Switch Name and Function

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Function

Functions of each switch are listed in the following table.



Switch Function

No.	Name	Function
1	CANCEL switch	When the switch is pressed, the ASCD control is cancelled.
2	ASCD MAIN switch	Turns the ASCD ON/OFF.
3	RESUME/ACCEL switch	 When the switch is pressed after the cruise control is cancelled in any method other than main switch operation, the vehicle speed is reset to the previous speed setting before the cancellation[*]. When the switch is pressed during cruise control, the setting speed is increased and the vehicle speed increases.
4	SET/COAST switch	 When the switch is pressed at the preferred vehicle speed, the cruise control starts to operate. When the switch is pressed during cruise control, the set speed is reduced and the vehicle speed reduces.

*: To reset vehicle speed, the vehicle condition must be as follows:

• Brake pedal is released

• Selector lever is in a position other than P, R, and N.

• Vehicle speed is greater than 40 km/h (25 MPH) and 144 km/h (89 MPH)

ECO MODE SWITCH

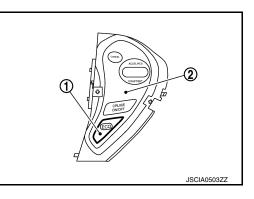
ECO MODE SWITCH : Switch Name and Function

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Function

When the ECO mode switch 1 is operated with the power switch ON, the mode switches between ON and OFF.

(2) : ASCD steering switch



ON BOARD DIAGNOSTIC (OBD) SYSTEM

< SYSTEM DESCRIPTION >

ON BOARD DIAGNOSTIC (OBD) SYSTEM

Diagnosis Description

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

In this system, "Power switch is turned OFF⇒ON" is defined as 1 trip. VCM detects malfunctions while saving the DTC and freeze frame data and continues saving this data for a maximum of 40 trips. In addition, if a DTC that is the same as the saved DTC is detected again, the counter is reset and the count up starts from "0" again.

DTC and Freeze Frame Data

VCM can store multiple DTCs and up to five Freeze Frame data. After the detection of a malfunction and storing of DTC and Freeze Frame data by VCM, if a different malfunction is detected, multiple DTCs can be identified. In contrast, only up to five FFDs are stored according to the preset priority. For priority, refer to <u>EVC-100, "DTC Inspection Priority Chart"</u>. The DTC and freeze frame data are deleted when the self-diagnostic is deleted.

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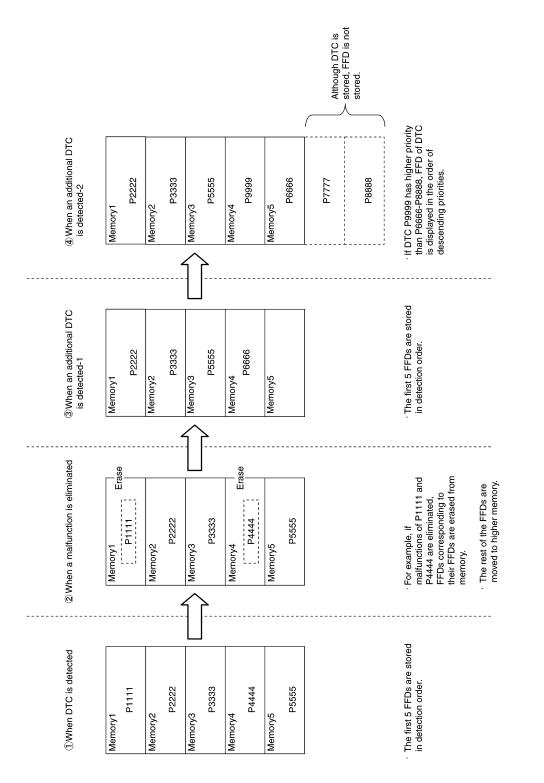
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ON BOARD DIAGNOSTIC (OBD) SYSTEM

< SYSTEM DESCRIPTION >

FREEZE FRAME DATA MEMORY IMAGE



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< SYSTEM DESCRIPTION >

DIAGNOSIS SYSTEM (VCM)

CONSULT Function

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FUNCTION

Diagnostic test mode	Function	
ECU Identification	VCM part number can be read.	EV
Self-diagnostic result ^{*1}	Self-diagnostic results and freeze frame data can be read and erased quickly.*2	
Data monitor	Input/Output data in VCM can be read.	D
Active test	Diagnostic Test Mode in which CONSULT drives some actuators apart from VCM and also shifts some parameters in a specified range.	
Work support	This mode enables a technician to adjust some devices faster and more accurately by following the in- dications on the CONSULT.	Ε
Load battery ID	Refer to "Li-ion Battery ID Registration Operation Manual".	

*2: The following diagnosis information is cleared when the VCM memory is erased.

- Diagnostic trouble codes
- Freeze frame data
- Applicable operational history and count

SELF-DIAG RESULTS MODE

Self Diagnostic Item Regarding items of DTC, refer to EVC-102. "DTC Index".

How to Erase DTC

- If power is continuously in the ON position after a DTC is detected, turn power switch OFF for at least 20 seconds before turning power switch to the ON position again, and then erase DTC.
- Check the all self-diagnostic screen to confirm there are no DTCs in other ECUs.

CAUTION:

DTC P0AA1 is not cleared even when "Self-diagnostic Result" is cleared. To clear DTC P0AA1, perform "SPECIFIC DTC CLEAR" in "WORK SUPPORT".

Freeze Frame Data

The Freeze Frame Data shows the state of the vehicle at the time a DTC is detected and is useful in re-creating the circumstances that caused the malfunction.

Freeze frame data item	Description	
DTC	Displays a DTC.	
VCM MODE	 Displays VCM status. 0-7: During VCM starts-up 10: Power switch is ON and the charge connector is not connected. 11-29: Mode changing to READY 30: READY 31-49: During system shutdown 50-59: Mode changing to charge mode. 60, 90: During charging 80-89: Mode changing to charge mode. 110-120: When connected to high voltage circuit except when READY or charge[*] 131-144: During system shutdown 	
NORMAL CHARGE CONNECTOR CON- NECTION	 Displays the connection status of the normal charge connector. 0: EVSE is not connected. 1: EVSE is semi-engaged. 2: EVSE is connected. 3: EVSE is malfunctioning. 	

< SYSTEM DESCRIPTION >

DUCK CHARGE CONNECTOR Displays the connection status of the quick charge connector. CONNECTOR • 0: Duck charge connector is not connected. VEHICLE SPEED Igmin or (mpin) Displays the vehicle speed that is calculated from the motor speed. SHIET FOSITION Displays the shift position. COULANT TEMP (regC) Displays the coolant temperature. COULANT TEMP (regC) Displays the traction motor speed. ACCEL OPEN AN- GLE [%] Displays the traction motor speed. ACCEL OPEN AN- GLE [%] Displays the target motor regeneration torque. TRG TORQ [Nm] Displays the target motor output. TRR CECE TORQ Displays the target motor output. TRR CECE TORQ Displays the Lifon battery voltage. HV BATT CURRENT [A] Displays the Lifon battery voltage. HV BATT CURRENT [A] Displays the Lifon battery regenerable power. WR (NM] Displays the Lifon battery regenerable power. CHARGEABLE PWR MAX (LW] Displays the Lifon battery available discharge power. NWENTERCOINPUT VOLT [M] Displays detection date of DTC applicable to stored FFD. DTC DETECTED DAY (Ga) Displays detection date of DTC applicable to stored FFD. DTC DETECTED DAY (Ga) Displ	Freeze frame data item	Description
Itempil Displays the vehicle speed that is calculated from the motor speed. SHIET POSITION Displays the shift position. COLLANT TEMP (legeC] Displays the colant temperature. MOTOR SPEED (rpm) Displays the traction motor speed. ACCEL OPEN AN- CLE [%] Displays the target motor torque. TRG FORQ [Nm] Displays the target motor regeneration torque. TRG REGE TORQ [Nm] Displays the target motor regeneration torque. HV BATT CURRENT [AT TURP Displays the Li-ion battery voltage. HV BATT CURRENT [A REGE TORQ Displays the Li-ion battery current. HV BATT CURRENT [A REGENERABLE PWR [kW] Displays the Li-ion battery regenerable power. CHARGEABLE PWR MAX [kW] Displays the Li-ion battery chargeable power. INVERTER DC INPUT VOLT [M] Displays DC input voltage of traction motor inverter. DTC DETECTED DAP WAR [kM] Displays DC input voltage of DTC applicable to stored FFD. DTC DETECTED DAP WAR [kM] Displays detection date of DTC applicable to stored FFD. DTC DETECTED DAP WAR [kM] Displays detection date of DTC applicable to stored FFD. DTC DETECTED DAP WAR [kM] Displays detection date of DTC applicable to stored FFD. DTC DETECTED DAP WAR [kM] Displays detection da	CONNECTOR CON-	O: Quick charge connector is not connected.
COOLANT TEMP [tdegC] Displays the colant temperature. MOTOR SPEED [rpm] Displays the traction motor speed. ACCEL OPEN AN- GLE [%] Displays the target motor torque. TRG FORM [N] Displays the target motor output. TRG FOWER [N] Displays the target motor output. TRG FORM [N] Displays the target motor output. TRG REGET TORQ [Nm] Displays the target motor regeneration torque. HV BATT VOLT [V] Displays the Li-ion battery voltage. HV ATT TEMP [degC] Displays the Li-ion battery current. HV BATT CURRENT [A] Displays the Li-ion battery regenerable power. CHARGEABLE PWR WM [kM] Displays the Li-ion battery regenerable power. CHARGEABLE PWR WM [kM] Displays the Li-ion battery chargeable power. AVAILABLE HV BAT PWR [kM] Displays DC input voltage of traction motor inverter. DTC DETECTED MONTH [month] Displays detection date of DTC applicable to stored FFD. DTC DETECTED DAND Displays detection date of DTC applicable to stored FFD. DTC DETECTED DAND Displays detection date of DTC applicable to stored FFD. DTC DETECTED DAND Displays detection date of DTC applicable to stored FFD. DTC DETECTED DAND Displays		Displays the vehicle speed that is calculated from the motor speed.
[degC]Displays the coolant temperature.MOTOR SPEED [rpm]Displays the traction motor speed.ACCEL OPEN AN- GLE [%]Displays the target motor torque.TRG FORQ [Nm]Displays the target motor output.TRG REGE TORQ [Nm]Displays the target motor output.TRG REGE TORQ [Nm]Displays the target motor regeneration torque.HV BATT VOLT [V]Displays the Li-ion battery voltage.HV BATT CURRENT [A]Displays the Li-ion battery current.HV BATT TEMP [CegC]Displays the Li-ion battery temperature.REGENERABLE PWR [kW]Displays the Li-ion battery regenerable power.AVALLABLE HV BAT VOLT [V]Displays the Li-ion battery available discharge power.AVALLABLE HV BAT PWR [kM]Displays the Li-ion battery available discharge power.AVALLABLE HV BAT PWR [kM]Displays detection date of DTC applicable to stored FFD.DTC DETECTED DAY (day)Displays detection date of DTC applicable to stored FFD.DTC DETECTED DAY (day)Displays detection date of DTC applicable to stored FFD.DTC DETECTED DAY (day)Displays detection date of DTC applicable to stored FFD.DTC DETECTED DAY (day)Displays detection date of DTC applicable to stored FFD.DTC DETECTED DAY (day)Displays detection date of DTC applicable to stored FFD.DTC DETECTED DAY (day)Displays detection date of DTC applicable to stored FFD.NINUTE [min]Displays detection date of DTC applicable to stored FFD.NINUTE [min]Displays insulation resistance of high voltage circuit.12V BATTERY VOLT- A	SHIFT POSITION	Displays the shift position.
ACCEL OPEN AN- GLE [%] Displays the accelerator pedal openness. TRG TORQ [Nm] Displays the target motor torque. TRG POWER [N] Displays the target motor output. TRG REGE TORQ [Nm] Displays the target motor regeneration torque. HV BATT VOLT [V] Displays the Li-ion battery voltage. HV BATT CURRENT [A] Displays the Li-ion battery current. HV BATT TEMP [degC] Displays the Li-ion battery regenerable power. CHARGEABLE PWR MAX [kW] Displays the Li-ion battery regenerable power. CHARGEABLE PWR MAX [kW] Displays the Li-ion battery available discharge power. NAXLABLE HV BAT VOLT [V] Displays the Li-ion battery available discharge power. NVERTER DCINPUT VOLT [V] Displays the Li-ion battery available discharge power. NVERTER DCINPUT VOLT [V] Displays detection date of DTC applicable to stored FFD. DTC DETECTED MONTH [month] Displays detection date of DTC applicable to stored FFD. DTC DETECTED MINUTE [min] Displays detection date of DTC applicable to stored FFD. INSULATION RESIS: TANCE VALUE[kohm] Displays detection date of DTC applicable to stored FFD. INSULATION RESIS: TANCE VALUE[kohm] Displays insulation resistance of high voltage circuit. 12V BATTERY VOLT- AGE[my] </td <td></td> <td>Displays the coolant temperature.</td>		Displays the coolant temperature.
GLE [%] Displays the accelerator pedal openness. TRG TORQ [Nm] Displays the target motor torque. TRG POWER [N] Displays the target motor output. TRG REGE TORQ Displays the target motor regeneration torque. HV BATT VOLT [M] Displays the Li-ion battery voltage. HV BATT CURRENT Displays the Li-ion battery temperature. [degC] Displays the Li-ion battery temperature. [degC] Displays the Li-ion battery regenerable power. CHARGEABLE PWR [MAX [KM] Displays the Li-ion battery regenerable power. AVAILABLE HV BAT Displays the Li-ion battery available discharge power. INVERTERDC INPUT VOLT [M] Displays the Li-ion battery available discharge power. INVERTERDC INPUT VOLT [M] Displays detection date of DTC applicable to stored FFD. DTC DETECTED MONTH [month] Displays detection date of DTC applicable to stored FFD. DTC DETECTED DAY (day) Displays detection date of DTC applicable to stored FFD. DTC DETECTED DAY (MINUTE [min] Displays detection date of DTC applicable to stored FFD. NINUTE [min] Displays detection date of DTC applicable to stored FFD. NINUTE [min] Displays usualation resistance of high voltage circuit. 12V	MOTOR SPEED [rpm]	Displays the traction motor speed.
TRG POWER [N]Displays the target motor output.TRG REGE TORQ [Nm]Displays the target motor regeneration torque.HV BATT VOLT [V]Displays the Li-ion battery voltage.HV BATT CURRENT [A]Displays the Li-ion battery current.HV BATT TEMP [degC]Displays the Li-ion battery temperature.REGENERABLE PWR [kW]Displays the Li-ion battery regenerable power.AVAILABLE HV BAT PWR [kW]Displays the Li-ion battery cargeable power.AVAILABLE HV BAT PWR [kW]Displays the Li-ion battery available discharge power.AVAILABLE HV BAT PWR [kW]Displays the Li-ion battery available discharge power.DTC DETECTED MONTH [month]Displays detection date of DTC applicable to stored FFD.DTC DETECTED AVILITY (day)Displays detection date of DTC applicable to stored FFD.DTC DETECTED HOUR [hour]Displays detection date of DTC applicable to stored FFD.DTC DETECTED HOUR [hour]Displays detection date of DTC applicable to stored FFD.DTC DETECTED HOUR [hour]Displays detection date of DTC applicable to stored FFD.DTC DETECTED HOUR [hour]Displays detection date of DTC applicable to stored FFD.DTC DETECTED HOUR [hour]Displays detection date of DTC applicable to stored FFD.12V BATT RMON RESIS- TANCE VALUE[kohm]Displays the amount of electric power used by electric compressor.ESTMT PWR CNSM (AYC CMP][W]Displays the amount of electric power used by PTC heater.		Displays the accelerator pedal openness.
TRG REGE TORQ [Nm]Displays the target motor regeneration torque.HV BATT VOLT [V]Displays the Li-ion battery voltage.HV BATT CURRENT [A]Displays the Li-ion battery current.HV BATT TEMP [degC]Displays the Li-ion battery temperature.REGENERABLE PWR [kW]Displays the Li-ion battery regenerable power.CHARGEABLE PWR [kW]Displays the Li-ion battery chargeable power.CHARGEABLE PWR [kW]Displays the Li-ion battery chargeable power.AVAILABLE HV BAT VOLT [M]Displays the Li-ion battery available discharge power.INVERTERD CINPUT VOLT [M]Displays DC input voltage of traction motor inverter.DTC DETECTED DAY [day]Displays detection date of DTC applicable to stored FFD.DTC DETECTED MONTH [month]Displays detection date of DTC applicable to stored FFD.DTC DETECTED MINUTE [min]Displays detection date of DTC applicable to stored FFD.DTC DETECTED MINUTE [min]Displays detection date of DTC applicable to stored FFD.DTC DETECTED MINUTE [min]Displays detection date of DTC applicable to stored FFD.INSULATION RESIS- SANCE VALUE[kohm]Displays voltage of 12 V battery.ESTIMT PWR CNSM (AC CMP]WI]Displays the amount of electric power used by PTC heater.	TRG TORQ [Nm]	Displays the target motor torque.
[Nm]Displays the target motor regeneration torque.HV BATT VOLT [V]Displays the Li-ion battery current.HV BATT CURRENT [A]Displays the Li-ion battery current.HV BATT TEMP [degC]Displays the Li-ion battery temperature.REGENERABLE PWR [kW]Displays the Li-ion battery regenerable power.CHARGEABLE PWR MAX [kW]Displays the Li-ion battery chargeable power.AVAILABLE HV BAT PWR [kW]Displays the Li-ion battery chargeable power.INVERTERDCINPUT VOLT [V]Displays the Li-ion battery available discharge power.INVERTERDCINPUT VOLT [V]Displays DC input voltage of traction motor inverter.DTC DETECTED DAY (day]Displays detection date of DTC applicable to stored FFD.DTC DETECTED DAY (day]Displays detection date of DTC applicable to stored FFD.DTC DETECTED MINUTE [min]Displays detection date of DTC applicable to stored FFD.INSULATION RESIS- ACAC MAU [komm]Displays detection date of DTC applicable to stored FFD.INSULATION RESIS- ACAC MAU [komm]Displays detection date of DTC applicable to stored FFD.INSULATION RESIS- ACAC MAU [komm]Displays insulation resistance of high voltage circuit.12V BATTERY VOLT AGE[mV]Displays the amount of electric power used by electric compressor.ESTIMT PWR CNSM (FTC HTR)[KW]Displays the amount of electric power used by PTC heater.	TRG POWER [N]	Displays the target motor output.
HV BATT CURRENT [A]Displays the Li-ion battery current.HV BATT TEMP [degC]Displays the Li-ion battery temperature.REGENERABLE PWR [kW]Displays the Li-ion battery regenerable power.CHARGEABLE PVWR MAX [kW]Displays the Li-ion battery chargeable power.AVAILABLE HV BAT PWR [kW]Displays the Li-ion battery available discharge power.INVERTER DC INPUT VOLT [V]Displays the Li-ion battery available discharge power.DTC DETECTED MONTH [month]Displays DC input voltage of traction motor inverter.DTC DETECTED DAVILT [Month]Displays detection date of DTC applicable to stored FFD.DTC DETECTED HOUR [hour]Displays detection date of DTC applicable to stored FFD.DTC DETECTED MINUTE [min]Displays detection date of DTC applicable to stored FFD.DTC DETECTED MINUTE [min]Displays detection date of DTC applicable to stored FFD.DTC DETECTED MINUTE [min]Displays detection date of DTC applicable to stored FFD.DTC DETECTED MINUTE [min]Displays insulation resistance of high voltage circuit.12V BATTERY VOLT- AGE[mV]Displays voltage of 12 V battery.ESTIMT PWR CNSM (PTC HTR)[KW]Displays the amount of electric power used by PTC heater.		Displays the target motor regeneration torque.
[A]Displays the Li-ion battery current.HV BATT TEMP [degC]Displays the Li-ion battery temperature.REGENERABLE PWR [kW]Displays the Li-ion battery regenerable power.CHARGEABLE PWR MAX [kW]Displays the Li-ion battery chargeable power.AVAILABLE HV BAT PWR [kW]Displays the Li-ion battery available discharge power.AVAILABLE HV BAT PWR [kW]Displays the Li-ion battery available discharge power.DTC DETECTED INPUT VOLT [V]Displays DC input voltage of traction motor inverter.DTC DETECTED MONTH [month]Displays detection date of DTC applicable to stored FFD.DTC DETECTED HOUR [hour]Displays detection date of DTC applicable to stored FFD.DTC DETECTED HOUR [hour]Displays detection date of DTC applicable to stored FFD.DTC DETECTED HOUR [hour]Displays detection date of DTC applicable to stored FFD.DTC DETECTED HOUR [hour]Displays detection date of DTC applicable to stored FFD.DTC DETECTED HOUR [hour]Displays detection date of DTC applicable to stored FFD.DTC DETECTED HOUR [hour]Displays insulation resistance of high voltage circuit.12V BATTERY VOLT- AE[mV]Displays voltage of 12 V battery.ESTMT PWR CNSM (PTC HTR)[KW]Displays the amount of electric power used by electric compressor.ESTMT PWR CNSM (PTC HTR)[KW]Displays the amount of electric power used by PTC heater.	HV BATT VOLT [V]	Displays the Li-ion battery voltage.
[degC]Displays the Li-ion battery temperature.REGENERABLE PVR [kW]Displays the Li-ion battery regenerable power.CHARGEABLE PVR MAX [kW]Displays the Li-ion battery chargeable power.AVAILABLE HV BAT PWR [kW]Displays the Li-ion battery available discharge power.INVERTER DC INPUT VOLT [V]Displays DC input voltage of traction motor inverter.DTC DETECTED MONTH [month]Displays detection date of DTC applicable to stored FFD.DTC DETECTED DAY [day]Displays detection date of DTC applicable to stored FFD.DTC DETECTED MINUTE [min]Displays detection date of DTC applicable to stored FFD.DTC DETECTED MINUTE [min]Displays detection date of DTC applicable to stored FFD.INSULATION RESIS TANCE VALUE[kohm]Displays insulation resistance of high voltage circuit.12V BATTERY VOLT- AGE[mV]Displays the amount of electric power used by electric compressor.ESTMT PWR CNSM (PTC HTR][kW]Displays the amount of electric power used by PTC heater.		Displays the Li-ion battery current.
PWR [kW]Displays the Li-ion battery regenerable power.CHARGEABLE PWR MAX [kW]Displays the Li-ion battery chargeable power.AVAILABLE HV BAT PWR [kW]Displays the Li-ion battery available discharge power.INVERTER DC INPUT VOLT [V]Displays DC input voltage of traction motor inverter.DTC DETECTED MONTH [month]Displays detection date of DTC applicable to stored FFD.DTC DETECTED DAY [day]Displays detection date of DTC applicable to stored FFD.DTC DETECTED HOUR [hour]Displays detection date of DTC applicable to stored FFD.DTC DETECTED MINUTE [min]Displays detection date of DTC applicable to stored FFD.DTC DETECTED MINUTE [min]Displays detection date of DTC applicable to stored FFD.DTC DETECTED MINUTE [min]Displays detection date of DTC applicable to stored FFD.INSULATION RESIS- TANCE VALUE[kohm]Displays insulation resistance of high voltage circuit.12V BATTERY VOLT- AGE[mV]Displays the amount of electric power used by electric compressor.ESTMT PWR CNSM (PTC HTR)[kW]Displays the amount of electric power used by PTC heater.		Displays the Li-ion battery temperature.
MAX [kW]Displays the Li-ion battery chargeable power.AVAILABLE HV BAT PWR [kW]Displays the Li-ion battery available discharge power.INVERTER DC INPUT VOLT [M]Displays DC input voltage of traction motor inverter.DTC DETECTED MONTH [month]Displays detection date of DTC applicable to stored FFD.DTC DETECTED DAY [day]Displays detection date of DTC applicable to stored FFD.DTC DETECTED HOUR [hour]Displays detection date of DTC applicable to stored FFD.DTC DETECTED HOUR [hour]Displays detection date of DTC applicable to stored FFD.DTC DETECTED HOUR [hour]Displays detection date of DTC applicable to stored FFD.DTC DETECTED HOUR [hour]Displays detection date of DTC applicable to stored FFD.DTC DETECTED HOUR [hour]Displays detection date of DTC applicable to stored FFD.INSULATION RESIS- TANCE VALUE[kohm]Displays insulation resistance of high voltage circuit.12V BATTERY VOLT- AGE[mV]Displays voltage of 12 V battery.ESTMT PWR CNSM (PTC HTR)[KW]Displays the amount of electric power used by electric compressor.ESTMT PWR CNSM (PTC HTR)[KW]Displays the amount of electric power used by PTC heater.		Displays the Li-ion battery regenerable power.
PWR [kW]Displays the Li-ion battery available discharge power.INVERTER DC INPUT VOLT [V]Displays DC input voltage of traction motor inverter.DTC DETECTED MONTH [month]Displays detection date of DTC applicable to stored FFD.DTC DETECTED DAY [day]Displays detection date of DTC applicable to stored FFD.DTC DETECTED HOUR [hour]Displays detection date of DTC applicable to stored FFD.DTC DETECTED HOUR [hour]Displays detection date of DTC applicable to stored FFD.DTC DETECTED HOUR [hour]Displays detection date of DTC applicable to stored FFD.INSULATION RESIS- TANCE VALUE[kohm]Displays insulation resistance of high voltage circuit.12V BATTERY VOLT- AGE[mV]Displays the amount of electric power used by electric compressor.ESTMT PWR CNSM (PTC HTR)[kW]Displays the amount of electric power used by PTC heater.		Displays the Li-ion battery chargeable power.
VOLT [V]Displays DC input voltage of traction motor inverter.DTC DETECTED MONTH [month]Displays detection date of DTC applicable to stored FFD.DTC DETECTED DAY [day]Displays detection date of DTC applicable to stored FFD.DTC DETECTED HOUR [hour]Displays detection date of DTC applicable to stored FFD.DTC DETECTED MINUTE [min]Displays detection date of DTC applicable to stored FFD.INSULATION RESIS- TANCE VALUE[kohm]Displays insulation resistance of high voltage circuit.12V BATTERY VOLT- AGE[mV]Displays voltage of 12 V battery.ESTMT PWR CNSM (A/C CMP)[W]Displays the amount of electric power used by electric compressor.ESTMT PWR CNSM (PTC HTR][kW]Displays the amount of electric power used by PTC heater.		Displays the Li-ion battery available discharge power.
MONTH [month]Displays detection date of DTC applicable to stored FFD.DTC DETECTED DAY [day]Displays detection date of DTC applicable to stored FFD.DTC DETECTED HOUR [hour]Displays detection date of DTC applicable to stored FFD.DTC DETECTED MINUTE [min]Displays detection date of DTC applicable to stored FFD.INSULATION RESIS- TANCE VALUE[kohm]Displays insulation resistance of high voltage circuit.12V BATTERY VOLT- AGE[mV]Displays voltage of 12 V battery.ESTMT PWR CNSM (A/C CMP)[W]Displays the amount of electric power used by electric compressor.ESTMT PWR CNSM (PTC HTR)[kW]Displays the amount of electric power used by PTC heater.		Displays DC input voltage of traction motor inverter.
[day]Displays detection date of DTC applicable to stored FFD.DTC DETECTED HOUR [hour]Displays detection date of DTC applicable to stored FFD.DTC DETECTED MINUTE [min]Displays detection date of DTC applicable to stored FFD.INSULATION RESIS- TANCE VALUE[kohm]Displays insulation resistance of high voltage circuit.12V BATTERY VOLT- AGE[mV]Displays voltage of 12 V battery.ESTMT PWR CNSM (A/C CMP)[W]Displays the amount of electric power used by electric compressor.ESTMT PWR CNSM (PTC HTR)[kW]Displays the amount of electric power used by PTC heater.		Displays detection date of DTC applicable to stored FFD.
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MINUTE [min]Displays detection date of DTC applicable to stored FFD.INSULATION RESIS- TANCE VALUE[kohm]Displays insulation resistance of high voltage circuit.12V BATTERY VOLT- AGE[mV]Displays voltage of 12 V battery.ESTMT PWR CNSM (A/C CMP)[W]Displays the amount of electric power used by electric compressor.ESTMT PWR CNSM (PTC HTR)[kW]Displays the amount of electric power used by PTC heater.		Displays detection date of DTC applicable to stored FFD.
TANCE VALUE[kohm] Displays insulation resistance of high voltage circuit. 12V BATTERY VOLT- AGE[mV] Displays voltage of 12 V battery. ESTMT PWR CNSM (A/C CMP)[W] Displays the amount of electric power used by electric compressor. ESTMT PWR CNSM (PTC HTR)[kW] Displays the amount of electric power used by PTC heater.		Displays detection date of DTC applicable to stored FFD.
AGE[mV] Displays Voltage of 12 V battery. ESTMT PWR CNSM (A/C CMP)[W] Displays the amount of electric power used by electric compressor. ESTMT PWR CNSM (PTC HTR)[kW] Displays the amount of electric power used by PTC heater.		Displays insulation resistance of high voltage circuit.
(A/C CMP)[W] Displays the amount of electric power used by electric compressor. ESTMT PWR CNSM (PTC HTR)[kW] Displays the amount of electric power used by PTC heater.		Displays voltage of 12 V battery.
(PTC HTR)[kW] Displays the amount of electric power used by PTC heater.		Displays the amount of electric power used by electric compressor.
OBC OUT PWR[kW] Displays electric power output of PDM (Power Delivery Module).		Displays the amount of electric power used by PTC heater.
	OBC OUT PWR[kW]	Displays electric power output of PDM (Power Delivery Module).

*: During 12 V battery automatic charge, remote air conditioner operation, and deice system operation.

DATA MONITOR MODE

NOTE:

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

Monitored Item

< SYSTEM DESCRIPTION >

For reference values of the following items, refer to EVC-84, "Reference Value".

		Monitor Ite	m Selection	
MONITOR ITEM	Unit	ECU INPUT SIGNALS	MAIN SIG- NALS	Description
VCM MODE			x	 Displays VCM status. 0-7: During VCM starts-up 10: Power switch is ON and the charge connector is not connected. 11-29: Mode changing to READY 30: READY 31-49: During system shutdown 50-59: Mode changing to charge mode. 60, 90: During charging 80-89: Mode changing to charge mode. 110-120: When connected to high voltage circuit except when READY or charge* 131-144: During system shutdown
/CM ACTIVATION	On/READY			 Displays that VCM has the EV system READY. On: Other than READY READY: READY control in progress
MOTOR SPEED	rpm	х	х	Displays the traction motor revolution received from the traction motor inverter.
NVERTER DC INPUT VOLT	V			Displays the high-voltage power supply voltage being input to the traction motor inverter.
'EHICLE SPEED	km/h or mph	х	Х	The vehicle speed computed by the motor speed sig- nal sent from the traction motor inverter is displayed.
II SPEC VEHICLE SPEED	km/h or mph			Displays the high accuracy vehicle speed from "VEHI- CLE SPEED"
MBIENT TEMP	degC	Х		Displays the outside air temperature received from the A/C auto amp.
CLASH DETECT INFO	• MID • HEAVY • ##	x		 Displays the car crush information received from the air bag diagnosis sensor unit. MID: A non-serious impact was detected. HEAVY: A serious impact was detected. ##: When the impact is not detected
12V BATTERY VOLTAGE	V	Х	Х	The 12 V power supply voltage of VCM is displayed.
/CM POWER SUPPLY (ACT)	V	Х		Displays the 12 V power supply voltage of VCM when VCM is started.
F/S RELAY VOLT	V	х		Displays the voltage on the F/S relay contact side that is being input to VCM.
2V BATTERY TEMP	degC	х		The 12V battery temperature (determined by the sig- nal voltage of the battery temperature sensor) is dis- played.
12V BATTERY CURRENT AVG	А	Х	Х	Displays the average current of 12V battery.
ACCEL SENSOR 1 VOLT	V	Х	Х	Accelerator pedal position sensor 1 signal voltage is displayed.
ACCEL SENSOR 2 VOLT	V	х	Х	Accelerator pedal position sensor 2 signal voltage is displayed.
ACCEL OPEN ANGLE	%			The accelerator pedal opening angle (determined by the signal voltage of the accelerator pedal position sensor) is displayed.
CURRENT MOTOR TORQ	N∙m			Displays the traction motor actual output value (esti- mated value) received from the traction motor inverter.
TRG MOTOR TORQ 1	N∙m		х	Displays the motor torque demand value VCM is re- questing of the traction motor inverter.

< SYSTEM DESCRIPTION >

		Monitor Iter	m Selection	
MONITOR ITEM	Unit	ECU INPUT SIGNALS	MAIN SIG- NALS	Description
MOTOR PWR LIMIT REQ (INV)	%			Displays the traction motor output limit value received from the traction motor inverter.
PRTCTN CNT OPERAT HIST 1	0/1/2/3			 The operation history of the Charge Insulation Resistance Loss Protection Control is indicated. For details of the protection control, refer to <u>EVC-425</u>, "<u>Description</u>". 1-3: Operation history exists. (The number of operations is indicated.) 0: No operation history NOTE: This history can be cleared by "Self-diagnostic Result Clear".
GEAR POSITION DISPLAY	P/R/N/D/B	x	x	 Displays the in-meter gear display request status. P: When there is a P display request R: When there is an R display request N: When there is an N display request D: When there is a D display request B: When there is an B display request
PRTCTN CNT OPERAT HIST 2	0/1/2/3			 The operation history of the Charging Connector-connecting Protection Control is indicated. For details of the protection control, refer to <u>EVC-425</u>, "<u>Description</u>". ON: Operation history exists. OFF: No operation history NOTE: This history can be cleared by "Self-diagnostic Result Clear".
NEXT GEAR POSITION	• R • N/P • D			 Displays the position of the selected selector lever. R: When R range is selected N/P: When N or P range is selected D: When D, B, or ECO range is selected
GEAR POSITION	• R • N/P • D			Displays the position of the currently selected selector lever. • R: R range • N/P: N or P range • D: D, B, or ECO range
COOLANT TEMP	degC	x	х	The coolant temperature (determined by the signal voltage of the coolant temperature sensor) is displayed.
WATER PUMP 1 TRG DUTY	%	Х		Displays the water pump target rotation command du- ty.
W/P 1 CRNT SPD DUTY	%		Х	Displays the water pump actual rotation duty.
COOLING FAN REQ DUTY	%		Х	Displays the cooling fan operation request duty.
DC/DC CONV STAT	On/STOP			 Displays the status of DC/DC converter operation request sent from VCM to PDM (Power Delivery Module). On: When there is a DC/DC converter operation request Off: No operation request
DC/DC CONV STATUS	0/1/2/3			 Displays the status of the DC/DC status signal being used for communication between VCM and the PDM (Power Delivery Module). 0: DC/DC converter does not operate. 1: When normal operation 2: VCM is detecting a DC/DC converter error. 3: VCM is prohibiting DC/DC converter operation.

< SYSTEM DESCRIPTION >

		Monitor Ite	m Selection		
MONITOR ITEM	Unit	ECU INPUT SIGNALS	MAIN SIG- NALS	Description	
VARIABLE V/CONT PERMIT	On/Off			Displays the power voltage variable control authoriza- tion status of VCM. • On: Authorized • Off: Prohibited	
DC/DC CONV REQ VOLT	V			Displays the power generation request voltage being requested to the DC/DC converter.	
POWER SW	On/Off	х		Displays the POWER switch operation status.On: When the POWER switch is operatedOff: On: When the POWER switch is not operated	
START SIGNAL	On/Off	x	х	Displays the status of READY permit signal received from BCM via CAN communication.On: Start signal input.Off: Start signal does not input.	
IMMEDIATE CHG SW	On/Off	x		Displays the operation status of the immediate charging switch.On: When the switch is operatedOff: When the switch is not operated	
A/C SW	On/Off	х	х	 Displays the A/C switch operation status received from the A/C auto amp. On: When the A/C switch is operating Off: When the A/C switch is not operating 	
FRONT WIPER	LOW/HIGH/ Off/INVALID			 Displays the front wiper operation status received from the IPDM E/R LOW: Front wiper is operating at low speed HIGH: Front wiper is operating at high speed Off: Front wiper is not operating INVALID: IPDM E/R cannot detect front wiper status. 	
HEAD LAMP LOW SIG	On/Off			Displays the operation status of the headlamp received from the IPDM E/R.On: When the low beam is operatingOff: When the low beam is not operating	
HEAD LAMP HI SIG	On/Off			Displays the operation status of the headlamp received from the IPDM E/R.On: When the high beam is operatingOff: When the high beam is not operating	
BLOWER FAN ACTIV	On/Off			 Displays the operation status of the blower fan received from the A/C auto amp. On: When the blower fan is operating Off: When the blower fan is not operating 	
REAR DEFOGGER	On/Off			 Displays the rear window defogger operation status received from the IPDM E/R. On: When the rear window defogger is operating Off: When the rear window defogger is not operating 	
HV INTERLOCK (DC/DC)	On/Off			 Displays the connection status of connection detecting circuit built in PDF (Power Delivery Module). On: Interlock detection circuit is energized. Off: Except above. 	
HV CNCTR INTRLCK (HV BAT)	On/Off	х		 Displays the connection status of the high voltage connector connected to the Li-ion battery pack. On: The high voltage connector is connected correctly. Off: Except above. 	

< SYSTEM DESCRIPTION >

	Monitor Item Selection			
MONITOR ITEM	Unit	ECU INPUT SIGNALS	MAIN SIG- NALS	Description
READY LAMP SIGNAL	On/BLINK/ Off		x	 Displays the READY to drive indicator lamp operation request status. On: This causes the READY to drive indicator lamp to light up. BLINK: This causes the READY to drive indicator lamp to flash. Off: No operation request
PWR LIMIT INDICAT LAMP	On/Off		х	Displays the power limit indicator lamp operation request status.On: The power limit indicator lamp is lit.Off: No operation request
EV SYSTEM W/L SIGNAL	On/BLINK/ Off		х	 This displays the EV system warning lamp operation request status. On: This causes the EV system warning lamp to light up BLINK: This causes the EV system warning lamp to flash. Off: No operation request
PLUG IN INDI LAMP	On/Off		х	Displays the plug in indicator lamp operation request status.On: The plug in indicator lamp is lit.Off: No operation request
CHARGE STAT INDI 1	On/Off		х	Displays the charging status indicator 1 operation request status.On: The charging status indicator 1 is lit.Off: No operation request
CHARGE STAT INDI 2	On/Off		х	 Displays the charging status indicator 2 operation request status. On: The charging status indicator 2 is lit. Off: No operation request
CHARGE STAT INDI 3	On/Off		х	Displays the charging status indicator 3 operation request status.On: The charging status indicator 3 is lit.Off: No operation request
CHARGE LAMP SIGNAL	On/BLINK/ Off		x	 Displays the 12V battery charge warning lamp operation request status. On: The causes the 12V battery charge warning lamp to light up. BLINK: The causes the 12V battery charge warning lamp to flash. Off: No operation request
AVAILABLE MOT OUTPUT MAX	%			Displays the maximum value that can currently be output by the traction motor.
MOTOR REGE PWR MAX	%			Displays the maximum value that is currently regener- able by the traction motor.
ECO INDICATOR				Displays the number of segments indicated by the in- stant ECO indicator.
ECO TREE	_			Displays the number of segments indicated by the ECO tree.
POWER CONSUM (MOTOR)	kW			Displays the traction motor estimated power con- sumption calculated by VCM from the traction motor torque and vehicle speed.
POWER CONSUM (AUXS)	kW			Displays the power consumption of the auxiliaries.
POWER CONSUMPTION (A/C)	kW			Displays the power consumption of the air conditioner system.

< SYSTEM DESCRIPTION >

		Monitor Item Selection			
MONITOR ITEM	Unit	ECU INPUT SIGNALS	MAIN SIG- NALS	Description	A
ESTMT PWR CNSM (A/C CMP)	kW	Х		Displays the A/C compressor estimated power con- sumption.	В
ESTMT PWR CNSM (PTC HTR)	kW	Х		Displays the PTC heater estimated power consumption.	
POWER LIMIT CAUSE	 B/T-LOW B/T-HI B LEV B CAP MOT-V MOT-T ## 			 When the motor power is limited, this shows the reason the power is being limited. B/T-LOW: Li-ion battery temperature is too low. B/T-HI: Li-ion battery temperature is too high. B LEV: The Li-ion battery remaining energy is low. B CAP: The Li-ion battery capacity is low. MOT-V: The input voltage to the traction motor or traction motor inverter is low. MOT-T: Traction motor temperature or traction motor tor inverter temperature is too high. ##: No torque limitation. 	EV D E
CHARGE MODE	100V/200V/ QUICK/NG/ Off			Displays the charging status. • 100V: Charging using AC 100-120 V • 200V: Charging using AC 200-240 V • QUICK: During quick charge • NG: When in a state where charging is not possible • Off: Except above	г G
N/CHG PORT CONNECTION	On/HALF/ Off	x	х	 Displays the normal charge connector engagement state. On: The normal charge connector is connected correctly. HALF: The normal charge connector is semi-engaged. Off: The normal charge connector is not connected. 	H
Q/CHG INTERLOCK	On/Off	x	х	 Displays the quick charger connector engagement status. On: The quick charger connector is connected correctly. Off: The quick charger connector is not connected. 	J
AC POWER TYPE	100V/200V/ NONE			 Displays the type of AC power supply that is connected to the normal charge port. 100V: A 100-120 V power supply is connected. 200V: A 200-240 V power supply is connected. NONE: An AC power supply is not connected. 	L
ENABLE OBC OUT PWR	kW			Displays the power that can be output by the PDM (Power Delivery Module).	M
HV BATT EMPTY	OK/EMPTY			Displays that the Li-ion battery remaining energy is low. • OK: Normal • EMPTY: When low	Ν
OBC OUT PWR	kW	Х	Х	Displays the power being output by the PDM (Power Delivery Module).	~
TRG HV BATT CHG LEVEL	100%/80%			Displays the selected Li-ion battery charging level.	0
HV BATT LEVEL (%)	%	x	x	The Li-ion battery remained energy rate is displayed. NOTE: Battery power indication method of VCM differs from that of quick charger. A value displayed for this item may not agree with a value displayed by quick charg- er.	Ρ
HV BATT LEVEL	kWh	Х	Х	The Li-ion battery remained energy is displayed.	
HV BATT VOLT	V		Х	Displays the Li-ion battery voltage received from the Li-ion battery controller.	

< SYSTEM DESCRIPTION >

	Monitor Item Selection		m Selection		
MONITOR ITEM	Unit	ECU INPUT SIGNALS	MAIN SIG- NALS	Description	
HV BATT CURRENT	А			Displays the Li-ion battery current received from the Li-ion battery controller.	
HV BATTERY TEMP	°C or °F		Х	Displays the Li-ion battery temperature received from the Li-ion battery controller.	
IR SENSOR SIGNAL P-P	mV			Displays the peak to peak of the signal sent from the on-board isolation resistance monitoring system.	
CHG CNECTR LOCK RLY V	mV			Displays the current of charge connector lock relay on the contact side.	
C/CNECTR LCK ACTR DUTY	%			Displays the DUTY rate of PWM signal transmitted from VCM to charge connector lock actuator.	
F/S RELAY	On/Off		х	Displays the F/S relay operation status. • On: F/S relay is ON • Off: F/S relay is OFF	
F/S CHG RELAY	On/Off		х	Displays the F/S CHG relay operation status. • On: F/S CHG relay is ON • Off: F/S CHG relay is OFF	
M/C RELAY	On/Off		х	Displays the M/C relay operation status. • On: M/C relay is ON • Off: M/C relay is OFF	
A/C RELAY	On/Off		х	Displays the A/C relay operation status. • On: A/C relay is ON • Off: A/C relay is OFF	
REVERSE LAMP RELAY	On/Off	х		Displays the reverse lamp relay operation status.On: Reverse lamp relay is ONOff: Reverse lamp relay is OFF	
REVERSE LAMP RELAY MONI	On/Off			Displays the status that VCM is operating the reverse lamp relay.On: Operation voltage is being output by VCM.Off: Operation voltage is not being output by VCM.	
HV P MAIN RLY ACTIV	On/Off		х	Displays the system main relay 1 operation status.On: System main relay 1 is ONOff: System main relay 1 is OFF	
HV P MAIN RLY ACTIV MONI	On/Off	x		 Displays the status that VCM is operating the system main relay 1. On: Operation voltage is being output by VCM. Off: Operation voltage is not being output by VCM. 	
HV N MAIN RLY ACTIV	On/Off		х	Displays the system main relay 2 operation status. • On: System main relay 2 is ON • Off: System main relay 2 is OFF	
HV N MAIN RLY ACTIV MONI	On/Off	х		Displays the status that VCM is operating the system main relay 2.On: Operation voltage is being output by VCM.Off: Operation voltage is not being output by VCM.	
HV PRE CHG RLY ACTIV	On/Off		х	Displays the pre-charge relay operation status.On: pre-charge relay is ONOff: pre-charge relay is OFF	
HV PRE CHG RLY ACTIV MONI	On/Off	x		Displays the status that VCM is operating the pre- charge relay.On: Operation voltage is being output by VCM.Off: Operation voltage is not being output by VCM.	
Q/CHG RELAY	On/Off			Displays the quick charge relay operation status.On: Quick charge relay is ONOff: Quick charge relay is OFF	
ASCD SET VEHICLE SPEED	km/h or mph			The preset ASCD vehicle speed is displayed	

< SYSTEM DESCRIPTION >

		Monitor Item Selection			
MONITOR ITEM	Unit	ECU INPUT SIGNALS	MAIN SIG- NALS	Description	
ASCD MAIN SW	On/Off	x		Displays the ASCD MAIN switch operation status.On: When the ASCD MAIN switch is operatedOff: When the ASCD MAIN switch is not operated	
ASCD CANCEL SW	On/Off	x		Displays the CANCEL switch operation status.On: When the CANCEL switch is operatedOff: When the CANCEL switch is not operated	
RESUME/ACC SW	On/Off	x		 Displays the RESUME/ACCELERATE switch operation status. On: When the RESUME/ACCELERATE switch is operated Off: When the RESUME/ACCELERATE switch is not operated 	
ASCD SET SW	On/Off	x		 Displays the SET/COAST switch operation status. On: When the SET/COAST switch is operated Off: When the SET/COAST switch is not operated 	
ASCD BRAKE SW	On/Off	x		Displays the brake pedal position switch operation status.On: The brake pedal is not depressed.Off: The brake pedal is depressed.	
STOP LAMP SW	On/Off	x		Displays the operation status of the stop lamp switch.On: The brake pedal is depressed.Off: The brake pedal is not depressed.	
ASCD CANCEL (LOW SPEED)	NON/CUT			 Indicates the vehicle cruise condition. NON: Vehicle speed is maintained at the ASCD set speed. CUT: Vehicle speed decreased to excessively low, and ASCD operation is cut off. 	
ASCD CANCEL (SPEED DIFF)	NON/CUT			 Indicates the vehicle cruise condition. NON: Vehicle speed is maintained at the ASCD set speed. CUT: Vehicle speed decreased to excessively low compared with the ASCD set speed, and ASCD operation is cut off. 	
ASCD CRUISE LAMP	On/Off			Indicates [ON/OFF] condition of CRUISE lamp deter- mined by the VCM according to the input signals.	
ASCD SET LAMP	On/Off			Displays the SET indicator operation request status.On: The SET indicator is lit.Off: No operation request	
SL TARGET VEHICLE SPEED	The item is in	dicated, but not	t used.		
READY COUNT	count			Displays the cumulative READY count from the time the vehicle is new.	
INTEG READY TIME	sec			Displays the cumulative READY time from the time the vehicle is new.	
QUICK CHG COUNT	count	Displays the cumulative quick charge coun time the vehicle is new.		Displays the cumulative quick charge count from the time the vehicle is new.	
INTEG Q/CHG TIME	sec			Displays the cumulative quick charge time from the time the vehicle is new.	
NORMAL CHG COUNT	count			Displays the cumulative normal charge count from the time the vehicle is new.	
INTEG N/CHG TIME	sec			Displays the cumulative normal charge time from the time the vehicle is new.	
EV SYS ACT REQ (VCM TIM- ER)	The item is in	dicated, but not	t used.		

< SYSTEM DESCRIPTION >

		Monitor Iter	m Selection	
MONITOR ITEM	Unit	ECU INPUT SIGNALS	MAIN SIG- NALS	Description
ASCD VHCL SPD BLINK REQ	BLINK/FIX	Displays the status of vehicle speed indicator blink r quest of ASCD. • BLINK: Blink request • FIX: No blink request		BLINK: Blink request
DIFF WHEEL SPD LRN VAL	_			Displays a leaning value of slip rate calculated from the rotation difference between front wheel and rear wheel.
REFRIGERANT PRESS	MPa	x		The refrigerant pressure (determined by the signal voltage of the refrigerant pressure sensor) is displayed.
REGE TORQ LIMIT VAL (INV)	%			Displays a regeneration side motor torque limit value received from traction motor inverter.
LIGHT CRASH JUDGMENT	_			Displays minor collision detection information re- ceived from the air bag diagnosis sensor unit.
CHARGE PORT LID OPENER	On/Off			Displays the control status of the charge port lid open- er controlled by VCM. • On: Controlled, open • Off: Inactive
ECO MODE	On/Off			Displays the control status of ECO mode controlled by VCM. • On: ECO mode • Off: Except above
KICK DOWN	The item is in	dicated, but not	used.	

*: During 12 V battery automatic charge, remote climate control operation, and deice system operation.

ACTIVE TEST MODE

Test Item

TEST ITEM	CONDITION	JUDGMENT	CHECK ITEM (REMEDY)
PLUG IN INDICA- TOR	 POWER ON This turns ON and OFF the indicator used by the ACTIVE TEST. 	This confirms the indicator is ON/ OFF.	VCMCombination meterCAN communication
CHARGE STAT INDICATOR 1	 POWER ON This turns ON and OFF the indicator used by the ACTIVE TEST. 	This confirms the indicator is ON/ OFF.	Harness and connectorsBulb and LEDVCM
CHARGE STAT INDICATOR 2	 POWER ON This turns ON and OFF the indicator used by the ACTIVE TEST. 	This confirms the indicator is ON/ OFF.	Harness and connectorsBulb and LEDVCM
CHARGE STAT INDICATOR 3	 POWER ON This turns ON and OFF the indicator used by the ACTIVE TEST. 	This confirms the indicator is ON/ OFF.	Harness and connectorsBulb and LEDVCM
F/S CHG RLY	 POWER ON This turns ON and OFF the F/S CHG relay used by the ACTIVE TEST. 	Check that the F/S CHG relay makes the operating sound.	 Harness and connectors F/S CHG relay VCM
REVERSE LAMP RLY	 POWER ON This turns ON and OFF the reverse lamp relay used by the ACTIVE TEST. 	 Check that the reverse lamp relay makes the operating sound. Check that the reverse lamp is turned ON. 	 Harness and connectors Bulb and LED Reverse lamp relay VCM
DC/DC CONV DUTY	 READY ON This changes the duty ratio used by the ACTIVE TEST. 	Check that the 12V battery power supply voltage changes.	DC/DC converterVCMCAN communication

< SYSTEM DESCRIPTION >

TEST ITEM	CONDITION	JUDGMENT	CHECK ITEM (REMEDY)	_
VOLTAGE CON- TROL	 POWER ON This changes the voltage used by the ACTIVE TEST. 	Check that the 12V battery power supply voltage changes.	DC/DC converterVCMCAN communication	- A
READY INDICA- TOR	 POWER ON This turns ON and OFF the indicator used by the ACTIVE TEST. 	This confirms the indicator is ON/ OFF.	VCMCombination meterCAN communication	В
Power Limita- Tion Indica- Tor	 POWER ON This turns ON and OFF the indicator used by the ACTIVE TEST. 	This confirms the indicator is ON/ OFF.	VCMCombination meterCAN communication	EVO
EV SYSTEM W/L	 POWER ON This turns ON and OFF the indicator used by the ACTIVE TEST. 	This confirms the indicator is ON/ OFF.	VCMCombination meterCAN communication	D
12V BATTERY CHARGE W/L	 POWER ON This turns ON and OFF the indicator used by the ACTIVE TEST. 	This confirms the indicator is ON/ OFF.	VCMCombination meterCAN communication	E
ECO INDICATOR	 POWER ON This changes the display value used by the ACTIVE TEST. 	Confirm that the ECO indicator display in the upper meter changes.	 VCM Combination meter Upper meter CAN communication 	F
ECO TREE	 POWER ON This changes the display value used by the ACTIVE TEST. 	Confirm that the ECO tree display in the upper meter changes.	 VCM Combination meter Upper meter CAN communication 	G
WATER PUMP 1	 POWER ON This turns changes the duty ratio used by the ACTIVE TEST. 	Check that the water pump opera- tion speed changes.	Harness and connectorsWater pumpVCM	— Н
COOLING FAN	 POWER ON This turns changes the duty ratio used by the ACTIVE TEST. 	Check that the cooling fan operation speed changes.	Harness and connectorsCooling fan systemVCM	

WORK SUPPORT MODE

Work Item

WORK ITEM	CONDITION	USAGE
SAVE DATA FOR CPU REPLACE	In this mode, the data saved in VCM is stored in CONSULT.	When VCM is replaced.
WRITE DATA AFTER REPLACE CPU	In this mode, write data stored by "SAVE DATA FOR CPU REPLACE" in work support mode to VCM.	When VCM is replaced.
BATTERY GRADUAL CAP LOSS DATA CLEAR	Li-ion Battery deterioration data stored in VCM is cleared.	Always perform after Li-ion Battery controller is replaced as new one.
HV BATT J/B DATA CLEAR	System Main Relay cutoff count stored in VCM is cleared.	Always perform after Li-ion Battery Junction Box is replaced as new one.
WRITE VIN DATA	VIN is registered in VCM.	When registering VIN in VCM.
SPECIFIC DTC CLEAR*	Self-diagnosis results of DTC P0AA1 and Freeze Frame Data are cleared.	When DTC P0AA1 is detected.

*: When this is performed, all self-diagnosis results in VCM and Freeze Frame Data are cleared.

Ρ

J

VCM

Reference Value

INFOID:000000008747000

VALUES ON THE DIAGNOSIS TOOL

NOTE:

- Specification data are reference values.
- The displayed data may differ from an actual signal/value/operation, as some of them are calculated by VCM, based on signals transmitted from VCM-related sensors to VCM.
- 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.
- The following table includes information (items) inapplicable to this vehicle. For information (items) applicable to this vehicle, refer to CONSULT display items.

For outlines of following items, refer to EVC-73, "CONSULT Function".

MONITOR ITEM	(CONDITION	Values/Status
	Power ON	Charge connector is not con- nected	10
VCM MODE	READY		30
	During normal charge		60
	During quick charge		90
	READY		READY
VCM ACTIVATION	Except READY		On
	When vehicle speed is 0 km	/h	0 rpm
MOTOR SPEED	When vehicle speed is 60 kr	n/h	4200 rpm (Approx.)
INVERTER DC INPUT VOLT	Power ON		200 – 403 V
VEHICLE SPEED	Turn drive wheels and comp eter indication.	are CONSULT value with the speedom-	Almost the same speed as the speedometer indication.
HI SPEC VEHICLE SPEED	Turn drive wheels and comp eter indication.	are CONSULT value with the speedom-	Almost the same speed as the speedometer indication.
AMBIENT TEMP	Power: ON		Indicates depending on am- bient temperature.
	When a non-serious collisior	MID	
CLASH DETECT INFO	When a serious collision is d	HEAVY	
	No collision is detected	##	
12V BATTERY VOLTAGE	Power ON (not READY)	11 – 15 V	
120 DATTERT VOLIAGE	READY		13 – 15 V
VCM POWER SUPPLY (ACT)	Power ON		11 – 15 V
F/S RELAY VOLT	Power ON	11 – 15 V	
	READY	12 – 15 V	
12V BATTERY TEMP	Power ON	Indicates depending on mo- tor room air temperature.	
12V BATTERY CURRENT AVG	 READY (at idle[*]) Li-ion battery remained en Selector lever: P or N A/C switch: OFF Electrical load: No load 	0 – 50 A	

< ECU DIAGNOSIS INFORMATION >

MONITOR ITEM	CONE	DITION	Values/Status
	5 01	Accelerator pedal: Fully de- pressed	4.0 – 4.8 V
ACCEL SENSOR 1 VOLT	Power ON	Accelerator pedal: Fully re- leased	0.6 – 0.9 V
	Power ON	Accelerator pedal: Fully de- pressed	3.9 – 4.8 V
ACCEL SENSOR 2 VOLT	Power ON	Accelerator pedal: Fully re- leased	0.6 – 0.9 V
ACCEL OPEN ANGLE	Power ON	Accelerator pedal: Fully de- pressed	90 – 100%
ACCEL OPEN ANGLE	Fuwer On	Accelerator pedal: Fully re- leased	0 – 5%
CURRENT MOTOR TORQ	READY		0 – 280 N·m (Depending on accelerator pedal opening angle)
TRG MOTOR TORQ 1	READY		0 – 280 N·m (Depending on accelerator pedal opening angle)
MOTOR PWR LIMIT REQ (INV)	Normal		100%
	When output is limited		0 – 98%
PRTCTN CNT OPERAT HIST 1	The operation history of the Charge tection Control exists.	1 – 3	
	Except above	0	
		Selector lever: P Range	Р
	READY	Selector lever: R range	R
GEAR POSITION DISPLAY		Selector lever: N Range	Ν
		Selector lever: D range	D
		Selector lever: B range	В
PRTCTN CNT OPERAT HIST 2	The operation history of the Charging Connector-connecting Protec- tion Control exists.		On
	Except above		Off
		Selector lever: R	R
NEXT GEAR POSITION	Power ON	Selector lever: N or P	N/P
		Selector lever: D, B, or ECO	D
		Selector lever: R	R
GEAR POSITION	Power ON	Selector lever: N or P	N/P
	Selector lever: D, B, or E		D
COOLANT TEMP	After 2 minutes have expired since	Above the outside tempera- ture and below 80°C (176°F) (Value in accordance with the cooling water tempera- ture)	
	Power ON	Pump is stopped	10%
WATER PUMP 1 TRG DUTY	READY	Pump speed 750 rpm – 4700rpm	20 - 80%
	Power ON	Pump is stopped	10%
W/P 1 CRNT SPD DUTY	READY	Pump speed 750 rpm – 4700rpm	20 - 80%
COOLING FAN REQ DUTY	READY	1	15 – 85%
	READY		On
DC/DC CONV STAT	Power ON		STOP

MONITOR ITEM	CONE	DITION	Values/Status
		DC/DC converter does not oper- ate	0
		When normal operation	1
DC/DC CONV STATUS	Power ON	When VCM detects a DC/DC converter error	2
		When VCM prohibits the DC/DC converter operation	3
VARIABLE V/CONT PERMIT	 READY The 12V battery is sufficiently c Wiper not operating 	harged	On
	Except above.		Off
DC/DC CONV REQ VOLT	Power ON		14,000 mV
DO/DC CONV REQ VOLI	READY		13,000 – 15,000 mV
POWER SW	Power switch operation: ON⇒OF	F⇒ON	On⇒Off⇒On
START SIGNAL	Power switch operation: ON⇒STA	ART⇒ON	Off⇒On⇒On
IMMEDIATE CHG SW	Power ON	Immediate charging switch: Pressed	On
	Power ON	Immediate charging switch: Re- leased	Off
A / O O M /	Dawar ON	A/C switch: ON	On
A/C SW	Power ON	A/C switch: OFF	Off
	Power ON	Front wiper operation status Low	LOW
FRONT WIPER		Front wiper operation status High	HIGH
		Front wiper operation status Not operation	OFF
	When the combination switch's low	w beam was selected	On
HEAD LAMP LOW SIG	Except above		Off
	When the combination switch's high	gh beam was selected	On
HEAD LAMP HI SIG	Except above	Off	
	Blower fan: Operates		On
BLOWER FAN ACTIV	Blower fan: Not operates		Off
	Rear defogger: Operates	On	
REAR DEFOGGER	Rear defogger: Not operates	Off	
HV INTERLOCK (DC/DC)	When the PDM (Power Delivery Minstalled normally.	On	
	Except above		Off
HV CNCTR INTRLCK (HV BAT)	Power ON	When the Li-ion battery's high voltage connector is connected correctly	On
		Except above	Off
	READY	1	On
READY LAMP SIGNAL	When READY is started		Blinks
	Except above		Off
	Power limitation indicator lamp: O	On	
PWR LIMIT INDICAT LAMP	Power limitation indicator lamp: O	FF	Off

< ECU DIAGNOSIS INFORMATION >

MONITOR ITEM	CON	Values/Status			
EV SYSTEM W/L SIGNAL	Power ON	When VCM has detected an er- ror.	On	/-	
		Except above	Off	r	
PLUG IN INDI LAMP	Plug in indicator lamp: ON		On	- 6	
	Plug in indicator lamp: OFF		Off	_	
	Charging status lamp 1: ON		On	E	
CHARGE STAT INDI 1	Charging status lamp 1: OFF		Off		
CHARGE STAT INDI 2	Charging status lamp 2: ON		On		
CHARGE STAT INDI Z	Charging status lamp 2: OFF		Off	_ [
CHARGE STAT INDI 3	Charging status lamp 3: ON		On		
CHARGE STAT INDI 5	Charging status lamp 3: OFF		Off	E	
CHARGE LAMP SIGNAL	Power ON		On		
CHARGE LAWF SIGNAL	READY		Off		
AVAILABLE MOT OUTPUT MAX	READY		0 – 100%	F	
MOTOR REGE PWR MAX	READY		0 – 100%		
ECO INDICATOR	Displays the same value as in the	e instant ECO indicator.		- 0	
ECO TREE	Displays the same value as in the	e ECO tree.			
POWER CONSUM (MOTOR)	READY		(-100) — (+100)%	ŀ	
	Power ON	0 – 0.6 kW			
POWER CONSUM (AUXS)	READY	0.2 – 0.8 kW			
	Charging	0.1 – 0.7 kW			
POWER CONSUMPTION (A/C)	 READYWhen the air conditioner is use	0 – 5 kW			
ESTMT PWR CNSM (A/C CMP)	 READY A/C switch: ON		0 – 5 kW		
ESTMT PWR CNSM (PTC HTR)	When the air conditioner is opeSet temperature: HOT side ma		0 – 10 kW	k	
		Li-ion battery temperature is too low.	B/T-LOW		
		Li-ion battery temperature is too high.	B/T-HI	_ L	
		When the Li-ion battery remain- ing energy is low	B LEV	N	
POWER LIMIT CAUSE	Output being limited	When the Li-ion battery capacity is low	ВСАР		
		When the voltage input to the traction motor or traction motor inverter is low	MOT-V	N	
		Traction motor temperature or traction motor inverter tempera- ture is too high.	МОТ-Т	C	
	No torque limitation	•	##	F	
	Charging using AC 100-120 V		100V		
	Charging using AC 200-240 V		200V		
CHARGE MODE	During quick charge		QUICK		
	When in a state where charging is	NG			
	Except above	Off			

MONITOR ITEM	CONE	NOITION	Values/Status
	Normal charge connector is conn	ected.	On
N/CHG PORT CONNECTION	Normal charge connector is half-e	HALF	
	Except above		Off
Q/CHG INTERLOCK	Quick charger connector is conne	ected.	On
Q/CHG INTERLOCK	Except above		Off
	When an AC power supply is not	connected	OFF
AC POWER TYPE	When an AC 100-120 V power su	upply is connected	100V
	When an AC 200-240 V power su	upply is connected	200V
	Charrier	When EVSE for 3.3 kW is used	3.3 kW
ENABLE OBC OUT PWR	Charging	When EVSE for 6.0 kW is used	6.0 kW
	Davies ON	The Li-ion battery remaining en- ergy is sufficient.	ок
HV BATT EMPTY	Power ON	The Li-ion battery remaining en- ergy is low.	EMPTY
	In Normal Charging	When EVSE for 3.3 kW is used	0 – 3.3 kW
OBC OUT PWR	in Normal Charging	When EVSE for 6.0 kW is used	0 – 6.0 kW
	In Quick Charging		0 – 50 kW
	Selected 100% charge		100%
TRG HV BATT CHG LEVEL	Selected 80% charge	80%	
HV BATT LEVEL (%)	Depending on Li-ion battery rema	ained energy.	0 – 100%
HV BATT LEVEL	Power ON		0 – 24 kWh
HV BATT VOLT	Power ON		200 – 403 V
HV BATT CURRENT	READY (at idle [*]) Electrical load: No load	0 – 10 A	
HV BATTERY TEMP	Power ON		Between the outside air tem perature and 50°C (122°F)
IR SENSOR SIGNAL P-P	Power ON		3150 mV or more
CHG CNECTR LOCK RLY V	Set vehicle as stated below and c switch to LOCK. • Power switch: OFF • Charge connector lock switch: • Connect EVSE to normal charge	OFF	0 V⇒12V battery voltage⇒ V
	Except above	0 V	
C/CNECTR LCK ACTR DUTY	Set vehicle as stated below and c switch to LOCK. • Power switch: OFF • Charge connector lock switch: • Connect EVSE to normal charge	0%⇒100%⇒0%	
	Except above		0 V
F/S RELAY	Power ON		On
	During quick charge		On
F/S CHG RELAY	Except above	Off	
M/C RELAY	Power ON		On
	Power ON		On
A/C RELAY	Power OFF		Off
	D 011	Selector lever: R range	On
REVERSE LAMP RELAY	Power ON Selector lever: Except R range		Off

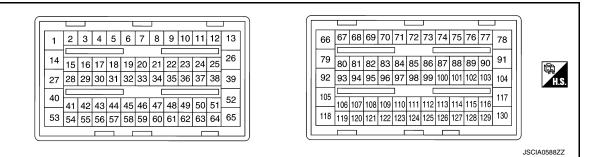
MONITOR ITEM	CONE	DITION	Values/Status
	Device ON	Selector lever: R range	On
REVERSE LAMP RELAY MONI	Power ON	Selector lever: Except R range	Off
	READY	On	
HV P MAIN RLY ACTIV	Power ON	Off	
HV P MAIN RLY ACTIV MONI	READY	On	
	Power ON		Off
HV N MAIN RLY ACTIV	READY		On
	Power ON		Off
HV N MAIN RLY ACTIV MONI	READY		On
	Power ON		Off
HV PRE CHG RLY ACTIV	Immediately after the power OFF:	⇒READY operation	Off⇒On⇒Off
HV PRE CHG RLY ACTIV MONI	Immediately after the power OFF:	⇒READY operation	Off⇒On⇒Off
Q/CHG RELAY	Quick charging		On
	Except above		Off
ASCD SET VEHICLE SPEED	ASCD: Operating		The preset vehicle speed is displayed
ASCD MAIN SW	Power ON	ASCD MAIN switch: Pressed	On
	Fower ON	ASCD MAIN switch: Released	Off
ASCD CANCEL SW	Power ON	CANCEL switch: Pressed	On
ASCD CANCEL SW	Power ON	CANCEL switch: Released	Off
	Davies ON	RESUME/ACCELERATE switch: Pressed	On
RESUME/ACC SW	Power ON	RESUME/ACCELERATE switch: Released	Off
	Device ON	SET/COAST switch: Pressed	On
ASCD SET SW	Power ON	SET/COAST switch: Released	Off
ASCD BRAKE SW	Power ON	Brake pedal: Fully released	On
ASCD BRAKE SW	Power ON	Brake pedal: Depressed	Off
STOP LAMP SW	Power ON	Brake pedal: Fully released	Off
STOP LAWIF SW	Power ON	Brake pedal: Depressed	On
ASCD CANCEL (LOW SPEED)	Power ON		NON
ASCD CANCEL (SPEED DIFF)	Power ON		NON
ASCD CRUISE LAMP	Power ON	ASCD MAIN switch: Pressed at the 1st time \rightarrow at the 2nd time	On⇒Off
ASCD SET LAMP	After the ASCD MAIN switch has	been pressed once, press it again.	On⇒Off
SL TARGET VEHICLE SPEED	The item is indicated, but not use	d.	
READY COUNT	Power ON	This shows the READY cu- mulative count	
INTEG READY TIME	Power ON	This shows the READY cu- mulative operation time	
QUICK CHG COUNT	Power ON	This shows the quick charge cumulative count	
INTEG Q/CHG TIME	Power ON	This shows the quick charge cumulative operation time	
NORMAL CHG COUNT	Power ON		This shows the normal charge cumulative count

< ECU DIAGNOSIS INFORMATION >

MONITOR ITEM	CONE	DITION	Values/Status			
INTEG N/CHG TIME	Power ON		This shows the normal charge cumulative operation time			
EV SYS ACT REQ (VCM TIM- ER)	The item is indicated, but not use	d.				
ASCD VHCL SPD BLINK REQ	Driving ASCD: ON	Blink				
	ASCD. ON	Except above	Off			
DIFF WHEEL SPD LRN VAL	Power ON	Power ON				
REFRIGERANT PRESS	 READY Both the A/C switch and blower sor is operating) 	0.6 – 2.6 MPa				
REGE TORQ LIMIT VAL (INV)	Normal	100%				
REGE TORQ LIMIT VAL (INV)	When output is limited		0 – 98%			
LIGHT CRASH JUDGMENT	When a light crash judgment signa sensor unit.	15				
	Except above	0				
CHARGE PORT LID OPENER	Charge port lid opener switch: OF	Off⇒On⇒Off				
ECO MODE	ECO mode indicator: ON	On				
	ECO mode indicator: OFF	ECO mode indicator: OFF				
KICK DOWN	Power ON	Accelerator pedal: Depressed	On			

*: Idle is the state when not driving in the READY state.

TERMINAL LAYOUT



PHYSICAL VALUES

NOTE:

Specification data are reference values.

	iinal No. e color)	Description			Condition	Value
+	_	Signal name	Input/ Output		Condition	(Approx.)
1	Ground	Motor coil A U-phase	Output	Power swite	ch: ON	9 V – 16 V
(B)	Giouna	Motor con A 0-phase	Output	Power swite	ch: OFF	0 V
3	Ground	Electric shift sensor No. 5	Input READY	Selector lever is held in D po- sition	0 V	
(W)					Other than the above	5 V
5				Power swite	ch: OFF	0 V
(LG)	Ground	F/S relay power supply	Input	Power switch: ON		12V BATTERY VOLTAGE (11 – 15 V)
7 (O/L)	Ground	Electric shift sensor pow- er supply 1	Input	Power swite	ch: ON	5 V

< ECU DIAGNOSIS INFORMATION >

	iinal No. e color)	Description			Condition	Value	А
+	-	Signal name	Input/ Output			(Approx.)	
8 (W)	Ground	F/S CHG relay	Output	During quic Except abo		0 V (Approx.) 12V BATTERY VOLTAGE (11 – 15 V)	B
9 (SB)	Ground	Parking actuator relay A	Output	Power swite Power swite		0 V 9 V - 16 V	
11 (BR)	Ground	12V Battery power supply	Input	Always		12V BATTERY VOLTAGE (11 – 15 V)	D
13 (SB)	Ground	Motor coil A V-phase	Output	Power swite Power swite		9 V – 16 V 0 V	Е
16 (R)	Ground	Electric shift sensor No. 3	Input	READY	Selector lever is held in H (Home) and N positions	0 V	F
(1)					Other than the above	5 V	
17 (B)	Ground	Electric shift sensor No. 1	Input	READY	Selector lever is held in R po- sition	0 V	G
(8)					Other than the above	5 V	
18 (Y)	Ground	R position output (selec- tor indicator)	Output	READY	Selector lever is held in R po- sition	1 V or less	Н
(1)					Other than the above	9 V – 16 V	
19	58	Water pump signal	Input	Power sw Pump op	vitch ON eration duty: 0%	250mSec/div	l J K
(W)	(B/R)			Power sw Pump op	vitch ON eration duty: Approx. 70%	250mSec/div 250mSec/div 2V/div	L
20	58	Water numn signal	Input	Pump opera	ation duty: 0%	250mSec/div	N
(G)	(B/R)	B/R) Water pump signal input –		Pump opera	ation duty: Approx. 70%	250mSec/div	Ρ

	iinal No. e color)	Description			Condition	Value
+	_	Signal name	Input/ Output		Condition	(Approx.)
21	Ground	F/S relay	Output	Power swite	ch: OFF	12V BATTERY VOLTAGE (11 – 15 V)
(GR)	Cround	170 Telay	Output	Power swite	ch: ON	0 V (Approx.)
23 (R)	Ground	Charge port lid opener actuator relay	Output	When the c is operating	harge port lid opener actuator J	12V BATTERY VOLTAGE (11 – 15 V)
(14)				Except abo	ve	0 V
24 (L)	_	EV system CAN-H	Input/ Output	—		_
25 (G)	—	EV system CAN-L	Input/ Output	—		_
28 (R)	58 (B/R)	System main relay 2	Output	During REA	ADY or during charging	12V BATTERY VOLTAGE (11 – 15 V)
30 (W)	Ground	READY signal	Input	ON under for • Selector	. 2 seconds after power switch ollowing condition: lever: P or N dal: Depressed	0 V (Approx.)
				Except abo	ve	12V BATTERY VOLTAGE (11 – 15 V)
32 (B)	Ground	Encoder power supply	Output	Power swite	ch: ON	5 V
33 (L)	Ground	N position output (selec- tor indicator)	Output	READY	Selector lever is held in N po- sition	1 V or less
(Ľ)					Other than the above	9 V – 16 V
34 (R)	Ground	D position output (selec- tor indicator)	Output	READY	Selector lever is held in D po- sition	1 V or less
(13)					Other than the above	9 V – 16 V
36 (W)	62 (B)	Sensor power supply (Accelerator pedal posi- tion sensor 1)	Output	Power swite	ch: ON	5 V (Approx.)
39	Ground	Motor coil A W-phase	Output	Power swite	ch: ON	9 V – 16 V
(R)	Ciouna		Output	Power swite	ch: OFF	0 V
40 (B)	Ground	Pre-charge relay	Output		y after the power DY operation	12V BATTERY VOLTAGE [*] (11 – 15 V)
(D)				Except abo	ve	0 V
44 (P)	Ground	Encoder signal B	Input	Parking actuator is operated		10.0mSec/div 10.0mSec/div 20V/div JSDIA2351GB
45 (V)	Ground	Encoder signal A	Input	Parking act	uator is operated	10.0mSec/div 10.0mSec/div 20V/div JSDIA2351GB

< ECU DIAGNOSIS INFORMATION >

	iinal No. e color)	Description		Condition		Value	A
+	_	Signal name	Input/ Output	Condition		(Approx.)	
46 (B)	Ground	P position output (selec- tor indicator)	Output	READY	Selector lever is held in P po- sition	1 V or less	В
(6)					Other than the above	9 V – 16 V	
47 (LG)	Ground	P/N position signal	Output	READY	Selector lever is held in P and N positions	9 V – 16 V	EVC
(20)					Other than the above	0 V	D
48 (W)	Ground	P position signal	Output	READY	Selector lever is held in P po- sition	0 V	D
(***)					Other than the above	9 V – 16 V	Е
49	62	Accelerator pedal posi-	Input	Power swAccelerat	vitch: ON or pedal: Fully released	0.6 – 0.9 V	
(R)	(B)	tion sensor 1	mput	Power swAccelerate	vitch: ON or pedal: Fully depressed	3.9 – 4.8 V	F
51 (R)	Ground	Power ON power supply	Input	Power swite	ch: ON	12V BATTERY VOLTAGE (11 – 15 V)	
54 (W)	58 (B/R)	System main relay 1	Output	During REA	DY or during charging	12V BATTERY VOLTAGE (11 – 15 V)	G
(**)	(B/IX)			Except abo	ve	0 V	Н
56 (G)	Ground	Encoder ground	_	Always		0 V	
57 (O)	Ground	Electric shift sensor ground 1	_	Always		0 V	
58 (B/R)	_	VCM ground		_		_	
62 (B)	_	Sensor ground (Accelerator pedal posi- tion sensor 1)	_	_		_	J
65 (B)	_	VCM ground		_		_	K
70 (SB)	Ground	Reverse lamp relay	Output	 Power OI Selector Power OI 	ever: R range	0 V (Approx.) 12V BATTERY VOLTAGE	L
(02)					N lever: Except R range	(11 – 15 V)	
72	Cround	Connection detecting cir-	logut		onnection detecting circuit of er Delivery Module) is ener-	3 – 7 V	Μ
(P)	Ground	cuit signal	Input		onnection detecting circuit of er Delivery Module) is not ener-	0 V	Ν
73 (O)	Ground	Connection detecting cir- cuit power supply	Output	Power switch: ON		3 – 7 V	0
74 (G)	Ground	Power ON power supply	Input	Power swite	ch: ON	12V BATTERY VOLTAGE (11 - 15 V)	5
75 (L)		CAN-H	Input/ Output	_		_	Ρ
76 (P)		CAN-L	Input/ Output			_	
78 (SB)	58 (B/R)	Charge connector lock re- lay	Output	When the c is operating	harge connector lock actuator	12V BATTERY VOLTAGE (11 – 15 V)	

Terminal No. (Wire color)		Description			Quadition	Value
+	-	Signal name	Input/ Output		Condition	(Approx.)
79 (R)	Ground	12V Battery power supply	Input	Always		12V BATTERY VOLTAGE (11 – 15 V)
81 (L)	Ground	Charge connector lock switch (AUTO)	Input	Charge con Except abo	nector lock switch: AUTO	0 V 12V BATTERY VOLTAGE (11 – 15 V)
82 (GR)	Ground	Charge port light	Output	Charge por Charge por		0 V 12V BATTERY VOLTAGE
83 (W)	Ground	Electric shift sensor pow- er supply 2	Input	Power swite	ch: ON	(11 – 15 V) 5 V
84 (W)	Ground	Electric shift sensor No. 2	Input	READY	Selector lever is held in R and N positions	0 V
()					Other than the above	5 V
85 (G)	Ground	Electric shift sensor No. 4	Input	READY	Selector lever is held in N and D positions	0 V
(-)					Other than the above	5 V
86 (G)	Ground	Electric shift sensor No. 6	Input	READY	Selector lever is held in H (Home) position	0 V
(0)					Other than the above	5 V
87	<u> </u>	Charge connector lock		"LOCK" indicator: ON		0 V
(V)	Ground	switch indicator (LOCK)	Input	"LOCK"indicator: OFF		12V BATTERY VOLTAGE (11 – 15 V)
88	58	M/C relay	Output	Power switch: OFF		12V BATTERY VOLTAGE (11 – 15 V)
(SB)	(B/R)	W/ O roldy	Output	Power swite	ch: ON	0 V (Approx.)
89	Cround	Charging status indicator	Output	Charging st	atus indicator 2: ON	0 V (Approx.)
(BR)	Ground	2	Output	Charging st	atus indicator 2: OFF	12V BATTERY VOLTAGE (11 – 15 V)
90	Ground	Charging status indicator	Quitout	Charging st	atus indicator 3: ON	0 V (Approx.)
(G)	Ground	3	Output	Charging st	atus indicator 3: OFF	12V BATTERY VOLTAGE (11 – 15 V)
91		Charge connector lock		"AUTO" ind	icator: ON	0 V
(O)	Ground	switch indicator (AUTO)	Input	"AUTO"indi	cator: OFF	12V BATTERY VOLTAGE (11 – 15 V)
93		Charge port lid opener		Charge por	t lit opener switch: Pressed.	0 V
(BR)	Ground	switch	Input	Charge por ed.	t lit opener switch: Not operat-	12V BATTERY VOLTAGE (11 – 15 V)
94		Charge connector lock		Charge connector lock switch: LOCK		0 V
(O)	Ground	switch (LOCK)	Input	Except abo	ve	12V BATTERY VOLTAGE (11 – 15 V)
95 (Y)	120 (L)	Battery current sensor	Input	READY12V batter	ery is fully charged	2.6 – 3.5 V
96 (R)	120 (L)	Sensor power supply (Battery current sensor)	Output	Power swite	ch: ON	5 V (Approx.)

Terminal No. (Wire color)		Description		Condition		Value	А				
+	_	Signal name	Input/ Output		Condition	(Approx.)					
97 (W)	122 (B)	Sensor power supply (Accelerator pedal posi- tion sensor 2)	Output	Power swite	ch: ON	5 V (Approx.)	В				
98 (L)	123 (BR)	Sensor power supply (Refrigerant pressure sensor)	Output	Power swite	ch: ON	5 V	EV				
99 (R)	Ground	P position switch No. 1	Input	READY	P position switch is pushed	5 V	D				
101	Cround	Stop Jomp quitch	laput	Power swBrake pe	Other than the above /itch: ON dal: depress	0 V 12V BATTERY VOLTAGE (11 – 15 V)	E				
(P)	Ground	Stop lamp switch	Input	Power swBrake per	<i>v</i> itch: ON dal: Fully released	0 V					
103	Ground	Plug in indicator lamp	Output	Plug in indi	cator lamp: ON	0 V (Approx.)	F				
(L)				Plug in indi	cator lamp: OFF	12V BATTERY VOLTAGE (11 – 15 V)	G				
104	Ground	Charge connector lock re-	Input	When the c is operating	harge connector lock actuator	12V BATTERY VOLTAGE (11 – 15V)	_				
(R)		lay power supply	•	Except abo	ve	0 V	Н				
107 (L)	120 (L)	Battery temperature sen- sor	Input	 Power switch: ON Motor room temperature: 25°C (77°F) 		3.3 V					
108	122	Accelerator pedal posi-		Power switch: ONAccelerator pedal: Fully released		0.3 – 0.45 V	I				
(R)	(B)	tion sensor 2	Input	Power swAccelerate	vitch: ON or pedal: Fully depressed	1.95 – 2.4 V	J				
109 (B)	123 (BR)	Refrigerant pressure sen- sor	Input	A/C compre	essor operating.	1.0 – 4.0 V	_				
110	121	Coolant temperature sen-	Input	Coolant ten	nperature: 20°C (68°F)	3.3 – 3.7 V	K				
(Y)	(W)	sor	mput	Coolant ten	nperature: 60°C (140°F)	1.6 – 2.1 V					
				Power OIASCD steel	N eering switch: All OFF	4.1 – 4.3 V	L				
				Power OIECO mod	N de switch: Pressed	3.5 – 3.7 V					
111 (SP)	58 (P/P)	ASCD steering switch	ASCD steering switch	ASCD steering switch	ASCD steering switch	ASCD steering switch	Input	 Power OI RESUME Pressed 	N ACCELERATE switch:	2.8 – 3.1 V	N
(56)	(SB) (B/R) (B/R)		Power ON SET/COAST switch: Pressed		2.0 – 2.4 V	Ν					
				Power OICANCEL	N switch: Pressed	1.1 – 1.6 V	C				
				Power ONASCD main switch: Pressed		0 – 0.6 V					
112 (B)	Ground	P position switch No. 2	Input	READY	P position switch is pushed	0 V	F				
(ם)					Other than the above	5 V					
113	Cround	Brake pedal position	Incut	Power swBrake pe	<i>v</i> itch: ON dal: depress	0 V					
(O)	Ground	switch	Input	Power swBrake per	<i>v</i> itch: ON dal: Fully released	12V BATTERY VOLTAGE (11 – 15 V)					

	iinal No. e color)	Description		Condition	Value
+	_	Signal name	Input/ Output	Condition	(Approx.)
115	Ground	Charging status indicator	Output	Charging status indicator 1: ON	0 V (Approx.)
(V)	Crodina	1	Output	Charging status indicator 1: OFF	12V BATTERY VOLTAGE (11 – 15 V)
116	Ground	A/C relay	Output	Power switch: ON	0 V (Approx.)
(SB)	Cround	A C Teldy	Output	A few seconds after turning power switch OFF	12V BATTERY VOLTAGE (11 – 15 V)
117 (LG)	58 (B/R)	Charge connector lock actuator (+)	Output	Charge connector lock actuator: un- lock⇒lock	★6 – 7 V 0.5S/div 0.5S/div JSCIA0587ZZ JSCIA0587ZZ NOTE: Repeat up to 3 times until normal- ly locked.
				Except above	0 V
118 (B)	_	VCM ground	_	_	_
120 (L)	_	Sensor ground (Battery current sensor)	_	_	_
121 (W)		Sensor ground (Coolant temperature sensor)		_	_
122 (B)		Sensor ground (Accelerator pedal posi- tion sensor 2)		_	_
123 (BR)		Sensor ground (Refrigerant pressure sensor)	_	_	_
124 (W/L)	Ground	Electric shift sensor ground 2	_	Always	0 V
125 (BR)	—	ASCD steering switch ground	_	_	_
126 (B/R)		VCM ground		_	_

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Terminal No. (Wire color)		Description		Condition	Value
+	_	Signal name	Input/ Output	Condition	(Approx.)
128	58	Cooling for control signal	Output	Fan duty: 40%	5mSec/div
(V)		Output	Fan duty: 100%	5mSec/div	
129 (Y)	Ground	Immediate charging switch	Input	Immediate charging switch: Pressed	12V BATTERY VOLTAGE (11 – 15 V)
(1)		Switch		Immediate charging switch: Released	0 V
					★6 – 7 V 0.5S/div
130 (W)	58 (B/R)	Charge connector lock actuator (-)	Output	Charge connector lock actuator: lock⇒un- lock	SV/div JSCIA0587ZZ NOTE: Repeat up to 3 times until normal- ly unlocked.
				Except above	0 V

*: This signal can be confirmed with oscilloscope.

Fail-Safe

FAIL-SAFE PATTERN

- Pattern A: Quick charge prohibited
- Pattern B: Normal charge prohibited
 Pattern C: READY OFF
- Pattern D: High-voltage power supply stop

FAIL-SAFE LIST

	DTO.		Pa	ttern		Others	
	DTC	А	В	С	D	Others	D
U1010	TYPE 1			×			
01010	TYPE 2	×	×	×	×		
P0A8D	L	×	×	×	×		
P0A8E		×	×	×	×		
P0AA0		×	×	×	×	Start not possible	
P0AA1		×	×	×	×	Start not possible	

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DTC			Pat	ttern		Others	
	DIC	Α	В	С	D	Others	
P0AA2		×	×	×	×		
P0AA4		×	×	×	×	Start not possible	
P0AA5		×	×	×	×		
P0AA6		×	×			Doing READY again is prohibited.	
P1564						ASCD operation prohibited	
P1572						ASCD operation prohibited	
P1574						ASCD operation prohibited	
P1610		×	×	×	×	Start not possible	
P1611		×	×	×	×	Start not possible	
P1612		×	×	×	×	Start not possible	
P2122							
P2123 P2127						 Traction motor output is limited. Reduced responsiveness during accelerator operation 	
P2128							
	TYPE 1			×			
P2138	TYPE 2					Traction motor output is limited.Reduced responsiveness during accelerator operation	
P3100		×	×	×	×		
	TYPE 1			×			
P3101	TYPE 2	×	×	×	×	Start not possible	
	TYPE 3					No fail-safe.	
P3102						Traction motor output is limited.	
P3117						 VCM inhibits the operation of the electric compressor. VCM inhibits the operation of the PTC heater. 	
P312B		×	×	×	×		
P312C		×	×	×	×		
P312D		×	×	×	×		
P312E		×	×	×	×		
P312F		×	×	×	×		
P3130		×	×	×	×		
	TYPE 1	×	×	×	×		
P3131	TYPE 2					No fail-safe.	
P3137		×	×	×	×	Start not possible	
P3141			×				
P315C		×	×	×	×		
P316A				×			
P316C		×					
P316D				×			
D0405	TYPE 1	×	×	×	×		
P316F	TYPE 2	×	×				
P3170	1		×				
P3173		×	×			Traction motor output is limited.	
P3175				×			
P3176		×	×	×	×		
P3177		×	×	×	×		

			Pat	tern		015.00
	DTC	А	В	С	D	Others
P3178		×	×	×	×	
P317A				×		
P317B		×	×	×	×	
P317D				×		
P317E		×	×			
P3182		×	×	×	×	
P3183		×	×			
P3187				×		
P3188	TYPE 1	×	×			Traction motor output is limited.
1 3100	TYPE 2					No fail-safe.
P318B	TYPE 1			×		Put the gear position in neutral.
1 5100	TYPE 2	×	×	×	×	
P3191	TYPE 1			×		
F 3 1 9 1	TYPE 2					No fail-safe.
P3193	TYPE 1	×	×			Only driving in creep is possible.
1 0 1 0 0	TYPE 2					No fail-safe.
P3196	TYPE 1	×				
F 3 1 9 0	TYPE 2	×	×			Traction motor output is limited.
P3197				×		
P319C				×		
P319E		×	×			Only driving in creep is possible.
P31A1	TYPE 1	×				
IJIAI	TYPE 2	×	×			Traction motor output is limited.
P31A2				×		
P31A7				×		
P31A9		×	×			Only driving in creep is possible.
P31AD				×		
P31AE	TYPE 1	×				
TOTAL	TYPE 2	×	×			Traction motor output is limited.
	TYPE 1					VCM inhibits the timer charge.
P31B0	TYPE 2					VCM inhibits the timer charge and the remote climate control.
	TYPE 3					No fail-safe.
P31B3	TYPE 1					When the power is turned on and the vehicle is charging, the cooling fan is operated at a constant speed.
	TYPE 2					No fail-safe.
	TYPE 1					VCM inhibits the timer charge.
P31B4	TYPE 2					VCM inhibits the remote climate control.
	TYPE 3					No fail-safe.
P31B5	TYPE 1					ASCD operation prohibited NOTE: The ECO indicator value also becomes extremely poor.
	TYPE 2					No fail-safe.
P31B6						VCM sets the DC/DC converter output power to a constant 14 V.
P31C5						 VCM inhibits the timer charge and the remote climate control. VCM inhibits the automatic 12V battery charge control.

DTC			Pat	ttern		Others
		Α	В	С	D	Oulers
P31C6						 VCM inhibits the timer charge and the remote climate control. VCM inhibits the automatic 12V battery charge control.
P31C7						VCM inhibits the timer charge and the remote climate control.VCM inhibits the automatic 12V battery charge control.
P31CA		×				Traction motor output is limited.
P31CB		×				Traction motor output is limited.
P31D5						 Traction motor output is limited. Vehicle speed is limited. [Approx. 40 km/h (25 MPH)]
P31DB		×	×	×	×	
P31DC		×	×	×	×	
P31DE	TYPE 1					Traction motor output is limited.
FUDE	TYPE 2	×	×	×	×	Start not possible
P31E0	TYPE 1	×	×	×	×	
PSIEU	TYPE 2					No fail-safe.
P31E1	TYPE 1	×	×	×	×	
FJIEI	TYPE 2					No fail-safe.
P31E7	4					Doing READY again is prohibited.
P31F2						VCM inhibits the timer charge and the remote climate control.

DTC Inspection Priority Chart

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If multiple DTC are displayed at the same time, check each of them one at a time in accordance with the following priority table.

Priority	DTC	Detection items
	U1000	CAN communication line
	U1010	Control unit (CAN)
	P0A00	Coolant temperature sensor
	P1551, P1552	Battery current sensor
	P1556, P1557	Battery temperature sensor
	P2122, P2123	Accelerator pedal position sensor 1
	P2127, P2128	Accelerator pedal position sensor 2
1	P3101	VCM
	P3135	Slight collision detection
	P3137	Car crash
	P3175	VCM
	P318B, P318D, P3191, P3193, P3194, P3195, P3196, P3197, P319C, P319E, P319F, P31A0, P31A1, P31A2, P31A3, P31A7, P31A9, P31AA, P31AB, P31AD, P31AE, P31AF, P31B0, P31B2, P31B3, P31B4, P31B5, P31B6, P31B7, P31B8, P31BA, P31BB	Communication error
	P31C5, P31C6, P31C7	VCM

Priority	DTC	Detection items
	P0A0B	High Voltage system interlock error
	P0A8D, P0A8E	14V power supply
	P0A94	DC/DC converter
	P0AA0, P0AA1, P0AA2	System main relay 1
	P0AA4, P0AA5	System main relay 2
	P1550, P1554	Battery current sensor
	P155A	Battery temperature sensor
	P1564	ASCD switch
	P1572	Brake pedal position switch
	P1574	ASCD vehicle speed sensor
	P1805	Brake switch
	P2138	Accelerator pedal position sensor
	P3102	Invalid battery
	P315C	Charge relay
	P315E	VDC system
0	P316A	Motor speed
2	P3172, P3173	PDM (Power Delivery Module) system
	P317D	Motor system
	P3183	High Voltage battery system
	P318A, P318B, P318C	Electric shift system
	P31CA, P31CB	PDM (Power Delivery Module) system
	P31D3	M/C relay
	P31D4, P31D5	Pre charge relay
	P31D6, P31D7	F/S relay
	P31D8	Charge connector lock relay
	P31DB	System main relay 1
	P31DC	System main relay 2
	P31DD	Pre charge relay
	P31E5	VCM power supply
	P31E8, P31E9, P31EC	Electric water pump
	P31EE	Refrigerant pressure sensor
	P31F2	AV set information

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Priority	DTC	Detection items		
	P0A8F	14V power supply		
	P0AA6	Li-ion battery voltage system isolation error		
	P3100, P312A	Communication error		
	P3117	A/C system		
	P311C	High voltage system		
	P312B	Restart error		
	P312C	Traction motor inverter discharge error		
	P312D	Quick charge relay		
	P312E	READY OFF error		
3	P312F	Charge OFF error		
	P3130	Traction motor inverter discharge error		
	P3131	System shutoff timeout		
	P3141	PDM (Power Delivery Module)		
	P316F	PDM (Power Delivery Module) system		
	P3176	Inverter condenser		
	P3177, P3178	ECU activation error		
	P31DE	Li-ion battery main relay		
	P31E0, P31E1	High voltage system interlock error		
	P31E7	Restart inhibition		
	P316C, P316D, P316E, P3170, P3171	PDM (Power Delivery Module) system		
4	P3179, P317A, P317B	Traction motor system		
4	P317E, P3180, P3182	Li-ion battery system		
	P3187, P3188, P3189	Electric shift system		

DTC Index

INFOID:000000008747003

×:Applicable —: Not applicable

DTC	Items (CONSULT screen terms)	EV system warning lamp	Trip	Reference page
U1000	CAN COMM CIRCUIT	—	1	<u>EVC-154</u>
U1010	CONTROL UNIT (CAN)	×	1	<u>EVC-155</u>
P0A00	COOLANT TEMPERATURE SENSOR	—	1	EVC-156
P0A0B	HV SYSTEM INTERLOCK ERROR	x	1	<u>EVC-159</u>
P0A8D	14V POWER SUPPLY	×	1	EVC-162
P0A8E	14V POWER SUPPLY	×	1	<u>EVC-164</u>
P0A8F	14V POWER SUPPLY	x	1	<u>EVC-166</u>
P0A94	DC/DC CONVERTER	—	1	<u>EVC-168</u>
P0AA0	HYBRID BATT POSITIVE CONTACTOR	x	1	<u>EVC-169</u>
P0AA1	HYBRID BATT POSITIVE CONTACTOR	×	1	<u>EVC-174</u>
P0AA2	HYBRID BATT POSITIVE CONTACTOR	×	1	EVC-179
P0AA4	HYBRID BATT NEGATIVE CONTACTOR	×	1	<u>EVC-181</u>
P0AA5	HYBRID BATT NEGATIVE CONTACTOR	×	1	<u>EVC-186</u>
P0AA6	HYBRID BATT VOLT SYS ISOLATION	×	1	<u>EVC-188</u>
P1550	BATTERY CURRENT SENSOR	—	1	<u>EVC-196</u>
P1551	BATTERY CURRENT SENSOR	—	1	<u>EVC-196</u>
P1552	BATTERY CURRENT SENSOR	—	1	<u>EVC-196</u>

DTC	Items (CONSULT screen terms)	EV system warning lamp	Trip	Reference page	A
P1554	BATTERY CURRENT SENSOR	_	1	EVC-200	_
P1556	BATTERY TEMPERATURE SENSOR	_	1	<u>EVC-204</u>	_
P1557	BATTERY TEMPERATURE SENSOR	_	1	EVC-204	– B
P155A	BATTERY TEMPERATURE SENSOR	_	1	EVC-206	_
P1564	ASCD SWITCH	_	1	EVC-208	E٧
P1572	ASCD BRAKE SWITCH	_	1	EVC-211	
P1574	ASCD VEHICLE SPEED SENSOR	_	1	EVC-217	
P1610	LOCK MODE	_	1	<u>SEC-72</u>	- D
P1611	ID DISCORD, IMMU-VCM	_	1	<u>SEC-73</u>	_
P1612	CHAIN OF VCM-IMMU	_	1	<u>SEC-74</u>	Ε
P1805	BRAKE SWITCH	×	1	<u>EVC-219</u>	
P2122	APP SENSOR D	×	1	EVC-222	
P2123	APP SENSOR D	×	1	EVC-222	F
P2127	APP SENSOR E	×	1	EVC-225	
P2128	APP SENSOR E	×	1	EVC-225	G
P2138	APP SENSOR	×	1	EVC-228	
P3100	COMMUNICATION ERROR	×	1	EVC-230	
P3101	VCM	× or —	1	EVC-232	F
P3102	INVALID BATTERY	×	1	EVC-233	_
P3117	A/C SYSTEM	_	1	EVC-234	-
P311C	HIGH VOLTAGE SYSTEM		1	EVC-236	- 1
P312A	COMMUNICATION ERROR	×	1	EVC-241	
P312B	RESTART ERROR	×	1	EVC-245	J
P312C	INVERTER DISCHARGE ERROR	×	1	EVC-247	
P312D	QUICK CHARGE RELAY	×	1	EVC-248	
P312E	READY OFF ERROR	×	1	EVC-249	- k
P312F	CHARGE OFF ERROR	×	1	EVC-251	
P3130	INVERTER DISCHARGE ERROR	×	1	EVC-247	L
P3131	SYSTEM SHUTOFF TIMEOUT	×	1	EVC-253	
P3135	SLIGHT COLLISION DETECTION	×	1	EVC-257	_
P3137	CAR CRASH	×	1	EVC-258	- N
P3141	PDM (POWER DELIVERY MODULE)	×	1	EVC-259	_
P315C	CHARGE RELAY	×	1	EVC-261	_ N
P315E	VDC SYSTEM	_	1	EVC-262	
P316A	MOTOR SPEED	×	1	EVC-263	
P316C	PD MODULE SYSTEM	_	1	EVC-264	C
P316D	PD MODULE SYSTEM	_	1	EVC-264	_
P316E	PD MODULE SYSTEM		1	EVC-264	
P316F	PD MODULE SYSTEM	×	1	<u>EVC-265</u>	_ F
P3170	PD MODULE SYSTEM		1	<u>EVC-267</u>	
P3171	PD MODULE SYSTEM	×	1	<u>EVC-267</u>	
P3172	PD MODULE SYSTEM	×	1	<u>EVC-268</u>	_
P3173	PD MODULE SYSTEM	× or —	1	<u>EVC-268</u>	_
P3175	VCM	× 01 —	1	<u>EVC-269</u>	

DTC	Items (CONSULT screen terms)	EV system warning lamp	Trip	Reference page
P3176	INVERTER CONDENSER	×	1	<u>EVC-270</u>
P3177	ECU ACTIVATION ERROR	—	1	<u>EVC-275</u>
P3178	ECU ACTIVATION ERROR	×	1	<u>EVC-278</u>
P3179	MOTOR SYSTEM	×	1	<u>EVC-279</u>
P317A	MOTOR SYSTEM	×	1	<u>EVC-279</u>
P317B	MOTOR SYSTEM	×	1	<u>EVC-279</u>
P317D	MOTOR SYSTEM	×	1	<u>EVC-280</u>
P317E	HV BATTERY SYSTEM	—	1	<u>EVC-282</u>
P3180	HV BATTERY SYSTEM	×	1	<u>EVC-282</u>
P3182	HV BATTERY SYSTEM	—	1	<u>EVC-282</u>
P3183	HV BATTERY SYSTEM	×	1	EVC-283
P3187	ELECTRIC SHIFT SYSTEM	×	1	<u>EVC-284</u>
P3188	ELECTRIC SHIFT SYSTEM	×	1	<u>EVC-285</u>
P3189	ELECTRIC SHIFT SYSTEM	_	1	<u>EVC-286</u>
P318A	ELECTRIC SHIFT SYSTEM	×	1	<u>EVC-287</u>
P318B	ELECTRIC SHIFT SYSTEM	×	1	<u>EVC-289</u>
P318C	ELECTRIC SHIFT SYSTEM	×	1	<u>EVC-290</u>
P318D	COMMUNICATION ERROR	×	1	EVC-292
P3191	COMMUNICATION ERROR	× or —	1	EVC-293
P3193	COMMUNICATION ERROR	× or —	1	<u>EVC-295</u>
P3194	COMMUNICATION ERROR	_	1	<u>EVC-297</u>
P3195	COMMUNICATION ERROR	—	1	EVC-299
P3196	COMMUNICATION ERROR	×	1	EVC-301
P3197	COMMUNICATION ERROR	×	1	EVC-303
P319C	COMMUNICATION ERROR	×	1	EVC-293
P319E	COMMUNICATION ERROR	×	1	EVC-295
P319F	COMMUNICATION ERROR	_	1	<u>EVC-297</u>
P31A0	COMMUNICATION ERROR	_	1	EVC-299
P31A1	COMMUNICATION ERROR	×	1	EVC-301
P31A2	COMMUNICATION ERROR	×	1	EVC-303
P31A7	COMMUNICATION ERROR	×	1	EVC-293
P31A9	COMMUNICATION ERROR	×	1	EVC-295
P31AA	COMMUNICATION ERROR	_	1	<u>EVC-297</u>
P31AB	COMMUNICATION ERROR	_	1	<u>EVC-299</u>
P31AD	COMMUNICATION ERROR	×	1	EVC-303
P31AE	COMMUNICATION ERROR	×	1	EVC-301
P31AF	COMMUNICATION ERROR	×	1	EVC-304
P31B0	COMMUNICATION ERROR		1	EVC-306
P31B2	COMMUNICATION ERROR	×	1	EVC-308
P31B3	COMMUNICATION ERROR	× or —	1	EVC-304
P31B4	COMMUNICATION ERROR		1	EVC-306
P31B5	COMMUNICATION ERROR		1	EVC-308
P31B6	COMMUNICATION ERROR		1	EVC-310
P31B7	COMMUNICATION ERROR	×	1	EVC-312

DTC	Items (CONSULT screen terms)	EV system warning lamp	Trip	Reference page
P31B8	COMMUNICATION ERROR	—	1	EVC-314
P31BA	COMMUNICATION ERROR	_	1	EVC-316
P31C5	VCM	_	1	EVC-318
P31C6	VCM	_	1	EVC-318
P31C7	VCM	x	1	EVC-320
P31CA	PD MODULE SYSTEM	×	1	EVC-322
P31CB	PD MODULE SYSTEM	x	1	EVC-322
P31D3	M/C RELAY	x	1	EVC-325
P31D4	PRE CHARGE RELAY	x	1	EVC-328
P31D5	PRE CHARGE RELAY	×	1	EVC-330
P31D6	F/S RELAY	×	1	EVC-335
P31D7	F/S RELAY	×	1	EVC-337
P31D8	CHARGING CONNECTOR LOCK RLY	x	1	EVC-340
P31DB	HV BATT MAIN RELAY +	×	1	EVC-343
P31DC	HV BATT MAIN RELAY -	×	1	<u>EVC-344</u>
P31DD	PRE CHARGE RELAY	x	1	EVC-345
P31DE	HV BATT MAIN RELAY	×	1	EVC-346
P31E0	HV SYSTEM INTERLOCK ERROR	×	1	<u>EVC-347</u>
P31E1	HV SYSTEM INTERLOCK ERROR	×	1	EVC-351
P31E5	VCM POWER SUPPLY	_	1	EVC-354
P31E7	RESTART INHIBITION	×	1	EVC-357
P31E8	WATER PUMP 1	×	1	EVC-358
P31E9	WATER PUMP 1	×	1	EVC-361
P31EC	WATER PUMP 1		1	EVC-363
P31EE	REFRIGERANT PRESSURE SENSOR	_	1	EVC-365
P31F2	AV SET INFORMATION		1	EVC-368

*: To clear DTC P0AA1, perform "SPECIFIC DTC CLEAR" in "WORK SUPPORT" of CONSULT.

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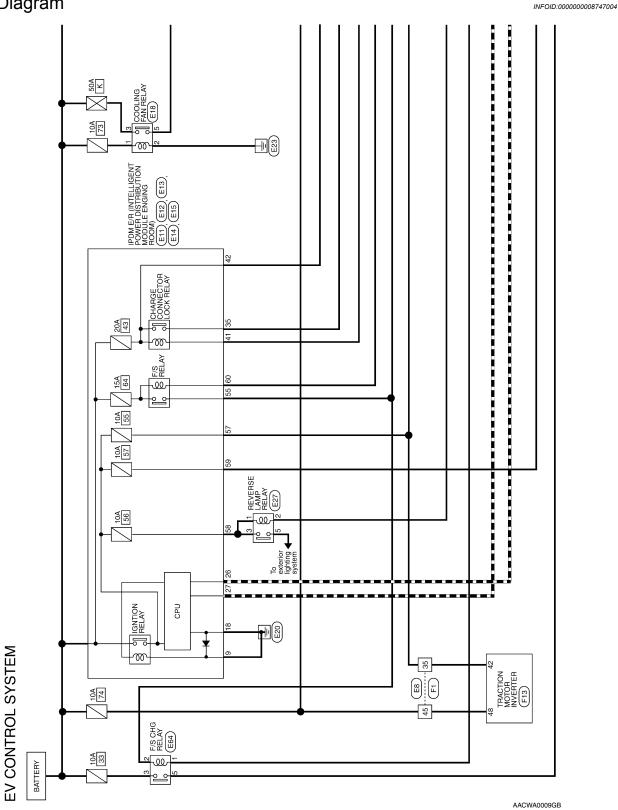
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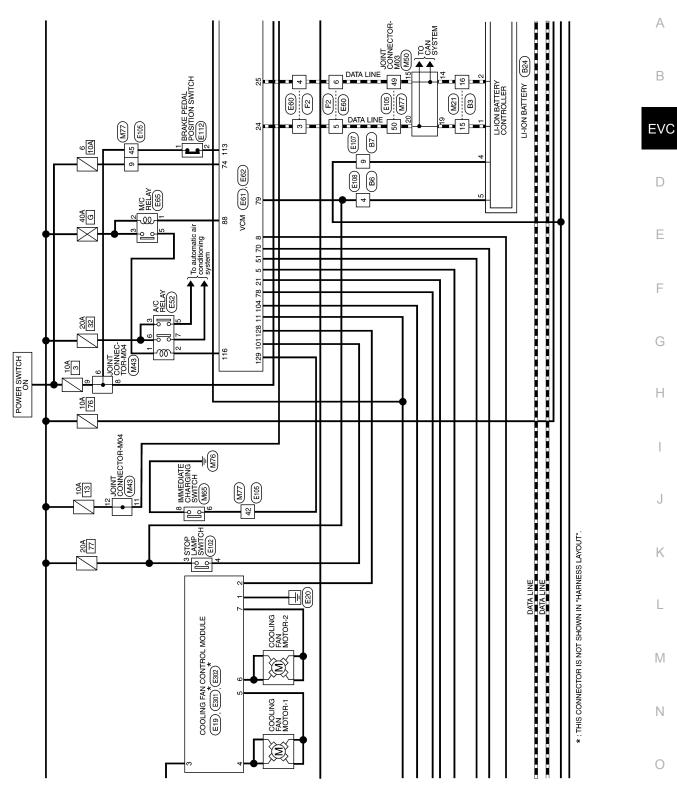
WIRING DIAGRAM

VCM

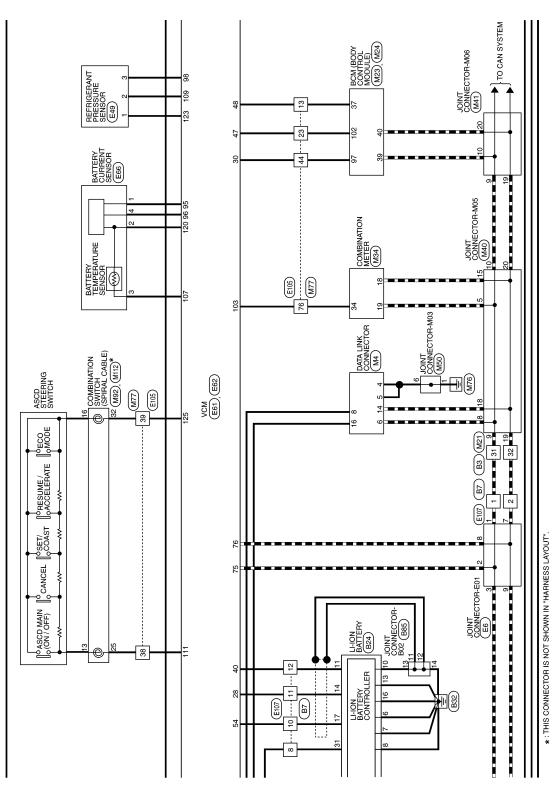
Wiring Diagram



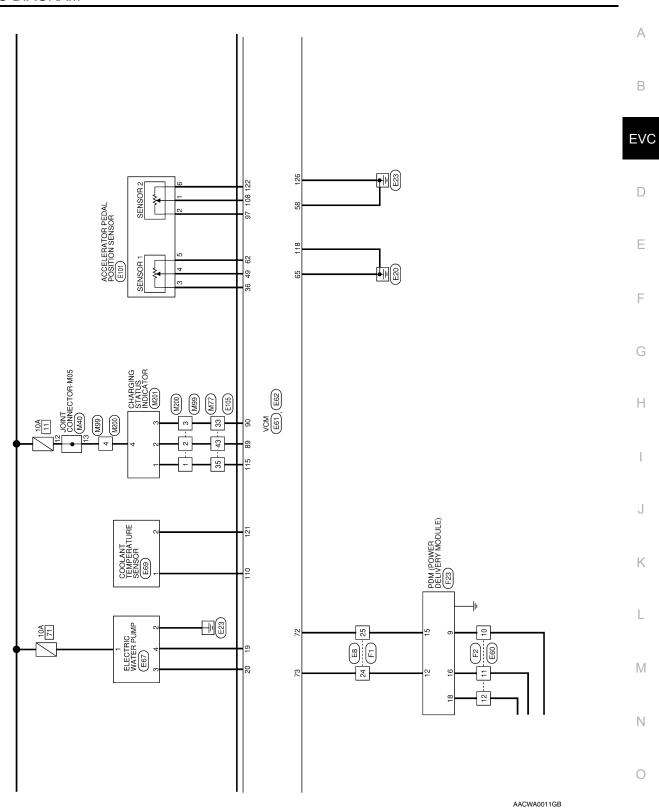
VCM



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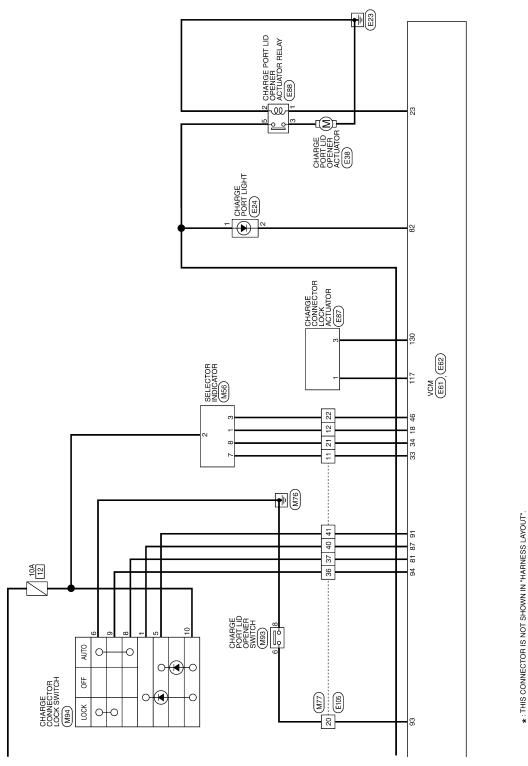


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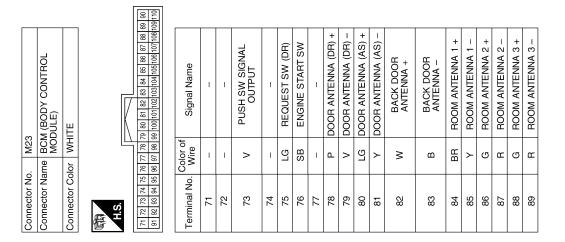


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signal Name	I	I	I	1	I	1	1	1	1	I																										
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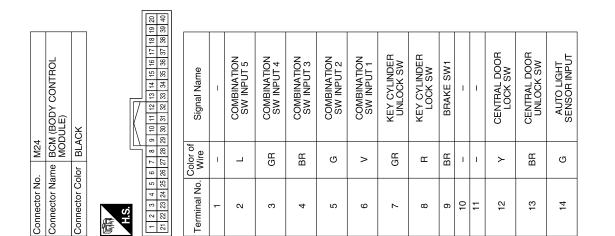
Signal Name	HIGHSIDE ENGINE START SW ILLUMINATION LED	POWER POSITION LED)	LOW SIDE ENGINE START SW ILLUMINATION LED OUTPUT	SMART KEYLESS BUZZER OUTPUT	SMART KEYLESS BUZZER OUTPUT	I	ACC RELAY OUTPUT	STARTER RELAY OUTPUT	IGN RELAY OUTPUT1 (USM)	IGN RELAY OUTPUT2 (ELEC)	REQUEST SW (AS)	1	SHIFT N, P	-	I	BRAKE SW2	I	I	I	I	I
Color of Wire	8	>	В	GR	I	I	BR	LG		GR	٩	I	BG	Ι	I	Μ	I	Ι	I	I	1
Terminal No.	06	91	92	93	94	95	96	26	86	66	100	101	102	103	104	105	106	107	108	109	110



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Signal Name	COMBINATION SW OUTPUT 1	SHIFT P POSITION, PARKING POSITION SW	INTELLIGENT TUNER	CAN-H	CAN-L
Color of Wire	٩	>	SB	L	Р
Terminal No. Wire	36	37	38	39	40

Terminal No.	Color of Wire	Signal Name
15	N	REAR DEFOGGER SW
16	œ	MR OUTPUT
17	7	AUTO LIGHT SENSOR POWER SUPPLY OUTPUT
18	L	KEYLESS TUNER, AUTO LIGHT SENSOR GND
19	Ι	Ι
20	Ι	I
21	д	IMMOBILIZER ONE WAY COMMUNICATION (CLOCK)
22	Ι	I
23	ш	SECURITY INDICATOR OUTPUT
24	SB	DONGLE LINK
25	LG	IMMOBILIZER TWO WAY COMMUNICATION
26	Ι	I
27	I	I
28	I	I
29	თ	HAZARD SW
30	>	TRUNK/BACK DOOR OPENER SW
31	N	DOOR LOCK STATUS SW (DR)
32	GR	COMBINATION SW OUTPUT 5
33	~	COMBINATION SW OUTPUT 4
34	×	COMBINATION SW OUTPUT 3
35	BG	COMBINATION SW OUTPUT 2



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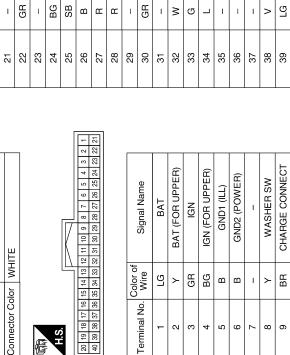
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Revision:	October	2013



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SDA (12C)

SCL (12C)

Terminal No.	Color of Wire	Signal Name
-	ГG	BAT
2	۲	BAT (FOR UPPER)
e	GR	IGN
4	BG	IGN (FOR UPPER)
5	В	GND1 (ILL)
9	в	GND2 (POWER)
7	I	I
8	٨	WASHER SW
6	BR	CHARGE CONNECT
10	I	I
11	-	I
12	>	SW GND
13	σ	MODE B SW
14	٢	MODE A SW
15	ВВ	TRIP RESET SW
16	٩	ILL CONT UP
17	Ð	UPPER ILL CONT
18	Р	CAN-H
19	L	CAN-L
20	ГG	AS SEATBELT W/L

BUCKLE SW FR DR

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LED H LAMP R LED H LAMP L

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EVC-114

CHARGE LAMP

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GND (FOR UPPER)

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Signal Name

Terminal No. Color of

Connector Name COMBINATION METER

M34

Connector No.

Connector Color WHITE

H.S. f

ILL CONT OUT A/BAG WARN

SECURITY

BRAKE OIL

PKB SW

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Connector Name JOINT CONNECTOR-M04 Connector Color GRAY	10 9 8 7 6 5 4 3 2 1 1 10 19 18 17 16 15 14 13 12 11	Signal Name	I	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		E
Connector Name JOINT (Connector Color GRAY	0 9 8 7 6	Color of Wire	U	7	8	8	N	~	~	IJ	8	8	7	~	1	1	1	1	1	в	B	ш		
Connector Name Connector Color	H.S.	Terminal No.	-	5	ო	4	ى ا	g	2	∞	0	10	1	12	13	14	15	16	17	18	19	20		
Connector Name JOINT CONNECTOR-M06 Connector Color BLUE	10 9 7 6 5 4 3 1 20 19 18 17 16 15 14 13 12 11	Signal Name	I	1	1	I	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		
ne JOINT or BLUE	0 9 8 7 6	Color of Wire	SB	SB	SB	SB	_	_	_	_	_	_	ГG	ГG	ГG	ГG	٩	٩	д.	٩	٩	۵.		
Connector Name Connector Color	H.S.	Terminal No.	-	5	e	4	5	9	7	8	6	10	11	12	13	14	15	16	17	18	19	20		
JOINT CONNECTOR-M05 BLUE	10 8 7 6 5 4 3 2 1 20 19 18 17 16 15 14 13 12 11	Signal Name	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		
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Connector Name Connector Color	H.S.	Terminal No.	-	5	ო	4	ۍ	9	7	ω	6	10	11	12	13	14	15	16	17	18	19	20		

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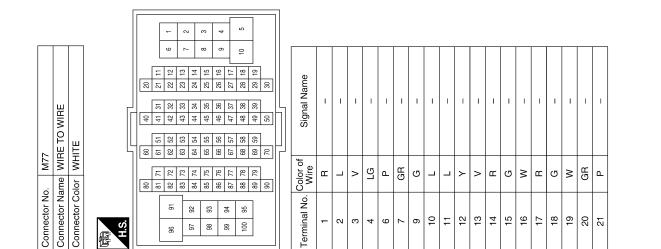
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	Connector No. Connector Name Connector Color		M50 JOINT CONNECTOR-CM03 PINK	Connector No. Connector Name Connector Color		M56 SELECTOR INDICATOR WHITE		Connector No. Connector Name Connector Color		M65 IMMEDIATE CHARGING SWITCH GRAV
Color of Wree Signat Name B - B - B - B - B - B - B - B - B - B - B - B - Color of B - Color of B - Color of Color of B - Color of Color of	<u>vi</u>		6 5 4 3 2 16 15 14 13 12	eeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeee		9		国 H.S.	-	
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	5	в	I	5	N	I		5	I	I
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Terminal No.	60	61	62	63	64	65	99	67	68	69	70	71	72	73	74	76	80	81	83	84	85	86	88	68	06	91	92	93	94	95	96	97	98	66	100

Signal Name	I	I	I	I	I	I	I	I	1	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
Color of Wire	В	BG	в	ŋ	в	В	Μ	щ	œ	N	GR	BR	ВВ	Ν	L	ГG	SB	>	٩	SB	ŋ	ГG	≻	œ	N		σ	_	SB	_	в	œ	>	۲	_
Terminal No.	22	23	24	26	27	28	25	29	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	54	55	56	57	58



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M94	Connector Name CHARGE CONNECTOR LOCK SWITCH	àRAY		of Signal Name	1	1	I	1	-	I	I	1	I	I
	- Name C	Color G		Vo. Color	>	σ	1	GR	٩	BR	1		8	>
Connector No.	Connector	Connector Color GRAY	H.S.	Terminal No. Wire		0	e	4	5	9	7	ω	6	10
	CHARGE PORT LID OPENER SWITCH	GREEN	3 2 1	Signal Name	I	1	I	I	I	I	I	1		
). M93			4 8	Color of Wire	٩.	1	I	в	1	I	I	в		
Connector No.	Connector Name	Connector Color	तिनि H.S.	Terminal No. Wire	-	2	e	4	5	9	7	80		
				<u></u>	1	1	1			1		1	1	
	- -]	
	COMBINATION SWITCH (SPIRAL CABLE)	٩Y	31 33	Signal Name	1	1	1	1	I	1	1	1		
. M92	tme CON (SPI	olor GRAY	25 24	Color of Wire	I	I	œ	LG	I	8	SB	в		
Connector No.	Connector Name COMBINATI (SPIRAL CA	Connector Color	的 H.S.	Terminal No.	21	22	24	25	27	31	32	33		

Connector No.	M99
Connector Name WIRE TO WIRE	WIRE TO WIRE
Connector Color WHITE	WHITE

H.S.

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Signal Name	I	I	I	I
Color of Wire	BR	თ	GR	ГG
Terminal No. Wire	Ŧ	2	3	4

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	12	COMBINATION SWITCH (SPIRAL CABLE)	GRAY			Signal Name	1	1	I	I	-	I	I	-			
:	-			20 19 18	-	Color of Wire	æ	3	_	В	BR	в	≻	٢			
:	Connector No.	Connector Name	Connector Color		H.S.	Terminal No.	13	14	15	16	17	18	19	20			
Revision: O						E	V	C-	11	EVC-119							

Connector No. M200 Connector Name WIRE TO WIRE Connector Color WHITE 2 3 4 H.S. E

Signal Name	I	I	I	I
Color of Wire	٨	٩	SB	L
Terminal No. Wire	Ļ	2	3	4

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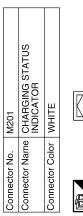
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Connector No. E6 Connector Name JOINT CONNECTOR-E01 Connector Color BLUE

1234	Color of
H.S.	

Signal Name	I	I	I	I
Color of Wire	>	٩	SB	Γ
Terminal No.	-	5	3	4

Terminal No. Other of Signal Name

Signal Name	1	I	I	I	I	I	I	I	I	I	I	I
Color of Wire	_	_	Г	Γ	I	L	Ь	٩	Ь	Ь	I	Ь
Terminal No.	-	2	3	4	ъ	9	7	8	6	10	1	12

EVC-120

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Revision:	October	2013
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EVC-	121
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AE TO WIRE	BLACK		2 3 4 5	7 8	27 36	37 30	8 68 94	32 41 4/ 51 33 42 48 51 34 43 52		Signal Name	I	I	-	-	I	I	I	Ι	I	1	I	-	-	Ι	I
			-	9	а 1 В			14 23 15 24 16 25		Color of Wire	I	I	-	-	I	I	I	I	>	SB	۲	G	BR	Г	T
Connector No. Connector Name	Connector Color	e e	H.S.						 رب ا	Terminal No.	-	2	3	4	5	9	7	8	6	10	11	12	13	14	15

۵.	I	I	-	I	I	-	Ι	I	-	æ	σ	>	٩	в	0	_	I	I	R/W	<u>م</u>	- 0		ט מ	no
25	26	27	28	29	30	16	32	33	34	35	36	37	38	39	40	41	42	43	44	15	45	5 7	4/ 10	+c
45	46 49	47 54	48 2	70				al Name		1	I	I	ļ	I	I	ļ	I	I	1	I	I	1	1	

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Signal Name	I	Ι	I	-
Color of Wire	B/R	Μ	н	В
minal No. Color of Wire	49	50	51	52

Signal Name

Terminal No. Wire

1 1 1 Т Т 1 1

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E11		Connector No.	E12		
1 E/R (IN	PDM E/R (INTELLIGENT		IPDN	A E/R (INTELLIGENT	I erminal No.
VER DÌS		Connector Name			20
			-		21
DLAUN			_	NIAA	22
11 10 9 14 13 12		明 H.S.	22 21	22 21 20 19 18	
No.	Signal Name	Terminal No.	Color of Wire	Signal Name	
g	GND (POWER)	15	ı	I	
	I	16	I	I	
	I	17	-	I	
	I	18	B/W	GND (SIGNAL)	
	I	19	M	FR FOG/L RH	
	RR DEF				
		T Compared No.	Color of	Oissol Nome	
1 E/R (II	IPDM E/R (INTELLIGENT		Wire	oigriai narrie	
		31	I	I	
		32	SB	HOOD SW	
WHILE		33	1	1	
		34	8	HORN RLY CONT	

Ι.					
	Signal Name	I	MS DOOH	I	HORN RLY CONT
	Color of Wire	I	SB	I	۸
	erminal No.	31	32	33	34

FR FOG/L LH Signal Name

Color of Wire > T T

1 1

EVC-122

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Signal Name	I	I	AUTO STOP SW	CAN-CL	CAN-CH	םדוו אבע	I	I
Color of Wire	I	I	œ	٩	Ļ	G	I	I
Terminal No.	23	24	25	26	27	28	29	30

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E18 COOLING FAN RELAY	BLACK	ŀ	1 3 4 L			Signal Name	I	I	I	I																
	_			<u>1</u>		Color of Wire	U	B/Υ	BR	Я																
Connector No. Connector Name	Connector Color	Æ		НS		Terminal No.	-	2	3	5																
A E/R (INTELLIGENT	POWER DISTRIBUTION MODULE ENGINE ROOM)	TE	[9 <u>58</u> 57 56 55 54		Signal Name	1	I	H/LAMP HI RH	H/LAMP HI LH	H/LAMP LO LH	H/LAMP LO RH	I	I	FAST CHARGE	Ι	VCM IGN	REVERSE LAMP IGN	ABS ECU IGN	F/S RLY CONT	I	E-ACT/HAS IGN				
_		or WHITE	0 r0 r1 r0	53 52 51 50 1 62 61 60 59 5		Color of Wire	ı	1	۲	U	L	Р	-	1	ГG	-	æ	0	BR	GR	I	>				
Connector No.	Connector Name	Connector Color		H.S.	-	Terminal No.	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62				
					г																					
M E/R (INTELLIGENT	POWER DISTRIBUTION MODULE ENGINE ROOM)	BROWN		39 38 <u>31</u> 37 36 35 46 45 44 43 42 41 40		Signal Name	VCM VB	I	I	TAIL 1 (WITHOUT	SOLAR CELL)	TAIL 1 (WITH	SOLAR CELL)	FR WIPER HI	I	VCM RLY CONT	VCM BAT	CLEARANCE/L LH	TAIL 2	FR WIPER LO	I					
				39 38 [46 45 4		Color of Wire	æ	I	I	0	2	۵	c		I	SB	ВВ	0	в	۲	-					
Connector No.	Connector Name	Connector Color		H.S.	-	Terminal No.	35	36	37	86	00	30	6	ő	40	41	42	43	44	45	46					

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P RELAY	Signal Name		Signal Name
E27 REVERSE LAMP RELAY BLUE		BROWN	
	Vo. Color of Mire SB SB G O	No. No. E	Vo. Color of Wire Wire BR
Connector No. Connector Color H.S.	Terminal No. 1 2 3 4	Connector No. E52 Connector Name A/C RELAY Connector Color BROWN	Terminal No. 1 2 3
E24 CHARGING PORT LID ILLUMINATION GRAY	Signal Name	E49 REFRIGERANT PRESSURE SENSOR BLACK	Signal Name
	Color of Wire BR BR GR		Color of Wire BR BB SB SB
Connector No. Connector Name Connector Color H.S.	Terminal No. 1 2	Connector No. Connector Name Connector Color	Terminal No.
E19 COOLING FAN CONTROL MODULE GRAY	Signal Name GND PWM_SIG PWM_POWER	E38 CHARGE PORT LID OPENEF ACTUATOR BLACK	Signal Name
Connector No. E19 Connector Name COOLI Connector Color GRAY	Color of Wire B B B B	e 5	Color of Wire Wire
	Terminal No. 2 3	Connector No. Connector Nan Connector Cold	Terminal No. 1 3 4

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Connector Color BLACK

Connector No. E60

Signal Name	I	I	I	I	I	I	I	I	I	I	I	I
Color of Wire	-	I	F	G	_	G	-	I	1	GR	BR	Y
Terminal No.	1	2	Э	4	ى ك	9	7	8	6	10	11	12

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< WIRING DIAGRAM >

Terminal No.	Color of Wire	Signal Name
40	в	PRE-CHARGE RELAY
41	I	I
42	I	I
43	1	I
44	٩	ENCODER SIGNAL B
45	٨	ENCODER SIGNAL A
46	В	P POSITION OUTPUT (SELECT INDICATOR)
47	ГG	P/N POSITION SIGNAL
48	N	P POSITION SIGNAL
49	œ	ACCELERATOR PEDAL POSITION SENSOR 1
50	I	I
51	н	POWER ON POWER SUPPLY
52	I	-
53	I	I
54	Ν	SYSTEM MAIN RELAY 1
55	I	I
56	g	ENCODER GROUND
57	0	ELECTRIC SHIFT SENSOR GND 1
58	B/R	VCM GROUND
59	I	I
60	I	I
61	I	-
62	В	SENSOR GROUND (ACCELERATOR PEDAL POSITION SENSOR 1)
63	I	I
64	I	I
65	в	VCM GROUND

EVC-126

r No. E61	· Name VCM	Color BLACK		1 2 3 4 5 6 7 8 9 10 11 12 13		¹⁴ 15 16 17 18 19 20 21 22 23 24 25 ²⁰	29 30 31 32 33 34 35 36 37	41 42 42 44 45 48 47 40 40 50 54	53 EA EE EE E7 E0 EN EN E1 E9 E9 EA 65
Connector No.	Connector Name	Connector Color		SH	5				

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

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Terminal No.	Color of Wire	Signal Name
109	В	REFRIGERANT PRESSURE SENSOR
110	~	COOLANT TEMPERATURE SENSOR
111	SB	ASCD STEERING SWITCH
112	В	P POSITION SW NO.2
113	0	BRAKE PEDAL POSITION SWITCH
115	>	CHARGING STATUS INDICATOR 1
116	SB	A/C RELAY
117	ГG	CHARGE CONNECTOR LOCK ACTUATOR (+)
118	В	VCM GROUND
120		SENSOR GROUND (BATTERY CURRENT SENSOR)
121	N	SENSOR GROUND (COOLANT TEMPERATURE SENSOR)
122	В	SENSOR GROUND (ACCELERATOR PEDAL POSITION SENSOR 2)
123	BR	SENSOR GROUND (REFRIGERANT PRESSURE SENSOR)
124	M/L	ELECTRIC SHIFT SENSOR GND 2
125	BR	ASCD STEERING SWITCH GROUND
126	B/R	VCM GROUND
128	>	COOLING FAN CONTROL SIGNAL
129	≻	IMMEDIATE CHARGING SWITCH
130	M	CHARGE CONNECTOR LOCK ACTUATOR (-)

Signal Name	ELECTRIC SHIFT SENSOR NO.6	CHARGE CONNECTOR LOCK SWITCH INDICATOR (LOCK)	M/C RELAY	CHARGING STATUS INDICATOR 2	CHARGING STATUS INDICATOR 3	CHARGE CONNECTOR LOCK SWITCH INDICATOR (AUTO)		CHARGE PORT LID OPENER SWITCH	CHARGE CONNECTOR LOCK SWITCH (LOCK)	BATTERY CURRENT SENSOR	SENSOR POWER SUPPLY (BATTERY CURRENT SENSOR)	SENSOR POWER SUPPLY (ACCELERATOR PEDAL POSITION SENSOR 2)	SENSOR POWER SUPPLY (REFRIGERANT PRESSURE SENSOR)	P POSITION SW NO.1	STOP LAMP SWITCH	PLUG IN INDICATOR LAMP	CHARGE CONNECTOR LOCK RELAY POWER SUPPLY	BATTERY TEMPERATURE SENSOR	ACCELERATOR PEDAL POSITION SENSOR 2
Color of Wire	G	>	SB	BR	U	0	I	BR	0	≻	ш	N	Ļ	щ	Ρ	_	н	Γ	ш
Terminal No.	86	87	88	89	06	91	92	93	94	95	96	67	86	66	101	103	104	107	108

E62 VCM BROWN	67 68 69 70 71 72 73 74 75 76 77 78 60 60 10 172 73 74 75 76 77 78 70 10 10 10 10 10 10 10 10 10 10 10 10 10	Signal Name	REVERSE LAMP RELAY	Ι	CONNECTION DETECTING CIRCUIT SIGNAL	CONNECTION DETECTING CIRCUIT POWER SUPPLY	POWER ON POWER SUPPLY	CAN-H	CAN-L	CHARGE CONNECTOR LOCK RELAY	12V BATTERY POWER SUPPLY	CHARGE CONNECTOR LOCK SWITCH (AUTO)	CHARGE PORT LIGHT	ELECTRIC SHIFT SENSOR POWER SUPPLY 2	ELECTRIC SHIFT SENSOR NO.2	ELECTRIC SHIFT SENSOR NO.4
	66 67 68 79 80 81 93 94 91 106 107 118 119 1207	Color of Wire	SB	I	٩	ο	U	-	٩	SB	ш	_	GR	Ν	×	J
Connector No. Connector Name Connector Color	С. Т	Terminal No.	70	71	72	73	74	75	76	78	79	81	82	83	84	85

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Connector No. E66 Connector Name BATTERY CURRENT SENSOR SENSOR Connector Color BLACK Image: Im	Terminal No.Color of WireSignal Name1Y-2L-3L-4R-	Connector No. E87 Connector Name CHARGE PORT LOCK Connector Color GRAY Connector Color GRAY	Terminal No.Color of WireSignal Name1W-23LG-4
Connector No. E65 Connector Name M/C RELAY Connector Color BLUE Image: State of the st	Terminal No.Color of WireSignal Name1SB-2R-3R-5W-	Connector No. E69 Connector Name COOLANT TEMPERATURE Connector Color GRAY	Terminal No. Color of Wire Signal Name 1 Y - 2 W -
E64 me F/S CHG RELAY or BLUE	Color of Signal Name Wire Signal Name Y LG GR GR -	image: E67 me ELECTRIC WATER PUMP Ior GREEN	Color of Signal Name Wire Signal Name BR - BY - BY - BY - G - G - G
Connector No. Connector Name Connector Color H.S.	Terminal No. (1 1 3 3 5	Connector No. Connector Name Connector Color	Terminal No. (1 2 3 4

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	40	Signal Name	1	1	I	I	
lor WHITE	8 4 2 2	Color of Wire	2	SB	æ	٩.	
Connector Color	园 H.S.	Terminal No.	-	N	е	ŋ	
POSITION SENSOR Connector Color BLACK	321	Signal Name)	1	I	1	1 1
POSIT	6543	Color of Wire	2	N	>	٣	<u>م</u> ھ
POSITIC Connector Color BLACK	同 H.S.	Terminal No.	-	2	e	4	ە ي
ACTUATOR RELAY Connector Color BLUE		Signal Name)	1	I	1	
ACTU, lor BLUE		Color of Wire		Β/Υ	٩	BR	
ACTU, Connector Color BLUE	雨 H.S.	Terminal No.	-	2	e	5	
	中国 H.S.	Termina	-	0	e	2	



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							96	┢	97	86		66	100	7			
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					8	81	83	ŝ	2	58	86	87	88	88	6		
						71	72	73	74	75	76	77	78	62			
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						51	52	53	5	55	29	57	58	59]		L De
					6	41	42	43	4	\$	46	47	48	49	3		Signal Name
	НE		Ľ	1	<u> </u>	31	8	33	8	35	98	37	38	33		┍┘	Jual
	M						_		_	_					, 		Sic
	0				20	21	8	23	24	55	26	27	28	29	8		
2	ш	Ш				Ξ	12	13	4	15	16	17	18	19			
E105	WIRE TO WIRE	WHITE				ſ	9	-		œ	6	ſ	10				olor of Wire
ö	ame	olor				ſ	-	~	L	ę	4		5				SS
Connector No.	Connector Name	Connector Color	ą			Ċ.		1									Terminal No. Color of Wire

													_						
Signal Name	I	I	– (WITHOUT FRONT FOG LAMPS)	– (WITH LED HEADLAMPS)	– (WITH LED HEADLAMPS)	- (WITHOUT FRONT FOG LAMPS)	I	I	I	I	I	I	I	Ι	I	I	Ι	I	I
Color of Wire	В	Γ	BW	н	ГG	B/W	B/R	Μ	σ	щ	Γ	≻	M	н	σ	თ	н	0	M/L
Terminal No.	Ļ	2	3	e	4	4	9	2	6	10	11	12	13	14	15	16	17	18	19

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58	60	61	62	63	64	65	66	67	68	69	20	71	72	73	74	76	17	80	81	83	84	85	86	88	89	06	91	92	93	94	95	96	67	86	66	100

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	ГG	GR	×	SB	SHIELD	×	ъ	>	æ	в	BR	LG	æ	в	0		~	٩	SB	GR		0	BR	в	×	SHIELD	٢	BR	0	œ	>	۵.	U	×	0	SB
58	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	76	77	80	81	83	84	85	86	88	89	06	91	92	93	94	95	96	97	98	66	100

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							Connector Name COOLING FAN CONTROL MODULE (COOLING FAN-2)	×		Signal Name	I	I						B
						E302	ne COOI MODI	or BLACK		Color of Wire	8	_						D
						Connector No.	Connector Nar	Connector Color	际 H.S.	Terminal No.	9	2						E
					1													F
1		I	1	I			COOLING FAN CONTROL MODULE (COOLING FAN-1)			Signal Name		I						G
						-	DULE (CC	S	4									Η
С			SHIELD	I		o. E301		olor BLACK	C	Color of Wire	_	ш						
5	1		53	24		Connector No.	Connector Name	Connector Color	雨 H.S.	Terminal No.	4	5						J
																		K
	I	I	1				RE			Signal Name	1	I	I	I				L
						8	RE TO WI											M
	GВ	I	٩	-		o. E108	ame WIF			Color of Wire	8	≻	SB	я				N
	9	7	α	þ		Connector No.	Connector Name WIRE TO WIRE		品.S.H	Terminal No. Color of Wire	-	N	ო	4				0

Signal Name	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
Color of Wire	BR	M	Н	в	g	В	ГG	BR	g	в	٢	В	0	M	SHIELD	I
Terminal No.	6	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24

			I		1					
2	WIRE TO WIRE	ITE		5 6 7 8 9 10 11 12 17 18 19 20 21 22 23 24		Signal Name	-	-	H	-
. E107	me WIF	lor WHITE		2 3 4 14 15 16		Color of Wire	_	٩	SB	ı
Connector No.	Connector Name	Connector Color	Ē	H.S.		Terminal No.	1	2	ო	4

Color o Wire	_	٩	SB	I	I	GR	I	٩
Terminal No.	1	2	3	4	5	9	2	8

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IE TO WIRE CK			7 6	36 27 18 9 37 28 19 10	29 29 30 21 21 21	32 23 24 25 25 25 26 25 26 25 26 25 25 25 25 25 25 25 25 25 25 25 25 25	Signal Name	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	
. F1 me WIRE T lor BLACK		ى س	8		49 46 50 46	51 47 52 48	Color of	1	1	I	I	I	I	I	I	>	SB	≻	IJ	BR	æ	I	Ν	_	1
Connector No. Connector Name Connector Color		H.S.					Terminal No.	-	~	3	4	5	9	7	8	6	10	1	12	13	14	15	16	17	18

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Termina 19 20	21 23 23 23 24 24	27 28 27 28 29 28 29 28 23 23 23 23 23 23 23 23 23 23 23 23 23	35 35	36	38	8 4 :	41	43	45	46	47	49	49 50	51	52
		18 9 19 10 20 11 22 13 23 14 25 16 26 17 26 17	Name												
F1 WIRE TO WIRE BLACK		45 36 27 45 37 28 46 43 33 30 46 40 1 1 1 46 41 31 41 32 48 42 33 30 41 32 48 43 33 33 43 33 43 33 33 43 33 44 33	or of Signal Name						> "		۰ ۳			× -	· ·

Signal Name	I	I	I	I	I	I	I	I	I	I	I	I	I	1	I	I	I	I	I	1	I	I	I	I	I	I	I	I	1	I	I	1	I	I	1
Color of Wire	ВВ	3	LG	I	I	0	٩	-	I	I	I	I	I	I	I	I	Ľ	σ	0	8	œ	≻	_	Ι	-	SHIELD	G	В	σ	SB	٩	в	×	ГG	в
erminal No.	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	49	50	51	52

Signal Name	I	I	1	I	I	I	I	I	I	I	I	I
Color of Wire	-	,	_	G	_	G	-		-	GR	>	В
Terminal No. Wire	Ļ	2	Э	4	5	9	7	8	6	10	11	12

Signal Na	REZ_S	I	I	I	I	I	REZ_R	I	I	1	1	Ι	I	-	Ι	I	Ι	Ι	Ι	Ι	I	IGN_SV	Ι	TMGND	MT	VB1	VBGND	VB2	VBGND					
Color of Wire	>	1	I	1	1	I	σ	1	1	-	-	I	1	-	I	ı	Ι	I	I	I	1	P	-	0	≻	J	в	J	в					
Terminal No.	21	52	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49					
	TRACTION MOTOR INVERTER	ž						2	29 28 27 26 25 24 23 22 6 5 4 3 3 3 3 3 3 3 3 3 1 0 0 8 7	13 12 1				Signal Name		1	1		1	1	1	1	1	1			1	EV SYSTEM CAN- H	EV SYSTEM CAN-L	1	REZ_S2	REZ_S4	REZ_R1	DE7 C1
		lor BLACK	-					21 20 19 18	29 28 27 26 37 36 35 34	45 44 43 42			3	Wire	1	1	1	1	I	,	1	1	1	1	1	1	1	_	σ	1	٩	-	œ	0
Connector No.	Connector Name	Connector Color		E	H.S.			47 46	2	49 48				Terminal No.	-	0	I 0	9 4	. rc	9 9	> ~	- α	0	10	£	12	13	14	15	16	17	18	19	ç

EVC-133

Signal Name	REZ_S3	I	Ι	I	-	I	REZ_R2	-	I	I	I	I	I	Ι	I	I	Ι	I	I	I	I	IGN_SW	I	TMGND	MT	VB1	VBGND1	VB2	VBGND2
Color of Wire	N	I	-	-	-	I	ŋ	-	-	I	-	I	I	I	I	-	Ι	-	-	I	Ι	ГG	I	0	Y	ŋ	в	ŋ	в
Terminal No.	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49

Signal Name	I	Ι	I	I	Ι	I	I	I	I	I	I	I	I	EV SYSTEM CAN- H	EV SYSTEM CAN-L	I	REZ_S2	REZ_S4	REZ_R1	REZ_S1
Color of Wire	I	Ι	I	I	-	I	I	I	I	I	I	I	I	-	ŋ	I	Р		н	В
Terminal No.	-	2	e	4	5	9	7	80	6	10	11	12	13	14	15	16	17	18	19	20

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 Connector No.
 F23

 Connector Name
 PDM (POWER DELIVERY

 MODULE)
 Connector Color
 GREN

 Connector Color
 GREN
 Connector Color

 Connector Color
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 Connector Color
 Connector Color
 Connector Color

Signal Name	I	I	I	I	I	Q-CAN-L	Q-CAN-H	I	QCRLY	CSTATE	EV CAN-L		I	I	INTERLOCK OUT	IGN	I	BAT	сноко	CHILI	
Color of Wire	I	-	-	I	-	_	8	I	GR	Ľ	G	0	I	-	٩	^	I	н	щ	BR	
Terminal No.	-	2	3	4	5	9	7	œ	6	10	11	12	13	14	15	16	17	18	19	20	

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Signal Name	CHSSI2	CHSS11	I	I	QCPTMP2	QCPTMP1	EV CAN-H	I	CONDETI	CNTRL	I	I	1	I	I	I
Color of Wire	σ	Y	Ι	I	SB	^	_	I	×	ВВ	I	Ι	I	I	Ι	I
Terminal No.	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36

]																						
	WIHE								Signal Name	1	I																							
Connector No. B6	Connector Name WIRE IO WIRE								Terminal No. Wire S	e e		-																						
		I			1																													
Signal Name	1	1	1	I	I	1	I	I	1																									
Color of Wire	۲ ۲	8	ГG	~	1	н	GR	_	٩																									
Terminal No.	24	25	26	27	28	29	30	31	32																									
	O WIRE					1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16	5 27 28 29 30 31 32		Signal Name	1	1	1	I	I	I	-	I	I	I	I	I	I	I	I	I	I	I	I	I	1	1	1		
B3	Connector Name WIHE TO WIHE					6 7 8 9 1	22 23 24 25 2		Color of Wire		1	1	1	1	I	В	SHIELD	В	SB	۵.	BR	GR	٩		J	1	I	1	1	1	1	1	_	
Connector No.	Connector Name			L L	5	3 4 5	19 20 21		Terminal No.	-	2	e	4	5	9	7	8	6	10	11	12	13	14	15	16	17	18	19	20	21	22	23		



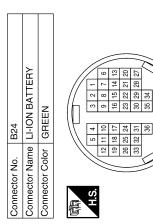
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Signal Name	1	1	I	I	I	I	I	I	I	I	1	I	I	I	I	I	I	I	I	1	I	I	I	I
Color of Wire		٩	≻			SB		٩	>	≻	_	U	J	В	ГG	ВВ	IJ	В	≻	œ	≻	8	SHIELD	
Terminal No.	-	2	e	4	£	9	7	8	6	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24

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	B85 JOINT CONNECTOR-B02 BLACK 8 7 6 5 4 3 2 1 18 17 16 15 14 13 12 11]	Signal Name	1	I	I	I	I	I	I	I	Ι	I	I	I	I	Ι	I	I	I	I	I	I
Innector Name Innector Name Innector Name Innector Nam <td< td=""><td></td><td>Color of Wire</td><td>В</td><td>I</td><td>В</td><td>В</td><td>I</td><td>1</td><td>_</td><td>Ν</td><td>^</td><td>^</td><td>SHIELD</td><td>SHIELD</td><td>В</td><td>В</td><td>σ</td><td>თ</td><td>თ</td><td>ГG</td><td>В</td><td>В</td></td<>		Color of Wire	В	I	В	В	I	1	_	Ν	^	^	SHIELD	SHIELD	В	В	σ	თ	თ	ГG	В	В
	Connector No. Connector Nat Connector Col	Terminal No.	-	2	ю	4	5	9	7	8	6	10	1		13	14	15	16	17	18	19	20

Signal Name	1	I	I	1	I	I	I	I	I	I	CHG IGN	I	I	I	I	I
Color of Wire	I	Ι	I	I	1	I	I	Ι	I	I	Р	I	I	Ι	I	I
Terminal No.	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36



Signal Name	EV CAN-H	EV CAN-L	I	IGN	BAT	GND3	GND2	GND1	I	PRE CHG GND	PRE CHG V	I	RLY N GND	ΒΓΥ Ν Υ	I	RLY P GND	ארא א א	I	I	
Color of Wire	Γ	g	I	>	æ	в	В	В	I	В	თ	I	В	L	I	В	٢	I	-	
Terminal No.	F	2	ę	4	5	9	7	8	6	10	11	12	13	14	15	16	17	18	19	

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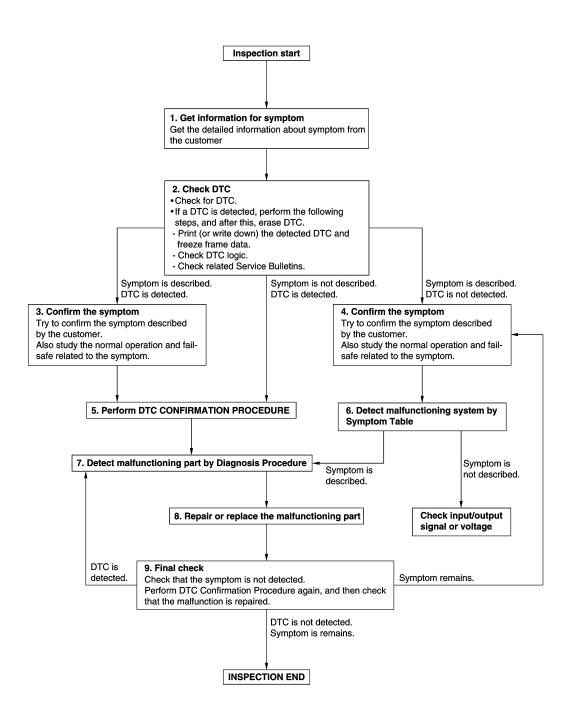
< BASIC INSPECTION >

BASIC INSPECTION DIAGNOSIS AND REPAIR WORK FLOW

Work Flow

INFOID:000000008747005

OVERALL SEQUENCE



DETAILED 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 EVC-141, "Diagnostic Work Sheet".)
>> GO TO 2.
2.снеск дтс
1. Check DTC.
2. If a DTC is detected, perform the following steps, and after this, erase DTC.
 Print (or write down) the detected DTC and freeze frame data. Check DTC logic. Refer to EVC-102, "DTC Index".
- Check related Service Bulletins.
- Study the relationship between the cause detected by DTC and the symptom described by the customer.
(Symptom Diagnosis is useful. Refer to EVC-412. "Symptom Index".)
Are any symptoms described and any DTCs detected?
Symptom is described, DTC is detected>>GO TO 3.
Symptom is described, DTC is not detected>>GO TO 4. Symptom is not described, DTC is detected>>GO TO 5.
3. CONFIRM THE SYMPTOM
Try to confirm the symptom described by the customer. Also study the normal operation and fail-safe related to the symptom. Refer to EVC-412, "Symptom Index"
and EVC-97, "Fail-Safe".
Diagnosis Work Sheet is useful to verify the incident.
Verify relation between the symptom and the condition when the symptom is detected.
>> GO TO 5.
4.CONFIRM THE SYMPTOM
Try to confirm the symptom described by the customer.
Also study the normal operation and fail-safe related to the symptom. Refer to EVC-412, "Symptom Index" and EVC-97, "Fail-Safe".
Diagnosis Work Sheet is useful to verify the incident.
Verify relation between the symptom and the condition when the symptom is detected.
>> GO TO 6.
5.PERFORM DTC CONFIRMATION PROCEDURE
Perform DTC CONFIRMATION PROCEDURE for the displayed DTC, and then check that DTC is detected
again.
If two or more DTCs are detected, refer to EVC-100, "DTC Inspection Priority Chart" and determine trouble diagnosis order.
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 shack presedure is an effective alternative theorem.
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 CONFIR-
MATION PROCEDURE.
Is DTC detected?
YES >> GO TO 7.
NO >> Check according to <u>GI-53, "Intermittent Incident"</u> .
6. DETECT MALFUNCTIONING SYSTEM BY SYMPTOM TABLE
Detect malfunctioning system according to EV/C 412 "Symptom Index" based on the confirmed symptom in

Detect malfunctioning system according to <u>EVC-412</u>, "<u>Symptom Index</u>" based on the confirmed symptom in step 4, and determine the trouble diagnosis order based on possible causes and symptoms.

< BASIC INSPECTION >

Is the symptom described?

- YES >> GO TO 7.
- NO >> Monitor input data from related sensors or check voltage of related VCM terminals using CON-SULT. Refer to <u>EVC-84</u>, "<u>Reference Value</u>".

7. DETECT MALFUNCTIONING PART BY DIAGNOSIS PROCEDURE

Inspect according to Diagnosis Procedure of the system.

Is a malfunctioning part detected?

YES >> GO TO 8.

NO >> Check according to <u>GI-53, "Intermittent Incident"</u>.

8. REPAIR OR REPLACE THE MALFUNCTIONING PART

- 1. Repair or replace the malfunctioning part.
- 2. Reconnect parts or connectors disconnected during Diagnosis Procedure again after repair and replacement.
- 3. Check DTC. If DTC is displayed, erase it. Refer to EVC-73, "CONSULT Function".

>> GO TO 9.

9.FINAL CHECK

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

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

Is DTC detected and does symptom remain?

- YES-1 >> DTC is detected: GO TO 7.
- YES-2 >> Symptom remains: GO TO 4.
- NO >> Before returning the vehicle to the customer, always erase DTC.

< BASIC INSPECTION >

Diagnostic Work Sheet

INFOID:000000008747006

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DIAGNOSTIC WORKSHEET

			Diagnos	stic work	sheet		
Customer name			License plate No.			Date of first registration	
hamo			Model				
Acceptance Date			VIN			Mileage	km (mile)
Ques	stion	Group			Information from th	ne customer	
Vehicle condition	n at malfunction	R/Q/N/O	READY (R)	□Qı	uick charge (Q) □No	ormal charge (N)	□ Others (O)
			"READY" not Driving impos Poor accelera Warning lamp (sible ition	□ □ Poor drivability □ Noise □ Poor s □ Low electricity cons □ Others	hifting 🛛 🗆 Poor I	Uibration praking witch malfunction
		R	Details of sympt				
			indication	nay			
			Electricity consumption				km (mile)/kW
Sumpton			Li-ion battery remaining energ	ау	1		
Symptom			□ Charging una □ Poor timer ch □ Others (□ Charging discontinue □ Poor remote char		rrging diate charging unable)
		Q, N	Details of sympt	tom			
			Quick charger monitor indication	on			
			□ A/C inoperativ □ Others	ve l	□ Poor A/C □ Dead	12V battery)
		0	Details of sympt	tom			<u>)</u>
		R/O	□ Not applicable □ Rough road □ Others		⊥ I Ordinary road □ Hi evel road □ Uphill		tain pass _eft/right turn
Location/status	of occurrence		()
Location/status	or occurrence	Q/N/O	 Start of charg During stands At the end of Others 	by of time	er charging □Du	After the end of ch ring timer charging emote charging	
			()

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< BASIC INSPECTION >

Question	Group	Information from the customer	
Driving condition	R	🗆 At start 🗆 During	During braking D Right before stopping D Right after stopping
		Vehicle speed	km (MPH)
		Accelerator pedal opening angle	/8
Quick charger	Q	Quick charger maker	 Not applicable Applicable ()
		Location	
		Model number	
		Serial number	
		Setting	
		Others	
Wall outlet	N	□ Not applicable □	Applicable
		Location	
		Voltage	V
		Breaker	А
		Other information	
Li-ion battery remaining energy	Q/N/O	Not applicable Applicable ()	
Shift position/operation	R	$\Box P \Box R \Box N \Box D \Box ECO \Box When operating (\Rightarrow)$	
Weather condition		Not applicable Applicable	
		Weather	
		Temperature	°C (or °F)
Occurrence frequency	 R/Q/N/O □ All the time □ Once □ Sometimes (times in the past) □ Others (
Timing of recovery from malfunction			Removal of 12V battery terminal Shift lever operation READY

[Memo]

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ADDITIONAL SERVICE WHEN REMOVING 12V BATTERY NEGATIVE TERMI-NAL

< BASIC INSPECTION >

ADDITIONAL SERVICE WHEN REMOVING 12V BATTERY NEGATIVE TERMINAL

Description

INFOID:00000008747007

INFOID:00000008747008

When the 12V battery negative terminal is disconnected, the timer mounted in VCM cannot be controlled normally because timer information stored in VCM is erased. In such case, the timer must be reset to correct time. NOTE:

If timer charge setting is previously set to ON, the timer charge ON setting can be cancelled by disconnecting the 12 V battery negative terminal.

Work Procedure

1. CHECK VEHICLE SPECIFICATIONS

Check vehicle specifications.

Models with NISSAN genuine navigation system>>GO TO 2. Except above>>GO TO 3.

2. PERFORM VCM TIMER ADJUSTMENT

Perform VCM timer adjustment. Refer to AV-166, "ADDITIONAL SERVICE WHEN REMOVING BATTERY <u>NEGATIVE TERMINAL</u>: Work Procedure["] (Navigation without BOSE) or <u>AV-312</u>, "<u>ADDITIONAL SERVICE</u> <u>WHEN REMOVING BATTERY NEGATIVE TERMINAL</u>: Work Procedure["] (Navigation with BOSE).

>> END

3.SET COMBINATION METER TIME

Set the combination meter clock right.

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ADDITIONAL SERVICE WHEN REPLACING VCM

< BASIC INSPECTION >

ADDITIONAL SERVICE WHEN REPLACING VCM

Description

INFOID:000000008747009

A/le e e e e e le e :

When replacing VCM, this procedure must be performed. **NOTE:**

The necessary operation is different depending on the operation result of VCM data save or write. Always perform the operation according to procedures. Refer to EVC-144, "Work Procedure".

Work Procedure

INFOID:000000008747010

1.SAVE VCM DATA

- 1. Turn off the power and wait at least 20 seconds.
- 2. Turn power switch ON.
- 3. Select "SAVE DATA FOR CPU REPLACE" in "WORK SUPPORT" mode using CONSULT.
- 4. Follow the instruction of CONSULT display. **NOTE:**

Necessary data in VCM is copied and saved to CONSULT.

Is operation completed successfully?

YES >> GO TO 2. NO >> GO TO 5.

2.REPLACE VCM

- 1. Turn off the power and wait at least 20 seconds.
- 2. Replace VCM. Refer to EVC-426, "Removal and Installation".

>> GO TO 3.

3. PERFORM VCM KEY ID REGISTRATION

Refer to SEC-70, "VCM : Work Procedure".

>> GO TO 4.

4.WRITE VCM DATA

- 1. Select "WRITE DATA AFTER REPLACE CPU" in "WORK SUPPORT" mode using CONSULT.
- 2. Follow the instruction of CONSULT display.
 - NOTE:

The data saved by "SAVE DATA FOR CPU REPLACE" is written to VCM.

Is operation completed successfully?

YES >> GO TO 9. NO >> GO TO 7.

5.REPLACE VCM

1. Turn off the power and wait at least 20 seconds.

2. Replace VCM. Refer to EVC-426, "Removal and Installation".

>> GO TO 6.

6.PERFORM VCM KEY ID REGISTRATION

Refer to SEC-70, "VCM : Work Procedure".

>> GO TO 7.

7.WRITE VIN DATA

Perform EVC-149, "Work Procedure".

>> GO TO 8.

ADDITIONAL SERVICE WHEN REPLACING VCM

< BASIC INSPECTION >

8.LI-ION BATTERY ID REGISTRATION	Λ
Refer to "Li-ion Battery Registration Operation Manual".	A
>> GO TO 9. 9.PERFORM ACCELERATE PEDAL CLOSED POSITION LEARNING	В
Perform EVC-146, "Work Procedure".	EVC
>> GO TO 10. 10. SET VCM TIMER	D
Models with navigation system: Perform <u>AV-166</u> , " <u>ADDITIONAL SERVICE WHEN REMOVING BATTERY</u> <u>NEGATIVE TERMINAL : Work Procedure</u> " (Navigation without BOSE) or <u>AV-312</u> , " <u>ADDITIONAL SERVICE</u> <u>WHEN REMOVING BATTERY NEGATIVE TERMINAL : Work Procedure</u> " (Navigation with BOSE). Models without navigation system: Set the combination meter clock right. Refer to <u>MWI-35</u> , "INFORMATION <u>DISPLAY : System Description</u> ".	E
	F
>> GO TO 11. 11. CHECK DTC	G
 Turn off the power and wait at least 20 seconds. Turn power switch ON. 	
3. Check DTC. If DTC is displayed, erase it.	Н
>> END	
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ACCELERATOR PEDAL RELEASED POSITION LEARNING

< BASIC INSPECTION >

ACCELERATOR PEDAL RELEASED POSITION LEARNING

Description

INFOID:000000008747011

Accelerator Pedal Closed Position Learning is a function of VCM to learn the fully released position of the accelerator pedal by monitoring the accelerator pedal position sensor output signal. This work must be performed each time the harness connector of the accelerator pedal position sensor or VCM harness connector is disconnected.

Work Procedure

INFOID:000000008747012

1.START

- 1. Check that accelerator pedal is fully released.
- 2. Turn power switch ON and wait at least 2 seconds.
- 3. Turn power switch OFF and wait at least 20 seconds.
- 4. Repeat steps 2 and 3 for 4 times.
- 5. Turn power switch OFF and wait at least 20 seconds.

>> END

LI-ION BATTERY GRADUAL CAPACITY LOSS DATA CLEAR

< BASIC INSPECTION >

LI-ION BATTERY GRADUAL CAPACITY LOSS DATA CLEAR

Description

INFOID:00000008747013

Perform Li-ion Battery Gradual Capacity Loss Data Clear when the Li-ion battery or Li-ion battery controller is В replaced with a new one. VCM saves the Li-ion battery deterioration information sent from the Li-ion battery controller and manages the Li-ion battery replacement timing. When the Li-ion battery or Li-ion battery controller is replaced with a new one, there is a difference between the Li-ion battery deterioration data stored in VCM and the actual Li-ion battery deterioration level. In this case, VCM will incorrectly manage the Li-ion battery replacement timing. So perform Li-ion Battery Deterioration Data Clear to clear the Li-ion battery deterioration data stored in VCM.

CAUTION:

Never perform Li-ion Battery Deterioration Data Clear when the Li-ion battery or Li-ion battery controller is not replaced as new one.

Work Procedure Ε INFOID:00000008747014 **1.**LI-ION BATTERY GRADUAL CAPACITY LOSS DATA CLEAR F (P) With CONSULT 1. Turn power switch ON. On the CONSULT screen, select "EV/HEV" >> "WORK SUPPORT" >> "BATTERY GRADUAL CAP LOSS DATA CLEAR". Touch "START" and wait a few seconds. 3. 4. Make sure that "COMPLETE" is displayed on CONSULT screen. Н >> END

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LI-ION BATTERY JUNCTION BOX DATA CLEAR

< BASIC INSPECTION >

LI-ION BATTERY JUNCTION BOX DATA CLEAR

Description

INFOID:000000008747015

Perform Li-ion Battery Junction Box Data Clear when the Li-ion Battery Junction Box is replaced with a new one. VCM counts the times system main relay is turned off due to a large current and use this information to manage the system main relay deterioration status. As the system main relay deterioration status progresses, a DTC "P31DE" is detected and notification that the Li-ion battery junction box needs to be replaced is given. When the Li-ion Battery Junction Box is replaced with a new one, there is a difference between the System Main Relay cutoff count stored in VCM and the actual System Main Relay cutoff count. In this case, VCM will detect the DTC with incorrect timing. So perform Li-ion Battery Junction Box Data Clear to clear the System Main Relay cutoff count stored in VCM.

Work Procedure

INFOID:000000008747016

1.LI-ION BATTERY JUNCTION BOX DATA CLEAR

With CONSULT

- 1. Turn power switch ON.
- On the CONSULT screen, select "EV/HEV" >> "WORK SUPPORT" >> "LI-ION BATTERY JUNCTION BOX DATA CLEAR".
- 3. Touch "START" and wait a few seconds.
- 4. Make sure that "COMPLETE" is displayed on CONSULT screen.

>> END

WRITE VEHICLE IDENTIFICATION NUMBER DATA

< BASIC INSPECTION >	
WRITE VEHICLE IDENTIFICATION NUMBER DATA	А
Description INFOID:00000008747017	A
VIN Registration is an operation to register the VIN in VCM.	В
NOTE: If there is an error in the VIN recorded in VCM, the telematics system may not operate correctly.	
Work Procedure	EVC
1.CHECK VIN	
Check the VIN of the vehicle and note it. Refer to GI-23. "Information About Identification or Model Code".	D
>> GO TO 2.	
2. PERFORM VIN REGISTRATION	E
 With CONSULT Turn power switch ON (not READY). On the CONSULT screen, select "EV/HEV" >> "WORK SUPPORT" >> "VIN REGISTRATION". Follow the instructions on the CONSULT display. 	F
>> END	G
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LOAD BATTERY IDENTIFICATION DATA

< BASIC INSPECTION >

LOAD BATTERY IDENTIFICATION DATA

Description

Load Battery Identification Data must be performed after the following operation.

• Li-ion battery is replaced.

• Li-ion battery controller is replaced.

• VCM is replaced.

NOTE:

If Load Battery Identification Data is not performed, VCM detects the DTC "P3102".

Work Procedure

INFOID:000000008747020

INFOID:000000008747019

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

POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

DTC/CIRCUIT DIAGNOSIS POWER SUPPLY AND GROUND CIRCUIT VCM

VCM : Diagnosis Procedure

1.CHECK FUSE			
I CHECKIOSE			

Check that the following fuse is not fusing.

Power supply	Fuse No.
12V Battery Power switch ON	43
	77
	6
	55

Is the fuse fusing?

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

NO >> GO TO 2.

2. CHECK VCM GROUND CIRCUIT

1. Turn power switch OFF.

2. Disconnect VCM harness connector.

3. Check the continuity between VCM harness connector and ground.

	+		
V	CM	-	Continuity
Connector	Terminal		
E61	58	- Ground	
LUT	65		Existed
E62	118		Ground
LOZ	126		

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected parts.

3.CHECK 12V BATTERY POWER SUPPLY-1

1. Insert the fuse which pulled out.

2. Check the voltage between VCM harness connector and ground.

	+		
V	СМ	_	Voltage
Connector	Terminal		
E61	11	Ground	12V battery power supply
le the increati	on recult perm	2	

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 4.

4.CHECK 12V BATTERY POWER SUPPLY CIRCUIT

1. Disconnect IPDM E/R harness connector.

2. Disconnect VCM harness connector.

3. Check the continuity between IPDM E/R harness connector and VCM harness connector.

A

В

EVC

D

Е

F

Н

M

INFOID:000000008747021

POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

+ IPDM F/R			_		
IPDM E/R		VCM		Continuity	
Connector	Terminal	Connector	Terminal		
E14	42	E61	11	Existed	

4. Also check harness for short to ground.

Is the inspection result normal?

YES >> Check power supply circuit for 12V battery power supply.

NO >> Repair or replace error-detected parts.

5.CHECK POWER ON POWER SUPPLY-2

Check the voltage between VCM harness connector and ground.

V	+ VCM		Voltage (Approx.)
Connector	Terminal		X FF - 7
E62	79	Ground	12V battery voltage

Is the inspection result normal?

YES >> GO TO 7.

NO >> GO TO 6.

6.CHECK 12V BATTERY POWER SUPPLY CIRCUIT

1. Pull out #77 fuse.

2. Check the continuity between #77 fuse terminal and VCM harness connector.

		-	
+	V	Continuity	
	Connector	Terminal	
#77 fuse termi- nal	E62	79	Existed

3. Also check harness for short to ground.

Is the inspection result normal?

YES >> Check power supply circuit for 12V battery power supply.

NO >> Repair or replace error-detected parts.

7. CHECK POWER ON POWER SUPPLY-1

1. Turn power switch ON.

2. Check the voltage between VCM harness connector and ground.

	+		
V	VCM		Voltage (Approx.)
Connector	Terminal		(
E61	51	Ground	12V battery voltage

Is the inspection result normal?

YES >> GO TO 9.

NO >> GO TO 8.

8.CHECK POWER ON POWER SUPPLY CIRCUIT

1. Turn power switch OFF.

2. Disconnect IPDM E/R harness connector.

3. Check the continuity between IPDM E/R harness connector and VCM harness connector.

POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

IPDM	+ 1 E/D	VC		Continuity		
Connector	Terminal	Connector	Terminal	Continuity		
E15	57	E61	51	Existed		
		for short to g		Existod		
	tion result n	-	round.			
		er supply circ	uit for nowe	r ON nower s	upply	
		place error-d			appiy.	
9. CHECK F		POWER SU	PPLY-2			
	ver switch C					
		etween VCM	harness co	onnector and	ground.	
	Ū				-	
	+					
,	VCM			Voltage (Approx.)		
Connector	Termina	ıl		(,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		
E62	74	Grour	nd 12V k	pattery voltage		
s the inspec	tion result n	ormal?				
. Disconn		relay-2 (fuse				
3. Check th	ne continuity	/ between igr	lition relay-2	2 (TUSE DIOCK)	terminal and VCM harness connector.	
+		_				
Ignition relay		VCM		Continuity		
(fuse block)				Continuity		
Terminal	Conne		rminal			
5	E62		74	Existed		
		for short to g	round.			
s the inspec						
					rcuit for power ON power supply.	
NO >>	Repair or re	place error-d	etected par	lS.		

< DTC/CIRCUIT DIAGNOSIS >

U1000 CAN COMM CIRCUIT

Description

INFOID:000000008747022

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:000000008747023

DTC DETECTION LOGIC

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	Possible cause
U1000	CAN COMM CIRCUIT (CAN communication cir- cuit)	When VCM is not transmitting or receiving CAN communication signal or EV system CAN communication for 2 seconds or more.	 CAN communication system EV system CAN communication system

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

• Turn power switch OFF and wait at least 20 seconds.

• Make sure that 12V battery voltage is 11 V or more.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT

Turn power switch ON and wait at least 5 seconds.

2. Check self-diagnostic result.

Is DTC detected?

YES >> Proceed to EVC-154, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000008747024

Perform the trouble diagnosis for CAN communication system. Refer to <u>LAN-16, "Trouble Diagnosis Flow</u> <u>Chart"</u>.

U1010 CONTROL MODULE (CAN)

< DTC/CIRCUIT DIAGNOSIS >

U1010 CONTROL MODULE (CAN)

DTC Logic

А

В

INFOID:000000008747025

DTC DETECTION LOGIC

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	Possible cause	EVC
U1010	CONTROL UNIT (CAN) [Control unit (CAN)]	Detecting error during the initial diagnosis of CAN controller of VCM.	VCM	
DTC CON	IFIRMATION PROCED	URE		D
1.PRECC	NDITIONING			
	ver switch OFF and wait a re that 12V battery voltag			Ε
· Wake Su	Te that 12 v Dattery voltag			
>	> GO TO 2.			F
2.DTC RE	EPRODUCTION PROCE	DURE		
With CC				G
	ower switch ON and wait self-diagnostic result.	t at least 5 seconds.		
Is DTC det	•			Н
	Proceed to <u>EVC-155, "</u> INSPECTION END	Diagnosis Procedure".		
				1
Diagnos	is Procedure		INFOID:00000008747026	I
1.PERFO	RM DTC CONFIRMATIC	ON PROCEDURE AGAIN		
With CC				J
	ower switch ON. self-diagnostic result.			
3. Perfor	m DTC confirmation proc	edure again. Refer to <u>EVC-155, "DTC Log</u>	<u>ic"</u> .	Κ
	self-diagnostic result.			
	<u>detected again?</u> > Replace VCM_Refer to	EVC-426, "Removal and Installation".		L
	> INSPECTION END	<u>Lvo 120, Renoval and Installation</u> .		
				М
				IVI

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P0A00 COOLANT TEMPERATURE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

P0A00 COOLANT TEMPERATURE SENSOR

DTC Logic

INFOID:000000008747033

DTC DETECTION LOGIC

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	Possible cause
P0A00	COOLANT TEMPERA- TURE SENSOR (Motor electronics coolant temperature sensor circuit)	 VCM detects that coolant temperature sensor voltage remains less than 0.1 V for 2.5 seconds. VCM detects coolant temperature sensor voltage remains more than 4.9 V for 2.5 seconds. 	 Harness or connectors (The sensor circuit is open or shorted.) Coolant temperature sensor

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

• Turn power switch OFF and wait at least 20 seconds.

• Make sure that 12V battery voltage is 11 V or more.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT

- Turn power switch ON and wait at least 5 seconds.
- 2. Check self-diagnostic result.

Is DTC detected?

- YES >> Proceed to EVC-156. "Diagnosis Procedure".
- NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000008747034

1.CHECK COOLANT TEMPERATURE SENSOR POWER SUPPLY-1

- 1. Turn power switch OFF.
- 2. Disconnect coolant temperature sensor harness connector.
- 3. Turn power switch ON.
- 4. Check the voltage between coolant temperature sensor harness connector terminals.

Coola	<u>М</u> И			
Connector	+	_	Voltage (Approx.)	
Connector	Term	ninal		
E69	1	2	5 V	

Is the inspection result normal?

YES >> GO TO 7.

NO >> GO TO 2.

2. CHECK COOLANT TEMPERATURE SENSOR POWER SUPPLY-2

Check the voltage between coolant temperature sensor harness connector and ground.

Coolant temp	+ erature sensor	_	Voltage	
Connector	Terminal	_	(Approx.)	
E69	1	Ground	5 V	

Is the inspection result normal?

YES >> GO TO 3. NO >> GO TO 5.

P0A00 COOLANT TEMPERATURE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

$\overline{\mathbf{3.}}$ CHECK COOLANT TEMPERATURE SENSOR GROUND CIRCUIT 1. Turn power switch OFF. Disconnect VCM harness connector. 2. 3. Check the continuity between VCM harness connector and coolant temperature sensor harness connec-В tor. + EVC VCM Coolant temperature sensor Continuity Connector Terminal Terminal Connector E62 121 E69 2 Existed D Is the inspection result normal? YES >> GO TO 4. Ε NO >> Repair or replace error-detected parts. 4.CHECK VCM GROUND CIRCUIT Check the continuity between VCM harness connector and ground. + VCM Continuity Connector Terminal 58 Н E61 65 Ground Existed 118 E62 126 Is the inspection result normal? YES >> GO TO 8. NO >> Repair or replace error-detected parts. 5.CHECK SENSOR POWER SUPPLY CIRCUIT 1. Turn power switch OFF. Κ Disconnect VCM harness connector. 2. 3. Check the continuity between VCM harness connector and coolant temperature sensor harness connector. L + VCM Coolant temperature sensor Continuity M Connector Terminal Connector Terminal E62 110 E69 1 Existed Ν Also check harness for short to ground and short to power. 4. Is the inspection result normal? YES >> GO TO 6. NO >> Repair or replace error-detected parts. $\mathbf{6}$.CHECK VCM POWER SUPPLY CIRCUIT Check VCM power supply circuit. Refer to EVC-151, "VCM : Diagnosis Procedure". P Is the inspection result normal? YES >> GO TO 8. NO >> Repair or replace error-detected parts. 7. CHECK COOLANT TEMPERATURE SENSOR Check coolant temperature sensor. Refer to EVC-158, "Component Inspection".

Is the inspection result normal?

EVC-157

P0A00 COOLANT TEMPERATURE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

- YES >> Check intermittent incident. Refer to <u>GI-53, "Intermittent Incident"</u>.
- NO >> Replace coolant temperature sensor. Refer to <u>HCO-14, "Exploded View"</u>.

8.CHECK INTERMITTENT INCIDENT

Check intermittent incident. Refer to GI-53. "Intermittent Incident".

Is the inspection result normal?

YES >> Replace VCM. Refer to EVC-426, "Removal and Installation".

NO >> Repair or replace error-detected parts.

Component Inspection

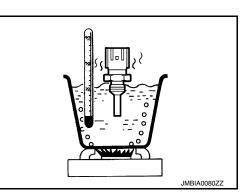
1.CHECK COOLANT TEMPERATURE SENSOR

- 1. Turn power switch OFF.
- 2. Disconnect coolant temperature sensor harness connector.
- 3. Remove coolant temperature sensor.
- 4. Check resistance between coolant temperature sensor terminals by heating with hot water as shown in the figure.

Terminals	Conditio	Resistance	
	Temperature [°C (°F)]	20 (68)	2.35 - 2.73 kΩ
1 and 2		50 (122)	0.68 - 1.00 kΩ
		90 (194)	0.236 - 0.260 kΩ

Is the inspection result normal?

- YES >> INSPECTION END
- NO >> Replace coolant temperature sensor. Refer to <u>HCO-14</u>, <u>"Exploded View"</u>.



INFOID:000000008747035

SIS >

P0A0B HIGH VOLTAGE CONNECTOR INTERLOCK DETECT CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

P0A0B HIGH VOLTAGE CONNECTOR INTERLOCK DETECT CIRCUIT

Description

INFOID:000000008747038

А

The connection detecting circuit is used to detect the connection status of the PDM (Power Delivery Module) B cover and the bus bar cover of PDM (Power Delivery Module).

The connection detecting circuit consists of two circuits (i.e. power supply circuit and signal input circuit). When the PDM (Power Delivery Module) cover and the bus bar cover are installed normally, their protrusions press the internal switch of PDM (Power Delivery Module). Accordingly, the connection detecting circuit is energized and a voltage signal is input.

DTC Logic

INFOID:000000008747039

DTC DETECTION LOGIC

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	Possible cause				
P0A0B	P0A0B HV SYSTEM INTERLOCK ERROR (High voltage system inter- lock circuit performance) VCM detects that high voltage harness con- nector interlock circuit voltage remains ex- cessively high for 0.5 seconds or more immediately before M/C relay turns ON. • Harness or connectors						
DTC CO	NFIRMATION PROCE	DURE		0			
1 .PREC	ONDITIONING						
	ower switch OFF and wai ure that 12V battery volta			Н			
•	>> GO TO 2.						
2.PERF	ORM DTC CONFIRMAT	ION PROCEDURE					
9	CONSULT power switch ON.			J			
	power switch OFF and w	vait at least 20 seconds.					
3. Turn	power switch ON and wa			K			
Is DTC detected?							
	> Proceed to EVC-159, >> INSPECTION END	"Diagnosis Procedure".		L			
Diagno	Diagnosis Procedure						
				N			

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.
- 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.
 Befor to EVC 11 "High Voltage Presentions"

Refer to <u>EVC-11, "High Voltage Precautions"</u>.
CAUTION:

P0A0B HIGH VOLTAGE CONNECTOR INTERLOCK DETECT CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

- 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.
- Erase DTC after the work is completed.
- **1.**OVERALL FUNCTION CHECK

With CONSULT

- 1. On the CONSULT screen, select "EV/HEV" >> "DATA MONITOR" >> "HV INTERLOCK (DC/DC)".
- 2. Check that "On" is displayed.

Is the inspection result normal?

YES >> Check intermittent incident. Refer to GI-53, "Intermittent Incident".

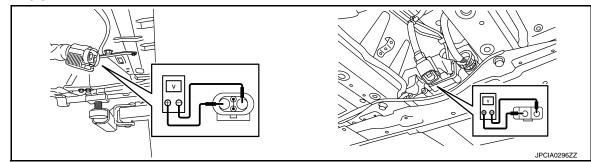
NO >> GO TO 2.

2. PRECONDITIONING

WARNING:

Disconnect high voltage. Refer to GI-33, "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-194, "Exploded View".
- 2. Disconnect high voltage harness connector and PTC heater harness connector from front side of Li-ion battery. Refer to EVB-194, "Removal and Installation".
- 3. Measure voltage between high voltage harness connector terminals and PTC heater harness connector terminals.



DANGER:

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

Standard

: 5 V or less

CAUTION:

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

>> GO TO 3.

3. CHECK CONNECTION DETECTING CIRCUIT POWER SUPPLY

- 1. Disconnect PDM (Power Delivery Module) harness connector.
- 2. Reconnect 12V battery negative terminal.
- 3. Turn power switch ON.
- 4. Check the voltage between PDM (Power Delivery Module) harness connector and ground.

	+		
PDM (Power D	elivery Module)	-	Voltage
Connector	Terminal	*	
F23	12	Ground	3 – 7 V

Is the inspection result normal?

P0A0B HIGH VOLTAGE CONNECTOR INTERLOCK DETECT CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

YES >> GO TO 6. NO >> GO TO 4. А ${f 4}$. CHECK CONNECTION DETECTING CIRCUIT POWER SUPPLY CIRCUIT 1. Turn power switch OFF. В Disconnect VCM harness connector. 2. Check the harness for short to power, between PDM (Power Delivery Module) harness connector and 3. VCM harness connector. EVC PDM (Power Delivery Module) Voltage D Connector Terminal F23 12 0 V Ground Is the inspection result normal? Ε YES >> GO TO 5. NO >> Repair or replace error-detected parts. ${f b.}$ CHECK INTERMITTENT INCIDENT Check intermittent incident. Refer to GI-53, "Intermittent Incident". Inspection result normal? >> Replace VCM. Refer to EVC-426, "Removal and Installation". YES NO >> Repair or replace error-detected parts. $\mathbf{6}$.CHECK CONNECTION DETECTING CIRCUIT SIGNAL CIRCUIT Н 1. Turn power switch OFF. 2. Disconnect VCM harness connector. 3. Check the harness for short to power, between PDM (Power Delivery Module) harness connector and VCM harness connector. + PDM (Power Delivery Module) Voltage Connector Terminal Κ F23 15 Ground 0 V Is the inspection result normal? YES >> GO TO 7. NO >> Repair or replace error-detected parts. **I**.CHECK INTERMITTENT INCIDENT M Check intermittent incident. Refer to GI-53, "Intermittent Incident". Inspection result normal? YES >> GO TO 8. Ν NO >> Repair or replace error-detected parts. **8**.REPLACE VCM 1. Replace VCM. Refer to EVC-426, "Removal and Installation". Reconnect harness connector and parts disconnected. 2. Perform DTC Confirmation Procedure. Refer to EVC-159, "DTC Logic". 3. Is DTC P0A0B detected again? Ρ YES >> Replace PDM (Power Delivery Module). Refer to VC-119, "Removal and Installation".

NO >> INSPECTION END

P0A8D 12V BATTERY POWER SUPPLY

< DTC/CIRCUIT DIAGNOSIS >

P0A8D 12V BATTERY POWER SUPPLY

DTC Logic

INFOID:000000008747041

DTC DETECTION LOGIC

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	Possible cause
P0A8D	14V POWER SUPPLY	VCM detects that a voltage of 12V battery power sup-	 Harness or connectors
	(14 V power module system	ply remains less than 10 V for 10 seconds during	(The sensor circuit is open or
	voltage low)	READY state.	shorted.) DC/DC converter IPDM E/R

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

• Turn power switch OFF and wait at least 20 seconds.

• Make sure that 12V battery voltage is 11 V or more.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT

- $\widetilde{1.}$ Set the vehicle to READY and wait at least 30 seconds.
- 2. Check self-diagnostic result.

Is DTC detected?

- YES >> Proceed to EVC-162. "Diagnosis Procedure".
- NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000008747042

1. CHECK SELF-DIAGNOSTIC RESULT IN PDM (POWER DELIVERY MODULE)

With CONSULT

Check self-diagnostic result in "CHARGER/PD MODULE".

Is any DTC detected?

- YES >> Perform trouble diagnosis for detected DTC. Refer to <u>VC-34, "DTC Index"</u>.
- NO >> GO TO 2.

2.CHECK SELF-DIAGNOSTIC RESULT IN VCM

With CONSULT

Check self-diagnostic result in "EV/HEV".

Is DTC (excluding P0A8D) related to DC/DC converter detected?

YES >> Perform trouble diagnosis for detected DTC. Refer to EVC-102, "DTC Index".

NO >> GO TO 3.

3.CHECK 12V BATTERY POWER SUPPLY

- 1. Turn power switch OFF.
- 2. Check the voltage between IPDM E/R harness connector and ground.

IPDM	+ /I E/R	_	Voltage
Connector	Terminal	-	
E14	42	Ground	12V battery volt- age

Is the inspection result normal?

P0A8D 12V BATTERY POWER SUPPLY

		PUA8D	12V BA	ITERY POWER SUPPLY	
< DTC/CIRCUIT	DIAGN	OSIS >			
YES >> GO NO >> GO					A
4.CHECK FUSE	<u>.</u>				
1. Pull out #43					В
2. Check the fu		-			D
Is the inspection		ormal?			
YES >> GO ⁻ NO >> Repl		fuse after re	placing the	applicable circuit.	EVC
5.CHECK IPDM			p		
	M E/R. I	Refer to PCS		oval and Installation". nector terminals.	D
	PDM E/R				E
+		_	C	ontinuity	
	Terminal			-	F
2		42		Existed	
Is the inspection	result no	ormal?			0
YES >> GO					G
NO >> Repl	ace IPD	M E/R. Refe	er to <u>PCS-29</u>	0. "Removal and Installation".	
6.CHECK 12V E	BATTER	Y POWER S	SUPPLY CI	RCUIT	Н
1. Disconnect \					
				ness connector and VCM harness conn	ector.
					1
+		-	_		
IPDM E/R		VC	CM	Continuity	.[
Connector Te	rminal	Connector	Terminal		0
E14	42	E61	11	Existed	
3. Also check h	arness f	or short to g	round.		K
Is the inspection					
				GI-53, "Intermittent Incident".	1
NO >> Repa	ur or rep	blace error-d	etected par	IS.	L
					Μ
					Ν
					-
					0
					P
					Р

P0A8E 12V BATTERY POWER SUPPLY

< DTC/CIRCUIT DIAGNOSIS >

P0A8E 12V BATTERY POWER SUPPLY

DTC Logic

INFOID:000000008747043

DTC DETECTION LOGIC

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	Possible cause
P0A8E	14V POWER SUPPLY	VCM detects that a voltage of 12V battery power sup-	 12V battery Harness or connectors
	(14 V power module system	ply remains more than 16 V for 25.5 seconds during	(The signal circuit is open or
	voltage high)	READY state.	shorted.) DC/DC converter VCM

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

• Turn power switch OFF and wait at least 20 seconds.

• Make sure that 12V battery voltage is 11 V or more.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

(B) With CONSULT

1. Set the vehicle to READY and wait at least 30 seconds.

2. Check self-diagnostic result.

Is DTC detected?

- YES >> Proceed to EVC-164, "Diagnosis Procedure".
- NO >> INSPECTION END

Diagnosis Procedure

1	
	.CHECK 12V BATTERY

Check that the correct 12V battery is installed.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace 12V battery with a correct one.

2. CHECK SELF-DIAGNOSTIC RESULT IN PDM (POWER DELIVERY MODULE)

With CONSULT

Check self-diagnostic result in "CHARGER/PD MODULE".

Is any DTC detected?

YES >> Perform trouble diagnosis for detected DTC. Refer to <u>VC-34</u>, "DTC Index".

NO >> GO TO 3.

3.CHECK SELF-DIAGNOSTIC RESULT IN VCM

With CONSULT

Check self-diagnostic result in "EV/HEV".

Is DTC (excluding P0A8E) related to DC/DC converter detected?

YES >> Perform trouble diagnosis for detected DTC. Refer to EVC-102. "DTC Index".

NO >> GO TO 4.

4.CHECK DC/DC CONVERTER POWER VOLTAGE VARIABLE CONTROL SIGNAL

With CONSULT

1. On the CONSULT screen, select "EV/HEV" >> "DATA MONITOR" >> "DC/DC CONV REQ VOLT".

2. Check that the value of "DC/DC CONV REQ VOLT" is less than 16 V.

EVC-164

INFOID:000000008747044

P0A8E 12V BATTERY POWER SUPPLY

< DTC/CIRCUIT DIAGNOSIS >

Is the in	spection result normal?
	>> Check intermittent incident. Refer to <u>GI-53, "Intermittent Incident"</u> .
NO	>> Replace VCM. Refer to EVC-426, "Removal and Installation".

В

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P0A8F 12V BATTERY POWER SUPPLY

< DTC/CIRCUIT DIAGNOSIS >

P0A8F 12V BATTERY POWER SUPPLY

DTC Logic

INFOID:000000008747045

DTC DETECTION LOGIC

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	Possible cause
P0A8F	14V POWER SUPPLY (14 V power module system performance)	When shift is except P range, VCM detects that a voltage of 12V battery power supply remains less than 12 V for 10 seconds.	 Harness or connectors (The sensor circuit is open or shorted.) DC/DC converter IPDM E/R

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

Turn power switch OFF and wait at least 20 seconds.

• Make sure that 12V battery voltage is 11 V or more.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT

1. Under the following conditions, and wait at least 30 seconds.

Power switch	READY
Shift position	Except P range

2. Check self-diagnostic result.

Is DTC detected?

YES >> Proceed to EVC-166, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

1.INTERVIEW THE CUSTOMER

Interview the customer to see if there is a history that all of the following conditions are satisfied for a long time.

Power switch	ON
Shift position	Except P range

NOTE:

This DTC may be detected if the above state continues for a long time.

Is the inspection result normal?

YES >> Explain the customer that this is the normal operation.

2. CHECK SELF-DIAGNOSTIC RESULT IN PDM (POWER DELIVERY MODULE)

With CONSULT

Check self-diagnostic result in "CHARGER/PD MODULE".

Is any DTC detected?

YES >> Perform trouble diagnosis for detected DTC. Refer to <u>VC-34</u>, "DTC Index".

NO >> GO TO 3.

 ${\it 3.}$ CHECK SELF-DIAGNOSTIC RESULT IN VCM

With CONSULT

INFOID:000000008747046

P0A8F 12V BATTERY POWER SUPPLY

NO >> GO TO 4. 4. CHECK 12V BATTERY POWER SUPPLY 1. Turn power switch OFF. 2. Check the voltage between IPDM E/R harness connector and ground.	<u>s any DTC that</u> YES >> Per					letected? er to <u>EVC-102, "DTC_Index"</u> .	A
1. Turn power switch OFF. 2. Check the voltage between IPDM E/R harness connector and ground. IPDM E/R Voltage Connector Terminal E14 42 Ground 12V battery voltage Is the inspection result normal? YES >> GO TO 5. 5. CHECK FUSE 1. Pull out #43 fuse. 2. Check the fuse is not fusing. Is the inspection result normal? YES >> GO TO 5. 5.CHECK FUSE 1. Pull out #43 fuse. 2. Check the fuse is not fusing. Is the inspection result normal? YES >> GO TO 6. NO >> Replace the fuse after repairing the applicable circuit. 6. CHECK IPDM E/R 1. Insert the fuse which pulled out. 2. Remove IPDM E/R. 3. Check the continuity between IPDM E/R connector terminals. Image: IPDM E/R 2 42 Existed Is the inspection result normal? YES >> GO TO 7. NO >> Replace IPDM E/R. Refer to PCS-29. "Removal and Installation".	NO >> GC) TO 4.	-				E
2. Check the voltage between IPDM E/R harness connector and ground. + IPDM E/R - Connector Terminal E14 42 Ground 12V battery voltage age age Is the inspection result normal? YES > GO TO 7. NO >> GO TO 5. 5.CHECK FUSE 1. Pull out #43 fuse. 2. Check the fuse is not fusing. Is the inspection result normal? YES >> GO TO 6. NO >> Replace the fuse after repairing the applicable circuit. 6.CHECK IPDM E/R 1. Insert the fuse which pulled out. 2. Remove IPDM E/R 3. Check the continuity between IPDM E/R connector terminals. Image: the inspection result normal? YES >> GO TO 7. NO > Replace IPDM E/R. 2 42 2 42 2 42 2 42 2 42 2 42 2 42 2 8 3 Set of 7. <th></th> <th></th> <th></th> <th>UPPLY</th> <th></th> <th></th> <th>_</th>				UPPLY			_
IPDM E/R - Voltage Connector Terminal - Voltage E14 42 Ground 12V battery voltage Is the inspection result normal? YES > GO TO 7. NO >> GO TO 5. 5. 5. CHECK FUSE - - 1. Pull out #43 fuse. - - 2. Check the fuse is not fusing. - - Is the inspection result normal? YES > GO TO 6. NO >> Replace the fuse after repairing the applicable circuit. - 6. CHECK IPDM E/R - - 1. Insert the fuse which pulled out. - - 2. Remove IPDM E/R - Continuity 4 - Continuity 7 - Continuity 18 the inspection result normal? YES YES > GO TO 7. Continuity NO >> Replace IPDM E/R. Refer to PCS-29. "Removal and Installation". 7 CHECK 12V BATTERY POWER SUPPLY CIRCUIT 1. Disconnect VCM harness connector. 2 - 4 - - - 1 Disconnect VCM harness connector.				E/R harr	iess connecto	and ground.	E١
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Connector Terminal Connector Terminal	YES >> GC NO >> Re CHECK IPD Insert the ft Remove IP Check the + 2 the inspection YES >> GC NO >> Re CHECK 12V Disconnect Check the +	D TO 6. place the fu M E/R use which p DM E/R. continuity b IPDM E/R IPDM E	use after rep pulled out. petween IPD 	DM E/R co	Continuity Existed 29, "Removal s IRCUIT	nals.	_
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	YES >> GC NO >> Re CHECK IPD Insert the ft Remove IP Check the + 2 Sthe inspection YES >> GC NO >> Re CHECK 12V Disconnect Check the + IPDM E/ Connector	D TO 6. place the fu M E/R use which p DM E/R. continuity b IPDM E/R IPDM E	use after rep pulled out. petween IPD 	DM E/R co	Continuity Existed Continuity Continuity Continuity Continuity Continuity Continuity	nals.	_
Also check harness for short to ground.	YES >> GC NO >> Re D.CHECK IPD Insert the ft Remove IP Check the Check the YES >> GC NO >> Re CHECK 12V Disconnect Check the Check the Check the Check the Connector E14	D TO 6. place the fu M E/R use which p DM E/R. continuity b IPDM E/R IPDM E/R IPDM E/R Terminal 0 TO 7. place IPDM 7 BATTERY 8 VCM harn continuity b R Terminal 42	use after rep pulled out. petween IPD 	DM E/R co	Continuity Existed 29, "Removal a IRCUIT arness connec	nals.	_

< DTC/CIRCUIT DIAGNOSIS >

P0A94 DC/DC CONVERTER

DTC Logic

INFOID:000000008747047

DTC DETECTION LOGIC

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	Possible cause
P0A94	DC/DC CONVERTER (DC/DC converter perfor- mance)	During READY, the following state continues for 2.5 seconds or more: The VCM power supply voltage is less than 12.48 V and VCM detects a malfunction in the DC/DC converter.	DC/DC converter VCM

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

• Turn power switch OFF and wait at least 20 seconds.

• Make sure that 12V battery voltage is 11 V or more.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT

- 1. Set the vehicle to READY and wait at least 10 seconds.
- 2. Check self-diagnostic result.

Is DTC detected?

- YES >> Proceed to EVC-168. "Diagnosis Procedure".
- NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000008747048

1.CHECK DC/DC CONVERTER STATUS SIGNAL

With CONSULT

- 1. On the CONSULT screen, select "EV/HEV" >> "DATA MONITOR" >> "DC/DC CONV STATUS".
- 2. Check that the value of "DC/DC CONV STATUS" is other than "3".

Is the inspection result normal?

YES >> GO TO 3.

NO >> GO TO 2.

2.CHECK SELF-DIAGNOSTIC RESULT IN PDM (POWER DELIVERY MODULE)

With CONSULT

Check self-diagnostic result in "CHARGER/PD MODULE".

Is any DTC detected?

- YES >> Perform trouble diagnosis for detected DTC. Refer to <u>VC-34, "DTC Index"</u>.
- NO >> Check intermittent incident. Refer to <u>GI-53, "Intermittent Incident"</u>.

3. PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT

- 1. Erase DTC.
- Perform DTC confirmation procedure again. Refer to <u>EVC-168, "DTC Logic"</u>.

Is DTC P0A94 detected again?

- YES >> Replace VCM. Refer to EVC-426, "Removal and Installation".
- NO >> Repair or replace error-detected parts.

< DTC/CIRCUIT DIAGNOSIS >

P0AA0 SYSTEM MAIN RELAY

DTC Logic

DTC DETECTION LOGIC

NOTE:

If DTC P0AA0 is displayed with DTC P0AA2, P0AA5, P31D4, P31DB, P31DC, or P31DD, perform diagnosis for DTC P0AA2, P0AA5, P31D4, P31DB, P31DC, or P31DD.

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	Possible cause	Г
P0AA0	HYBRID BATT POSITIVE CONTACTOR (Hybrid battery positive contactor circuit)	 A traction motor inverter input voltage is 240 V or more for 9 seconds or more while starting the EV system. A traction motor inverter input voltage is 190 V or more for 1 minute or more while starting the EV system. 	 Harness or connectors Battery J/B Electric compressor PTC heater Traction motor inverter High voltage harness 	E

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

CAUTION:

Since this DTC may be displayed if a malfunction is detected in other systems, check them for malfunction before performing this diagnosis.

- Turn power switch OFF and wait at least 20 seconds.
- Make sure that 12V battery voltage is 11 V or more.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT

- 1. Turn power switch ON and wait at least 90 seconds.
- 2. Check self-diagnostic result.

Is DTC "P0AA0" detected?

YES >> Proceed to EVC-169, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

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.
- 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 <u>EVC-11, "High Voltage Precautions"</u>.

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.
- Erase DTC after the work is completed.

EVC-169

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< DTC/CIRCUIT DIAGNOSIS >

1. CHECK SYSTEM MAIN RELAY DRIVE POWER VOLTAGE

- 1. Turn power switch OFF.
- 2. Disconnect Li-ion battery harness connector.

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

		+		
Relay	Li-ion battery		-	Voltage
	Connector	Terminal		
System main relay 1		17		
System main relay 2	B24	14	Ground	0 V
Pre-charge relay		11		

Is the inspection result normal?

YES >> GO TO 3.

NO >> GO TO 2.

2.CHECK SYSTEM MAIN RELAY DRIVE CIRCUIT

1. Disconnect VCM harness connector.

2. Check harness for short to power, between Li-ion battery harness connector and VCM harness connector.

	+		
Li-ion	battery	_	Voltage
Connector	Terminal	•	
	17		
B24	14	Ground	0 V
	11		

Is the inspection result normal?

YES >> Check intermittent incident. Refer to GI-53, "Intermittent Incident".

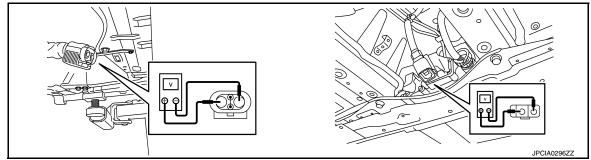
NO >> Repair or replace error-detected parts.

3.preconditioning

WARNING:

Disconnect high voltage. Refer to GI-33, "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 <u>ÉVB-194, "Exploded View"</u>.
- 2. Disconnect high voltage harness connector and PTC heater harness connector from front side of Li-ion battery. Refer to EVB-194, "Removal and Installation".
- Measure voltage between high voltage harness connector terminals and PTC heater harness connector terminals.



DANGER:

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

< DTC/CIRCUIT DIAGNOSIS >

Standard	: 5 V or I	ess		
CAUTION: For voltage mea	surements, use a tes	ter which can measure to	o 500 V or higł	ner.
	,		5	
>> GO TO 4				
CHECK ELECTRI				
		tage harness connector. compressor terminals.		
With heat pump system	n			
Electric	compressor			
+	-	Resistance		
	rminal			
1	2	3 k Ω or more		
Without heat pump sys				
	compressor			
+		Resistance		
1	rminal 3	3 kΩ or more		
the inspection resul	It normal?			
the inspection resu (ES >> GO TO 5 IO >> Replace (With hea	electric compressor. A at pump system) or <u>HA</u>	and then, GO TO 9. Reference of the second s	r to <u>HA-37, "Re</u> t <u>ion"</u> (Without h	emoval and Installation" leat pump system).
the inspection resu ES >> GO TO 5 O >> Replace (With hea CHECK PTC HEA Disconnect Li-ion	electric compressor. A at pump system) or <u>HA</u> TER battery harness conne sircuit between Li-ion b	And then, GO TO 9. Reference of the sector (H19).	r to <u>HA-37, "Re</u> i <u>tion"</u> (Without h	emoval and Installation" leat pump system).
the inspection result (ES >> GO TO 5 IO >> Replace (With heat Disconnect Li-ion Check the short of With heat pump system	electric compressor. A at pump system) or <u>HA</u> TER battery harness conne sircuit between Li-ion b	And then, GO TO 9. Refer -95, "Removal and Installa ector (H19). attery terminals. Li-ion battery	r to <u>HA-37, "Re</u> <u>ition"</u> (Without h	ieat pump system).
the inspection resu (ES >> GO TO 5 IO >> Replace (With hea CHECK PTC HEA Disconnect Li-ion Check the short of	electric compressor. A at pump system) or <u>HA</u> TER battery harness conne sircuit between Li-ion b	And then, GO TO 9. Refer- 95, "Removal and Installa ector (H19). attery terminals. Li-ion battery +	r to <u>HA-37, "Re</u> <u>ition"</u> (Without h	emoval and Installation" leat pump system).
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the inspection resu (ES >> GO TO 5 IO >> Replace (With hea CHECK PTC HEA Disconnect Li-ion Check the short of With heat pump system Connected to: PTC heater	electric compressor. A at pump system) or <u>HA</u> TER battery harness conne circuit between Li-ion b n Connector H19	And then, GO TO 9. Refer- 95, "Removal and Installa ector (H19). attery terminals. Li-ion battery +	r to <u>HA-37, "Re</u> <u>ition"</u> (Without h	ieat pump system).
the inspection resu ES >> GO TO 5 IO >> Replace (With hea CHECK PTC HEA Disconnect Li-ion Check the short of With heat pump system Connected to:	electric compressor. A at pump system) or <u>HA</u> TER battery harness conne circuit between Li-ion b n Connector H19	And then, GO TO 9. Refer -95, "Removal and Installa ector (H19). attery terminals. Li-ion battery + Terminal 40	i <u>tion"</u> (Without h	Resistance
the inspection resu ES >> GO TO 5 IO >> Replace (With hea CHECK PTC HEA Disconnect Li-ion Check the short of With heat pump system Connected to: PTC heater	electric compressor. A at pump system) or <u>HA</u> TER battery harness conne circuit between Li-ion b n Connector H19	And then, GO TO 9. Refer -95, "Removal and Installa ector (H19). attery terminals. Li-ion battery + Terminal	i <u>tion"</u> (Without h	Resistance
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the inspection resu ES >> GO TO 5 O >> Replace (With hea CHECK PTC HEA Disconnect Li-ion Check the short of With heat pump system Connected to: PTC heater Without heat pump system	electric compressor. A at pump system) or <u>HA</u> TER battery harness conne circuit between Li-ion b n Connector H19	And then, GO TO 9. Refer- 95, "Removal and Installa ector (H19). attery terminals. Li-ion battery + Terminal 40 Li-ion battery +	i <u>tion"</u> (Without h	Resistance 3 kΩ or more
the inspection resu ES >> GO TO 5 IO >> Replace (With heat CHECK PTC HEAT Disconnect Li-ion Check the short of With heat pump system Connected to: PTC heater Without heat pump system Connected to:	electric compressor. A at pump system) or HA TER battery harness conne circuit between Li-ion b n Connector H19 tem Connector H19	And then, GO TO 9. Refer -95, "Removal and Installa ector (H19). attery terminals. Li-ion battery + Terminal 40 Li-ion battery + Terminal	- 41 -	Resistance 3 kΩ or more Resistance

Disconnect Li-ion battery harness connector (H3).
 Check the short circuit between Li-ion battery harness connector terminals.

< DTC/CIRCUIT DIAGNOSIS >

Connected to:	Connector	+	-	Resistance	
	Connector	Terminal			
PDM (Power Delivery Module)	H3	37	38	3 kΩ or more	
Without heat pump system	1				
		Li-ion battery			
Connected to:	Connector	+	-	Resistance	
		Tern	ninal		

ne inspection result normal?

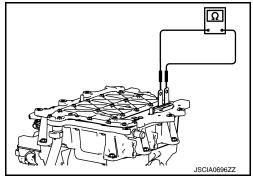
YES >> The high voltage harness within Li-ion battery may be shorted. Check the related circuits. And then, GO TO 9.

NO >> GO TO 7.

7. CHECK TRACTION MOTOR INVERTER

- Remove PDM (Power Delivery Module). Refer to VC-119, "Removal and Installation". 1.
- 2. Check the short circuit between traction motor inverter terminals.

: more than 3 k Ω Resistance



Is the inspection result normal?

- YES >> GO TO 8.
- >> Replace traction motor inverter. And then, GO TO 9. Refer to TMS-108, "Removal and Installa-NO tion".

8. CHECK HIGH VOLTAGE HARNESS-2

- Remove high voltage harness from PDM (Power Delivery Module). Refer to VC-119, "Removal and Instal-1. lation".
- Check the short circuit between high voltage harness connector (Li-ion battery side) and high voltage har-2. ness connector [PDM (Power Delivery Module) side].

With heat pump system

	PDM				
Connected to:	Connector	+	_	Resistance	
	Connector	Terminal			
Li-ion battery	H5	38	39	3 kΩ or more	

	PE			
Connected to:	Connector	+	_	Resistance
	Connector	Terminal		
Li-ion battery	H5	38	39	3 k Ω or more

< DTC/CIRCUIT DIAGNOSIS >

3. Check the short circuit between high voltage harness connector (electric compressor side) and high voltage harness connector [PDM (Power Delivery Module) side].

	PDM	I (Power Delivery Mod	dule)		
Connected to:	Connector	+	-	Resistance	
			rminal		
Electric compressor	H6	42	41	$3 k\Omega$ or more	,
Without heat pump system					
	PDM	I (Power Delivery Mod	dule)		
Connected to:	Connector	+	_	Resistance	
			rminal		
Electric compressor	H7	41	42	$3 k\Omega$ or more	ı
ES >> GO TO 9. D >> Replace malfunct REPLACE BATTERY JUN place battery junction box assembly and Assembly".			TION BOX AND B	ATTERY HARNESS	-
>> INSPECTION EN	ID				

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< DTC/CIRCUIT DIAGNOSIS >

P0AA1 SYSTEM MAIN RELAY +

DTC Logic

INFOID:000000008747051

DTC DETECTION LOGIC

WARNING:

• When this DTC is detected, the implementation of the DTC confirmation procedure may damage other parts. To prevent damage from occurring, perform <u>EVC-174</u>, "<u>Diagnosis Procedure</u>" first. After repairing malfunctioning part, perform the DTC confirmation procedure.

To erase DTC, always repair malfunctioning part first. NOTE:

- To Clear DTC P0AA1, perform "SPECIFIC DTC CLEAR" in "WORK SUPPORT" of CONSULT.
- If DTC P0AA1 is displayed with DTC P0AA2, P31D4, P31DB, or P31DD, perform diagnosis for DTC P0AA2, P31D4, P31DB, or P31DD.

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	Possible cause
P0AA1	HYBRID BATT POSITIVE CONTACTOR (Hybrid battery positive contactor circuit stuck closed)	The voltage of the traction motor inverter is 160 V or more and the voltage does not decreases 100 V or more even after a lapse of the specified time after starting diagnosis.	 Harness or connectors Battery J/B Electric compressor PTC heater Traction motor inverter High voltage harness

DTC CONFIRMATION PROCEDURE

WARNING:

- When this DTC is detected, the implementation of the DTC confirmation procedure may damage other parts. To prevent damage from occurring, perform <u>EVC-174</u>, "<u>Diagnosis Procedure</u>" first. After repairing malfunctioning part, perform the DTC confirmation procedure.
- To erase DTC, always repair malfunctioning part first.

1.PRECONDITIONING

CAUTION:

Since this DTC may be displayed if a malfunction is detected in other systems, check them for malfunction before performing this diagnosis.

- Turn power switch OFF and wait at least 20 seconds.
- Make sure that 12V battery voltage is 11 V or more.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

() With CONSULT

- 1. Set the vehicle to READY and perform test drive.
- 2. Turn power switch OFF and wait at least 130 seconds.
- 3. Turn power switch ON.
- 4. Check self-diagnostic result.

Is the DTC detected?

YES >> Proceed to EVC-174, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000009315678

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:

< DTC/CIRCUIT DIAGNOSIS >

- 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 EVC-11, "High Voltage Precautions".

CAUTION:

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

1. CHECK SYSTEM MAIN RELAY DRIVE POWER VOLTAGE

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

	+ Li-ion battery			
Relay			_	Voltage
	Connector	Terminal		
System main relay 1		17		
System main relay 2	B24	14	Ground	0 V
Pre-charge relay		11		

Is the inspection result normal?

YES >> GO TO 3.

NO >> GO TO 2.

2.CHECK SYSTEM MAIN RELAY DRIVE CIRCUIT

1. Disconnect VCM harness connector.

2. Check harness for short to power, between Li-ion battery harness connector and VCM harness connector.

	+		Voltage
Li-ion	battery	_	
Connector	Terminal		
	17		
B24	14	Ground	0 V
	11		

Is the inspection result normal?

- YES >> Check intermittent incident. Refer to <u>GI-53, "Intermittent Incident"</u>.
- NO >> Repair or replace error-detected parts.

3. preconditioning

WARNING:

Disconnect high voltage. Refer to GI-33, "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-194, "Exploded View".
- Disconnect high voltage harness connector and PTC heater harness connector from front side of Li-ion battery. Refer to <u>EVB-194</u>, "<u>Removal and Installation</u>".

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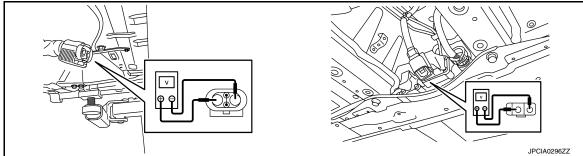
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< DTC/CIRCUIT DIAGNOSIS >

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



DANGER:

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



Standard

: 5 V or less

CAUTION:

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

>> GO TO 4.

4.CHECK ELECTRIC COMPRESSOR

- 1. Disconnect electric compressor high voltage harness connector.
- 2. Check the short circuit between electric compressor terminals.

With heat pump system

Electric c	Electric compressor				
+	_	Resistance			
Terr	minal				
1	2	3 k Ω or more			
Without heat pump syste	em				
Electric c	ompressor				
+	_	Resistance			
Terr	Terminal				
1	3	3 k Ω or more			

Is the inspection result normal?

YES >> GO TO 5.

NO >> Replace electric compressor. And then, GO TO 9. Refer to <u>HA-37, "Removal and Installation"</u> (With heat pump system) or <u>HA-95, "Removal and Installation"</u> (Without heat pump system).

5. CHECK PTC HEATER

- 1. Disconnect Li-ion battery harness connector (H19).
- 2. Check the short circuit between Li-ion battery terminals.

With heat pump system

Connected to:	Connector	+	_	Resistance	
	Connector	Terminal			
PTC heater	H19	40	41	3 k Ω or more	

Revision: October 2013

< DTC/CIRCUIT DIAGNOSIS >

Without heat pump syste	em			
		Li-ion battery		
Connected to:	Connector	+	_	Resistance
	Connector	Termin	al	
PTC heater	H19	40	41	$3 \text{ k}\Omega$ or more
the inspection result	normal?			
YES >> GO TO 6.				
	TC heater. And then, C at pump)] or <u>HAC-374.</u>			
	• • • • •			ntilout neat pump)].
		(
	pattery harness connect rcuit between Li-ion ba		or terminals.	
With heat pump system				
		Li-ion battery		
Connected to:		+		Resistance
	Connector —	Termin		
PDM (Power Delivery	НЗ	27	20	2 kO er mere
Module)	ПЗ	37	38	3 kΩ or more
Without heat pump syste	em			
		Li-ion battery		
Connected to:	Connector	+	_	Resistance
	Connector	Termin	al	
PDM (Power Delivery	H3	37	38	3 k Ω or more
Module)				
the inspection result		1.: : k k	abartad. Obsala	
YES >> The high \ then, GO T	/oltage harness within FO 9.	LI-ION Dattery may be	Shorled. Check	ine related circuits. Ar
NO >> GO TO 7.				
CHECK TRACTION	I MOTOR INVERTER			
. Remove PDM (Po	wer Delivery Module).	Refer to VC-119, "Rem	oval and Installati	on".
. Check the short of	circuit between traction			 Ω
nals.				
Resistance	: more than 3 k Ω			
Nesistance				

Is the inspection result normal?

- YES >> GO TO 8.
- NO >> Replace traction motor inverter. And then, GO TO 9. Refer to <u>TMS-108. "Removal and Installa-</u> P <u>tion"</u>.

8. CHECK HIGH VOLTAGE HARNESS-2

- Remove high voltage harness from PDM (Power Delivery Module). Refer to <u>VC-119</u>, "<u>Removal and Instal-</u> lation".
- 2. Check the short circuit between high voltage harness connector (Li-ion battery side) and high voltage harness connector [PDM (Power Delivery Module) side].

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< DTC/CIRCUIT DIAGNOSIS >

With heat pump system

	P[DM (Power Delivery Mode			
Connected to:	Connector	+	_	Resistance	
	Connector	Terminal		1	
Li-ion battery	H5	38	39	3 kΩ or more	

	PD			
Connected to:	Connector	+	-	Resistance
	Connector	Terminal		
Li-ion battery	H5	38	39	3 k Ω or more

3. Check the short circuit between high voltage harness connector (electric compressor side) and high voltage harness connector [PDM (Power Delivery Module) side].

with heat pump system

-

	PD			
Connected to:	Connector	+	_	Resistance
	Connector	Terr		
Electric compressor	H6	42	41	3 k Ω or more

Without heat pump system

Connected to:	PD			
	Connector	+	_	Resistance
	Connector	Terr	minal	
Electric compressor	H7	41	42	$3 \text{ k}\Omega$ or more

Is the inspection result normal?

YES >> GO TO 9.

NO >> Replace malfunctioning harness. And then, GO TO 9.

9.REPLACE BATTERY JUNCTION BOX

Replace battery junction box. Refer to EVB-219, "BATTERY JUNCTION BOX AND BATTERY HARNESS : Disassembly and Assembly".

>> INSPECTION END

< DTC/CIRCUIT DIAGNOSIS >

P0AA2 SYSTEM MAIN RELAY +

DTC Logic

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INFOID:000000008747053

DTC DETECTION LOGIC

DTC	CONSULT screen terms (Trouble diagnosis conter		DTC detecting cond	ition	Possible cause	
P0AA2	HYBRID BATT POSITIVE CONTACTOR (Hybrid battery positive contactor circuit stuck open)	VCM detect	ts a break in the drive 1 or an extremely hig s or more.		 Harness or connectors Battery J/B 	D
DTC CON	FIRMATION PROCE	EDURE				E
1.PRECO	NDITIONING					
	er switch OFF and wa e that 12V battery volt					F
•	► GO TO 2. RM DTC CONFIRMAT	ION PROCE	DURE			G
	ower switch ON and w self-diagnostic result.	ait a least 10) seconds.			Η
YES >>	 Proceed to <u>EVC-179</u> INSPECTION END 	, "Diagnosis	Procedure".			I
Diagnosi	s Procedure				INFOID:00000008747054	
1.снеск	SYSTEM MAIN RELA	Y GROUND	CIRCUIT			0
2. Discon	ower switch OFF. nect Li-ion battery har the continuity betweer			ctor and grour	nd.	К
	+					L
L	i-ion battery	_	Continuity			
Connecto						\mathbb{M}
B24	16 ection result normal?	Ground	Existed			
YES >> NO >>	 GO TO 2. Repair or replace error 	-	parts.			Ν
2.CHECK	SYSTEM MAIN RELA	Y CIRCUIT				0
Check cont	tinuity between Li-ion t	pattery conne	ector terminals.			-
L	i-ion battery terminals	Continuity	-			Ρ

Is the inspection result normal?

YES >> GO TO 3.

< DTC/CIRCUIT DIAGNOSIS >

NO >> Check the relay circuit of Li-ion battery for malfunction. If no malfunction is found, replace battery junction box. Refer to EVB-219, "BATTERY JUNCTION BOX AND BATTERY HARNESS : Disassembly and Assembly".

3.CHECK SYSTEM MAIN RELAY DRIVE CIRCUIT

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

+				
V	СМ	Li-ion battery		Continuity
Connector	terminal	Connector	terminal	
E61	54	B24	17	Existed

Is the inspection result normal?

- YES >> Check intermittent incident. Refer to GI-53, "Intermittent Incident".
- NO >> Repair harness or connector.

P0AA4 SYSTEM MAIN RELAY -

< DTC/CIRCUIT DIAGNOSIS >

P0AA4 SYSTEM MAIN RELAY -

DTC Logic

DTC DETECTION LOGIC

NOTE:

If DTC P0AA4 is displayed with DTC P0AA5 or P31DC, perform diagnosis for DTC P0AA5 or P31DC.

				EVC
DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	Possible cause	
P0AA4	HYBRID BATT NEGATIVE CONTACTOR (Hybrid battery negative con- tactor circuit stuck closed)	During the stop state from READY or charging state, the voltage of the traction monitor inverter is 100 V or more.	 Harness or connectors Battery J/B Electric compressor PTC heater Traction motor inverter High voltage harness 	D
DTC CC	ONFIRMATION PROCE	DURE		
1.PREC	CONDITIONING			F
functior • Turn p • Make s	 before performing this over switch OFF and wai sure that 12V battery volta > GO TO 2. FORM DTC CONFIRMAT 	it at least 20 seconds. age is 11 V or more.		G
 Set Turr Turr Turr Che 	CONSULT the vehicle to READY. a power switch OFF and v a power switch ON. ck self-diagnostic result.	vait at least 60 seconds.		J
YES NO	<pre>detected? >> Proceed to EVC-181, >> INSPECTION END</pre>	"Diagnosis Procedure".		K
Diagno	osis Procedure		INFOID:000000009315684	L
	_			

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.
- 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 EVC-11, "High Voltage Precautions".
- CAUTION:
- Never bring the vehicle into the READY status with the service plug removed unless otherwise instructed in the Service Manual. A malfunction may occur if this is not observed.

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P0AA4 SYSTEM MAIN RELAY -

< DTC/CIRCUIT DIAGNOSIS >

• Erase DTC after the work is completed.

1. CHECK SYSTEM MAIN RELAY DRIVE POWER VOLTAGE

- 1. Turn power switch OFF.
- 2. Disconnect Li-ion battery harness connector.

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

		+		
Relay	Li-ion	battery	_	Voltage
	Connector	Terminal		
System main relay 1		17		
System main relay 2	B24	14	Ground	0 V
Pre-charge relay		11		

Is the inspection result normal?

YES >> GO TO 3.

NO >> GO TO 2.

2.CHECK SYSTEM MAIN RELAY DRIVE CIRCUIT

1. Disconnect VCM harness connector.

2. Check harness for short to power, between Li-ion battery harness connector and VCM harness connector.

	+			
Li-ion battery		_	Voltage	
Connector	Terminal	*		
	17			
B24	14	Ground	0 V	
	11			

Is the inspection result normal?

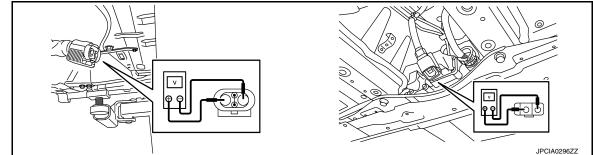
- YES >> Check intermittent incident. Refer to <u>GI-53, "Intermittent Incident"</u>.
- NO >> Repair or replace error-detected parts.

3. PRECONDITIONING

WARNING:

Disconnect high voltage. Refer to GI-33, "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-194, "Exploded View".
- Disconnect high voltage harness connector and PTC heater harness connector from front side of Li-ion battery. Refer to <u>EVB-194</u>, "<u>Removal and Installation</u>".
- 3. Measure voltage between high voltage harness connector terminals and PTC heater harness connector terminals.



DANGER:

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

< DTC/CIRCUIT DIAGNOSIS >

	: 5 V or	ess		
CAUTION: For voltage mea	surements, use a tes	ter which can measur	re to 500 V or high	ner.
>> GO TO 4				
	C COMPRESSOR			
		ltage harness connecto compressor terminals.	r.	
With heat pump system				
	compressor		_	
+	-	Resistance		
Те	rminal			
1	2	3 k Ω or more		
Without heat pump sys	stem			
Electric	compressor		_	
+	-	Resistance		
-	rminal			
-	-	0.1.5		
1 ne inspection resu		3 kΩ or more	-	
1 <u>ne inspection resu</u> S >> GO TO 5) >> Replace (With hea	I <u>t normal?</u> electric compressor. <i>A</i> at pump system) or <u>HA</u>			emoval and Installation neat pump system).
1 The inspection result S >> GO TO 5 D >> Replace (With heat CHECK PTC HEAT Disconnect Li-ion	It normal? electric compressor. <i>A</i> at pump system) or <u>HA</u> TER battery harness conn	And then, GO TO 9. R -95, "Removal and Inst ector (H19).		
1 The inspection result S >> GO TO 5 D >> Replace (With heat CHECK PTC HEAT Disconnect Li-ion Check the short of	It normal? electric compressor. A at pump system) or <u>HA</u> TER battery harness conn circuit between Li-ion b	And then, GO TO 9. R -95, "Removal and Inst ector (H19).		
1 The inspection result S >> GO TO 5 D >> Replace (With heat CHECK PTC HEAT Disconnect Li-ion	It normal? electric compressor. A at pump system) or <u>HA</u> TER battery harness conn circuit between Li-ion b	And then, GO TO 9. R -95, "Removal and Inst ector (H19). attery terminals.		
1 The inspection result S >> GO TO 5 D >> Replace (With heat CHECK PTC HEAT Disconnect Li-ion Check the short of	It normal? electric compressor. A at pump system) or <u>HA</u> TER battery harness conn circuit between Li-ion b	And then, GO TO 9. R -95, "Removal and Inst ector (H19).		
1 The inspection result S >> GO TO 5 D >> Replace (With heat CHECK PTC HEAT Disconnect Li-ion Check the short of With heat pump system	It normal? electric compressor. A at pump system) or <u>HA</u> TER battery harness conn circuit between Li-ion b	And then, GO TO 9. R -95, "Removal and Inst ector (H19). attery terminals. Li-ion battery	<u>allation"</u> (Without h	neat pump system).
1 The inspection result S >> GO TO 5 D >> Replace (With heat CHECK PTC HEAT Disconnect Li-ion Check the short of With heat pump system	It normal? electric compressor. A at pump system) or <u>HA</u> TER battery harness conn circuit between Li-ion b	And then, GO TO 9. R -95, "Removal and Inst ector (H19). attery terminals. Li-ion battery +	<u>allation"</u> (Without h	neat pump system).
1 ie inspection resu S >> GO TO 5 >> Replace (With heat CHECK PTC HEAT Disconnect Li-ion Check the short of With heat pump system Connected to:	It normal? electric compressor. A at pump system) or HA TER battery harness conne circuit between Li-ion b n Connector H19	And then, GO TO 9. R -95, "Removal and Inst ector (H19). attery terminals. Li-ion battery + Termi	<u>allation"</u> (Without h	Resistance
1 ie inspection resu S >> GO TO 5 >> Replace (With heat CHECK PTC HEAT Disconnect Li-ion Check the short of With heat pump system Connected to: PTC heater	It normal? electric compressor. A at pump system) or HA TER battery harness conne circuit between Li-ion b n Connector H19	And then, GO TO 9. R -95, "Removal and Inst ector (H19). attery terminals. Li-ion battery + Termi	<u>allation"</u> (Without h	Resistance
1 ie inspection resu is >> GO TO 5 >> Replace (With heat CHECK PTC HEAT Disconnect Li-ion Check the short of With heat pump system Connected to: PTC heater	It normal? electric compressor. A at pump system) or HA TER battery harness conne circuit between Li-ion b n Connector H19	And then, GO TO 9. R -95, "Removal and Inst ector (H19). attery terminals. Li-ion battery + Termi 40	<u>allation"</u> (Without h	Resistance
1 ie inspection resu is >> GO TO 5 >> Replace (With heat CHECK PTC HEAT Disconnect Li-ion Check the short of With heat pump system Connected to: PTC heater Without heat pump system Connected to:	It normal? electric compressor. A at pump system) or HA TER battery harness conn- circuit between Li-ion b n Connector H19 stem Connector	And then, GO TO 9. R -95, "Removal and Inst ector (H19). attery terminals. Li-ion battery + Termi 40 Li-ion battery + Termi	allation" (Without h	Resistance
1 ie inspection resu is >> GO TO 5 >> Replace (With heat CHECK PTC HEAT Disconnect Li-ion Check the short of With heat pump system Connected to: PTC heater Without heat pump system	It normal? electric compressor. A at pump system) or HA TER battery harness connector Connector H19 tem Connector H19	And then, GO TO 9. R -95, "Removal and Inst ector (H19). attery terminals. Li-ion battery + Termi 40 Li-ion battery +	allation" (Without h	Resistance

1. Disconnect Li-ion battery harness connector (H3).

2. Check the short circuit between Li-ion battery harness connector terminals.

P0AA4 SYSTEM MAIN RELAY -

< DTC/CIRCUIT DIAGNOSIS >

Connected to:	Connector	+	_	Resistance	
	Connector	Terminal		_	
PDM (Power Delivery Module)	H3	37	38	3 kΩ or more	
Without heat pump system	1				
		Li-ion battery			
Connected to:	Connector	+	-	Resistance	
Connected to:	Connector	+ Term	- inal	Resistance	

ne inspection result normal?

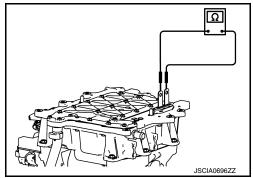
YES >> The high voltage harness within Li-ion battery may be shorted. Check the related circuits. And then, GO TO 9.

NO >> GO TO 7.

7. CHECK TRACTION MOTOR INVERTER

- Remove PDM (Power Delivery Module). Refer to VC-119, "Removal and Installation". 1.
- 2. Check the short circuit between traction motor inverter terminals.

: more than 3 k Ω Resistance



Is the inspection result normal?

- YES >> GO TO 8.
- >> Replace traction motor inverter. And then, GO TO 9. Refer to TMS-108, "Removal and Installa-NO tion".

8. CHECK HIGH VOLTAGE HARNESS-2

- Remove high voltage harness from PDM (Power Delivery Module). Refer to VC-119, "Removal and Instal-1. lation".
- Check the short circuit between high voltage harness connector (Li-ion battery side) and high voltage har-2. ness connector [PDM (Power Delivery Module) side].

With heat pump system

	PI	PDM (Power Delivery Module)			
Connected to:	Connector	+	-	Resistance	
	Connector	Terr			
Li-ion battery	H5	38	39	3 kΩ or more	
Without heat pump system					
	DI	DM (Power Delivery Mod			

	PE			
Connected to:	Connector	+	_	Resistance
	Connector	Terr	minal	
Li-ion battery	H5	38	39	3 k Ω or more

P0AA4 SYSTEM MAIN RELAY -

< DTC/CIRCUIT DIAGNOSIS >

3. Check the short circuit between high voltage harness connector (electric compressor side) and high voltage harness connector [PDM (Power Delivery Module) side].

_	PDM	(Power Delivery Modul	le)	
Connected to:	Connector	+	_	Resistance
	Connector	Terminal		
Electric compressor	H6	42	41	3 k Ω or more
Without heat pump system				
	PDM	(Power Delivery Modul	le)	
Connected to:	Connector	+	_	Resistance
_		Term		
Electric compressor he inspection result norma	H7	41	42	$3 \text{ k}\Omega$ or more
O >> Replace malfunct REPLACE BATTERY JUN place battery junction box assembly and Assembly".	. Refer to <u>EVB-219, "E</u>		ON BOX AND B	ATTERY HARNES
>> INSPECTION EN				

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< DTC/CIRCUIT DIAGNOSIS >

P0AA5 SYSTEM MAIN RELAY -

DTC Logic

INFOID:000000008747057

DTC DETECTION LOGIC

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	Possible cause
P0AA5	HYBRID BATT NEGATIVE CONTACTOR (Hybrid battery negative contactor circuit stuck open)	VCM detects a break in the drive circuit of the sys- tem main relay or an extremely high resistance for 2.5 seconds or more when the F/S relay is ON with the system main relay OFF.	 Harness or connectors Battery J/B

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

• Turn power switch OFF and wait at least 20 seconds.

• Make sure that 12V battery voltage is 11 V or more.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT

- Turn power switch ON wait at least 10 seconds.
- 2. Check self-diagnostic result.

Is DTC detected?

- YES >> Proceed to EVC-186, "Diagnosis Procedure".
- NO >> INSPECTION END

Diagnosis Procedure

1. CHECK SYSTEM MAIN RELAY GROUND CIRCUIT

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

	+		
Li-ion	Li-ion battery		Continuity
Connector	terminal		
B24	13	Ground	Existed

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

2. CHECK SYSTEM MAIN RELAY CIRCUIT

Check continuity between Li-ion battery connector terminals.

Li-ion	Continuity	
term	inals	Continuity
13	14	Existed

Is the inspection result normal?

YES >> GO TO 3.

INFOID:000000008747058

P0AA5 SYSTEM MAIN RELAY -

< DTC/CIRCUIT DIAGNOSIS >

NO >> Check the relay circuit of Li-ion battery for malfunction. If no malfunction is found, replace battery junction box. Refer to <u>EVB-219</u>, "<u>BATTERY JUNCTION BOX AND BATTERY HARNESS</u> : <u>Disassembly</u> and <u>Assembly</u>".

3. CHECK HARNESS

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

	+		-	
V	CM	Li-ion battery		Continuity
Connector	terminal	Connector terminal		
E61	28	B24	14	Existed

Is the inspection result normal?

YES	>> Check intermittent incident. Refer to GI-5	3. "Intermittent Incident".
-----	---	-----------------------------

NO >> Repair harness or connector.

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< DTC/CIRCUIT DIAGNOSIS >

P0AA6 HIGH VOLTAGE SYSTEM ISOLATION

Description

INFOID:000000008747059

Li-ion battery is equipped with the IR (Insulation resistance) sensing system. VCM receives the IR sensor signal sent from Li-ion battery controller and monitors the insulation resistance of the high voltage circuit.

DTC Logic

INFOID:000000008747060

DTC DETECTION LOGIC

NOTE:

- DTC "P0AA6" is not detected when insulation resistance decreases between quick charge relay and quick charge port. In this case, insulation check performed by the quick charger becomes NG, resulting in no implementation of quick charge.
- DTC "P0AA6" is not detected when insulation resistance decreases between normal charge port and PDM (Power Delivery Module). In this case, the "Fault" lamp of EVSE control box blinks and normal charge does not start even when trying to perform normal charge.

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	Possible cause
P0AA6	HYBRID BATT VOLT SYS ISOLATION (Hybrid battery voltage sys- tem isolation fault)	VCM detects a insulation resistance calculated based on IR sensor signal sent from Li-ion battery is 380 k Ω or less.	 High voltage harness or connectors Electric compressor PTC heater Traction motor PDM (Power Delivery Module) Li-ion battery

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

- Turn power switch OFF and wait at least 20 seconds.
- Make sure that 12V battery voltage is 11 V or more.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE-1

With CONSULT

1. Maintain the following conditions for at least 50 seconds.

Power switch	READY
Shift position	P range
A/C set temperature	OFF

2. Check DTC.

Is the DTC detected?

YES >> Proceed to EVC-189, "Diagnosis Procedure".

NO >> GO TO 3.

3. PERFORM DTC CONFIRMATION PROCEDURE-2

With CONSULT

1. Maintain the following conditions for at least 30 minutes.

Power switch	READY
Shift position	P range
A/C set temperature	Full cold

2. Check DTC.

Is DTC detected?

-	A6 HIGH VOLTAGE SYSTEM ISOLATION		
< DTC/CIRCUIT DIAGNOSIS YES >> Proceed to EVC-1 NO >> GO TO 4.	S > 189, "Diagnosis Procedure".		
4.PERFORM DTC CONFIRM	ATION PROCEDURE-3		A
With CONSULT A Maintain the following cor	iditions for at least 30 minutes.		В
Power switch	READY		EVC
Shift position	P range		
A/C set temperature	Full hot		
2. Check DTC. Is DTC detected?			D
YES >> Proceed to <u>EVC-1</u> NO >> GO TO 5. 5. PERFORM DTC CONFIRM	189, "Diagnosis Procedure".		E
 With CONSULT 1. Shift selector lever in D po 2. Drive the vehicle at more CAUTION: Always drive vehicle at selector 	osition. than 15 km (10 MPH) at least 40 seconds.		F
NO >> GO TO 6.	189, "Diagnosis Procedure".		Н
Ö .PERFORM DTC CONFIRM	ATION PROCEDURE-5		
 Stop the vehicle and turn Connect quick charge cor 			J
Is DTC detected?YES>> Proceed to EVC-1NO>> INSPECTION EN	<u>189, "Diagnosis Procedure"</u> . D		К
Diagnosis Procedure		INFOID:000000008747062	L

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.
- 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 performed 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 EVC-11, "High Voltage Precautions".

CAUTION:

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

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< DTC/CIRCUIT DIAGNOSIS >

• Erase DTC after the work is completed.

1.CHECK HIGH VOLTAGE PART

- 1. Turn power switch OFF.
- 2. Visually check that there is no damage in each high voltage part.

Is the inspection result normal?

YES >> GO TO 2

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

2. IDENTIFY THE MODE USED AT THE OCCURRENCE OF MALFUNCTION

On which DTC Confirmation Procedure is the DTC P0AA6 detected?

DTC Confirmation Procedure-1>>GO TO 12.

DTC Confirmation Procedure-2>>GO TO 3.

DTC Confirmation Procedure-3>>GO TO 6.

DTC Confirmation Procedure-4>>GO TO 8.

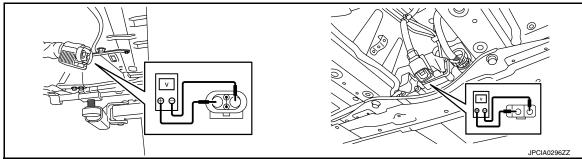
DTC Confirmation Procedure-5>>GO TO 10.

3.preconditioning

WARNING:

Disconnect high voltage. Refer to GI-33, "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-194, "Exploded View".
- Disconnect high voltage harness connector and PTC heater harness connector from front side of Li-ion battery. Refer to EVB-194, "Removal and Installation".
- 3. Measure voltage between high voltage harness connector terminals and PTC heater harness connector terminals.



DANGER:

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



Standard

: 5 V or less

CAUTION:

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

>> GO TO 4.

4.CHECK INSULATION RESISTANCE OF ELECTRIC COMPRESSOR

Check insulation resistance of electric compressor. Refer to <u>HAC-186, "Component Inspection"</u>.

- Since testers are polarized, check the polarity of the tester and connect it in the forward direction to the circuit.
- If the inspection results show no continuity, check the parts for proper installation.

EVC-190

< DTC/CIRCUIT DIAGNOSIS >

Is the inspection result normal?	
YES >> Check intermittent incident. Refer to <u>GI-53, "Intermittent Incident"</u> .	
NO >> GO TO 5.	
5. CHECK REFRIGERANT GAS	
Interview the customer and check maintenance records to see if there is the possibility that coolant a gas of than EV specific refrigerant gas is mixed in A/C refrigerant gas. NOTE:	
If A/C refrigerant gas other than EV specific refrigerant gas is used, insulation resistance may decrease.	E
Is the inspection result normal?	
 YES >> Replace electric compressor. Refer to <u>HA-37. "Removal and Installation"</u> (With heat pump tem) or <u>HA-95. "Removal and Installation"</u> (Without heat pump system). NO >> Change refrigerant gas and compressor oil. 	sys-
6.PRECONDITIONING	
WARNING:	
 Disconnect high voltage. Refer to <u>GI-33, "How to Disconnect High Voltage"</u>. 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 <u>EVB-194, "Exploded View"</u>. 2. Disconnect high voltage harness connector and PTC heater harness connector from front side of L battery. Refer to <u>EVB-194, "Removal and Installation"</u>. 	
 Measure voltage between high voltage harness connector terminals and PTC heater harness connector terminals. 	ector
DANGER:	
Touching high voltage components without using the appropriate protective equipment cause electrocution.	t will
Standard : 5 V or less	
CAUTION: For voltage measurements, use a tester which can measure to 500 V or higher.	
>> GO TO 7.	
7. CHECK INSULATION RESISTANCE OF PTC HEATER	
Check insulation resistance of PTC heater. Refer to <u>HAC-188</u> , " <u>Component Inspection</u> " [Auto A/C (with pump)] or <u>HAC-356</u> , " <u>Component Inspection</u> " [Auto A/C (without heat pump)]. CAUTION: • Since testers are polarized, check the polarity of the tester and connect it in the forward direction	
the circuit.If the inspection results show no continuity, check the parts for proper installation.	

Is the inspection result normal?

YES >> Check intermittent incident. Refer to <u>GI-53. "Intermittent Incident"</u>.

< DTC/CIRCUIT DIAGNOSIS >

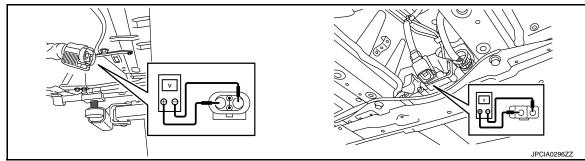
NO >> Replace PTC heater. Refer to HAC-208, "Removal and Installation" [Auto A/C (with heat pump)] or HAC-374, "Removal and Installation" [Auto A/C (without heat pump)].

8.PRECONDITIONING

WARNING:

Disconnect high voltage. Refer to <u>GI-33, "How to Disconnect High Voltage"</u>. Check voltage in high voltage circuit. (Check that condenser are discharged.)

- Lift up the vehicle and remove the Li-ion battery under covers. Refer to EVB-194, "Exploded View". 1.
- Disconnect high voltage harness connector and PTC heater harness connector from front side of Li-ion 2. battery. Refer to EVB-194, "Removal and Installation".
- Measure voltage between high voltage harness connector terminals and PTC heater harness connector 3. terminals.



DANGER:

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

: 5 V or less

CAUTION:

Standard

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

>> GO TO 9.

9.CHECK INSULATION RESISTANCE OF TRACTION MOTOR INVERTER

Check insulation resistance of traction motor inverter. Refer to TMS-105, "Component Inspection". CAUTION:

- Since testers are polarized, check the polarity of the tester and connect it in the forward direction to the circuit.
- If the inspection results show no continuity, check the parts for proper installation.

Is the inspection result normal?

YES >> Replace traction motor inverter. Refer to TMS-108, "Removal and Installation".

>> Replace traction motor. Refer to TMS-114, "Removal and Installation". NO

10.preconditioning

WARNING:

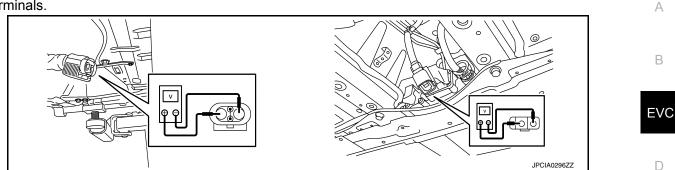
Disconnect high voltage. Refer to GI-33, "How to Disconnect High Voltage".

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

- Lift up the vehicle and remove the Li-ion battery under covers. Refer to EVB-194, "Exploded View". 1.
- 2. Disconnect high voltage harness connector and PTC heater harness connector from front side of Li-ion battery. Refer to EVB-194, "Removal and Installation".

< DTC/CIRCUIT DIAGNOSIS >

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



DANGER:

2 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 11.

11. CHECK INSULATION RESISTANCE OF PDM (POWER DELIVERY MODULE)

Check insulation resistance of PDM (Power Delivery Module). Refer to <u>VC-107, "Diagnosis Procedure"</u>.

- Since testers are polarized, check the polarity of the tester and connect it in the forward direction to the circuit.
- If the inspection results show no continuity, check the parts for proper installation.

Is the inspection result normal?

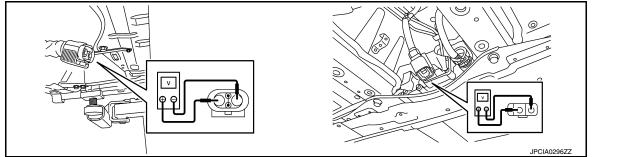
- YES >> Check intermittent incident. Refer to GI-53, "Intermittent Incident".
- NO >> Replace PDM (Power Delivery Module). Refer to <u>VC-119, "Removal and Installation"</u>.
- 12.PRECONDITIONING

WARNING:

Disconnect high voltage. Refer to GI-33, "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 <u>ÉVB-194, "Exploded View"</u>.
- Disconnect high voltage harness connector and PTC heater harness connector from front side of Li-ion battery. Refer to <u>EVB-194</u>, "<u>Removal and Installation</u>".
- 3. Measure voltage between high voltage harness connector terminals and PTC heater harness connector terminals.



DANGER:

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< DTC/CIRCUIT DIAGNOSIS >

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 13.

13. CHECK INSULATION RESISTANCE OF HIGH VOLTAGE HARNESS

WARNING:

Unlike the ordinary tester, the insulation resistance tester applies 500 V when measuring. If used incorrectly, there is the danger of electric shock. If used in the vehicle 12 V system, there is the danger of damage to electronic devices. Read the insulation resistance tester instruction manual carefully and be sure to work safely.

- 1. Disconnect Li-ion battery high voltage harness connector (H3).
- 2. Check the insulation resistance of high voltage harness with an insulation resistance tester (Multi tester), between Li-ion battery and PDM (Power Delivery Module).
 - CAUTION:
 - Use 500 V range of insulation resistance tester to measure insulation resistance.
 - Wait for 30 seconds until the value becomes stable.
 - If the inspection results show no continuity, check the parts for proper installation.

	+			
Li-ion	battery	—	Resistance	
Connector	Terminal			
H3	37	Ground	5.6 MΩ	
	38	Glound	5.6 10122	

Is the inspection result normal?

YES >> GO TO 19.

NO >> GO TO 14.

14. CHECK INSULATION RESISTANCE OF ELECTRIC COMPRESSOR

Check insulation resistance of electric compressor. Refer to <u>HAC-186, "Component Inspection"</u> [Auto A/C (with heat pump)] or <u>HAC-354, "Component Inspection"</u> [Auto A/C (without heat pump)]. CAUTION:

 Since testers are polarized, check the polarity of the tester and connect it in the forward direction to the circuit.

• If the inspection results show no continuity, check the parts for proper installation.

Is the inspection result normal?

YES >> GO TO 16. NO >> GO TO 15.

15.CHECK REFRIGERANT GAS

Interview the customer and check maintenance records to see if there is the possibility that coolant a gas other than EV specific refrigerant gas is mixed in A/C refrigerant gas. **NOTE:**

If A/C refrigerant gas other than EV specific refrigerant gas is used, insulation resistance may decrease. Is the inspection result normal?

< DTC/CIRCUIT DIAGNOSIS >	
 YES >> Replace electric compressor. Refer to <u>HA-37</u>, "<u>Removal and Installation</u>" (With heat pump system) or <u>HA-95</u>, "<u>Removal and Installation</u>" (Without heat pump system). NO >> Change refrigerant gas and compressor oil. 	А
16. CHECK INSULATION RESISTANCE OF PDM (POWER DELIVERY MODULE)	
 Remove high voltage harness, normal charge port, and quick charge port from PDM (Power Delivery Module). Refer to <u>VC-126</u>, "Disassembly and Assembly". 	В
 Check insulation resistance of PDM (Power Delivery Module). Refer to <u>VC-107, "Diagnosis Procedure"</u>. 	
CAUTION:	EVC
 Since testers are polarized, check the polarity of the tester and connect it in the forward direc- tion to the circuit. 	
 If the inspection results show no continuity, check the parts for proper installation. 	D
Is the inspection result normal?	D
YES >> GO TO 17.	
NO >> Replace PDM (Power Delivery Module). Refer to <u>VC-119, "Removal and Installation"</u> .	Е
17. CHECK INSULATION RESISTANCE OF TRACTION MOTOR	
Check insulation resistance of traction motor. Refer to TMS-103, "Component Inspection".	
CAUTION:	F
• Since testers are polarized, check the polarity of the tester and connect it in the forward direction to	
the circuit.If the inspection results show no continuity, check the parts for proper installation.	
Is the inspection result normal?	G
YES >> GO TO 18.	
NO >> Replace traction motor. Refer to <u>TMS-114, "Removal and Installation"</u> .	
18. CHECK INSULATION RESISTANCE OF TRACTION MOTOR INVERTER	Н
Check insulation resistance of traction motor inverter. Refer to <u>TMS-105</u> , "Component Inspection".	1
• Since testers are polarized, check the polarity of the tester and connect it in the forward direction to	
the circuit.	
 If the inspection results show no continuity, check the parts for proper installation. 	J
Is the inspection result normal?	
YES >> Replace high voltage harness between PDM (Power Delivery Module) and Li-ion battery. NO >> Replace traction motor inverter. Refer to <u>TMS-108, "Removal and Installation"</u> .	K
19. CHECK INSULATION RESISTANCE OF PTC HEATER	
Check insulation resistance of PTC heater. Refer to <u>HAC-188</u> . "Component Inspection" [Auto A/C (with heat pump)] or <u>HAC-356</u> , "Component Inspection" [Auto A/C (without heat pump)]. CAUTION:	L
• Since testers are polarized, check the polarity of the tester and connect it in the forward direction to	
the circuit.	M
 If the inspection results show no continuity, check the parts for proper installation. 	
Is the inspection result normal?	
YES >> GO TO 20.	Ν
NO >> Replace PTC heater. Refer to <u>HAC-208, "Removal and Installation"</u> [Auto A/C (with heat pump)] or <u>HAC-374, "Removal and Installation"</u> [Auto A/C (without heat pump)].	
20. CHECK INSULATION RESISTANCE OF LI-ION BATTERY	0
Check insulation resistance of Li-ion battery. Refer to <u>EVB-176, "Component Inspection"</u> .	
 Since testers are polarized, check the polarity of the tester and connect it in the forward direction to the circuit. 	Ρ
 If the inspection results show no continuity, check the parts for proper installation. 	
Is the inspection result normal?	
YES >> Check intermittent incident. Refer to <u>GI-53, "Intermittent Incident</u> ".	

NO >> Repair or replace error-detected parts.

< DTC/CIRCUIT DIAGNOSIS >

P1550, P1551, P1552 BATTERY CURRENT SENSOR

DTC Logic

INFOID:000000008747063

DTC DETECTION LOGIC

NOTE:

If DTC P1550 is displayed with DTC P31E5, first perform the trouble diagnosis for DTC P31E5. Refer to <u>EVC-354, "DTC Logic"</u>.

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	Possible cause	
P1550	BATTERY CURRENT SEN- SOR (Battery current sensor)	The output voltage of the battery current sensor remains within the specified range during READY or charging.	 Harness or connectors (Battery current sensor circuit is open or shorted.) Battery current sensor 	
P1551	BATTERY CURRENT SEN- SOR (Battery current sensor)	An excessively low voltage from the sensor is sent to VCM.		
P1552	BATTERY CURRENT SEN- SOR (Battery current sensor)	An excessively high voltage from the sensor is sent to VCM.		

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

• Turn power switch OFF and wait at least 20 seconds.

• Make sure that 12V battery voltage is 11 V or more.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE-1

1. Turn power switch ON and wait at least 10 seconds.

2. Check self-diagnostic result.

Is DTC detected?

YES >> Proceed to EVC-196, "Diagnosis Procedure".

NO >> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE-2

1. Turn power switch OFF and wait at least 20 seconds.

2. Maintain the following conditions for at least 60 seconds.

Power switch	READY
Selector lever	P range
Brake pedal	Fully released
Ambient air temperature	10°C (50°F) or more

3. Check self-diagnostic result.

Is DTC detected?

YES >> Proceed to EVC-196. "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

1.CHECK BATTERY CURRENT SENSOR POWER SUPPLY-1

- 1. Turn power switch OFF.
- 2. Disconnect battery current sensor harness connector.
- 3. Turn power switch ON.
- 4. Check the voltage between battery current sensor harness connector terminals.

EVC-196

INFOID:000000008747064

< DTC/CIRCUIT DIAGNOSIS >

Battery current sensor					
Connector E66		+	_	Voltage (Approx.)	
		Terminal			
		4	2	5 V	
Is the inspection result normal?					
YES >	> GO	TO 7.			
NO >	> GO	TO 2.			
2.CHECK	K BAT	TERY CURRE	NT SENSOR P	OWER SUPPL	

Check the voltage between battery current sensor harness connector and ground.

	+		Mallara	
Battery cur	rrent sensor	_	Voltage (Approx.)	
Connector	Terminal			
E66	4	Ground	5 V	

Is the inspection result normal?

YES >> GO TO 3. NO >> GO TO 5.

3.CHECK VCM GROUND CIRCUIT

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

	+		
V	VCM		Continuity
Connector	Terminal		
E61	58	- Ground	Existed
LOT	65		
E62	118		
LUZ	126		

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace error-detected parts.

4.CHECK BATTERY CURRENT SENSOR GROUND CIRCUIT

1. Check the continuity between battery current sensor harness connector and VCM harness connector.

+		-		
Battery cur	rrent sensor	VCM		Continuity
Connector	Terminal	Connector Terminal		
E66	2	E62	120	Existed

2. Also check harness for short to power.

Is the inspection result normal?

YES >> Check intermittent incident. Refer to <u>GI-53, "Intermittent Incident"</u>.

NO >> Repair or replace error-detected parts.

CHECK BATTERY CURRENT SENSOR POWER SUPPLY CIRCUIT

1. Turn power switch OFF.

2. Disconnect VCM harness connector.

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< DTC/CIRCUIT DIAGNOSIS >

3. Check the continuity between VCM harness connector and battery current sensor harness connector.

-		+		
Battery cur	rent sensor	VCM		Continuity
Connector	Terminal	Connector Terminal		
E66	4	E62	96	Existed

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

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace error-detected parts.

6.CHECK SENSOR POWER SUPPLY CIRCUIT

Check harness for short to power and short to ground, between the following terminals.

VCM		Sensor		
Connector	Terminal	Name	Connector	Terminal
E61	36	Accelerator pedal position sensor 1	E101	3
E62	97	Accelerator pedal position sensor 2	E101	2
⊑02	98	Refrigerant pressure sensor	E49	3

Is the inspection result normal?

YES >> Perform the trouble diagnosis for power supply circuit. Refer to <u>EVC-151</u>, <u>"VCM : Diagnosis Pro-</u> cedure".

NO >> Repair or replace error-detected parts.

7.CHECK BATTERY CURRENT SENSOR INPUT SIGNAL CIRCUIT

1. Turn power switch OFF.

- 2. Disconnect VCM harness connector.
- 3. Check the continuity between battery current sensor harness connector and VCM harness connector.

+		-		
Battery cur	rent sensor	VCM		Continuity
Connector	Terminal	Connector Terminal		
E66	1	E62	95	Existed

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

Is the inspection result normal?

YES >> GO TO 8.

NO >> Repair or replace error-detected parts

8.CHECK BATTERY CURRENT SENSOR

Check the battery current sensor. Refer to EVC-198, "Component Inspection".

Is the inspection result normal?

YES >> Check intermittent incident. Refer to <u>GI-53, "Intermittent Incident"</u>.

NO >> Replace battery current sensor. Refer to PG-69, "Removal and Installation".

Component Inspection

1. CHECK BATTERY CURRENT SENSOR

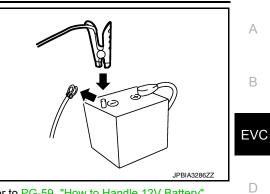
- 1. Turn power switch OFF.
- 2. Reconnect harness connectors disconnected.
- 3. Disconnect battery negative cable.

INFOID:000000008747065

< DTC/CIRCUIT DIAGNOSIS >

- Install jumper cable between battery negative terminal and body 4. ground. Turn power switch ON.
- 5.
- 6. Check the voltage between VCM harness connector terminals.

VCM			
Connector	+	-	Voltage (Approx.)
Connector	Terminal		
E62	95 (Battery current sensor signal)	120	2.5 V



Before measuring the terminal voltage, confirm that the battery is fully charged. Refer to PG-59. "How to Handle 12V Battery".

<u>Is the</u>	inspection	result r	<u>normal?</u>
	•		

YES	>> INSPECTION END
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< DTC/CIRCUIT DIAGNOSIS >

P1554 BATTERY CURRENT SENSOR

DTC Logic

INFOID:000000008747066

DTC DETECTION LOGIC

NOTE:

If DTC P1554 is displayed with DTC P31E5, first perform the trouble diagnosis for DTC P31E5. Refer to <u>EVC-354, "DTC Logic"</u>.

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	Possible cause
P1554	BATTERY CURRENT SEN-	The output voltage of the battery current	 Harness or connectors
	SOR	sensor is lower than the specified value	(Battery current sensor circuit is open
	(Battery current sensor)	while the battery voltage is high enough.	or shorted.) Battery current sensor

DTC CONFIRMATION PROCEDURE

1.PERFORM COMPONENT FUNCTION CHECK

Perform component function check. Refer to EVC-200, "Component Function Check".

NOTE:

Use component function check to check the overall function of the battery current sensor circuit. During this check, a DTC might not be confirmed.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Proceed to EVC-200, "Diagnosis Procedure".

Component Function Check

INFOID:000000008747067

1.PRECONDITIONING

TESTING CONDITION:

- Before performing the following procedure, confirm that battery voltage is more than 12.8 V while power switch ON.
- Before performing the following procedure, confirm that all load switches and A/C switch are turned OFF.

>> GO TO 2.

2.PERFORM COMPONENT FUNCTION CHECK

1. Turn power switch ON.

2. Check the voltage between VCM harness connector terminals.

Connector	r + -	Voltage	
Connector	Terminal	Terminal	
E62	95 (Battery current sensor signal)	120	Above 2.37 V at least once

Is the inspection result normal?

YES >> INSPECTION END

NO >> Proceed to EVC-200, "Diagnosis Procedure".

Diagnosis Procedure

1.CHECK BATTERY CURRENT SENSOR POWER SUPPLY-1

1. Turn power switch OFF.

- 2. Disconnect battery current sensor harness connector.
- 3. Turn power switch ON.

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EVC-200

INFOID:00000009345596

P1554 BATTERY CURRENT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

4. Check the voltage between battery current sensor harness connector terminals.

В			
Connector	+	_	Voltage (Approx.)
Connector	Terr	ninal	
E66	4	2	5 V

Is the inspection result normal?

YES >> GO TO 7. NO >> GO TO 2.

2. CHECK BATTERY CURRENT SENSOR POWER SUPPLY-2

Check the voltage between battery current sensor harness connector and ground.

+				
Battery current sensor		_	Voltage (Approx.)	
Connector	Terminal		(II)	
E66 4		Ground	5 V	

Is the inspection result normal?

YES >> GO TO 3.

NO >> GO TO 5.

3.CHECK VCM GROUND CIRCUIT

1. Turn power switch OFF.

2. Disconnect VCM harness connector.

3. Check the continuity between VCM harness connector and ground.

	+		
V	СМ		Continuity
Connector	Terminal	1	
E61	58		
LOT	65	Ground	Existed
E62	118		LAIsted
LUZ	126		

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace error-detected parts.

4.CHECK BATTERY CURRENT SENSOR GROUND CIRCUIT

1. Check the continuity between battery current sensor harness connector and VCM harness connector.

+			_	
Battery cur	rrent sensor	VCM		Continuity
Connector	Terminal	Connector	Terminal	
E66	2	E62	120	Existed

2. Also check harness for short to power.

Is the inspection result normal?

YES >> Check intermittent incident. Refer to GI-53, "Intermittent Incident".

NO >> Repair or replace error-detected parts.

5. CHECK BATTERY CURRENT SENSOR POWER SUPPLY CIRCUIT

1. Turn power switch OFF.

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P1554 BATTERY CURRENT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

2. Disconnect VCM harness connector.

3. Check the continuity between VCM harness connector and battery current sensor harness connector.

-		+		
Battery cur	rent sensor	VCM		Continuity
Connector	Terminal	Connector	Terminal	
E66	4	E62	96	Existed

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

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace error-detected parts.

6.CHECK SENSOR POWER SUPPLY CIRCUIT

Check harness for short to power and short to ground, between the following terminals.

VCM		Sensor		
Connector	Terminal	Name	Connector	Terminal
E61	36	Accelerator pedal position sensor 1	E101	3
E62	97	Accelerator pedal position sensor 2	E101	2
L02	98	Refrigerant pressure sensor	E49	3

Is the inspection result normal?

YES >> Perform the trouble diagnosis for power supply circuit. Refer to <u>EVC-151</u>, <u>"VCM : Diagnosis Pro-</u> cedure".

NO >> Repair or replace error-detected parts.

7. CHECK BATTERY CURRENT SENSOR INPUT SIGNAL CIRCUIT

1. Turn power switch OFF.

2. Disconnect VCM harness connector.

3. Check the continuity between battery current sensor harness connector and VCM harness connector.

+		_		
Battery cur	rent sensor	VCM		Continuity
Connector	Terminal	Connector	Terminal	
E66	1	E62	95	Existed

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

Is the inspection result normal?

YES >> GO TO 8.

NO >> Repair or replace error-detected parts

8.CHECK BATTERY CURRENT SENSOR

Check the battery current sensor. Refer to EVC-202, "Component Inspection".

Is the inspection result normal?

YES >> Check intermittent incident. Refer to GI-53, "Intermittent Incident".

NO >> Replace battery current sensor. Refer to PG-69, "Removal and Installation".

Component Inspection

1.CHECK BATTERY CURRENT SENSOR

- 1. Turn power switch OFF.
- 2. Reconnect harness connectors disconnected.
- 3. Disconnect battery negative cable.

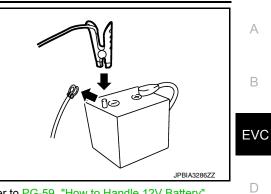
INFOID:000000009345597

P1554 BATTERY CURRENT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

- Install jumper cable between battery negative terminal and body 4. ground. Turn power switch ON.
- 5.
- 6. Check the voltage between VCM harness connector terminals.

Connector	+	-	Voltage (Approx.)
Connector	Terminal		(FF - 7
E62	95 (Battery current sensor signal)	120	2.5 V



Before measuring the terminal voltage, confirm that the battery is fully charged. Refer to PG-59, "How to Handle 12V Battery".

Is the inspection	result normal?

YES >> INSPECTION END

NO	>> Replace battery current sensor. Refer to <u>PG-69, "Removal and Installation"</u> .	
----	--	--

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P1556, P1557 BATTERY TEMPERATURE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

P1556, P1557 BATTERY TEMPERATURE SENSOR

DTC Logic

DTC DETECTION LOGIC

NOTE:

If DTC P1556 or P1557 is displayed with DTC P31E5, first perform the trouble diagnosis for DTC P31E5. Refer to <u>EVC-354, "DTC Logic"</u>.

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	Possible cause
P1556	BATTERY TEMPERATURE SENSOR (Battery temperature sensor)	Signal voltage from Battery temperature sensor remains 0.1 V or less for 5 seconds or more.	 Harness or connectors [Battery current sensor (Battery tem- perature sensor) circuit is shorted.]
P1557	BATTERY TEMPERATURE SENSOR (Battery temperature sensor)	Signal voltage from Battery temperature sensor remains 4.84 V or more for 5 seconds or more.	Battery current sensor (Battery tem-

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

• Turn power switch OFF and wait at least 20 seconds.

• Make sure that 12V battery voltage is 11 V or more.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT

1. Turn power switch ON at least 10 seconds.

2. Check self-diagnostic result.

Is DTC detected?

YES >> Proceed to EVC-204, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

1.CHECK BATTERY TEMPERATURE SENSOR POWER SUPPLY

- 1. Turn power switch OFF.
- 2. Disconnect battery current sensor harness connector.
- 3. Turn power switch ON.
- 4. Check the voltage between battery current sensor harness connector and ground.

+			
Battery current sensor		-	Voltage (Approx.)
Connector	Terminal		(-)
E66	3	Ground	5 V

Is the inspection result normal?

YES >> GO TO 3.

NO >> GO TO 2.

2. CHECK BATTERY TEMPERATURE SENSOR POWER SUPPLY CIRCUIT

1. Turn power switch OFF.

2. Disconnect VCM harness connector.

3. Check the continuity between battery current sensor harness connector and VCM harness connector.

EVC-204

INFOID:000000008747071

INFOID:000000008747070

P1556, P1557 BATTERY TEMPERATURE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

+	-	_			
Battery curr	rent sensor	VC	M	_ Continuity	
Connector	Terminal	Connector	Terminal		
E66	3	E62	107	Existed	
4. Also che	ck harness	for short to g	round and	short to power.	
s the inspec	<u>tion result n</u>	ormal?			
		trouble diag	nosis for po	ower supply circuit. Refer to <u>EVC-151, "VCM : Diagn</u>	<u>osis Pro</u>
	<u>cedure"</u> . Repair or rei	place error-d	etected par	rts	
~				R GROUND CIRCUIT	
	wer switch C				
		rness conne	ctor.		
3. Check th	ne continuity	between ba	ttery currer	nt sensor harness connector and VCM harness conne	ector.
+					
Battery curr		VC	- • \\	Continuity	
Connector	Terminal	Connector	Terminal		
E66	2	E62	120	Existed	
		for short to p	-		
Is the inspec		•	UWEI.		
	GO TO 4.	<u>ormar:</u>			
-		place error-d	etected par	rts.	
4.снеск в	ATTERY TE	EMPERATUR	RE SENSO	R	
Check the ba	attery tempe	rature senso	r. Refer to	EVC-205, "Component Inspection".	
Is the inspec	tion result n	ormal?			
YES >> (Check intern	nittent incide	nt. Refer to	GI-53, "Intermittent Incident".	
	-	-	sensor. Ref	er to <u>PG-69, "Removal and Installation"</u> .	
Compone	nt Inspect	tion		INFOID:00	00000000874707.
	ATTERY TE	EMPERATU	RE SENSO	B	
1. Turn pov	ect battery c	urrent senso	r namess o	connector.	
1. Turn pov 2. Disconne	ect battery c			connector. nt sensor connector terminals.	
 Turn pov Disconne Check the 	ect battery one resistance				
 Turn pov Disconno Check the Battery cur 	ect battery c	e between ba	attery curre	nt sensor connector terminals.	
 Turn pov Disconne Check the Battery cur + 	ect battery c ne resistance rrent sensor	e between ba			
1. Turn pov 2. Disconno 3. Check th Battery cur + Terr	ect battery c ne resistance rrent sensor 	e between ba	attery curre	nt sensor connector terminals.	
1. Turn pov 2. Disconno 3. Check th Battery cur + Terr 3	ect battery c ne resistance rrent sensor – minal 2	e between ba	attery curre	nt sensor connector terminals.	
1. Turn pov 2. Disconno 3. Check th Battery cur + Terr 3 Is the inspec	ect battery c ne resistance rrent sensor 	Temperature	attery curre	nt sensor connector terminals.	
1. Turn pov 2. Disconno 3. Check th Battery cur + Terr 3 Is the inspec YES >> I	ect battery c ne resistance rrent sensor 	Temperature	Condition : 25°C (77°F)	Resistance 1.9 – 2.1 kΩ	oval and
1. Turn pov 2. Disconno 3. Check th Battery cur + Terr 3 Is the inspec YES >> I NO >> F	ect battery c ne resistance rrent sensor 	Temperature	Condition : 25°C (77°F)	nt sensor connector terminals.	oval and

P155A BATTERY TEMPERATURE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

P155A BATTERY TEMPERATURE SENSOR

DTC Logic

INFOID:000000008747073

DTC DETECTION LOGIC

NOTE:

If DTC P155A is displayed with DTC P31E5, first perform the trouble diagnosis for DTC P31E5. Refer to <u>EVC-354, "DTC Logic"</u>.

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	Possible cause
P155A	BATTERY TEMPERATURE SENSOR (Battery temperature sensor)	A ambient temperature of 12V battery re- mains 50°C (122°F) or more for 10 sec- onds or more.	 Harness or connectors [Battery current sensor (Battery tem- perature sensor) circuit is shorted.] Battery current sensor (Battery tem- perature sensor)

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

• Turn power switch OFF and wait at least 20 seconds.

• Make sure that 12V battery voltage is 11 V or more.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT

T. Drive the vehicle under the following conditions.

Coolant temperature	Less than 20°C (68°F)
Vehicle speed	20 km/h (13 MPH) or more

2. Check self-diagnostic result.

Is DTC detected?

YES >> Proceed to EVC-206, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

1. CHECK BATTERY TEMPERATURE SENSOR POWER SUPPLY

- 1. Turn power switch OFF.
- 2. Disconnect battery current sensor harness connector.
- 3. Turn power switch ON.
- 4. Check the voltage between battery current sensor harness connector and ground.

	+		
Battery cur	rent sensor	_	Voltage (Approx.)
Connector	Terminal	*	V FF - 7
E66	3	Ground	5 V

Is the inspection result normal?

YES >> GO TO 3.

NO >> GO TO 2.

2.CHECK BATTERY TEMPERATURE SENSOR POWER SUPPLY CIRCUIT

1. Turn power switch OFF.

- 2. Disconnect VCM harness connector.
- 3. Check the continuity between battery current sensor harness connector and VCM harness connector.

Revision: October 2013

EVC-206

INFOID:000000009345599

P155A BATTERY TEMPERATURE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

Battery curr					
	ent sensor	VC	М	Continuity	
Connector	Terminal	Connector	Terminal		
E66	3	E62	107	Existed	
<u>he inspec</u> ES >> F	<u>tion result n</u> Perform the	ormal?		short to power	cuit. Refer to <u>EVC-151, "VCM : Diagnosis Pro-</u>
0 >> F		place error-de EMPERATUF	-	ts. R GROUND C	IRCUIT
Disconne		rness conneo		t sensor harne	ess connector and VCM harness connector.
+	.	_	-		
Battery curr	ent sensor	VC	M	Continuity	
Connector	Terminal	Connector	Terminal		
E66	2	E62	120	Existed	
CHECK B eck the ba	BATTERY TE attery tempe tion result n	ormal?	RE SENSOF r. Refer to <u>E</u>	7	nponent Inspection".
	Replace bat	tery current s	nt. Refer to ensor. Refe	<u>GI-53, "Interm</u> er to PG-69, "F	<u>nittent Incident"</u> . Removal and Installation".
0 >> F	Replace bat	tery current s	nt. Refer to sensor. Refe	<u>GI-53, "Interm</u> er to <u>PG-69, "F</u>	nittent Incident". Removal and Installation".
0 >> F mponer	Replace bat nt Inspect	tery current s tion	sensor. Refe	er to <u>PG-69, "F</u>	Removal and Installation".
O >> F PMPONER CHECK B	Replace bat nt Inspect	tery current s tion EMPERATUF	sensor. Refe	er to <u>PG-69, "F</u>	Removal and Installation".
O >> F omponer CHECK B Turn pow Disconne	Replace bat nt Inspect ATTERY TE ver switch C ect battery c	tery current s tion EMPERATUF DFF. current senso	sensor. Refe RE SENSOF or harness c	er to <u>PG-69, "F</u> R connector.	Removal and Installation".
D >> F mponer CHECK B Turn pow Disconne Check th	Replace bat nt Inspect ATTERY TE ver switch C ect battery c	tery current s tion EMPERATUF DFF. current senso	sensor. Refe RE SENSOF or harness c	er to <u>PG-69, "F</u> R connector.	Removal and Installation".
D >> F mponer CHECK B Turn pow Disconne Check th	Replace bat nt Inspect ATTERY TE ver switch C ect battery c ne resistance	tery current s tion EMPERATUF DFF. current senso e between ba	sensor. Refe RE SENSOF or harness c	er to <u>PG-69, "F</u> R connector.	Removal and Installation".
O >> F PMPONER CHECK B Turn pow Disconne Check th Battery cur +	Replace bat nt Inspect ATTERY TE ver switch C ect battery c ne resistance	tery current s tion EMPERATUF DFF. current senso e between ba	sensor. Refe RE SENSOF or harness c attery currer	er to <u>PG-69, "F</u> R connector.	Removal and Installation".
O >> F PMPONER CHECK B Turn pow Disconne Check th Battery cur +	Replace bat nt Inspect BATTERY TE ver switch C ect battery c ne resistance rent sensor	tery current s tion EMPERATUF DFF. current senso e between ba	sensor. Refe RE SENSOF or harness c attery currer	er to <u>PG-69, "F</u> R connector.	Removal and Installation".
O >> F mponer CHECK B Turn pow Disconne Check th Battery cur + Term 3 he inspect	Replace bat nt Inspect ATTERY TE ver switch C ect battery c ne resistance rent sensor 	tery current s tion EMPERATUF DFF. current senso e between ba 	RE SENSOF or harness c attery currer	er to <u>PG-69, "F</u> R connector.	Removal and Installation".

< DTC/CIRCUIT DIAGNOSIS >

P1564 ASCD STEERING SWITCH

DTC Logic

INFOID:000000008747076

DTC DETECTION LOGIC

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	Possible cause
P1564	ASCD SWITCH (ASCD switch)	 An excessively high voltage signal from the ASCD steering switch is sent to VCM. VCM detects that input signal from the ASCD steering switch is out of the specified range. VCM detects that the ASCD steering switch is stuck ON. 	 Harness or connectors (The switch circuit is open or shorted.) ASCD steering switch VCM

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

• Turn power switch OFF and wait at least 20 seconds.

• Make sure that 12V battery voltage is 11 V or more.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT

- Turn power switch ON and wait at least 10 seconds.
- 2. Press CANCEL switch for at least 10 seconds, then release it and wait at least 10 seconds.
- Press RESUME/ACCELERATE switch for at least 10 seconds, then release it and wait at least 10 seconds.
- 4. Press SET/COAST switch for at least 10 seconds, then release it and wait at least 10 seconds.
- 5. Press ECO mode switch for at least 10 seconds, then release it and wait at least 10 seconds.
- 6. Check self-diagnostic result.

Is DTC detected?

- YES >> Proceed to EVC-208, "Diagnosis Procedure".
- NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000008747077

1. CHECK ASCD STEERING SWITCH CIRCUIT

() With CONSULT

- Turn power switch ON.
- On the CONSULT screen, select "EV/HEV" >> "DATA MONITOR" >> "ASCD MAIN SW", "ASCD CANCEL SW", "RESUME/ACC SW", "ASCD SET SW", and "ECO MODE".
- 3. Check each item indication under the following conditions.

Monitor item	Condition	Indication	
ASCD MAIN SW	ASCD MAIN switch	Pressed	On
ASCD MAIN SW		Released	Off
ASCD CANCEL	CANCEL switch	Pressed	On
SW	CANCEL SWICH	Released	Off
RESUME/ACC SW	RESUME/ACCELERATE	Pressed	On
RESOME/ACC SW	switch	Released	Off
ASCD SET SW	SET/COAST switch	Pressed	On
AGOD GET SW		Released	Off

P1564 ASCD STEERING SWITCH

< DTC/CIRCUIT DIAGNOSIS >

Monitor item		Conditio	n	Indication			
ECO MODE		Operate the ECO mode SW to put into ECO mode.		On			
ECOMODE	Operate the ECO mode SW again to cancel ECO mode.		Off				
s the inspection	on result n	ormal?					
NO >> G(O TO 2.				mittent Incident".		
2.CHECK AS	CD STEE	RING SWITC	CH GROUND) CIRCUIT			
3. Disconnec	ct VCM hai ct spiral ca	rness conneo ble harness o	connector.	ness conne	ector and VCM har	ness connect	or.
+		-	-				
Spiral ca	able	VC	CM	Continuity			
Connector	Terminal	Connector	Terminal		_		
M112	32	E62	125	Existed			
NO >> Re		place error-d					
NO >> Re 3. CHECK AS	epair or rep CD STEE	RING SWITC	CH INPUT SI	GNAL CIRC	CUIT ector and VCM hai	ness connect	Dr.
NO >> Re 3.CHECK AS	epair or rep CD STEE	RING SWITC	CH INPUT SI iral cable har	GNAL CIRC		mess connect	Dr.
NO >> Re 3.CHECK AS 1. Check the	epair or rep CD STEE continuity	RING SWITC	CH INPUT SI	GNAL CIRC		mess connect	Dr.
NO >> Re 3.CHECK AS 1. Check the + Spiral ca Connector	epair or rep CD STEE continuity able Terminal	RING SWITC between spi 	CH INPUT SI iral cable har 	GNAL CIRC ness conne Continuity		ness connect	Dr.
NO >> Re 3.CHECK AS 1. Check the + Spiral ca Connector M112	able 25 25 25	RING SWITC between spi 	CH INPUT SI iral cable har 	GNAL CIRC ness conne Continuity Existed	ctor and VCM har	mess connect	Dr.
NO >> Re 3.CHECK AS 1. Check the + Spiral ca Connector M112 2. Also check	epair or rep CD STEE continuity able Terminal 25 k harness	RING SWITC between spin 	CH INPUT SI iral cable har 	GNAL CIRC ness conne Continuity Existed	ctor and VCM har	ness connect	or.
NO >> Re 3.CHECK AS 1. Check the + Spiral ca Connector M112 2. Also check Is the inspection YES >> GO	able Terminal 25 k harness On result n O TO 4.	RING SWITC between spin 	CH INPUT SI iral cable har CM Terminal 111 iround and sh	GNAL CIRC ness conne Continuity Existed nort to powe	ctor and VCM har	ness connect	Dr.
NO >> Re 3.CHECK AS 1. Check the + Spiral ca Connector M112 2. Also check Is the inspection YES >> GO	epair or rep CD STEE continuity able Terminal 25 k harness on result n O TO 4. epair or rep	RING SWITC between spire Connector E62 for short to g ormal? place error-de	CH INPUT SI iral cable har CM Terminal 111 iround and sh etected parts	GNAL CIRC ness conne Continuity Existed nort to powe	ctor and VCM har	ness connect	or.
NO >> Re 3.CHECK AS 1. Check the + Spiral ca Connector M112 2. Also check Is the inspection YES >> GO NO >> Re	epair or rep CD STEE continuity able Terminal 25 k harness on result n O TO 4. epair or rep SCD STEE	RING SWITC between spi vc Connector E62 for short to g ormal? place error-de	CH INPUT SI iral cable har 	GNAL CIRC ness conne Continuity Existed nort to powe	ector and VCM har	ness connect	Dr.
NO >> Re 3.CHECK AS 1. Check the + Spiral ca Connector M112 2. Also check Is the inspection YES >> GO NO >> Re 4.CHECK AS	able Terminal 25 k harness on result n O TO 4. epair or rej CD STEE 209, "Com	RING SWITC between spi vc Connector E62 for short to g ormal? place error-dr RING SWITC	CH INPUT SI iral cable har 	GNAL CIRC ness conne Continuity Existed nort to powe	ector and VCM har	mess connect	Dr.
NO $>>$ Re 3.CHECK AS 1. Check the + Spiral ca Connector M112 2. Also check Is the inspection YES $>>$ GC NO $>>$ Re 4.CHECK AS Refer to EVC-2 Is the inspection YES $>>$ Ch	epair or rep CD STEE continuity able Terminal 25 k harness on result n O TO 4. epair or rep CD STEE 209. "Com on result n neck intern	RING SWITC between spi vc Connector E62 for short to g ormal? place error-de RING SWITC ponent Inspe ormal? nittent incide	CH INPUT SI iral cable har 	GNAL CIRC ness conne Continuity Existed nort to powe	ector and VCM har	ness connect	Dr.
NO $>>$ Re 3.CHECK AS 1. Check the + Spiral ca Connector M112 2. Also check Is the inspection YES $>>$ GC NO $>>$ Re 4.CHECK AS Refer to EVC-2 Is the inspection YES $>>$ Ch	able Terminal 25 k harness on result n O TO 4. epair or rep 3CD STEE 209, "Com on result n heck interri eplace ASC	RING SWITC between spi vc Connector E62 for short to g ormal? place error-de RING SWITC ponent Inspe ormal? nittent incide CD steering s	CH INPUT SI iral cable har CM Terminal 111 round and sh etected parts CH ection (ASCD nt. Refer to Q switch. Refer	GNAL CIRC ness conne Continuity Existed nort to powe	ector and VCM har er. <u>G SWITCH)"</u> . <u>mittent Incident"</u> . <u>'Exploded View"</u> .	ness connect	Dr.
NO $>>$ Re 3.CHECK AS 1. Check the + Spiral ca Connector M112 2. Also check Is the inspection YES $>>$ GO NO $>>$ Re 4.CHECK AS Refer to EVC-2 Is the inspection YES $>>$ Check AS Refer to EVC-2 State inspection State inspectio	epair or rep CD STEE continuity able Terminal 25 k harness on result n O TO 4. epair or rep CD STEE 209. "Com on result n neck interrep act as a t Inspect	RING SWITC between spi vc Connector E62 for short to g ormal? place error-de RING SWITC ponent Inspe ormal? nittent incide CD steering s tion (ASCI	CH INPUT SI iral cable har CM Terminal 111 round and sh etected parts CH ection (ASCD nt. Refer to <u>C</u> switch. Refer D STEERI	GNAL CIRC ness conne Continuity Existed nort to powe	ector and VCM har er. <u>G SWITCH)"</u> . <u>mittent Incident"</u> . <u>'Exploded View"</u> .	ness connect	
NO $>>$ Re 3.CHECK AS 1. Check the + Spiral ca Connector M112 2. Also check Is the inspection YES $>>$ GO NO $>>$ Re 4.CHECK AS Refer to EVC-2 Is the inspection YES $>>$ Cr NO $>>$ Re Component	epair or rep CD STEE continuity able Terminal 25 k harness on result n O TO 4. epair or rep CD STEE 209. "Com on result n neck interreplace ASC t Inspect CD STEE CD STEE	RING SWITC between spi VC Connector E62 for short to g ormal? place error-de RING SWITC ponent Inspe ormal? nittent incide CD steering s tion (ASCI RING SWITC	CH INPUT SI iral cable har CM Terminal 111 round and sh etected parts CH ection (ASCD nt. Refer to <u>C</u> switch. Refer D STEERI	GNAL CIRC ness conne Continuity Existed nort to powe	ector and VCM har er. <u>G SWITCH)"</u> . <u>mittent Incident"</u> . <u>'Exploded View"</u> .	mess connect	

Check resistance between spiral cable harness connector terminals under the following conditions.

P1564 ASCD STEERING SWITCH

< DTC/CIRCUIT DIAGNOSIS >

Combinat	tion switch	Condition	Resistance (Ω)	
Connector	Terminals	Condition		
		ASCD main switch: Pressed	Approx. 0	
		CANCEL switch: Pressed	Approx. 309	
M112	25 and 32	SET/COAST switch: Pressed	Approx. 741	
IVI I I Z	25 anu 52	RESUME/ACCELERATE switch: Pressed	Approx. 1,406	
	ECO mode switch: Pressed		Approx. 2,586	
		All ASCD steering switches: Released	Approx. 5,456	

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace ASCD steering switch. Refer to <u>SR-20, "Exploded View"</u>.

< DTC/CIRCUIT DIAGNOSIS >

P1572 BRAKE PEDAL POSITION SWITCH

DTC Logic

INFOID:000000008747079

DTC DETECTION LOGIC

В

А

DTC	CONSULT screen terms (Trouble diagnosis content)		DTC detecting condition	Possible cause
		A	When the vehicle speed is above 30 km/h (19 MPH), ON signals from the stop lamp switch and the brake pedal position switch are sent to the VCM at the same time.	 Harness or connectors (The stop lamp switch circuit is shorted.) Harness or connectors
P1572	brake pedal position switch (ASCD brake switch)	В	brake pedal position switch signal is not sent to VCM for extremely long time while the ve-	 (The brake pedal position switch circuit is shorted.) Stop lamp switch brake pedal position switch Incorrect stop lamp switch installation
			hicle is being driven.	tionIncorrect brake pedal position switch installationVCM
	NFIRMATION PROCE	DUR	E	
.PREC	ONDITIONING			
	wer switch OFF and wait ure that 12V battery volta			
marce o	are that 127 battery volta	ge io		
	CD system>>GO TO 2.			
	ASCD system>>GO TO			
	ORM DTC CONFIRMATIO	ON F	ROCEDURE-1	
	ONSULT power switch ON (VDC s	witch	OFF).	
. On th	ne CONSULT screen, se		"EV/HEV" >> "DATA MONITOR" >> "	VEHICLE SPEED" and "GEAR
	ITION". s ASCD MAIN switch and	che	ck that CRUISE lamp illuminates.	
. Drive	the vehicle for at least 5		secutive seconds under the following co	onditions.
-	TION: ys drive vehicle at a sat	fe sp	eed.	
VEHICLE		D	e than 30 km/h (19 MPH)	
	k self-diagnostic result.	D		
. 01100	•			
SDTC de			<u>anosis Procedure"</u> .	
	> Proceed to <u>EVC-212,</u> >> GO TO 3.	Diag		
YES NO			PROCEDURE-2	

This procedure may be conducted with the drive wheels lifted in the shop or by driving the vehicle. If a road test is expected to be easier, it is unnecessary to lift the vehicle.

< DTC/CIRCUIT DIAGNOSIS >

VEHICLE SPEED	More than 30 km/h (19 MPH)
GEAR POSITION	D or R
Driving location	Depress the brake pedal for more than 5 seconds so as not to come off from the above-mentioned vehicle speed.

2. Check self-diagnostic result.

Is DTC detected?

YES >> Proceed to EVC-212, "Diagnosis Procedure".

NO >> GO TO 4.

4.PERFORM COMPONENT FUNCTION CHECK

Perform component function check. Refer to EVC-212, "Component Function Check".

Is the inspection result normal?

YES >> INSPECTION END

NO >> Proceed to EVC-212. "Diagnosis Procedure".

Component Function Check

INFOID:00000009325446

1.COMPONENT FUNCTION CHECK

With CONSULT

1. Turn power switch ON.

- On the CONSULT screen, select "EV/HEV" >> "DATA MONITOR" >> "ASCD BRAKE SW" and "STOP LAMP SW".
- 3. Check the indication under the following conditions.

Item	Condition		Indication
ASCD BRAKE SW		Slightly de- pressed	Off
300	Brake pedal	Fully released	On
STOP LAMP SW	Diake pedai	Slightly de- pressed	On
3**		Fully released	Off

Is the inspection result normal?

YES >> INSPECTION END

NO >> Proceed to EVC-212, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:000000008747080

1.CHECK OVERALL FUNCTION-1

With CONSULT

- 1. Turn power switch ON.
- 2. On the CONSULT screen, select "EV/HEV" >> "DATA MONITOR" >> "ASCD BRAKE SW".
- 3. Check "ASCD BRAKE SW" indication under the following conditions.

Monitor item	Condition		Indication
ASCD BRAKE	Brake pedal	Slightly de- pressed	Off
310		Fully released	On

Is the inspection result normal?

YES >> GO TO 7.

NO >> GO TO 2.

2. CHECK BRAKE PEDAL POSITION SWITCH

< DTC/CIRCUIT DIAGNOSIS >

del position ou	, - itab Dafar ta El	10 215 "Com	venent Inspection (Broke Dodel Desition Switch)"
•		<u>/C-215, Comp</u>	onent inspection (Brake Pedal Position Switch)
	<u>′</u>		1
	hal position swit	ch Refer to BR	-523 "Exploded View"
	•		
		FOWER 50	
	sition switch ha	rnoss connoct	
	Sillon Switch he		E
	n brake pedal p	osition switch h	arness connector and ground.
F			
osition switch	_	Voltage	
Terminal			
1	Ground	Battery voltage	
n result normal	?		
	-		I
KE PEDAL PO	SITION SWITC	H POWER SU	PPLY CIRCUIT
			(
the fuse is not			
continuity betwo	een brake peda	position switch	harness connector and fuse terminal.
F			
osition switch	_	Continuity	
Terminal			
1	#3 fuse terminal	Existed	
harness for sh	ort to ground.		
n result normal	?		
form trouble di	agnosis for pow	er ON power s	upply circuit.
KE PEDAL PO	SITION SWITC	H SIGNAL	
switch OFF			
	ition switch. Re	fer to <u>BR-514, '</u>	Inspection and Adjustment".
		rness connecto	pr.
	connector.		
Switch On.			
l is fully release	ed.		1
voltage betwee	n VCM harness	connector and	ground.
F			(
	-	Voltage	
CM			
CM Terminal			г
	Ground	Battery voltage	
Terminal 113		Battery voltage	
Terminal 113 n result normal	?		
Terminal 113 n result normal	?		mittent Incident".
	n result normal) TO 3. place brake peod AKE PEDAL PC r switch OFF. t brake pedal por r switch ON. voltage between + bosition switch Terminal 1 n result normal 0 TO 5. 0 TO 4. AKE PEDAL PC r switch OFF. fuse. the fuse is not continuity between + bosition switch Terminal 1 harness for she n result normal form trouble dia pair or replace of AKE PEDAL PC r switch OFF. prake pedal pos brake pedal pos	n result normal?) TO 3. place brake pedal position switch AKE PEDAL POSITION SWITC r switch OFF. t brake pedal position switch har r switch ON. voltage between brake pedal position switch ON. voltage between brake pedal position switch of a <u>rerminal</u> 1 Ground <u>n result normal?</u>) TO 5.) TO 4. AKE PEDAL POSITION SWITC r switch OFF. fuse. the fuse is not fusing. continuity between brake pedal <u>t</u> <u>t</u> <u>t</u> <u>sosition switch</u> <u>t</u> <u>t</u> <u>t</u> <u>t</u> <u>t</u> <u>t</u> <u>t</u> <u>t</u>	a) TO 3. place brake pedal position switch. Refer to BR a) AKE PEDAL POSITION SWITCH POWER SU r switch OFF. t brake pedal position switch harness connector r switch ON. voltage between brake pedal position switch harness connector *

1. Turn power switch OFF.

< DTC/CIRCUIT DIAGNOSIS >

- 2. Disconnect brake pedal position switch harness connector.
- Check the continuity between brake pedal position switch harness connector and VCM harness connector.

+				
Brake pedal position switch		VCM		Continuity
Connector	Terminal	Connector	Terminal	
E112	2	E62	113	Existed

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

Is the inspection result normal?

YES >> Check intermittent incident. Refer to GI-53, "Intermittent Incident".

NO >> Repair or replace error-detected parts.

I.CHECK OVERALL FUNCTION-2

(I) With CONSULT

Select "STOP LAMP SW" and check indication under the following conditions.

Monitor item	Con	Indication	
STOP LAMP	Brake pedal	Slightly de- pressed	On
011		Fully released	Off

Is the inspection result normal?

YES >> Check intermittent incident. Refer to <u>GI-53, "Intermittent Incident"</u>.

NO >> GO TO 8.

8.CHECK STOP LAMP SWITCH

Refer to EVC-216, "Component Inspection (Stop Lamp Switch)"

Is the inspection result normal?

YES >> GO TO 9.

NO >> Replace stop lamp switch. Refer to <u>BR-523</u>, "Exploded View".

9.CHECK STOP LAMP SWITCH POWER SUPPLY

- 1. Turn power switch OFF.
- 2. Disconnect stop lamp switch harness connector.
- 3. Check the voltage between stop lamp switch harness connector and ground.

	+		
Stop lan	np switch	—	Voltage
Connector	Connector Terminal		
E102	E102 3		Battery voltage

Is the inspection result normal?

YES >> GO TO 11.

10.CHECK STOP LAMP SWITCH POWER SUPPLY CIRCUIT

1. Pull out #77 fuse.

2. Check that the fuse is not fusing.

3. Check the continuity between stop lamp switch harness connector and fuse terminal.

< DTC/CIRCUIT DIAGNOSIS >

	+				
Stop lamp switch			– Continuity		
Connector	Termi	nal			
E102	3	#77 fi	use termi- nal	Existed	
. Also che	ck harness	for short to g			
	tion result n	-			
YES >> I	Perform trou	uble diagnosi	s for 12V	battery power	supply circuit.
	•	place error-d	•	parts.	
11.CHECK	STOP LAN	IP SWITCH	SIGNAL		
. Turn pov	ver switch C)FF.			
					and Adjustment".
		p switch harr rness conne		nector.	
	the brake p		0.01.		
			l harness	connector and	ground.
	+				
	VCM		_	Voltage	
Connector	Termi	nal			
E62	101	1 G	round	Pottonuvoltaga	
E0Z	10		lound	Battery voltage	
s the inspec	tion result n	ormal?			nittent Incident".
s the inspec YES >> (NO >> (2.CHECK . Disconne	tion result n Check interr GO TO 12. STOP LAN ect stop larr	ormal? mittent incide /IP SWITCH np switch har	nt. Refer INPUT S ness con	to <u>GI-53, "Inter</u> IGNAL CIRCUI nector.	
s the inspec YES >> (NO >> (12. CHECK . Disconne	tion result n Check interr GO TO 12. STOP LAN ect stop larr	ormal? mittent incide /IP SWITCH np switch har	nt. Refer INPUT S ness con	to <u>GI-53, "Inter</u> IGNAL CIRCUI nector.	
s the inspec YES >> (NO >> (12.CHECK . Disconne	tion result n Check interr GO TO 12. STOP LAN ect stop lam ne continuity	ormal? mittent incide /IP SWITCH np switch har	nt. Refer INPUT S ness con	to <u>GI-53, "Inter</u> IGNAL CIRCUI nector.	Г
s the inspec YES >> (NO >> (2.CHECK . Disconne . Check th	tion result n Check interr GO TO 12. STOP LAN ect stop lam e continuity	ormal? mittent incide /P SWITCH p switch han / between sto	nt. Refer INPUT S ness con	to <u>GI-53, "Inter</u> IGNAL CIRCUI nector.	Г
s the inspec YES >> (NO >> (2.CHECK . Disconne . Check th	tion result n Check interr GO TO 12. STOP LAN ect stop lam e continuity	ormal? mittent incide /P SWITCH p switch han / between sto	nt. Refer INPUT S ness con op lamp s	to <u>GI-53, "Inter</u> IGNAL CIRCUI nector. witch harness o	Г
s the inspec YES >> (NO >> (2.CHECK . Disconne . Check th . Stop lam	tion result n Check interr GO TO 12. STOP LAN ect stop lam he continuity	iormal? mittent incide /IP SWITCH ip switch har / between sto	INPUT S ness con op lamp s	to <u>GI-53, "Inter</u> IGNAL CIRCUI nector. witch harness o	Г
s the inspec YES >> (NO >> (2.CHECK . Disconne . Check th Stop lam Connector E102	tion result n Check interr GO TO 12. STOP LAN ect stop lam he continuity p switch Terminal 4	iormal? mittent incide /IP SWITCH ip switch har / between sto Connector E62	ent. Refer INPUT S ness con op lamp s 	to <u>GI-53, "Inter</u> IGNAL CIRCUI nector. witch harness of Continuity	r connector and VCM harness connector.
s the inspec YES >> (NO >> (2.CHECK . Disconne . Check th Stop lam Connector E102 . Also che	tion result n Check interr GO TO 12. STOP LAN ect stop lam te continuity p switch Terminal 4 cck harness	iormal? mittent incide MP SWITCH p switch har between sto vo Connector E62 for short to g	ent. Refer INPUT S ness con op lamp s 	to <u>GI-53, "Inter</u> IGNAL CIRCUI nector. witch harness of Continuity	r connector and VCM harness connector.
s the inspec YES >> (NO >> (I2.CHECK . Disconne . Check the . Stop lam Connector E102 . Also che s the inspec YES >> (tion result n Check interr GO TO 12. STOP LAN ect stop lam he continuity p switch Terminal 4 cck harness tion result n Check interr	iormal? mittent incide MP SWITCH p switch har between sto Connector E62 for short to g ormal? mittent incide	ent. Refer INPUT S ness con op lamp s 	to <u>GI-53</u> , "Inter IGNAL CIRCUI nector. witch harness of Continuity Continuity Existed d short to powe to <u>GI-53, "Inter</u>	r connector and VCM harness connector.
s the inspec YES >> (NO >> (I2.CHECK . Disconne . Check the . Stop lam Connector E102 . Also che s the inspec YES >> (tion result n Check interr GO TO 12. STOP LAN ect stop lam he continuity p switch Terminal 4 cck harness tion result n Check interr	ormal? mittent incide /IP SWITCH p switch hard between stor connector E62 for short to g oormal?	ent. Refer INPUT S ness con op lamp s 	to <u>GI-53</u> , "Inter IGNAL CIRCUI nector. witch harness of Continuity Continuity Existed d short to powe to <u>GI-53, "Inter</u>	r.
s the inspec YES >> 0 NO >> 0 2.CHECK Disconne Check th Stop lam Connector E102 S. Also che s the inspec YES >> 0 NO >> 1	tion result n Check interr GO TO 12. STOP LAN ect stop lam e continuity p switch Terminal 4 eck harness tion result n Check interr Repair or re	iormal? mittent incide MP SWITCH p switch hard between stor void Connector E62 for short to g iormal? mittent incide place error-d	ent. Refer INPUT S ness con op lamp s 	to <u>GI-53</u> , "Inter IGNAL CIRCUI nector. witch harness of Continuity Continuity Existed d short to powe to <u>GI-53, "Inter</u>	r.
s the inspec YES >> (NO >> (12.CHECK Disconne Check the Stop lam Connector E102 Connector E102 Connector E102 Connector E102 Connector YES >> (NO >> F Componel	tion result n Check interr GO TO 12. STOP LAN ect stop lar he continuity p switch Terminal 4 cck harness tion result n Check interr Repair or re nt Inspec	iormal? mittent incide MP SWITCH p switch hard between stor void Connector E62 for short to g iormal? mittent incide place error-d	ent. Refer INPUT S ness con op lamp s 	to <u>GI-53</u> , "Inter IGNAL CIRCUI nector. witch harness of Continuity Continuity Existed d short to powe to <u>GI-53, "Inter</u> parts.	r.
s the inspec YES >> (NO >> (12.CHECK Disconne Check the Stop lam Connector E102 B. Also che s the inspec YES >> (NO >> F Compone 1.CHECK B	tion result n Check interr GO TO 12. STOP LAN ect stop lar he continuity p switch Terminal 4 ck harness tion result n Check interr Repair or re nt Inspec	iormal? mittent incide MP SWITCH p switch harr between sto Connector E62 for short to g iormal? mittent incide place error-d tion (Brake	ent. Refer INPUT S ness con op lamp s 	to <u>GI-53</u> , "Inter IGNAL CIRCUI nector. witch harness of Continuity Continuity Existed d short to powe to <u>GI-53, "Inter</u> parts.	r.
s the inspec YES >> (NO >> (2.CHECK Disconne Check th Stop lam Connector E102 S. Also che s the inspec YES >> (NO >> F Componel .CHECK B Disconne	tion result n Check interr GO TO 12. STOP LAN ect stop lar he continuity p switch Terminal 4 eck harness tion result n Check interr Repair or re nt Inspec BRAKE PED ver switch C ect brake pe	iormal? mittent incide MP SWITCH p switch har between sto vo Connector E62 for short to g ormal? mittent incide place error-d tion (Brake DAL POSITIO DFF. edal position	ent. Refer INPUT S ness con op lamp s 	to <u>GI-53</u> , "Inter IGNAL CIRCUI nector. witch harness of Continuity Continuity Existed d short to powe to <u>GI-53</u> , "Inter parts. I Position SV CH-1	r. mittent Incident". vitch)
s the inspec YES >> (NO >> (2.CHECK Disconne Check th Stop lam Connector E102 S. Also che s the inspec YES >> (NO >> F Componel .CHECK B Disconne	tion result n Check interr GO TO 12. STOP LAN ect stop lar he continuity p switch Terminal 4 eck harness tion result n Check interr Repair or re nt Inspec BRAKE PED ver switch C ect brake pe	iormal? mittent incide MP SWITCH p switch har between sto vo Connector E62 for short to g ormal? mittent incide place error-d tion (Brake DAL POSITIO DFF. edal position	ent. Refer INPUT S ness con op lamp s 	to <u>GI-53</u> , "Inter IGNAL CIRCUI nector. witch harness of Continuity Continuity Existed d short to powe to <u>GI-53</u> , "Inter parts. I Position SV CH-1	r. witch)

Is the inspection result normal?

Brake pedal

Slightly de-

pressed

1 and 2

Not existed

< DTC/CIRCUIT DIAGNOSIS >

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

NO >> GO TO 2.

2.CHECK BRAKE PEDAL POSITION SWITCH-2

- 1. Adjust brake pedal position switch installation. Refer to BR-524, "Inspection and Adjustment".
- 2. Check the continuity between brake pedal position switch terminals under the following conditions.

Terminals	Condition		Continuity
		Fully released	Existed
1 and 2	Brake pedal	Slightly de- pressed	Not existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace brake pedal position switch. Refer to <u>BR-523</u>, "Exploded View".

Component Inspection (Stop Lamp Switch)

INFOID:000000008747082

1.CHECK STOP LAMP SWITCH-1 1. Turn power switch OFF.

- Disconnect stop lamp switch harness connector.
- 3. Check the continuity between stop lamp switch terminals under the following conditions.

Terminals	Condition		Continuity
3 and 4	Brake nedal	Fully released	Not existed
	Brake pedal	Slightly depressed	Existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 2.

2.CHECK STOP LAMP SWITCH-2

1. Adjust stop lamp switch installation. Refer to <u>BR-524, "Inspection and Adjustment"</u>.

2. Check the continuity between stop lamp switch terminals under the following conditions.

Terminals	Condition		Continuity
3 and 4	Brake pedal	Fully released	Not existed
	Блаке рецаг	Slightly depressed	Existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace stop lamp switch. Refer to <u>BR-523</u>, "Exploded View".

P1574 ASCD VEHICLE SPEED SENSOR

Description

The VCM receives two vehicle speed sensor signals via CAN communication. One is sent from the electrically-driven intelligent brake unit, and the other is from the traction motor inverter (motor speed signal). The VCM uses these signals for ASCD control. Refer to EVC-65, "AUTOMATIC SPEED CONTROL DEVICE (ASCD) : System Description" for ASCD functions. EVC

DTC Logic

INFOID:000000008747084

INFOID:000000008747083

DTC DETECTION LOGIC

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	Possible cause
P1574	ASCD VEHICLE SPEED SENSOR (ASCD vehicle speed sen- sor)	The difference between the two vehicle speed signals is out of the specified range.	 Electrically-driven intelligent brake unit Traction motor VCM
DTC CO	NFIRMATION PROCE	DURE	
1.PREC	ONDITIONING		
	wer switch OFF and wait ure that 12V battery volta		
>	>> GO TO 2.		
2.PERFO	ORM DTC CONFIRMATIO	ON PROCEDURE	
 Push Drive CAU Alway 	the vehicle to READY. the VDC OFF switch to s the vehicle at more than	40 km/h (25 MPH).	
Is DTC de	•		
	Proceed to <u>EVC-217, '</u> INSPECTION END	<u>'Diagnosis Procedure"</u> .	
Diagnos	sis Procedure		INFOID:00000008747085
1 .CHEC	K DTC IN TRACTION MO	DTOR INVERTER	
	C in traction motor invert	er.	
	Dection result normal? > GO TO 2.		
-		to TMS-28, "DTC Index".	
2.CHECI	K DTC IN ELECTRICALL	Y-DRIVEN INTELLIGENT BRAKE UNIT	
Check DT	C in electrically-driven in	telligent brake unit.	
	pection result normal?		
	>> GO TO 3. >> Check the DTC. Refer	to BR-44 "DTC Index"	
	K INTERMITTENT INCID		
		o <u>GI-53, "Intermittent Incident"</u> .	
	pection result normal?		
YES >	>> Replace VCM. Refer to	o EVC-426, "Removal and Installation".	

>> Replace VCM. Refer to EVC-426, "Removal and Installation". YES

А

В

D

P1574 ASCD VEHICLE SPEED SENSOR

< DTC/CIRCUIT DIAGNOSIS >

NO >> Repair or replace error-detected parts.

P1805 BRAKE SWITCH

DTC Logic

INFOID:000000008747086

В

А

DTC DETECTION LOGIC

DTC		SULT screen terms e diagnosis content	DTC detecting condition		Possible	cause	
P1805	BRAKE (Brake	E SWITCH switch)	Stop lamp signal is not sent to VCM for ex- tremely long time while the vehicle is driving.(Stop lamp signal is shorted.)			 Harness or connect (Stop lamp switch or shorted.) Stop lamp switch 	
		TION PROCE					
	ORM DT	C CONFIRMAT	ON PROCEDU	RE			
IOTE: Since this	DTC is	difficult to be co	nfirmed, check o	component	function to jud	dge the normality.	
>	> Proce	ed to <u>EVC-219,</u>	"Component Fu	Inction Che	<u>eck"</u> .		
Compor	nent Fu	unction Cheo	k				INFOID:000000008747087
.CHECK	K BRAKI	E SWITCH FUN	CTION				
) With C							
. On the	e CONS	ULT screen, sel	ect "EV/HEV" >: ication under the			STOP LAMP SW".	
. Checr	V STOP	LAWF SVV IIIU		lonowing	contaitions.		
Monitor	item	Con	dition	Indication			
STOP LAI	MP SW	Brake pedal	Slightly depressed	ON			
			Fully released	OFF			
•		esult normal?					
		ECTION END ed to <u>EVC-219,</u>	"Diagnosis Prod	<u>cedure"</u> .			
Diagnos	is Pro	cedure					INFOID:000000008747088
		LAMP SWITCH					
		vitch OFF.	OFLICATION				
			pressing and re	leasing the	brake pedal.		
	Brake pe	dal	Stop lam	0	-		
I	Fully relea		OFF		_		
Sli	ghtly depr	essed	ON		_		
		esult normal?					
	> GO T(> GO T(
		LAMP SWITCH					
NO >	(STOP					1	
NO >		witch. Refer to	<u>EVC-220, "Com</u>	ponent Ins	pection (Stop	Lamp Switch)".	
NO > CHECK Check stop the insp	p lamp s	esult normal?	EVC-220, "Com	ponent Ins	pection (Stop	Lamp Switch)".	

EVC-219

P1805 BRAKE SWITCH

< DTC/CIRCUIT DIAGNOSIS >

$\overline{\mathbf{3}}$.check stop lamp switch power supply

1. Disconnect stop lamp switch harness connector.

2. Check the voltage between stop lamp switch harness connector and ground.

+	-			
Stop lam	p switch	_	Voltage	
Connector	Terminal			
E102	3	Ground	Battery voltage	

3. Also check harness for short to ground.

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 4.

4.CHECK STOP LAMP SWITCH POWER SUPPLY CIRCUIT

1. Pull out #77 fuse.

2. Check that the fuse is not fusing.

3. Check the continuity between stop lamp switch harness connector and fuse terminal.

+	-		
Stop lam	p switch	_	Continuity
Connector	Connector Terminal		
E102	3	#77 fuse terminal	Existed

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

Is the inspection result normal?

YES >> Perform trouble diagnosis for 12V battery power supply circuit.

NO >> Repair or replace error-detected parts.

5.CHECK STOP LAMP SWITCH INPUT SIGNAL CIRCUIT

- 1. Disconnect stop lamp switch harness connector.
- 2. Disconnect VCM harness connector.
- 3. Check the continuity between stop lamp switch harness connector and VCM harness connector.

+				
Stop lan	np switch	V	СМ	Continuity
Connector	Terminal	Connector	Terminal	
E102	4	E62	101	Existed

4. Also check harness for short to ground.

Is the inspection result normal?

YES >> Check intermittent incident. Refer to GI-53. "Intermittent Incident".

NO >> Repair or replace error-detected parts.

Component Inspection (Stop Lamp Switch)

1.CHECK STOP LAMP SWITCH-1

1. Turn power switch OFF.

2. Disconnect stop lamp switch harness connector.

3. Check the continuity between stop lamp switch terminals under the following conditions.

INFOID:000000009345601

P1805 BRAKE SWITCH

< DTC/CIRCUIT DIAGNOSIS >

3 and 4 Brake pedal Utiliv released Existed 1:Be inspection result normal? Existed Existed YES >> NSPECTON END NO >> GOTO2. CHECK STOP LAMP SWITCH-2 Check the continuity between stop lamp switch installation. Refer to BR-524 . "Inspection and Adjustment". Check the continuity between stop lamp switch terminals under the following conditions. Terminals Condition Continuity 3 and 4 brake pedal Fully released Not existed 3 and 4 brake pedal Signity depressed Existed 3 make pedal Signity depressed Existed Signity depressed NO > Replace stop lamp switch. Refer to BR-523 . "Exploded View".						
3 and 4 Brake pedal Fully released Existed 1:the inspection result normal? YES >> NNSPECTION END NO >> GO TO 2. CHECK STOP LAMP SWITCH-2 4 Adjust stop lamp switch installation. Refer to BR-524, "Inspection and Adjustment". Check the continuity between stop lamp switch terminals under the following conditions. Terminals Condition 3 and 4 Brake pedal Sighty depressed Existed 3 and 4 Brake pedal Sighty depressed Existed 1: the inspection result normal? YES >> INSPECTION END NO >> Replace stop lamp switch. Refer to BR-523. "Exploded View".	Terminals	C	Condition	Continuity		A
intermination Slightly depressed Existed intermination Existed NO >> GO TO 2. intermination Condition Refer to BR-524. "Inspection and Adjustment". Check the continuity between stop lamp switch terminals under the following conditions. Termination Condition intermination Sightly depressed isolation Existed ittermination Sightly depressed isolation Regression ittermination Sightly depression isolation Regression isolation Regresion <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>						
Ithe inspection result normal? YES ⇒ INSPECTION END ON ⇒ GOTO2. CHECK STOP LAMP SWITCH-2 Adjust stop lamp switch installation. Refer to <u>BR-524. "Inspection and Adjustment"</u> Check the continuity between stop lamp switch terminals under the following conditions. Terminals <u>Condition</u> <u>Continuity</u> 3 and 4 <u>Brake pead</u> <u>Fully released Not existed</u> Sightly depressed <u>Existed</u> Interminals <u>Condition</u> Sightly depressed <u>Existed</u> No ⇒ Replace stop lamp switch. Refer to <u>BR-523. "Exploded View"</u> .	3 and 4	Brake pedal	Slightly depressed	Existed		В
NO >> GO TO2. CHECK STOP LAMP SWITCH-2 Adjust stop lamp switch installation. Refer to <u>BR-524. "Inspection and Adjustment"</u> . Check the continuity between stop lamp switch terminals under the following conditions. Terminals Condition 3 and 4 Condition Signty depressed Existed Signty depressed Existed Signty depressed Existed NO >> INSPECTION END NO >> Replace stop lamp switch. Refer to <u>BR-523. "Exploded View</u> ".	Is the insp	ection result	t normal?			D
Adjust stop lamp switch installation. Refer to <u>BR-524, "Inspection and Adjustment"</u> Check the continuity between stop lamp switch terminals under the following conditions. <u>Terminals Condition Continuity</u> 3 and 4 Brake pedal Fully released Not existed <u>Slightly depressed Existed</u> <u>Slightly depressed E</u>						
Adjust stop lamp switch installation. Refer to <u>BR-524, "Inspection and Adjustment"</u> . Check the continuity between stop lamp switch terminals under the following conditions. Terminals <u>Condition</u> <u>Continuity</u> 3 and 4 <u>Brake peal</u> <u>Fully released Not existed</u> Sightly depressed <u>Existed</u> The inspection result normal? YES >> INSPECTION END NO >> Replace stop lamp switch. Refer to <u>BR-523</u> , "Exploded View".	-					EV
Check the continuity between stop lamp switch terminals under the following conditions. Terminals Condition Continuity 3 and 4 Brake pedal Fully released Not existed 3 and 4 Brake pedal Fully released Not existed 3 and 4 Brake pedal Fully released Not existed 3 and 4 Brake pedal Fully released Existed 3 the inspection result normal? Existed Software YES > INSPECTION END NO >> Replace stop lamp switch. Refer to BR-523. "Exploded View". NO >> Replace stop lamp switch. Refer to BR-523. "Exploded View".				Defer to PD /	24 "Increation and Adjustment"	
Terminals Condition Continuity 3 and 4 Brake peda Fully released Not existed sightly depressed Existed Existed stete inspection result normal? YS NSPECTION END NO >> Replace stop lamp switch. Refer to BR-523. "Exploded View".	 Adjust Check 	the continu	ity between stop	lamp switch te	rminals under the following conditions.	D
3 and 4 Brake pedat Fully released Existed athe inspection result normal? YES >> INSPECTION END NO >> Replace stop lamp switch. Refer to BR-523. "Exploded View".			,		U U	
3 and 4 Brake pedal Fully released Not existed 1:the inspection result normal? YES >> INSPECTION END NO >> Replace stop lamp switch. Refer to BR-523. "Exploded View".	Terminals	C	Condition	Continuity		-
Slightly depressed Existed the inspection result normal? YES > INSPECTION END NO > Replace stop lamp switch. Refer to <u>BR-523. "Exploded View"</u> .	2 and 4	Droko nodol	Fully released	Not existed		E
YES >> INSPECTION END NO >> Replace stop lamp switch. Refer to <u>BR-523. "Exploded View"</u> .	3 and 4	втаке ресаг	Slightly depressed	Existed		
NO >> Replace stop lamp switch. Refer to <u>BR-523. "Exploded View"</u> .	s the insp	ection resul	t normal?			F
	NO >	> Replace s	top lamp switch.	Refer to <u>BR-52</u>	3. "Exploded View".	
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P2122, P2123 APP SENSOR

DTC Logic

INFOID:000000008747090

DTC DETECTION LOGIC

NOTE:

If DTC P2122 or P2123 is displayed with DTC P31E5, first perform the trouble diagnosis for DTC P31E5. Refer to <u>EVC-354, "DTC Logic"</u>.

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	Possible cause
P2122	APP SENSOR D (Throttle/Pedal position sensor/switch "D" circuit low)	An excessively low voltage from the accelerator pedal position sensor 1 is sent to VCM.	 Harness or connectors (APP sensor 1 circuit is open or shorted.)
P2123	APP SENSOR D (Throttle/Pedal position sensor/switch "D" circuit high)	An excessively high voltage from the accelerator pedal position sensor 1 is sent to VCM.	Accelerator pedal position sensor 1

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

• Turn power switch OFF and wait at least 20 seconds.

• Make sure that 12V battery voltage is 11 V or more.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT

- 1. Turn power switch ON and wait at least 1 second.
- 2. Check self-diagnostic result.

Is DTC detected?

YES >> Proceed to EVC-222, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

1.CHECK APP SENSOR 1 POWER SUPPLY-1

- 1. Turn power switch OFF.
- 2. Disconnect accelerator pedal position (APP) sensor harness connector.
- 3. Turn power switch ON.
- 4. Check the voltage between APP sensor harness connector terminals.

	APP sensor					
Connector	+	-	Voltage (Approx.)			
Connector	Terr	, , , , , , , , , , , , , , , , , , ,				
E101	3	5	5 V			

Is the inspection result normal?

YES >> GO TO 6.

NO >> GO TO 2.

2.CHECK APP SENSOR 1 POWER SUPPLY-2

Check the voltage between APP sensor harness connector and ground.

INFOID:000000008747091

P2122, P2123 APP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

	+					
A	PP sensor		-	Voltage (Approx.)		
Connector	r Termi	nal			_	
E101	3	G	Ground	5 V	_	
- >> NECK	ction result n GO TO 4. GO TO 3. APP SENSC	R POWER	SUPPLY	CIRCUIT		
Disconr Check t	-	rness conne		r harness conn	ector and VCM ha	rness connector
	+		_			
	sensor		CM	Continuity		
	Terminal	Connector	Termina		-	
E101	3	E61	36	Existed	-	
	eck harness ction result n		ground ar	d snort to pow	er.	
ES >>) >>	Check VCM Repair or re	power supp place error-c	letected p	oarts.	151, "VCM : Diagno	osis Procedure"
	VDD CENICU					
Turn po Disconr	APP SENSC ower switch C nect VCM ha the continuity)FF. rness conne	ctor.		ector and VCM har	rness connector
Turn po Disconr	wer switch C nect VCM ha)FF. rness conne	ctor.		ector and VCM har	rness connector
Turn po Disconr Check t	wer switch C nect VCM ha)FF. rness conne	ctor.		ector and VCM har	rness connector
Turn po Disconr Check t	ower switch C nect VCM ha the continuity	DFF. rness conne v between Al	ctor.		ector and VCM hai	rness connector
Turn po Disconr Check t	wer switch C nect VCM ha the continuity	DFF. rness conne v between Al	ctor. PP senso -	r harness conn	ector and VCM hai	rness connector
Turn po Disconr Check t APP onnector E101	wer switch C nect VCM ha the continuity + sensor Terminal 5	DFF. rness conne between Al Connector E61	ctor. PP senso - CM Termina 62	r harness conn	ector and VCM hai - -	rness connector
Turn po Disconr Check t APP onnector E101 Also ch ne insper ES >> D >> CHECK	wer switch C nect VCM ha the continuity + sensor Terminal 5 eck harness ction result n GO TO 5. Repair or re VCM GROU	DFF. rness conne between Al Connector E61 for snort to p ormal? place error-condition	ctor. PP senso 	r harness conn Continuity Existed	-	rness connector
Turn po Disconr Check t APP onnector E101 Also ch ne insper ES >> D >> CHECK	wer switch C nect VCM ha the continuity + sensor Terminal 5 eck harness ction result n GO TO 5. Repair or re VCM GROU continuity bet	DFF. rness conne between Al Connector E61 for snort to p ormal? place error-condition	ctor. PP senso 	Continuity Existed	-	rness connector
Turn po Disconr Check t APP onnector E101 Also ch ne insper ES >> D >> CHECK	wer switch C nect VCM ha the continuity + sensor Terminal 5 eck harness ction result n GO TO 5. Repair or re VCM GROU continuity bet + VCM	DFF. rness conner between Al Connector E61 for snort to p ormal? place error-co ND CIRCUIT ween VCM h	ctor. PP senso 	r harness conn Continuity Existed	-	rness connector
Turn po Disconr Check t APP onnector E101 Also ch ne insper ES >> CHECK Connector E61	wer switch C nect VCM ha the continuity + sensor Terminal 5 eck harness ction result n GO TO 5. Repair or re VCM GROU continuity bet + VCM	DFF. rness conner between Al Connector E61 for snort to p ormal? place error-c ND CIRCUIT ween VCM h	ctor. PP senso 	r harness conn Continuity Existed Oarts.	-	rness connector
Turn po Disconr Check t APP onnector E101 Also ch ne insper S S CHECK Connector	wer switch C nect VCM ha the continuity + sensor Terminal 5 eck harness ction result n GO TO 5. Repair or re VCM GROU continuity bet + VCM r Termi 58 65	DFF. rness conner between Al Connector E61 for snort to p ormal? place error-co ND CIRCUIT ween VCM h	ctor. PP senso CM Termina 62 Dower. detected p narness c	r harness conn Continuity Existed oarts. Connector and g	-	rness connector

NO >> Repair or replace error-detected parts.

P2122, P2123 APP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

6. CHECK APP SENSOR SIGNAL CIRCUIT

- 1. Turn power switch OFF.
- 2. Disconnect VCM harness connector.
- 3. Check the continuity between APP sensor harness connector and VCM harness connector.

+				
APP	sensor	VCM		Continuity
Connector	Terminal	Connector	Terminal	
E101	4	E62	49	Existed

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

Is the inspection result normal?

YES >> GO TO 7.

NO >> Repair or replace error-detected parts.

7.CHECK APP SENSOR

Refer to EVC-224, "Component Inspection (Accelerator Pedal Position Sensor)".

Is the inspection result normal?

- YES >> Check intermittent incident. Refer to <u>GI-53, "Intermittent Incident"</u>.
- NO >> Replace Accelerator pedal. Refer to ACC-4, "Removal and Installation".

Component Inspection (Accelerator Pedal Position Sensor)

INFOID:000000008747092

1.CHECK ACCELERATOR PEDAL POSITION (APP) SENSOR

- 1. Turn power switch OFF.
- 2. Reconnect all harness connectors disconnected.
- 3. Turn power switch ON.
- 4. Check the voltage VCM harness connector terminals under the following conditions.

	VCM					
Connector	+ –		Con	Condition		
Connector	Terminal	Terminal				
E61	49 (APP sensor 1)	62		Fully released	0.6 - 0.9	
LOT	49 (AFF Selisor I)	02	Accelerator pedal	Fully depressed	3.9 - 4.8	
E62	108 (APP sensor 2)	122		Fully released	0.3 - 0.45	
E02	100 (AFP Selisor 2)	122		Fully depressed	1.95 - 2.4	

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace accelerator pedal. Refer to <u>ACC-4, "Removal and Installation"</u>.

P2127, P2128 APP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

P2127, P2128 APP SENSOR

DTC Logic

DTC DETECTION LOGIC

NOTE:

If DTC P2127 or P2128 is displayed with DTC P31E5, first perform the trouble diagnosis for DTC P31E5. Refer to <u>EVC-354, "DTC Logic"</u>.

EVC

DTC	CONSULT screen terms (Trouble diagnosis content)	D	TC detecting condition	Possible cause		
P2127	APP SENSOR E (Throttle/Pedal position sen- sor/switch "E" circuit low)	An excessively sent to VCM.	sor 2 circuit is shorted.)			
P2128	APP SENSOR E (Throttle/Pedal position sen- sor/switch "E" circuit high)	An excessively l sent to VCM.	nigh voltage from the APP sensor 2 is	 Accelerator pedal position sensor 2 		
DTC CON	IFIRMATION PROCED	URE				
1.PRECO	NDITIONING					
	ver switch OFF and wait					
 Make sui 	re that 12V battery voltag	je is 11 v or m	ore.			
>:	> GO TO 2.					
2.PERFO	RM DTC CONFIRMATIC	N PROCEDU	RE			
	ower switch ON and wai	t at least 1 sec	ond.			
 Check Is DTC det 	self-diagnostic result.					
	Proceed to EVC-225, "	Diagnosis Pro	cedure".			
	> INSPECTION END					
Diagnosi	is Procedure			INFOID:00000008747094		
1 .CHECK	APP SENSOR 2 POWE	R SUPPLY-1				
	ower switch OFF.					
	nnect accelerator pedal p ower switch ON.	osition (APP)	sensor harness connector.			
	the voltage between AP	P sensor harn	ess connector terminals.			
	APP sensor		Voltage			
Connect	or + Terminal	_	(Approx.)			
E101	2	6	5 V			
Is the inspe	ection result normal?					
	<u> </u>					
YES >:	> GO TO 6.					
YES >> NO >>	> GO 10 6. > GO TO 2. (APP SENSOR 2 POWE					

А

В

INFOID:000000008747093

P2127, P2128 APP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

	+			
APP	sensor	_	Voltage (Approx.)	
Connector	Terminal			
E101	2	Ground	5 V	

Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 3.

3.CHECK APP SENSOR POWER SUPPLY CIRCUIT

- 1. Turn power switch OFF.
- 2. Disconnect VCM harness connector.
- 3. Check the continuity between APP sensor harness connector and VCM harness connector.

+				
APP	APP sensor		VCM	
Connector	Terminal	Connector	Terminal	
E101	2	E62	97	Existed

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

Is the inspection result normal?

- YES >> Perform trouble diagnosis for VCM power supply circuit. Refer to <u>EVC-151, "VCM : Diagnosis</u> <u>Procedure"</u>.
- NO >> Repair or replace error-detected parts.

4. CHECK APP SENSOR GROUND CIRCUIT

1. Turn power switch OFF.

- 2. Disconnect VCM harness connector.
- 3. Check the continuity between APP sensor harness connector and VCM harness connector.

+				
APP	sensor	V	СМ	Continuity
Connector	Terminal	Connector	Terminal	
E101	6	E62	122	Existed

4. Also check harness for snort to power.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace error-detected parts.

5.CHECK VCM GROUND CIRCUIT

Check the continuity between VCM harness connector and ground.

	+		
V	VCM		Continuity
Connector	Terminal		
E61	58		
LUT	65	Ground	Existed
E62	118	Ground	
LOZ	126		

Is the inspection result normal?

YES >> Check intermittent incident. Refer to GI-53, "Intermittent Incident".

NO >> Repair or replace error-detected parts.

EVC-226

P2127, P2128 APP SENSOR

< DTC/CIRCUIT DIAGNOSIS > 6. CHECK APP SENSOR SIGNAL CIRCUIT 1. Turn power switch OFF. 2. Disconnect VCM harness connector. 3. Check the continuity between APP sensor harness connector and VCM harness connector. В + _ VCM APP sensor Continuity EVC Connector Terminal Connector Terminal E101 E62 108 1 Existed D Also check harness for short to ground and snort to power. 4. Is the inspection result normal? YES >> GO TO 7. Е NO >> Repair or replace error-detected parts. 7.CHECK APP SENSOR Check APP sensor. Refer to EVC-227, "Component Inspection (Accelerator Pedal Position Sensor)". F Is the inspection result normal? YES >> Check intermittent incident. Refer to <u>GI-53, "Intermittent Incident"</u>. NO >> Replace Accelerator pedal. Refer to ACC-4, "Removal and Installation". Component Inspection (Accelerator Pedal Position Sensor) INFOID:000000009325573 Н 1.CHECK ACCELERATOR PEDAL POSITION (APP) SENSOR 1. Turn power switch OFF. 2. Reconnect all harness connectors disconnected. Turn power switch ON. 3. Check the voltage VCM harness connector terminals under the following conditions. 4. VCM Condition + Voltage (V) Connector Terminal Terminal Κ Fully released 0.6 - 0.9 E61 49 (APP sensor 1) 62 3.9 - 4.8 Fully depressed Accelerator pedal L Fully released 0.3 - 0.45 E62 108 (APP sensor 2) 122 Fully depressed 1.95 - 2.4 Is the inspection result normal? Μ YES >> INSPECTION END NO >> Replace accelerator pedal. Refer to ACC-4, "Removal and Installation". Ν

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P2138 APP SENSOR

DTC Logic

DTC DETECTION LOGIC

NOTE:

If DTC P2138 is displayed with DTC P31E5, first perform the trouble diagnosis for DTC P31E5. Refer to <u>EVC-354, "DTC Logic"</u>.

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	Possible cause
P2138	APP SENSOR (Throttle/Pedal position sensor/switch "D" / " E" volt- age correlation)	VCM detects abnormal signal of APP sensor 1 and APP sensor 2 at a time.	 Harness or connectors (APP sensor 1 or 2 circuit is open or shorted.) APP sensor

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

• Turn power switch OFF and wait at least 20 seconds.

• Make sure that 12V battery voltage is 11 V or more.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

- 1. Turn power switch ON and wait at least 1 second.
- 2. Check self-diagnostic result.

Is DTC detected?

YES >> Proceed to <u>EVC-228, "Diagnosis Procedure"</u>. NO >> INSPECTION END

Diagnosis Procedure

1. CHECK VCM GROUND CIRCUIT

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

	+			
V	CM	-	Continuity	
Connector	Terminal			
E61	58			
LUT	65	Ground	Existed	
E62	118	Giouna	LAISIEU	
E02	126			

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

2. CHECK ACCELERATOR PEDAL POSITION (APP) SENSOR SIGNAL CIRCUIT

1. Disconnect APP sensor harness connector.

2. Check the continuity between APP sensor harness connector terminals.

INFOID:000000008747096

INFOID:000000008747097

P2138 APP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

	APP sensor						
Connector	+	-	Continuit	у			
	Tern	ninal					
E101	4	1	Not existe	ed			
	ck harness for sho	-	ind and snort to p	oower.			
-	tion result normal?	-					E
	GO TO 3. Repair or replace e	prror_dete	cted narts				
	PP SENSOR		cica parts.				
		<u>(0.000 ll</u>					
	sensor. Refer to <u>E\</u> tion result normal?		<u>Component insp</u>	ection (Acceleration	or Pedal Position	<u>Sensor)</u> .	
	Check intermittent	-	Refer to GI-53 "	ntermittent Incide	nt"		
-	Replace Accelerate						
ompone	nt Inspection (Acceler	ator Pedal Po	osition Senso	r)	INFOID:000000009325574	
•					• /	INI OID.000000003323314	
.CHECK A	CCELERATOR PI	EDAL PO	SITION (APP) S	ENSOR			
	ver switch OFF.						
Reconne	ect all harness con	nectors d	isconnected.				
	ver ewitch ON						
Turn pov	ver switch ON. ne voltage VCM ha	rness cor	nnector terminals	under the follow	ina conditions.		
Turn pov	ver switch ON. ne voltage VCM ha	irness cor	nnector terminals	under the follow	ing conditions.		
Turn pov		irness cor	nnector terminals	under the follow	ing conditions.		
Turn pov Check th	ne voltage VCM ha	irness cor		under the follow	Voltage (V)		
Turn pov	vcM	rness cor – Terminal					
Turn pov Check th Connector	vCM VCM + Terminal	– Terminal					
Turn pov Check th	vcm +	_	Con	dition	Voltage (V)		
Connector E61	vCM + Terminal 49 (APP sensor 1)	– Terminal 62		dition Fully released	Voltage (V) 0.6 - 0.9		
Turn pov Check th Connector	vCM VCM + Terminal	– Terminal	Con	dition Fully released Fully depressed	Voltage (V) 0.6 - 0.9 3.9 - 4.8		
Connector E61 E62	vCM + Terminal 49 (APP sensor 1)	- Terminal 62 122	Con	dition Fully released Fully depressed Fully released	Voltage (V) 0.6 - 0.9 3.9 - 4.8 0.3 - 0.45		
Turn pov Check th Connector E61 E62 the inspec YES >> I	VCM + Terminal 49 (APP sensor 1) 108 (APP sensor 2) tion result normal? NSPECTION END	- Terminal 62 122	Con Accelerator pedal	dition Fully released Fully depressed Fully released Fully depressed	Voltage (V) 0.6 - 0.9 3.9 - 4.8 0.3 - 0.45 1.95 - 2.4		
Turn pov Check th Connector E61 E62 the inspec YES >> I	vCM + Terminal 49 (APP sensor 1) 108 (APP sensor 2) tion result normal?	- Terminal 62 122	Con Accelerator pedal	dition Fully released Fully depressed Fully released Fully depressed	Voltage (V) 0.6 - 0.9 3.9 - 4.8 0.3 - 0.45 1.95 - 2.4		
Turn pov Check th Connector E61 E62 the inspec YES >> I	VCM + Terminal 49 (APP sensor 1) 108 (APP sensor 2) tion result normal? NSPECTION END	- Terminal 62 122	Con Accelerator pedal	dition Fully released Fully depressed Fully released Fully depressed	Voltage (V) 0.6 - 0.9 3.9 - 4.8 0.3 - 0.45 1.95 - 2.4		
Turn pov Check th Connector E61 E62 the inspec YES >> I	VCM + Terminal 49 (APP sensor 1) 108 (APP sensor 2) tion result normal? NSPECTION END	- Terminal 62 122	Con Accelerator pedal	dition Fully released Fully depressed Fully released Fully depressed	Voltage (V) 0.6 - 0.9 3.9 - 4.8 0.3 - 0.45 1.95 - 2.4		
Turn pov Check th Connector E61 E62 the inspec YES >> I	VCM + Terminal 49 (APP sensor 1) 108 (APP sensor 2) tion result normal? NSPECTION END	- Terminal 62 122	Con Accelerator pedal	dition Fully released Fully depressed Fully released Fully depressed	Voltage (V) 0.6 - 0.9 3.9 - 4.8 0.3 - 0.45 1.95 - 2.4		
Turn pov Check th Connector E61 E62 the inspec YES >> I	VCM + Terminal 49 (APP sensor 1) 108 (APP sensor 2) tion result normal? NSPECTION END	- Terminal 62 122	Con Accelerator pedal	dition Fully released Fully depressed Fully released Fully depressed	Voltage (V) 0.6 - 0.9 3.9 - 4.8 0.3 - 0.45 1.95 - 2.4		
Turn pov Check th Connector E61 E62 the inspec YES >> I	VCM + Terminal 49 (APP sensor 1) 108 (APP sensor 2) tion result normal? NSPECTION END	- Terminal 62 122	Con Accelerator pedal	dition Fully released Fully depressed Fully released Fully depressed	Voltage (V) 0.6 - 0.9 3.9 - 4.8 0.3 - 0.45 1.95 - 2.4		
Turn pov Check th Connector E61 E62 the inspec YES >> I	VCM + Terminal 49 (APP sensor 1) 108 (APP sensor 2) tion result normal? NSPECTION END	- Terminal 62 122	Con Accelerator pedal	dition Fully released Fully depressed Fully released Fully depressed	Voltage (V) 0.6 - 0.9 3.9 - 4.8 0.3 - 0.45 1.95 - 2.4		
Turn pov Check th Connector E61 E62 the inspec YES >> I	VCM + Terminal 49 (APP sensor 1) 108 (APP sensor 2) tion result normal? NSPECTION END	- Terminal 62 122	Con Accelerator pedal	dition Fully released Fully depressed Fully released Fully depressed	Voltage (V) 0.6 - 0.9 3.9 - 4.8 0.3 - 0.45 1.95 - 2.4		
Turn pov Check th Connector E61 E62 the inspec YES >> I	VCM + Terminal 49 (APP sensor 1) 108 (APP sensor 2) tion result normal? NSPECTION END	- Terminal 62 122	Con Accelerator pedal	dition Fully released Fully depressed Fully released Fully depressed	Voltage (V) 0.6 - 0.9 3.9 - 4.8 0.3 - 0.45 1.95 - 2.4		
Turn pov Check th Connector E61 E62 the inspec YES >> I	VCM + Terminal 49 (APP sensor 1) 108 (APP sensor 2) tion result normal? NSPECTION END	- Terminal 62 122	Con Accelerator pedal	dition Fully released Fully depressed Fully released Fully depressed	Voltage (V) 0.6 - 0.9 3.9 - 4.8 0.3 - 0.45 1.95 - 2.4		

< DTC/CIRCUIT DIAGNOSIS >

P3100 EV SYSTEM CAN COMMUNICATION

Description

INFOID:000000008747099

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:000000008747100

DTC DETECTION LOGIC

NOTE:

If DTC P3100 is displayed with DTC P3191 or P3193, perform diagnosis for DTC P3191 or P3193.

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	Possible cause
P3100	COMMUNICATION ERROR (Communication error)	VCM cannot receive EV system CAN communication sig- nal from LBC and traction motor inverter for 5 seconds or more when VCM starts-up.	 Harness or connectors LBC Traction motor inverter VCM

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

• Turn power switch OFF and wait at least 20 seconds.

• Make sure that 12V battery voltage is 11 V or more.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE-1

With CONSULT

- Turn power switch ON and wait at least 20 seconds.
- 2. Check DTC.

Is DTC detected?

- YES >> Proceed to EVC-230, "Diagnosis Procedure".
- NO >> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE-2

With CONSULT

- 1. Turn power switch OFF.
- 2. Check that the charging status indicator is not illuminating, and wait at least 20 seconds.
- 3. Connect EVSE (with AC power input) and wait at least 20 seconds.
- 4. Turn power switch ON.
- 5. Check DTC.
- Is DTC detected?

YES >> Proceed to EVC-230, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

1.PERFORM DTC CONFIRMATION PROCEDURE AGAIN

With CONSULT

1. Erase DTC.

2. Perform DTC confirmation procedure again. Refer to EVC-230, "DTC Logic".

Is DTC" P3100" detected again?

Revision: October 2013

EVC-230

2013 LEAF

INFOID:000000008747101

< DTC/CIRCUIT DIAGNOSIS >

YES	>> Replace VCM. Refer to EVC-426, "Removal and Installation".
NO	>> INSPECTION END

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P3101 VCM

DTC Logic

INFOID:000000008747102

DTC DETECTION LOGIC

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	Possible cause
P3101	VCM (Vehicle control module)	VCM calculation function is malfunctioning.	VCM

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

- Turn power switch OFF and wait at least 20 seconds.
- Make sure that 12V battery voltage is 11 V or more.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

- 1. Turn power switch ON wait at least 10 seconds.
- 2. Set the vehicle to READY.
- **NOTE:** If the vehicle does not enter the READY state, proceed to the next step with the power switch ON.
- 3. Shift selector lever to the entire position from "P" to "D".
- 4. Turn power switch OFF and wait at least 20 seconds.
- 5. Turn power switch ON wait at least 10 seconds.
- 6. Turn power switch OFF and wait at least 20 seconds.
- 7. Turn power switch ON.
- 8. Check self-diagnostic result.

Is DTC detected?

- YES >> Proceed to EVC-232, "Diagnosis Procedure".
- NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000008747103

1.PERFORM CONFIRMATION PROCEDURE AGAIN

- 1. Erase DTC.
- 2. Perform DTC confirmation procedure again. Refer to EVC-232, "DTC Logic".
- 3. Check self-diagnostic result.

Is the DTC detected again?

- YES >> Replace VCM. Refer to EVC-426, "Removal and Installation".
- NO >> INSPECTION END

P3102 LI-ION BATTERY

Description

Li-ion Battery ID Registration must be performed if the Li-ion battery controller or VCM is replaced.

DTC Logic

INFOID:000000008747105

INFOID:000000008747104

DTC DETECTION LOGIC

CAUTION:

This DTC may be detected when the Li-ion battery is replaced. If this DTC is detected, check that the Li-ion battery is replaced by using the correct parts and method.

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	Possible cause
P3102	INVALID BATTERY (Invalid battery)	Detects invalid Li-ion battery ID.	 Improper replacement of Li- ion battery or Li-ion battery controller. Li-ion battery Li-ion battery controller
	ONFIRMATION PROC	EDURE	
1 .PRE	CONDITIONING		
	ower switch OFF and wa sure that 12V battery vol		
Marco			
2	>> GO TO 2.		
	FORM DTC CONFIRMA		
 Turr Turr Turr Che 	CONSULT a power switch OFF and a power switch ON and w a brC. <u>detected?</u>	wait at least 20 seconds. /ait at least 5 seconds.	
YES NO	>> Proceed to EVC-233 >> INSPECTION END	, "Diagnosis Procedure".	
Diagno	osis Procedure		INFOID:00000008747106
1 .CHE	CK SELF-DIAGNOSTIC	RESULT OF LI-ION BATTERY CONTROLLER	
1. Turr 2. Che	CONSULT n power switch ON. eck self-diagnostic result TC detected?	of the "HV BAT".	
YES NO	>> Check the DTC. Ref >> GO TO 2.	er to <u>EVB-45, "DTC Index"</u> .	
2. LI-IO	N BATTERY VISUALLY	СНЕСК	
Li-ion b Visually Is the ins	C may be detected wh attery is replaced by us check Li-ion battery for r spection result normal?		
YES NO		y ID Registration. Refer to "Li-ion Battery Regist ery. Refer to EVB-194, "Removal and Installa	

NO >> Replace Li-ion battery. Refer to <u>EVB-194</u>, "<u>Removal and Installation</u>" (without Li-ion battery heater) or <u>EVB-194</u>, "<u>Removal and Installation</u>" (with Li-ion battery heater).

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P3117 A/C SYSTEM

Description

This DTC shows a decrease in insulation resistance of the high voltage circuit.

When detecting a decrease in insulation resistance of the high voltage circuit during use of air-conditioner, VCM turns ON/OFF the electric compressor and the PTC heater to check changes in insulation resistance and identifies a decrease in insulation resistance of the air-conditioning system.

DTC Logic

INFOID:000000008747108

INFOID:000000008747107

DTC DETECTION LOGIC

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	Possible cause
P3117	A/C SYSTEM (Air conditioner system)	When VCM detects a decrease in insulation resistance of A/C system.	Electric compressorA/C refrigerant gasPTC heater

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

Turn power switch OFF and wait at least 20 seconds.

• Make sure that 12V battery voltage is 11 V or more.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE-1

With CONSULT

1. Set the vehicle as the following condition and wait at least 30 minutes.

Power switch	READY
Vehicle speed	0 km/h (0 MPH)
A/C switch	ON
A/C set temperature	Full cold

2. Check DTC.

Is DTC detected?

YES >> Proceed to EVC-235, "Diagnosis Procedure" NO >> GO TO 3.

3. PERFORM DTC CONFIRMATION PROCEDURE-2

With CONSULT

1. Set the vehicle as the following condition and wait at least 30 minutes.

Power switch	READY
Vehicle speed	0 km/h (0 MPH)
A/C switch	ON
A/C set temperature	Full hot

2. Check DTC.

Is DTC detected?

YES >> Proceed to EVC-235, "Diagnosis Procedure"

NO >> INSPECTION END

P3117 A/C SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

Diagnosis Procedure

INFOID:000000008747109

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1.CHECK A/C REFRIGERANT GAS

Interview the customer and check maintenance records to see if there is possibility that a refrigerant gas other than EV specific refrigerant gas is mixed in A/C refrigerant gas. **NOTE:**

If A/C refrigerant gas other than EV specific refrigerant gas is used, insulation resistance may decrease.

Is the inspection result normal?

- YES-1 (DTC P3117 is detected during Step 1 of DTC CONFIRMATION PROCEDURE)>>Replace electric compressor. Refer to <u>HA-37</u>, <u>"Removal and Installation"</u> (with heat pump system) or <u>HA-95</u>, <u>"Removal and Installation"</u> (without heat pump system).
- YES-2 (DTC P3117 is detected during Step 2 of DTC CONFIRMATION PROCEDURE)>>Replace PTC heater. Refer to <u>HAC-208, "Removal and Installation"</u> [auto A/C (with heat pump)] or <u>HAC-374,</u> <u>"Removal and Installation"</u> [auto A/C (without heat pump)].
- NO >> Change A/C refrigerant gas and compressor oil.

P311C HIGH VOLTAGE CIRCUIT

DTC Logic

DTC DETECTION LOGIC

NOTE:

If DTC P311C is displayed with DTC P0AA2, P0AA5, P31D4, P31DB, P31DC, or P31DD, perform diagnosis for DTC P0AA2, P0AA5, P31D4, P31DB, P31DC, or P31DD.

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	Possible cause
P311C		 Remains all of following condition for 0.2 seconds. Li-ion battery current: 5.5 A or more Input voltage to traction motor inverter: 24 V or less Pre-charge impossible 	High voltage circuit
	HIGH VOLTAGE SYSTEM (High voltage system)	 Remains all of following condition for 0.5 seconds. Li-ion battery current: less than 5.5 A Input voltage to traction motor inverter: 24 V or less Pre-charge impossible 	 Li-ion battery J/B Traction motor inverter PDM (Power Delivery Module) Electric compressor PTC heater
		 Remains all of following condition for 0.5 seconds. Difference between Li-ion battery voltage and input voltage to traction motor inverter 100 V or more. Pre-charge impossible 	

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

CAUTION:

Since this DTC may be displayed if a malfunction is detected in other systems, check them for malfunction before performing this diagnosis.

- Turn power switch OFF and wait at least 20 seconds.
- Make sure that 12V battery voltage is 11 V or more.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT

- 1. Set the vehicle to READY.
- 2. Check DTC.

Is DTC detected?

YES >> Proceed to <u>EVC-236, "Diagnosis Procedure"</u>. NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000008747111

INFOID:000000008747110

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.

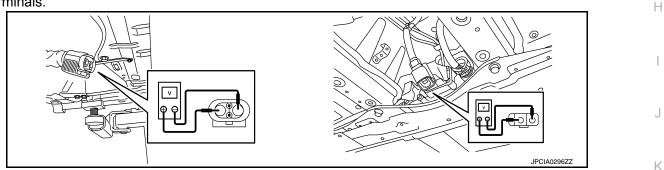
WARNING:

- 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.
- 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.

< DTC/CIRCUIT DIAGNOSIS >

 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 EVC-11, "High Voltage Precautions". 	A
 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. 	В
• Erase DTC after the work is completed.	-
1.CHECK SELF-DIAGNOSTIC RESULT IN TRACTION MOTOR INVERTER	EVC
With CONSULT	
Check self-diagnostic result in "MOTOR".	D
Is any DTC detected?	D
YES >> Check the DTC. Refer to TMS-28, "DTC Index".	
NO >> GO TO 2.	F
2. PRECONDITIONING	
WARNING: Disconnect high voltage, Refer to GI-33, "How to Disconnect High Voltage".	F

- 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-194, "Exploded View".
- Disconnect high voltage harness connector and PTC heater harness connector from front side of Li-ion G battery. Refer to EVB-194, "Removal and Installation".
- 3. Measure voltage between high voltage harness connector terminals and PTC heater harness connector terminals.



DANGER:

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

Standard

: 5 V or less

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

>> GO TO 3.

3.CHECK ELECTRIC COMPRESSOR

1. Disconnect electric compressor high voltage harness connector.

2. Check the short circuit between electric compressor terminals.

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< DTC/CIRCUIT DIAGNOSIS >

With heat	pump	system
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Electric c					
+	Resistance				
Terr	Terminal				
1	2	3 k Ω or more			
Without heat pump syste	Without heat pump system				
Electric c	Electric compressor				
+	Resistance				
Terr	Terminal				
1	3	3 kΩ or more			

Is the inspection result normal?

YES >> GO TO 4.

NO >> Replace electric compressor. And then, GO TO 10. Refer to <u>HA-37, "Removal and Installation"</u> (with heat pump system) or <u>HA-95, "Removal and Installation"</u> (without heat pump system).

4.CHECK PTC HEATER

- 1. Disconnect Li-ion battery harness connector (H19).
- 2. Check the short circuit between Li-ion battery terminals.

With heat pump system

Connected to:	Connector	+	_	Resistance
	Connector	Terr	minal	
PTC heater	H19	40	41	$3 \text{ k}\Omega$ or more

Without heat pump system

Connected to:	Connector	+	_	Resistance
	Connector	Terr	ninal	
PTC heater	H19	40	41	$3 \text{ k}\Omega$ or more

Is the inspection result normal?

YES >> GO TO 5.

NO >> Replace PTC heater. And then, GO TO 10. Refer to <u>HAC-205, "Removal and Installation"</u> [(Auto A/C (with heat pump)] or<u>HAC-374, "Removal and Installation"</u> [(Auto A/C (without heat pump)].

5. CHECK HIGH VOLTAGE HARNESS-1

- 1. Disconnect Li-ion battery harness connector (H3).
- 2. Check the short circuit between Li-ion battery harness connector terminals.

With heat pump system

Connected to:	Li-ion battery			
	Connector	+	_	Resistance
			minal	
PDM (Power Delivery Module)	H3	37	38	$3 \text{ k}\Omega$ or more
Without heat pump syste	em			

 $\begin{tabular}{|c|c|c|c|} \hline Connected to: & $$Li-ion battery$ & $$PDM (Power Delivery$ Module)$ & $H3$ & $$37$ & $$38$ & $$3 k\Omega$ or more$ \end{tabular}$

Is the inspection result normal?

Revision: October 2013

< DTC/CIRCUIT DIAGNOSIS >

- YES >> The high voltage harness within Li-ion battery may be shorted. Check the related circuits. And then, GO TO 10.
- NO >> GO TO 6.
- **6.**CHECK TRACTION MOTOR INVERTER В Remove PDM (Power Delivery Module). Refer to VC-119, "Removal and Installation". 1. Check the short circuit between traction motor inverter termi-2. Ω nals. EVC Resistance : more than 3 k Ω D Ε JSCIA0696ZZ F Is the inspection result normal? YES >> GO TO 7. NO >> Replace traction motor inverter. And then, GO TO 10. Refer to TMS-108, "Removal and Installation". 7.CHECK HIGH VOLTAGE HARNESS-2
 - Remove high voltage harness from PDM (Power Delivery Module). Refer to <u>VC-119, "Removal and Installation"</u>.
 - 2. Check the short circuit between high voltage harness connector (Li-ion battery side) and high voltage harness connector [PDM (Power Delivery Module) side].

With heat pump system

PDM (Power Delivery Module)				
Connector	+	-	Resistance	
Connector	Terminal			
H5	38	39	3 kΩ or more	
	Connector -	Connector + Te	Connector +	

	PDM (Power Delivery Module)					
Connected to:		Connector	+	_	Resistance	L
		Connector	Terr	ninal	7	
	Li-ion battery	H5	38	39	3 k Ω or more	B. 4
		(I. ¹ . I		(.1		IVI

3. Check the short circuit between high voltage harness connector (electric compressor side) and high voltage harness connector [PDM (Power Delivery Module) side].

with heat pump system

	PE	DM (Power Delivery Mod	ule)		
Connected to:	Connector	+	-	Resistance	
	Connector	Terr	minal		0
Electric compressor	H6	42	41	3 kΩ or more	

Without heat pump system

	PE	OM (Power Delivery Mod	ule)	
Connected to:	Connector	+	_	Resistance
	Connector	Terminal		
Electric compressor	H7	41	42	3 kΩ or more

Is the inspection result normal?

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< DTC/CIRCUIT DIAGNOSIS >

NO >> Replace malfunctioning harness. And then, GO TO 10.

8. CHECK PDM (POWER DELIVERY MODULE)

Check the short circuit between PDM (Power Delivery Module) harness connector terminals.

PDM (Power D		
+	_	Resistance
Terr	Ť	
38	39	3 k Ω or more

Is the inspection result normal?

YES >> GO TO 9.

NO >> Replace PDM (Power Delivery Module). Refer to <u>VC-119</u>, "<u>Removal and Installation</u>". And then, GO TO 10.

9. CHECK SERVICE PLUG FUSE

- 1. Turn power switch OFF.
- 2. Disconnect service plug.
- 3. Check service plug fuse fusing.

Is the fuse is fusing?

YES >> Replace service plug. And then, GO TO 10.

NO >> GO TO 10.

10.REPLACE LI-ION BATTERY JUNCTION BOX

Replace Li-ion battery junction box. Refer to EVB-219, "BATTERY JUNCTION BOX AND BATTERY HAR-NESS : Disassembly and Assembly".

>> INSPECTION END

< DTC/CIRCUIT DIAGNOSIS >

P312A EV SYSTEM CAN COMMUNICATION

Description

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 EVC 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:000000008747113

INFOID:000000008747112

DTC DETECTION LOGIC

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	Possible cause
P312A	COMMUNICATION ERROR (Communication error)	CAN communication of the EV system CAN connecting unit does not stop for 25.5 seconds or more immediately before the VCM self-shutoff.	 Harness or connectors LBC Traction motor inverter On board charger Electric shift control module A/C auto amp. TCU VCM
	NFIRMATION PROCEDU	IRE	
1. PREC	ONDITIONING		
	ower switch OFF and wait at		
 Make s NOTE: 	ure that 12V battery voltage	is 11 V or more.	
	ect CONSULT if it is connected	ed.	
	00 70 0		
~	>> GO TO 2.		
_	ORM DTC CONFIRMATION	PROCEDURE-1	
	CONSULT power switch ON and wait a	t least 20 seconds.	
	power switch OFF and wait power switch ON.	at least 1 minutes.	
	x DTC.		
<u>ls DTC d</u>	etected?		
	>> Proceed to <u>EVC-242, "Di</u> >> GO TO 3.	agnosis Procedure".	
^	ORM DTC CONFIRMATION	PROCEDURE-2	
	CONSULT		
1. Turn	power switch OFF.		
		dicator is not illuminating, and wait at least 20 se oput) and wait at least 10 seconds.	conds.
4. Disco	onnect EVSE and wait at lea		
	power switch ON. ck DTC.		
ls DTC d			

YES >> Proceed to EVC-242, "Diagnosis Procedure".

NO >> INSPECTION END А

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< DTC/CIRCUIT DIAGNOSIS >

Diagnosis Procedure

INFOID:000000008747114

1.CHECK VCM POWER SUPPLY-1

- 1. Turn power switch ON.
- 2. Check the voltage between IPDM E/R harness connector and ground.

+ IPDM E/R –		- 	Voltage
Connector	Terminal		voluge
E15	57	Ground	12V battery volt- age

Is the inspection result normal?

YES >> GO TO 3.

NO >> GO TO 2.

2.CHECK FUSE

1. Turn power switch OFF.

- 2. Pull out #55 fuse.
- 3. Check the fuse is not fusing.

Is the inspection result normal?

- YES >> Replace IPDM E/R. Refer to PCS-29, "Removal and Installation".
- NO >> Replace the fuse after repairing the applicable circuit.

3.CHECK VCM POWER SUPPLY-2

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

+ VCM		_	Voltage
Connector	Terminal		
E61	51	Ground	12V battery volt- age

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 4.

4.CHECK VCM POWER SUPPLY CIRCUIT

- 1. Turn power switch OFF.
- 2. Disconnect IPDM E/R harness connector.
- 3. Check the continuity between VCM harness connector and IPDM E/R harness connector.

+			_	
IPDN	/I E/R	VCM		Continuity
Connector	Terminal	Connector Terminal		
E15	57	E61	51	Existed

Is the inspection result normal?

YES >> Check intermittent incident. Refer to <u>GI-53, "Intermittent Incident"</u>.

NO >> Repair or replace error-detected parts.

5.CHECK VCM POWER SUPPLY-3

1. Turn power switch OFF.

< DTC/CIRCUIT DIAGNOSIS >

2. Disconnect VCM harness connector.

3. Check the voltage between VCM harness connector and ground.

	+			
	CM	_	Voltage	
Connector	Terminal			
E62	74	Ground	0 V	
s the inspectio	n result normal?	>		
YES >> GO	D TO 7.	•		
•) TO 6.			
J.CHECK VC	M POWER SUP	PLY-4		
	t ignition relay-2		connector on	around
2. Check the	voltage betweer	I VCIVI Harriess	connector and	ground.
	+			
V	СМ	_	Voltage	
Connector	Terminal		-	
E62	74	Ground	0 V	
s the inspectio	n result normal?	>		
	e ignition relay-2			
	e harness betwe cuits.	en fuse block	and VCM ma	become shorted with power. Check the related
-			ם מיוויס מ	
			OWER SUPP	Y (POWER ON) CIRCUIT
	VCM harness c t traction motor i		s connector (F	3).
 Turn powe 	r switch ON and	erase DTC.		
	nfirmation proce	dure. Refer to	<u>EVC-241, "DT</u>	<u>C Logic"</u> .
<u>s DTC "P312A</u> YES >> GC	<u>" detected?</u>) TO 8.			
		or inverter pow	er supply (PO	VER ON) circuit for short to power.
~	C POWER SUPP			, , , , , , , , , , , , , , , , , , ,
	r switch OFF.		,	
2. Reconnect	traction motor in			
	t LBC harness c			
	r switch ON and infirmation proce		EVC-241, "DT	C Logic".
<u>s "P312A" dete</u>	ected?			
) TO 9.			
•			,	or short to power.
J. CHECK PD	M (POWER DEL	IVERY MODU	LE) POWER S	UPPLY (POWER ON) CIRCUIT
	r switch OFF.			
	LBC harness co PDM (Power D) harness conr	ector (F23).
I. Turn powe	r switch ON and	erase DTC.		
	nfirmation proce	edure. Refer to	<u>EVC-241, "DT</u>	<u>C Logic"</u> .
<u>s DTC "P312A</u>				
	D TO 10.	orgor power of		ON) aircuit for abort to new or
	eck on board ch	alger nower st		UND CITCUILIOF SHOLLIO DOWEL
NO >> Ch	eck on board ch /C AUTO AMP.	• •		ON) circuit for short to power.

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< DTC/CIRCUIT DIAGNOSIS >

- 2. Reconnect PDM (Power Delivery Module) harness connector.
- 3. Disconnect A/C auto amp. harness connector (M55).
- 4. Turn power switch ON and erase DTC.
- 5. Perform confirmation procedure. Refer to EVC-241, "DTC Logic".

Is DTC "P312A" detected?

YES-1 (With TCU)>>GO TO 11.

YES-2 (Without TCU)>>GO TO 12.

NO >> Check A/Ć auto amp. power supply (POWER ON) circuit for short to power.

11. CHECK TCU POWER SUPPLY (POWER ON) CIRCUIT

- 1. Turn power switch OFF.
- 2. Reconnect A/C auto amp. harness connector.
- 3. Disconnect TCU harness connector (M67).
- 4. Turn power switch ON and erase DTC.
- 5. Perform confirmation procedure. Refer to EVC-241, "DTC Logic".

Is DTC "P312A" detected?

YES >> GO TO 12.

NO >> Check TCU power supply (POWER ON) circuit for short to power.

12. CHECK INTERMITTENT INCIDENT

Check intermittent incident. Refer to GI-53, "Intermittent Incident".

Is DTC "P312A" detected?

- YES >> Replace VCM. Refer to EVC-426, "Removal and Installation".
- NO >> Repair or replace error-detected parts.

P312B EV SYSTEM RESTART ERROR

< DTC/CIRCUIT DIAGNOSIS >

P312B EV SYSTEM RESTART ERROR

DTC Logic

INFOID:000000008747115

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DTC DETECTION LOGIC

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	Possible cause
P312B	RESTART ERROR (Restart error)	The traction motor inverter and the PDM (Power Delivery Module) cannot be activated for 30 seconds or more at a restart before the completion of VCM self shut off.	 Harness or connectors Traction motor inverter PDM (Power Delivery Module) VCM
DTC CC	NFIRMATION PROCEDU	RE	
1. PREC	ONDITIONING		
	ower switch OFF and wait at		
 Make s 	ure that 12V battery voltage	is 11 v or more.	
	>> GO TO 2.		
2.perf	ORM DTC CONFIRMATION	PROCEDURE-1	
	CONSULT		
	power switch ON and wait a OFF the power switch. Bety	t least 10 seconds. veen 5 seconds later and within 10 seconds, tur	n ON the power switch
agai	n. Wait at least 1 minute.		
3. Cheo <u>Is DTC d</u>	ck DTC. etected?		
	>> Proceed to EVC-246, "Di	agnosis Procedure".	
	>> GO TO 3.		
3. PERF	ORM DTC CONFIRMATION	PROCEDURE-2	
\sim	CONSULT power switch OFF.		
2. Cheo	ck that the charging status in	dicator is not illuminating, and wait at least 20 se	conds.
	power switch ON.	put) and wait at least 10 seconds.	
5. Disc	onnect EVSE and wait at lea	st 1 minutes.	
6. Cheo <u>Is DTC d</u>	ck DTC. etected?		
	>> Proceed to <u>EVC-246, "Di</u>	agnosis Procedure".	
4	>> GO TO 4.		
4. PERF	ORM DTC CONFIRMATION	PROCEDURE-3	
	CONSULT power switch OFF.		
2. Cheo	ck that the charging status in	dicator is not illuminating, and wait at least 20 se	conds.
	nect quick charge connector. quick charge and wait at lea	st 60 seconds	
5. Turn	power switch ON.		
	quick charge and wait at lea	st 60 seconds.	
<u>Is DTC d</u>	<u>elecled ?</u>		

NO >> INSPECTION END

P312B EV SYSTEM RESTART ERROR

< DTC/CIRCUIT DIAGNOSIS >

Diagnosis Procedure

INFOID:000000008747116

1.PERFORM SELF-DIAGNOSIS OF TRACTION MOTOR INVERTER

With CONSULT

Perform self-diagnosis of traction motor inverter.

Is DTC detected?

YES >> Check the DTC. Refer to <u>TMS-28, "DTC Index"</u>.

NO >> GO TO 2.

2.PERFORM SELF-DIAGNOSIS OF PDM (POWER DELIVERY MODULE)

Perform self-diagnosis of PDM (Power Delivery Module).

Is DTC detected?

YES >> Check the DTC. Refer to <u>VC-34, "DTC Index"</u>.

NO >> GO TO 3.

\mathbf{3}. PERFORM DTC CONFIRMATION PROCEDURE AGAIN

1. Erase DTC.

2. Perform DTC confirmation procedure again. Refer to EVC-245, "DTC Logic".

Is DTC "P312B" detected again?

YES >> Replace VCM. Refer to EVC-426, "Removal and Installation".

NO >> INSPECTION END

P312C, P3130 TRACTION MOTOR INVERTER CONDENSER DISCHARGE ER-ROR

< DTC/CIRCUIT DIAGNOSIS >

P312C, P3130 TRACTION MOTOR INVERTER CONDENSER DISCHARGE ERROR

DTC Logic

INFOID:000000008747117

DTC DETECTION LOGIC

NOTE:

If DTC P312C or P3130 is displayed with DTC P0AA0 or P0AA1, perform diagnosis for DTC P0AA0 or EVC P0AA1.

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	Possible cause
P312C P3130	INVERTER DISCHARGE ER- ROR (Inverter discharge error)	Traction motor inverter voltage is 54 V or more for 14 sec- onds during stop of READY or charge	Traction motor inverter VCM
DTC CO	NFIRMATION PROCEDU	RE	
1.PREC	ONDITIONING		
	ower switch OFF and wait at ure that 12V battery voltage		
• Make S	ure that 12 v battery voltage		
-	>> GO TO 2.		
2.PERF	ORM DTC CONFIRMATION	PROCEDURE	
 Set t Turn Turn 	CONSULT he vehicle to READY and pe power switch OFF and wait power switch ON and wait a ck DTC. etected?	at least 20 seconds.	
YES NO	>> Proceed to EVC-247, "Dis >> INSPECTION END	agnosis Procedure".	
Diagno	sis Procedure		INFOID:0000000874711
1.PERF	ORM SELF-DIAGNOSIS OF	TRACTION MOTOR INVERTER	
	CONSULT		
<u>ls DTC d</u>	self-diagnosis of traction mot <u>etected?</u> >> Check the DTC. Refer to		
	>> GO TO 2.		
2.PERF	ORM CONFIRMATION PRC	OCEDURE AGAIN	
	• •	n. Refer to <u>EVC-247. "DTC Logic"</u>	
YES	<u>P312C" or "P3130" detected?</u> >> Replace VCM. Refer to <u>E</u> >> INSPECTION END	VC-426, "Removal and Installation".	

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P312D QUICK CHARGE ERROR

< DTC/CIRCUIT DIAGNOSIS >

P312D QUICK CHARGE ERROR

DTC Logic

INFOID:000000008747119

DTC DETECTION LOGIC

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	Possible cause
P312D	QUICK CHARGE RELAY	Immediately before starting quick charge, the quick charg-	 Harness or connector PDM (Power Delivery
	(Quick charge relay)	er cannot be ready for 60 seconds.	Module) VCM

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

• Turn power switch OFF and wait at least 20 seconds.

• Make sure that 12V battery voltage is 11 V or more.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT

- 1. Check that the charging status indicator is not illuminating, and wait at least 20 seconds.
- 2. Connect quick charge connector.
- 3. Start the quick charging and wait at least 2 minutes.
- 4. Turn power switch ON.
- 5. Check DTC.

Is DTC detected?

- YES >> Proceed to EVC-248, "Diagnosis Procedure".
- NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000008747120

1.PERFORM SELF-DIAGNOSIS OF PDM (POWER DELIVERY MODULE)

With CONSULT

Perform self-diagnosis of PDM (Power Delivery Module).

Is DTC detected?

- YES >> Check the DTC. Refer to VC-34, "DTC Index".
- NO >> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE AGAIN

With CONSULT

- 1. Erase DTC.
- 2. Perform DTC confirmation procedure again. Refer to EVC-248, "DTC Logic".

Is DTC detected?

- YES >> Replace VCM. Refer to EVC-426, "Removal and Installation".
- NO >> INSPECTION END

P312E READY OFF ERROR

< DTC/CIRCUIT DIAGNOSIS >

P312E READY OFF ERROR

DTC Logic

DTC DETECTION LOGIC

NOTE:

If DTC P312E is displayed with DTC P317A, P3191, P31A7, or P319C, perform diagnosis for DTC P317A, P3191, P31A7, or P319C.

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	Possible cause
P312E	READY OFF ERROR (Ready off error)	 During the shutdown from READY, battery current remains 5.5 A or more for 25.5 seconds or more. During the shutdown from READY, traction motor inverter is not ready for discharge for 25.5 seconds or more. 	 Harness or connector LBC Traction motor inverter A/C auto amp. PDM (Power Delivery Module) VCM
	NFIRMATION PROCEDU	IRE	Γ
• Turn po	ower switch OFF and wait at		G
 Make s 	ure that 12V battery voltage	is 11 V or more.	H
•	>> GO TO 2. ORM DTC CONFIRMATION		
		PROCEDURE	
 Set ti Oper Turn Wait Turn Turn Chec Is DTC de YES 	he vehicle to READY. ate the automatic air condition power switch OFF as autom at least 30 seconds. power switch ON. ck DTC.	oning system (A/C switch ON). natic air conditioning system ON condition agnosis Procedure".	J
Diagno	sis Procedure		INFOID:00000008747122
1.PERF	ORM SELF-DIAGNOSIS OF	PDM (POWER DELIVERY MODULE)	N
Perform s Is DTC do YES	CONSULT Self-diagnosis of PDM (Powe etected? >> Check the DTC. Refer to >> GO TO 2.	. ,	Ν
2.PERF	ORM SELF-DIAGNOSIS OF	A/C AUTO AMP.	C
Perform s Is DTC de YES	> Check the DTC. Refer to <u>Index</u> " [auto A/C (without >> GO TO 3.	HAC-58, "DTC Index" [auto A/C (with heat pun heat pump)].	F np)] or <u>HAC-260, "DTC</u>
		TRACTION MOTOR INVERTER	
	ONSULT		

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INFOID:000000008747121

P312E READY OFF ERROR

< DTC/CIRCUIT DIAGNOSIS >

Perform self-diagnosis of traction motor inverter.

Is DTC detected?

YES >> Check the DTC. Refer to <u>TMS-28, "DTC Index"</u>.

NO >> GO TO 4.

4.PERFORM SELF-DIAGNOSIS OF LBC

(B) With CONSULT

Perform self-diagnosis of LBC.

Is DTC detected?

YES >> Check the DTC. Refer to EVB-45. "DTC Index".

NO >> GO TO 5.

5.PERFORM DTC CONFIRMATION PROCEDURE AGAIN

With CONSULT

1. Erase DTC.

2. Perform DTC confirmation procedure again. Refer to EVC-249, "DTC Logic".

Is DTC "P312E" detected again?

YES >> Replace VCM. Refer to EVC-426, "Removal and Installation".

NO >> INSPECTION END

P312F CHARGE OFF ERROR

DTC Logic

DTC DETECTION LOGIC

NOTE:

If DTC P312F is displayed with DTC P317A, P3191, P3196, P319C, P31A1, P31A7, or P31AE, perform diagnosis for DTC P317A, P3191, P3196, P319C, P31A1, P31A7, or P31AE.

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	Possible cause
P312F	CHARGE OFF ERROR (Charge off error)	 During the shutdown from charging, 10 seconds pass without satisfying the following conditions: Battery current is 5.5 A or less Traction motor inverter is ready for discharge. Quick charge relay OFF 	 Harness or connector LBC Traction motor inverter A/C auto amp. PDM (Power Delivery Module) VCM
	NFIRMATION PROCEDU	JRE	
• Turn po	wer switch OFF and wait at ure that 12V battery voltage		
~	>> GO TO 2. ORM DTC CONFIRMATION	PROCEDURE-1	
 Conr Disco Turn Chec Is DTC do YES NO-1 (w NO-2 (w 	nect EVSE (with AC power in connect EVSE and wait at lea power switch ON. ck DTC.	iagnosis Procedure". TO 3. INSPECTION END	
1. Turn 2. Cheo		dicator is not illuminating, and wait at least 20 sec	conds.
4. Start 5. Stop 6. Turn	nect quick charge connector. quick charging and wait at lea quick charge and wait at lea power switch ON. & DTC.	east 60 seconds.	
	<u>etected?</u> >> Proceed to <u>EVC-251, "Di</u> >> INSPECTION END	agnosis Procedure".	
Diagnosis Procedure			
1. PERF	ORM SELF-DIAGNOSIS OF	F A/C AUTO AMP.	
With C	ONSULT		

(B) With CONSULT Perform self-diagnosis of A/C auto amp. <u>Is DTC detected?</u> A

INFOID:000000008747123

EVC

P312F CHARGE OFF ERROR

< DTC/CIRCUIT DIAGNOSIS >

- YES >> Check the DTC. Refer to <u>HAC-58. "DTC Index"</u> [auto A/C (with heat pump)] or <u>HAC-260. "DTC Index"</u> [auto A/C (without heat pump)].
- NO >> GO TO 2.

2.PERFORM SELF-DIAGNOSIS OF POWER DELIVERY MODULE

With CONSULT

Perform self-diagnosis of PDM (Power Delivery Module).

Is DTC detected?

YES >> Check the DTC. Refer to <u>VC-34, "DTC Index"</u>.

NO >> GO TO 3.

$\mathbf{3}$. PERFORM SELF-DIAGNOSIS OF TRACTION MOTOR INVERTER

With CONSULT

Perform self-diagnosis of traction motor inverter.

Is DTC detected?

YES >> Check the DTC. Refer to TMS-28, "DTC Index".

NO >> GO TO 4.

4.PERFORM SELF-DIAGNOSIS OF LBC

With CONSULT

Perform self-diagnosis of LBC.

Is DTC detected?

YES >> Check the DTC. Refer to EVB-45, "DTC Index".

NO >> GO TO 5.

5. PERFORM DTC CONFIRMATION PROCEDURE AGAIN

With CONSULT

- 1. Erase DTC.
- 2. Perform DTC confirmation procedure again. Refer to EVC-251, "DTC Logic".

Is DTC "P312F" detected again?

YES >> Replace VCM. Refer to EVC-426, "Removal and Installation".

NO >> INSPECTION END

< DTC/CIRCUIT DIAGNOSIS >

P3131 SYSTEM SHUTOFF ERROR

DTC Logic

INFOID:000000008747125

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DTC DETECTION LOGIC

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	Possible cause
P3131	SYSTEM SHUTOFF TIMEOUT (System shut-off time out)	 When before shutdown, all of the following conditions are fulfilled for 31 minutes or more. VCM does not receive a EV system activation request signal. Either of EV system CAN connection unit is not shutdown 	 Harness or connectors LBC Traction motor inverter PDM (Power Delivery Module) Electric shift control module (built in to VCM) A/C auto amp. TCU VCM
	NFIRMATION PROCEDU	RE	
1. PREC	ONDITIONING		
	ower switch OFF and wait at		
NOTE:	ure that 12V battery voltage	is it v of more.	
Disconne	ect the CONSULT if it is conn	ected.	
	>> GO TO 2.		
-	ORM DTC CONFIRMATION	PROCEDURE-1	
	CONSULT		
1. Turn	power switch ON.		
2. Turn NOT	power switch OFF and wait E :	at least 35 minutes.	
		utoff of VCM, the next step can be performed wit f self shutoff, check that the power supply termin	
curre	ent sensor changes to approx		al voltage of the battery
	power switch ON. ck DTC.		
	etected?		
	>> Proceed to <u>EVC-254, "Di</u>	agnosis Procedure".	
^	>> GO TO 3.		
	ORM DTC CONFIRMATION	PROCEDURE-2	
	power switch OFF. ck that the charging status in	dicator is not illuminating, and wait at least 20 se	conds.
		put) and wait at least 10 seconds.	
4. Disc NOT	onnect EVSE and wait at lea E:	st 55 minutes.	
utes	To confirm the completion o	utoff of VCM, the next step can be performed wit f self shutoff, check that the power supply termin	
	ent sensor changes to approx ck DTC.		
<u>ls DTC d</u>	etected?		
YES	>> Proceed to EVC-254, "Di	agnosis Procedure".	

- YES >> Proceed to EVC-254. "Diagnosis Procedure".
- NO >> INSPECTION END

< DTC/CIRCUIT DIAGNOSIS >

Diagnosis Procedure

INFOID:000000009325612

1.CHECK VCM POWER SUPPLY-1

- 1. Turn power switch ON.
- 2. Check the voltage between IPDM E/R harness connector and ground.

IPDN	+ /I E/R	_	Voltage
Connector	Terminal		
E15	57	Ground	12V battery volt- age

Is the inspection result normal?

YES >> GO TO 3.

NO >> GO TO 2.

2.CHECK FUSE

1. Turn power switch OFF.

2. Pull out #55 fuse.

3. Check the fuse is not fusing.

Is the inspection result normal?

YES >> Replace IPDM E/R. Refer to PCS-29, "Removal and Installation".

NO >> Replace the fuse after repairing the applicable circuit.

3.CHECK VCM POWER SUPPLY-2

- 1. Turn power switch OFF.
- 2. Disconnect VCM harness connector.

3. Turn power switch ON.

4. Check the voltage between VCM harness connector and ground.

V	+ CM	_	Voltage
Connector	Terminal		
E61	51	Ground	12V battery volt- age

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 4.

4.CHECK VCM POWER SUPPLY CIRCUIT

1. Turn power switch OFF.

2. Disconnect IPDM E/R harness connector.

3. Check the continuity between VCM harness connector and IPDM E/R harness connector.

	+		_	
IPDN	/I E/R	V	СМ	Continuity
Connector	Terminal	Connector	Terminal	
E15	57	E61	51	Existed

Is the inspection result normal?

YES >> Check intermittent incident. Refer to <u>GI-53, "Intermittent Incident"</u>.

NO >> Repair or replace error-detected parts.

5.CHECK VCM POWER SUPPLY-3

1. Turn power switch OFF.

< DTC/CIRCUIT DIAGNOSIS >

Disconnect VCM harness connector.
 Check the voltage between VCM harness connector and ground.

	+			
V	СМ	_	Voltage	
Connector	Terminal		3-	
E62	74	Ground	0 V	
Is the inspectio	n result normal?	?		
NO >> GC) TO 7.) TO 6. M POWER SUP	PLY-4		
	t ignition relay-2 voltage betweer		connector and	ground.
	+			
V	СМ	_	Voltage	
Connector	Terminal			
E62	74	Ground	0 V	
YES >> The NO >> The circ	cuits.	2 may stick to C een fuse block	and VCM may	become shorted with power. Check the related
CHECK TR			OWER SUPP	Y (POWER ON) CIRCUIT
	VCM harness of			
	t traction motor i r switch ON and		s connector (F	3).
	nfirmation proce		<u>EVC-253, "DT</u>	<u>C Logic"</u> .
<u>s DTC "P3131</u>	<u>'detected?</u>			
) TO 8.	· · · · · · · · · · · · · · · · · · ·		
^		•		VER ON) circuit for short to power.
	POWER SUP			
	r switch OFF. traction motor in	nverter harness	connector	
	t LBC harness c			
	r switch ON and			
s "Perform co	nfirmation proce		<u>=vu-200, DI</u>	
) TO 9.			
		supply (POWE	R ON) circuit f	or short to power.
9. CHECK PDI	M (POWER DEI		LE) POWER S	UPPLY (POWER ON) CIRCUIT
1. Turn powe	r switch OFF.			
	LBC harness co			
	t PDM (Power D r switch ON and) namess conr	ECIOI (F23).
	infirmation proce		<u>EVC-253, "DT</u>	<u>C Logic"</u> .
0 DTC "D3131	" detected?			
<u>SDIC F3131</u>				
YES >> GC) TO 10.			
YES >> GC NO >> Ch				ON) circuit for short to power.

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< DTC/CIRCUIT DIAGNOSIS >

- 2. Reconnect PDM (Power Delivery Module) harness connector.
- 3. Disconnect A/C auto amp. harness connector (M55).
- 4. Turn power switch ON and erase DTC.
- 5. Perform confirmation procedure. Refer to EVC-253, "DTC Logic".

Is DTC "P3131" detected?

YES-1 (With TCU)>>GO TO 11.

YES-2 (Without TCU)>>GO TO 12.

NO >> Check A/Ć auto amp. power supply (POWER ON) circuit for short to power.

11. CHECK TCU POWER SUPPLY (POWER ON) CIRCUIT

- 1. Turn power switch OFF.
- 2. Reconnect A/C auto amp. harness connector.
- 3. Disconnect TCU harness connector (M67).
- 4. Turn power switch ON and erase DTC.
- Perform confirmation procedure. Refer to <u>EVC-253, "DTC Logic"</u>.

Is DTC "P3131" detected?

YES >> GO TO 12.

NO >> Check TCU power supply (POWER ON) circuit for short to power.

12. CHECK INTERMITTENT INCIDENT

Check intermittent incident. Refer to GI-53, "Intermittent Incident".

Is DTC "P3131" detected?

- YES >> Replace VCM. Refer to EVC-426, "Removal and Installation".
- NO >> Repair or replace error-detected parts.

P3135 SLIGHT COLLISION DETECTION

< DTC/CIRCUIT DIAGNOSIS >

P3135 SLIGHT COLLISION DETECTION

DTC Logic

INFOID:000000009314802

DTC DETECTION LOGIC

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DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	Possible cause	EVC
P3135	SLIGHT COLLISION DETEC- TION (Slight collision detection)	VCM received car crash information signal from air bag diag- nosis sensor unit	 Air bag inflated CAN communication signal Air bag diagnosis sen- sor unit VCM 	D
	ONFIRMATION PROCE	DURE		E
	CK AIR BAG MODULE			_
	nat the air bag modules are <u>g module inflating?</u>	e not inflating.		F
YES	>> Refer to <u>SR-15, "For S</u>	ide and Rollover Collision".		
NO 2.PREC	>> GO TO 2. CONDITIONING			G
	ower switch OFF and wait	at least 20 seconds.		Н
Make s	sure that 12V battery voltag	ge is 11 V or more.		
	>> GO TO 3.			I
3.PERF	FORM DTC CONFIRMATIO	ON PROCEDURE		
	ver switch ON and wait at I detected?	east 5 seconds.		J
YES	>> Proceed to EVC-257."	Diagnosis Procedure".		
NO	>> INSPECTION END			K
	osis Procedure		INFOID:000000009325617	
		N OF AIR BAG MODULE REPLACEMENT		L
	see if there is a record of a	air bag module replacement.		
YES	>> GO TO 2.			Μ
	>> GO TO 3. FORM DTC CONFIRMATIO			
$\frac{\mathbf{Z}_{\mathbf{F}}}{1}$		JN PROCEDURE AGAIN		Ν
2. Perf	orm DTC confirmation proc	cedure again. Refer to <u>EVC-258, "DTC Logic"</u> .		
<u>Is DTC "</u> YES	P3135" detected again? >> GO TO 3.			0
NO	>> INSPECTION END			
	CK SLIGHT COLLISION D	ETECTION SIGNAL		Ρ
	CONSULT CONSULT screen, select "E	EV/HEV" >> "DATA MONITOR" >> "LIGHT CRASH 、	JUDGMENT".	
<u>Is indica</u>	ted "0"?			

YES >> Replace VCM. Refer to EVC-426, "Removal and Installation".

NO >> Replace air bag diagnosis sensor unit. Refer to <u>SR-38, "Removal and Installation"</u>.

P3137 CAR CRASH DETECTION

< DTC/CIRCUIT DIAGNOSIS >

P3137 CAR CRASH DETECTION

DTC Logic

INFOID:000000008747127

DTC DETECTION LOGIC

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	Possible cause
P3137	CAR CLASH (Car crash)	VCM received slight collision detection signal from air bag diag- nosis sensor unit	 Air bag inflated CAN communication signal Air bag diagnosis sen- sor unit VCM

DTC CONFIRMATION PROCEDURE

1.CHECK AIR BAG MODULE

Check that the air bag modules are not inflating.

Is air bag module inflating?

- YES >> Refer to <u>SR-15</u>, "For Side and Rollover Collision".
- NO >> GO TO 2.

2. PRECONDITIONING

• Turn power switch OFF and wait at least 20 seconds.

• Make sure that 12V battery voltage is 11 V or more.

>> GO TO 3.

3. PERFORM DTC CONFIRMATION PROCEDURE

Turn power switch ON and wait at least 5 seconds.

Is DTC detected?

YES >> Proceed to EVC-258, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000008747128

1. CHECK THE IMPLEMENTATION OF AIR BAG MODULE REPLACEMENT

Check to see if there is a record of air bag module replacement.

Is there a record of air bag module replacement?

YES >> GO TO 2.

NO >> GO TO 3.

2. PERFORM DTC CONFIRMATION PROCEDURE AGAIN

1. Erase DTC.

2. Perform DTC confirmation procedure again. Refer to EVC-258, "DTC Logic".

Is DTC "P3137" detected again?

YES >> GO TO 3.

NO >> INSPECTION END

3. CHECK SLIGHT COLLISION DETECTION SIGNAL

With CONSULT

On the CONSULT screen, select "EV/HEV" >> "DATA MONITOR" >> "CLASH DETECT INFO".

Is indicated "##"?

YES >> Replace VCM. Refer to EVC-426, "Removal and Installation".

NO >> Replace air bag diagnosis sensor unit. Refer to <u>SR-38, "Removal and Installation"</u>.

P3141 PDM (POWER DELIVERY MODULE)

< DTC/CIRCUIT DIAGNOSIS >

P3141 PDM (POWER DELIVERY MODULE)

Description

If the situation is not improved under the operation of the Charge Insulation Resistance Loss Protection Control, VCM stops charging and detects DTC P3141. For details of the protection control, refer to EVC-425. "Description".

DTC Logic

DTC DETECTION LOGIC NOTE:

If DTC P3141 is displayed with other DTC, first perform the trouble diagnosis for other DTC.

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	Possible cause
P3141	PDM (POWER DELIVERY MODULE) [PDM (Power Delivery Mod- ule)]	The Charge Insulation Resistance Loss Protection Control is repeated more than the specified number of times.	PDM (Power Delivery Module)
DTC CC	ONFIRMATION PROCE	DURE	
1.PERF	FORM DTC CONFIRMATI	ON PROCEDURE	
NOTE: Since thi	is DTC is difficult to be cor	nfirmed, check component function to judge the norm	nality.
	>> Proceed to EVC-259.	Component Function Check	
Compo	onent Function Chec	k	INFOID:00000008747131
1.CHEC	CK OPERATIONAL HISTC	ORY OF CHARGE INSULATION RESISTANCE LOS	S PROTECTION CON-
1. Turn 2. Perf	CONSULT n power switch OFF and w form normal charging at lea JTION:		
Nev 3. On t 4. Che	er turn ON the power sw	ritch during normal charging. ect "EV/HEV" >> "DATA MONITOR" >> "PRTCTN CI	NT OPERAT HIST 1".
YES	>> INSPECTION END		I
NO	>> Proceed to EVC-259.	"Diagnosis Procedure".	
Diagno	sis Procedure		INFOID:00000008747132
1.PERF	FORM SELF-DIAGNOSIS		
	CONSULT self-diagnosis of VCM.		(
	other than P3141 detected	?	
YES NO		to <u>EVC-102</u> , "DTC Index".	
2.REPL	ACE PDM (POWER DEL	IVERY MODULE)	
1. Rep 2. Turr	lace PDM (Power Delivery power switch ON.	/ Module). Refer to <u>VC-119, "Removal and Installation</u>	<u>n"</u> .
	se self-diagnostic result. n power switch OFF.		

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INFOID:000000008747129

INFOID:000000008747130

P3141 PDM (POWER DELIVERY MODULE)

< DTC/CIRCUIT DIAGNOSIS >

5. Perform normal charge at least 15 seconds. CAUTION:

Never turn the power switch to ON during normal charge.

- 6. Check that normal charge operates normally.
- 7. Stop normal charge.
- 8. Check self-diagnostic result of VCM and PDM (Power Delivery Module).

Is any DTC detected?

- YES >> Check the DTC. Refer to <u>EVC-102, "DTC Index"</u> (VCM), <u>VC-34, "DTC Index"</u> [PDM (Power Delivery Module)].
- NO >> INSPECTION END

P315C CHARGE RELAY

< DTC/CIRCUIT DIAGNOSIS >

P315C CHARGE RELAY

DTC Logic

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INFOID:000000008747133

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DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	Possible cause
P315C	CHARGE RELAY (Charge relay)	VCM detects DTC P31CA or P31CB.	Harness or connectorsNormal charge relayPDM (Power Delivery Module)
	IFIRMATION PROCED	DURE	
	CTION START		
		31CA or P31CB is detected. If this D	C is displayed, perform trouble diag
osis for D	TC P31CA or P31CB.		
>	> Proceed to <u>EVC-261, "</u>	Diagnosis Procedure".	
Diagnos	is Procedure		INFOID:00000008747134
Perform tro	ouble diagnosis for P31C	A or P31CB. Refer to <u>EVC-322, "DTC</u>	<u>Logic"</u> .

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< DTC/CIRCUIT DIAGNOSIS >

P315E ABS/VDC

DTC Logic

INFOID:000000008747135

DTC DETECTION LOGIC

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	Possible cause
P315E	VDC SYSTEM (VDC system)	VCM detected torque request signal error for 2 seconds	 ABS actuator and electric unit (control unit) VCM

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

• Turn power switch OFF and wait at least 20 seconds.

• Make sure that 12V battery voltage is 11 V or more.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT

- Turn power switch OFF and wait at least 60 seconds.
- 2. Turn power switch OFF and wait at least 10 seconds.
- 3. Check DTC.

Is DTC detected?

- YES >> Proceed to EVC-262, "Diagnosis Procedure".
- NO >> INSPECTION END

Diagnosis Procedure

1.PERFORM SELF-DIAGNOSIS OF VCM

Perform self-diagnosis of VCM.

Is DTC detected other than P315E?

- YES >> Check the DTC. Refer to EVC-102, "DTC Index".
- NO >> GO TO 2.

2.REPLACE ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

- 1. Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-176, "Removal and Installation"</u>.
- 2. Erase DTC.
- 3. Perform DTC confirmation procedure. Refer to EVC-262, "DTC Logic".

Is DTC "P315E" detected again?

- YES >> Replace VCM. Refer to EVC-426, "Removal and Installation".
- NO >> INSPECTION END

INFOID:000000008747136

P316A MOTOR SPEED

< DTC/CIRCUIT DIAGNOSIS >

P316A MOTOR SPEED

DTC Logic

INFOID:000000008747139

DTC DETECTION LOGIC

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DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	Possible cause
P316A	MOTOR SPEED (Motor speed)	VCM received motor speed invalid value from traction motor inverter.	Traction motor inverter
DTC CC	ONFIRMATION PROCE	DURE	
1. PREC	CONDITIONING		
	ower switch OFF and wai sure that 12V battery volta		
7	>> GO TO 2. FORM DTC CONFIRMAT		
		ION PROCEDURE-1	
1. Set		d wait at least 60 seconds.	
	ck DTC. letected?		
YES	>> Proceed to EVC-263,	"Diagnosis Procedure".	
NO 3.pfrf	>> GO TO 3. FORM DTC CONFIRMAT	ION PROCEDURE-2	
	CONSULT		
	orm test drive. ck DTC.		
	letected?		
YES NO	>> Proceed to EVC-263, >> INSPECTION END	"Diagnosis Procedure".	
	sis Procedure		INFOID:00000000874714
		OF TRACTION MOTOR INVERTER	
9	CONSULT		
Perform	self-diagnosis of traction	motor.	
	>> Perform diagnosis pro	ocedure of detected DTC. Refer to TMS-28, "DTC Ind	<u>ex"</u> .

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P316C, P316D, P316E PDM (POWER DELIVERY MODULE)

< DTC/CIRCUIT DIAGNOSIS >

P316C, P316D, P316E PDM (POWER DELIVERY MODULE)

DTC Logic

INFOID:000000009314804

DTC DETECTION LOGIC

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition	Possible cause
P316C	PD MODULE SYSTEM		
P316D	(Power Delivery Module	VCM receives a DTC detection signal sent from PDM (Pow- er Delivery Module).	PDM (Power Delivery Mod- ule)
P316E	system)		

DTC CONFIRMATION PROCEDURE

1.INSPECTION START

NOTE:

This DTC is displayed when PDM (Power Delivery Module) detects a DTC. If the DTC is displayed, perform trouble diagnosis for a DTC that detected by PDM (Power Delivery Module).

>> Proceed to EVC-264, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:000000009314805

Perform the self-diagnosis of PDM (Power Delivery Module).

P316F PDM (POWER DELIVERY MODULE)

< DTC/CIRCUIT DIAGNOSIS >

P316F PDM (POWER DELIVERY MODULE)

DTC Logic

INFOID:000000008747141

DTC DETECTION LOGIC

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	Possible cause
P316F	PD MODULE SYSTEM (Power delivery Module system)	The charge electricity of the PDM (Power Delivery Module) is less than 0.1KW	 Harness or connector PDM (Power Delivery Module) VCM
DTC CC	ONFIRMATION PROC	EDURE	
1.PREC	CONDITIONING		
	ower switch OFF and wa sure that 12V battery vol		
-	>> GO TO 2.		
2.PERF	FORM DTC CONFIRMA	TION PROCEDURE-1	
	orm normal charging and power switch ON.	d wait at least 10 minutes.	
	ck DTC.		
	letected?		
	>> Proceed to <u>EVC-265</u> ithout quick charge port) ith quick charge port)>>0		
3.PERF	FORM DTC CONFIRMA	TION PROCEDURE-2	
 Perf Turr 	n power switch OFF. form quick charging and n power switch ON. ck DTC.	wait at least 10 minutes.	
<u>Is DTC o</u> YES NO	<u>letected?</u> >> Proceed to <u>EVC-265</u> >> INSPECTION END	i, "Diagnosis Procedure".	
Diagno	osis Procedure		INFOID:0000000874714
1. CHE	CK PDM (POWER DELI	VERY MODULE) OUTPUT POWER-1	
1. Turr 2. Perf	CONSULT power switch OFF. form normal charging. power switch ON.		
		elect "EV/HEV" >> "DATA MONITOR" >> "OBC OUT P	WR".
Is value			
YES NO-1 (v	>> GO TO 3. with quick charge port)>>	>GO TO 2.	
NO-2 (without quick charge por	t)>>Replace VCM. Refer to <u>EVC-426, "Removal and li</u> /ERY MODULE) OUTPUT POWER-2	nstallation".

- 1. Turn power switch OFF.
- 2. Perform quick charging.
- 3. Turn power switch ON.
- 4. On the CONSULT screen, select "EV/HEV" >> "DATA MONITOR" >> "OBC OUT PWR".

EVC-265

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P316F PDM (POWER DELIVERY MODULE)

< DTC/CIRCUIT DIAGNOSIS >

Is value 0 kW?

- YES >> INSPECTION END (quick charger malfunction)
- NO >> Replace VCM. Refer to EVC-426, "Removal and Installation".

3.PERFORM SELF-DIAGNOSIS OF PDM (POWER DELIVERY MODULE)

Perform self-diagnosis of PDM (Power Delivery Module).

Is any DTC detected?

- YES >> Check the DTC. Refer to <u>VC-34, "DTC Index"</u>.
- NO >> Check to see if there is a factor causing a situation that battery charge does not start. Refer to EVC-412, "Symptom Index".

P3170, P3171 PDM (POWER DELIVERY MODULE)

< DTC/CIRCUIT DIAGNOSIS >

P3170, P3171 PDM (POWER DELIVERY MODULE)

DTC Logic

INFOID:000000009314806 DTC DETECTION LOGIC В CONSULT screen terms DTC DTC detection condition Possible cause (Trouble diagnosis content) EVC P3170 PD MODULE SYSTEM VCM receives a DTC detection signal sent from PDM (Pow-PDM (Power Delivery Mod-(Power Delivery module er Delivery Module). ule) P3171 system) D DTC CONFIRMATION PROCEDURE **1.**INSPECTION START Е NOTE: This DTC is displayed when PDM (Power Delivery Module) detects a DTC. If the DTC is displayed, perform trouble diagnosis for a DTC that detected by PDM (Power Delivery Module). F >> Proceed to EVC-267, "Diagnosis Procedure". Diagnosis Procedure INFOID:000000009314807 Perform the self-diagnosis of PDM (Power Delivery Module). Н Κ L Μ Ν Ο

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P3172, P3173 PDM (POWER DELIVERY MODULE)

< DTC/CIRCUIT DIAGNOSIS >

P3172, P3173 PDM (POWER DELIVERY MODULE)

DTC Logic

INFOID:000000008747143

DTC DETECTION LOGIC

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	Possible cause
P3172	PD MODULE SYSTEM	VCM detects an error signal that is received from PDM (Power	PDM (Power Delivery
P3173	(Power Delivery Module sys- tem)	Delivery Module) via EV system CAN communication.	Module)

DTC CONFIRMATION PROCEDURE

1.INSPECTION START

NOTE:

This DTC is displayed when PDM (Power Delivery Module) detects a DTC. If the DTC is displayed, perform trouble diagnosis for a DTC that detected by PDM (Power Delivery Module).

>> Proceed to EVC-268, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:000000008747144

Perform the self-diagnosis of PDM (Power Delivery Module).

P3175 VCM

< DTC/CIRCUIT DIAGNOSIS >

P3175 VCM

DTC Logic

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INFOID:000000008747145

DTC DETECTION LOGIC

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г	``	
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DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	Possible cause	EVC
P3175	VCM (VCM)	VCM detects a CAN error signal that is received from electric shift control module via CAN communication for 0.1 seconds or more.	VCM	D
	ONFIRMATION PROCE	DURE		D
1 .PREC	CONDITIONING			F
	ower switch OFF and wait sure that 12V battery volta			
• WARES		ge is it voi more.		_
_	>> GO TO 2.			F
2.PERF	FORM DTC CONFIRMATI	ON PROCEDURE		
	power switch ON and wa	it at least 5 seconds.		G
	letected?			
	>> Proceed to <u>EVC-269</u> , >> INSPECTION END	"Diagnosis Procedure".		Η
Diagno	sis Procedure		INFOID:00000008747146	
1.REPL	ACE VCM			
Replace	the VCM. Refer to EVC-4	26, "Removal and Installation".		J
	>> INSPECTION END			K
				I.

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< DTC/CIRCUIT DIAGNOSIS >

P3176 TRACTION MOTOR INVERTER CONDENSER

DTC Logic

INFOID:000000008747147

DTC DETECTION LOGIC

NOTE:

If DTC P3176 is displayed with DTC P0A94, P311C, P317A, P3191, P319C, P31A7, P31D4, P31D7, or P31DD, perform diagnosis for DTC P0A94, P311C, P317A, P3191, P319C, P31A7, P31D4, P31D7, or P31DD.

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	Possible cause
P3176	INVERTER CONDENSER (Inverter condenser)	Immediately before READY or the start of charge, pre-charging cannot be performed for 5 seconds or more.	 High voltage harness LBC PDM (Power Delivery Module) Traction motor inverter VCM

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

• Turn power switch OFF and wait at least 20 seconds.

• Make sure that 12V battery voltage is 11 V or more.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT

1. Set the vehicle to READY and wait at least 10 seconds.

2. Check DTC.

Is DTC detected?

YES >> Proceed to EVC-270, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

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.
- 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 EVC-11, "High Voltage Precautions".

CAUTION:

- Never bring the vehicle into the READY status with the service plug removed unless otherwise instructed in the Service Manual. A malfunction may occur if this is not observed.
- Erase DTC after the work is completed.
- **1.**PERFORM SELF-DIAGNOSIS OF VCM

INFOID:000000008747148

< DTC/CIRCUIT DIAGNOSIS >

(P)With CONSULT Perform self-diagnosis of VCM. А Is DTC detected other than P3176? YES >> Check the DTC. Refer to EVC-102, "DTC Index". В NO >> GO TO 2. 2. PRECONDITIONING WARNING: EVC Disconnect high voltage. Refer to GI-33, "How to Disconnect High Voltage". Check voltage in high voltage circuit. (Check that condenser are discharged.) Lift up the vehicle and remove the Li-ion battery under covers. Refer to <u>EVB-194, "Exploded View"</u>. D 2. Disconnect high voltage harness connector and PTC heater harness connector from front side of Li-ion battery. Refer to EVB-194, "Removal and Installation". Measure voltage between high voltage harness connector terminals and PTC heater harness connector 3. terminals. Е

Touching high voltage components without using the appropriate protective equipment will

Standard

cause electrocution.

: 5 V or less

CAUTION:

DANGER:

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

>> GO TO 3.

3.CHECK ELECTRIC COMPRESSOR

Disconnect electric compressor high voltage harness connector.
 Check the short circuit between electric compressor terminals.

With heat pump system

Electric c	Electric compressor				
+	_	Resistance			
Terr	Terminal				
1	1 2				
Without heat pump syste	em				
Electric c	ompressor				
+	Resistance				
Terr	Terminal				
1	3	3 kΩ or more			

Is the inspection result normal?

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< DTC/CIRCUIT DIAGNOSIS >

YES >> GO TO 4.

NO >> Replace electric compressor. And then, GO TO 9. Refer to <u>HA-37, "Removal and Installation"</u> (with heat pump system) or <u>HA-95, "Removal and Installation"</u> (without heat pump system).

4.CHECK PTC HEATER

- 1. Disconnect Li-ion battery harness connector (H19).
- 2. Check the short circuit between Li-ion battery terminals.

With heat pump system

Connected to:		Li-ion battery		
	Connector	+	_	Resistance
	Connector	Terr	minal	
PTC heater	H19	40	41	3 k Ω or more

Without heat pump system

Connected to:		Li-ion battery		
	Connector	+	_	Resistance
	Connector	Terr	ninal	
PTC heater	H19	40	41	$3 \text{ k}\Omega$ or more

Is the inspection result normal?

- YES >> GO TO 5.
- NO >> Replace PTC heater. And then, GO TO 9. Refer to <u>HAC-208, "Removal and Installation"</u> [auto A/C (with heat pump)] or <u>HAC-374, "Removal and Installation"</u> [auto A/C (without heat pump)].

5. CHECK HIGH VOLTAGE HARNESS-1

- 1. Disconnect Li-ion battery harness connector (H3).
- 2. Check the short circuit between Li-ion battery harness connector terminals.

With heat pump system

Connected to:				
	Connector	+	_	Resistance
	Connector	Terr		
PDM (Power Delivery Module)	H3	37	38	3 k Ω or more

Without heat pump system

Connected to:				
	Connector	+	_	Resistance
	Connector	Terminal		
PDM (Power Delivery Module)	H3	37	38	3 k Ω or more

Is the inspection result normal?

YES >> The high voltage harness within Li-ion battery may be shorted. Check the related circuits. And then, GO TO 9.

NO >> GO TO 6.

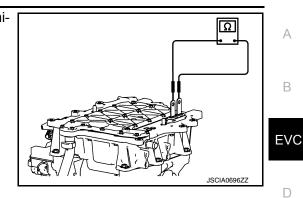
6.CHECK TRACTION MOTOR INVERTER

1. Remove PDM (Power Delivery Module). Refer to <u>VC-119, "Removal and Installation"</u>.

< DTC/CIRCUIT DIAGNOSIS >

2. Check the short circuit between traction motor inverter terminals.

Resistance : more than 3 k Ω



Is the inspection result normal?

- YES >> GO TO 7.
- NO >> Replace traction motor inverter. And then, GO TO 9. Refer to <u>TMS-108, "Removal and Installa-</u> E <u>tion"</u>.

7.CHECK HIGH VOLTAGE HARNESS-2

- 1. Remove high voltage harness from PDM (Power Delivery Module). Refer to <u>VC-126</u>, "Disassembly and <u>Assembly</u>".
- 2. Check the short circuit between high voltage harness connector (Li-ion battery side) and high voltage harness connector [PDM (Power Delivery Module) side].

With heat pump system

	PE	DM (Power Delivery Mod	ule)		H
Connected to:	Connector	+	-	Resistance	
	Connector	Terminal			
Li-ion battery	H5	38	39	$3 \text{ k}\Omega$ or more	

Without heat pump system

	PDM (Power Delivery Module)				.1
Connected to:	Connector	+	_	Resistance	0
			minal		
Li-ion battery	H5	38	39	3 k Ω or more	Κ

3. Check the short circuit between high voltage harness connector (electric compressor side) and high voltage harness connector [PDM (Power Delivery Module) side].

with heat pump system

	PDM (Power Delivery Module)				
Connected to:	Connector	+	-	Resistance	
	Terminal		minal	1	
Electric compressor	H6	42	41	3 kΩ or more	
Without heat pump system	1	1		1	•

Connected to:	PD	OM (Power Delivery Mod	ule)		
	Connector	+	-	Resistance	0
	Connector	Ter	minal		
Electric compressor	H7	41	42	3 kΩ or more	

Is the inspection result normal?

YES >> GO TO 8.

NO >> Replace malfunctioning harness. And then, GO TO 9.

 ${\sf 8.}$ CHECK PDM (POWER DELIVERY MODULE)

Check the short circuit between PDM (Power Delivery Module) terminals.

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< DTC/CIRCUIT DIAGNOSIS >

PDM (Power D		
+	_	Resistance
Terr	*	
38	39	3 k Ω or more

Is the inspection result normal?

- YES >> Check intermittent incident. Refer to GI-53, "Intermittent Incident".
- NO >> Replace PDM (Power Delivery Module). And then, GO TO 9. Refer to <u>VC-119. "Removal and</u> <u>Installation"</u>.

$9. {\tt Replace battery junction box}$

Replace battery junction box. Refer to <u>EVB-219</u>, "BATTERY JUNCTION BOX AND BATTERY HARNESS : <u>Disassembly and Assembly</u>".

>> INSPECTION END

P3177 ECU ACTIVATION ERROR

< DTC/CIRCUIT DIAGNOSIS >

P3177 ECU ACTIVATION ERROR

DTC Logic

DTC DETECTION LOGIC

NOTE:

If DTC P3177 is displayed with DTC P316C, P316D, P316E, P3170, P3171, P3173, P317A, or P3191, perform diagnosis for DTC P316C, P316D, P316E, P3170, P3171, P3173, P317A, or P3191.

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	Possible cause
P3177	ECU ACTIVATION ERROR (ECU activation error)	When EV system starts up, PDM (Power Delivery Module) or traction motor inverter does not permit EV system activa- tion.	 Charging system Traction motor system EVSE Quick charger External input
DTC C	ONFIRMATION PROCE	EDURE	
1.PRE	CONDITIONING		
	oower switch OFF and wa sure that 12V battery volt		
* Wake			
•	>> GO TO 2.		
2.per	FORM DTC CONFIRMAT	ION PROCEDURE-1	
1. Set	CONSULT the vehicle to READY an eck DTC.	d wait at least 200 seconds.	
	detected?		
	>> Proceed to <u>EVC-276</u> <(with quick charge port)>> (without quick charge port)		
3.PER	FORM DTC CONFIRMAT	TION PROCEDURE-2	
1. Tur 2. Che 3. Cor 4. Stat 5. Tur 6. Che	nnect quick charge conne rt quick charging and wait n power switch ON. eck DTC. <u>detected?</u>) seconds.
4.per	FORM DTC CONFIRMAT	TION PROCEDURE-3	
1. Tur 2. Che 3. Cor CA	nnect normal charge conr UTION:	us indicator is not illuminating, and wait at least 20 lector (with AC power input) and wait at least 200 Confirmation Procedure before Diagnosis I	seconds.

Is DTC detected?

>> Proceed to EVC-277, "TYPE 3 : Diagnosis Procedure" YES NO-1 (before performing diagnosis procedure)>>Proceed to EVC-277, "TYPE 3 : Diagnosis Procedure". А

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INFOID:000000008747149

EVC

< DTC/CIRCUIT DIAGNOSIS >

NO-2 (after performing diagnosis procedure)>>INSPECTION END TYPE 1

TYPE 1 : Diagnosis Procedure

INFOID:000000008747150

1. СНЕСК DTC

With CONSULT

Check DTC.

Is any DTC other than P3177 detected?

YES >> Check the DTC. Refer to EVC-102, "DTC Index".

NO >> GO TO 2.

2.CHECK SELF-DIAGNOSTIC RESULT IN TRACTION MOTOR INVERTER

Check self-diagnostic result in "MOTOR".

Is any DTC detected?

YES >> Check the DTC. Refer to <u>EVC-102, "DTC Index"</u>.

NO >> GO TO 3.

3.CHECK SELF-DIAGNOSTIC RESULT IN PDM (POWER DELIVERY MODULE)

With CONSULT

Check self-diagnostic result in "CHARGER/PD MODULE".

Is any DTC detected?

YES >> Check the DTC. Refer to <u>VC-34, "DTC Index"</u>.

NO >> Check intermittent incident. Refer to <u>GI-53, "Intermittent Incident"</u>.

TYPE 2

TYPE 2 : Diagnosis Procedure

INFOID:000000008747151

1.CHECK CONDITION

Check and study the quick charger to see that it is within the specification.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Erase DTC. (Quick charger malfunction)

2.CHECK DTC

With CONSULT

Check DTC.

Is any DTC other than P3177 detected?

YES >> Check the DTC. Refer to EVC-102, "DTC Index".

NO >> GO TO 3.

3. CHECK SELF-DIAGNOSTIC RESULT IN TRACTION MOTOR INVERTER

With CONSULT

Check self-diagnostic result in "MOTOR".

Is any DTC detected?

YES >> Check the DTC. Refer to <u>EVC-102, "DTC Index"</u>.

NO >> GO TO 4.

4.CHECK SELF-DIAGNOSTIC RESULT IN PDM (POWER DELIVERY MODULE)

With CONSULT

Check self-diagnostic result in "CHARGER/PD MODULE".

Is any DTC detected?

YES >> Check the DTC. Refer to <u>VC-34, "DTC Index"</u>.

NO >> Check intermittent incident. Refer to <u>GI-53, "Intermittent Incident"</u>.

< DTC/CIRCUIT DIAGNOSIS >	
TYPE 3	^
TYPE 3 : Diagnosis Procedure INFOLD:00000008747152	A
1.PERFORM NORMAL CHARGING	В
 4. Connect normal charge connector (with AC power input) and wait at least 200 seconds. CAUTION: • Use an EVSE other than the one used for the previous DTC confirmation procedure. 	EVC
Use NISSAN genuine EVSE or an equivalent. Check DTC.	D
Is DTC P3177 detected again? YES >> GO TO 3. NO >> GO TO 2.	E
2.CHECK CONDITION	F
 Check adherence to the following conditions at the occurrence of the malfunction: No interruption in the indoor power and EVSE. Use of the specified EVSE. Proper connection of EVSE. EVSE LED (FAULT) is not ON or blinking. 	G
<u>Is the inspection result normal?</u> YES >> Check intermittent incident. Refer to <u>GI-53, "Intermittent Incident"</u> . NO >> Repair or replace error-detected parts. 3. CHECK DTC	H
(P)With CONSULT	I
Check DTC.	J
<u>Is any DTC other than P3177 detected?</u> YES >> Check the DTC. Refer to <u>EVC-102, "DTC Index"</u> . NO >> GO TO 4.	J
4. CHECK SELF-DIAGNOSTIC RESULT IN PDM (POWER DELIVERY MODULE)	Κ
With CONSULT Check self-diagnostic result in "CHARGER/PD MODULE". Is any DTC detected? YES >> Check the DTC. Refer to VC-34, "DTC Index". NO >> GO TO 5.	L
5. CHECK SELF-DIAGNOSTIC RESULT IN TRACTION MOTOR INVERTER	
 With CONSULT Check self-diagnostic result in "MOTOR". <u>Is any DTC detected?</u> YES >> Check the DTC. Refer to <u>TMS-28, "DTC Index"</u>. NO >> GO TO 6. 6.CHECK CONDITION 	N
Check and study the following items: No interruption in the indoor power and EVSE. Use of the specified EVSE. Proper connection of EVSE. PDM (Power Delivery Module) remains cold. Is the inspection result normal? YES >> Check intermittent incident. Refer to <u>GI-53, "Intermittent Incident"</u> . NO >> Repair or replace error-detected parts.	Ρ

< DTC/CIRCUIT DIAGNOSIS >

P3178 ECU ACTIVATION ERROR

DTC Logic

DTC DETECTION LOGIC

NOTE:

If DTC P3178 is displayed with DTC P0AA0, P317A, P3191, P3193, P319C, P319E, P31A7, or P31A9, perform diagnosis for DTC P0AA0, P317A, P3191, P3193, P319C, P319E, P31A7, or P31A9.

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	Possible cause
P3178	ECU ACTIVATION ERROR (ECU activation error)	When EV system starts up, Li-ion battery or traction motor inverter does not permit EV system activation.	Harness or connectorsLi-ion battery systemTraction motor system

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

• Turn power switch OFF and wait at least 20 seconds.

• Make sure that 12V battery voltage is 11 V or more.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT

- Turn power switch ON and wait at least 20 seconds.
- 2. Check DTC.

Is DTC detected?

YES >> Proceed to EVC-278, "Diagnosis Procedure". NO >> INSPECTION END

Diagnosis Procedure

1.CHECK SELF-DIAGNOSTIC RESULT IN VCM

With CONSULT

Perform self-diagnosis of VCM.

Is DTC other than P3178 detected?

YES >> Check the DTC. Refer to EVC-102. "DTC Index".

NO >> GO TO 2.

2. CHECK SELF-DIAGNOSTIC RESULT IN TRACTION MOTOR INVERTER

With CONSULT

Check self-diagnostic result in "MOTOR".

Is any DTC detected?

YES >> Check the DTC. Refer to <u>TMS-28, "DTC Index"</u>.

NO >> GO TO 3.

3.CHECK SELF-DIAGNOSTIC RESULT IN LI-ION BATTERY CONTROLLER

With CONSULT

Check self-diagnostic result in "HV BAT".

Is any DTC detected?

- YES >> Check the DTC. Refer to EVB-45, "DTC Index".
- NO >> Check high voltage harness connector installation condition of Li-ion battery and traction motor inverter.

INFOID:000000008747153

INFOID:000000008747154

P3179, P317A, P317B TRACTION MOTOR INVERTER

< DTC/CIRCUIT DIAGNOSIS >

P3179, P317A, P317B TRACTION MOTOR INVERTER

DTC Logic

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DTC DETECTION LOGIC

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	Possible cause	EVC
P3179				
P317A	MOTOR SYSTEM (Motor system)	VCM detects an error signal that is received from traction motor inverter via CAN communication for 0.01 seconds or more.	Traction motor inverter	
P317B				D
DTC CC	NFIRMATION PROCE	EDURE		1

1.INSPECTION START

NOTE:

This DTC is displayed when the traction motor inverter detects a DTC. If this DTC is displayed, perform trouble diagnosis for a DTC that detected by traction motor inverter.

>> Proceed to EVC-279, "Diagnosis Procedure".

Diagnosis Procedure

Perform the self-diagnosis of traction motor inverter.

P317D TRACTION MOTOR INVERTER

< DTC/CIRCUIT DIAGNOSIS >

P317D TRACTION MOTOR INVERTER

DTC Logic

INFOID:000000008747157

DTC DETECTION LOGIC

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	Possible cause
P317D	MOTOR SYSTEM (Motor system)	 The estimated torque value from the traction motor inverter to VCM remains greater/smaller than the torque command value from VCM to the traction motor inverter for the specified time. The difference between the estimated power consumption calculated based on a torque value from VCM to the traction motor inverter and the actual power consumption calculated based on a high voltage battery voltage and current is 54 kW or more. 	 Traction motor inverter VCM

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

• Turn power switch OFF and wait at least 20 seconds.

• Make sure that 12V battery voltage is 11 V or more.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT

1. Set the vehicle to READY and perform test drive.

CAUTION:

Always drive vehicle at a safe speed. NOTE:

DTC can be reproduced more easily when vehicle speed is higher.

2. Check DTC.

Is DTC detected?

YES >> Proceed to EVC-280, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000008747158

1. CHECK TRACTION MOTOR TORQUE

With CONSULT

- 1. On the CONSULT screen, select "EV/HEV" >> "DATA MONITOR" >> "TRG MOTOR TORQ 1" and "CUR-RENT MOTOR TORQ".
- 2. Shift selector lever in P range.
- 3. Set the vehicle to READY.
- 4. Check that the difference between values indicated by "TRG MOTOR TORQ 1" and "CURRENT MOTOR TORQ" is within 20 N·m.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace traction motor inverter. Refer to <u>TMS-108, "Removal and Installation"</u>.

2.REPLACE VCM

- 1. Replace VCM. Refer to EVC-426, "Removal and Installation".
- 2. Turn power switch ON and erase DTC.
- 3. Perform DTC confirmation procedure. Refer to EVC-280, "DTC Logic".

Is DTC "P317D" detected again?

YES >> Replace traction motor inverter. Refer to <u>TMS-108. "Removal and Installation"</u>.

P317D TRACTION MOTOR INVERTER

< DTC/CIRCUIT DIAGNOSIS >	
NO >> INSPECTION END	A
	В
	EVC
	D
	E
	F
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P317E, P3180, P3182 LI-ION BATTERY

< DTC/CIRCUIT DIAGNOSIS >

P317E, P3180, P3182 LI-ION BATTERY

DTC Logic

INFOID:000000008747159

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	Possible cause
P317E	HV BATTERY SYSTEM		
P3180	(High voltage battery sys-	VCM detects an error signal that is received from LBC via CAN communication for 0.02 seconds or more.	Li-ion battery system
P3182	tem)		

DTC CONFIRMATION PROCEDURE

1.INSPECTION START

NOTE:

This DTC is displayed when LBC detects a DTC. If this DTC is displayed, perform trouble diagnosis for a DTC that detected by LBC.

>> Proceed to EVC-282, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:000000008747160

Perform the self-diagnosis of LBC.

< DTC/CIRCUIT DIAGNOSIS >

P3183 LI-ION BATTERY

DTC Logic

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INFOID:000000008747161

DTC DETECTION LOGIC

P3183 HV BATTERY SYSTEM (High voltage battery sys- tem) After a lapse of 0.3 seconds from M/C RELAY ON, the following state remains for 2.8 seconds or more: LBC's calculation result to the VCM-second processory - LBC VCM DTC CONFIRMATION PROCEDURE - VCM - VCM 1. PRECONDITIONING - VCM - VCM • Turn power switch OFF and wait at least 20 seconds. - Make sure that 12V battery voltage is 11 V or more. >> GO TO 2. 2. PERFORM DTC CONFIRMATION PROCEDURE @With CONSULT 1. Turn power switch ON and wait at least 5 seconds. 2. Check DTC. Is DTC detected? YES >> Proceed to EVC-283. "Diagnosis Procedure". NO >> INSPECTION END Diagnosis Procedure 1. REPLACE LBC - Meron arease DTC. 3. Perform DTC confirmation procedure. Refer to EVC-283. "DTC Logic". 1. Replace LBC. Refer to EVE-214. "LI-ION BATTERY CONTROLLER : Exploded View". 2. Turn power switch ON and erase DTC. 3. Perform DTC confirmation procedure. Refer to EVC-283. "DTC Logic". Is DTC "P3183" detected again? YES >> Replace VCM. Refer to EVC-426, "Removal and Installation". NO NO >> INSPECTION END	EVC
 1.PRECONDITIONING Turn power switch OFF and wait at least 20 seconds. Make sure that 12V battery voltage is 11 V or more. >> GO TO 2. 2.PERFORM DTC CONFIRMATION PROCEDURE With CONSULT Turn power switch ON and wait at least 5 seconds. Check DTC. Is DTC detected? YES >> Proceed to EVC-283, "Diagnosis Procedure". NO >> INSPECTION END Diagnosis Procedure IncepLace LBC 1. Replace LBC. Refer to EVB-214, "LI-ION BATTERY CONTROLLER : Exploded View". Turn power switch ON and erase DTC. 3. Perform DTC confirmation procedure. Refer to EVC-283, "DTC Logic". Is DTC "P3183" detected again? YES >> Replace VCM. Refer to EVC-426, "Removal and Installation". 	D
 Turn power switch OFF and wait at least 20 seconds. Make sure that 12V battery voltage is 11 V or more. >> GO TO 2. 2.PERFORM DTC CONFIRMATION PROCEDURE @With CONSULT 1. Turn power switch ON and wait at least 5 seconds. 2. Check DTC. Is DTC detected? YES >> Proceed to EVC-283. "Diagnosis Procedure". NO >> INSPECTION END Diagnosis Procedure I.REPLACE LBC 1. Replace LBC. Refer to EVB-214. "LI-ION BATTERY CONTROLLER : Exploded View". 2. Turn power switch ON and erase DTC. 3. Perform DTC confirmation procedure. Refer to EVC-283. "DTC Logic". Is DTC "P3183" detected again? YES >> Replace VCM. Refer to EVC-426, "Removal and Installation". 	
 Make sure that 12V battery voltage is 11 V or more. >> GO TO 2. 2.PERFORM DTC CONFIRMATION PROCEDURE (9) With CONSULT 1. Turn power switch ON and wait at least 5 seconds. 2. Check DTC. Is DTC detected? YES >> Proceed to EVC-283, "Diagnosis Procedure". NO >> INSPECTION END Diagnosis Procedure I.REPLACE LBC 1. Replace LBC. Refer to EVB-214, "LI-ION BATTERY CONTROLLER : Exploded View". 2. Turn power switch ON and erase DTC. 3. Perform DTC confirmation procedure. Refer to EVC-283, "DTC Logic". Is DTC "P3183" detected again? YES >> Replace VCM. Refer to EVC-426, "Removal and Installation". 	_ F
>> GO TO 2. 2.PERFORM DTC CONFIRMATION PROCEDURE Interpretation of the second secon	
2.PERFORM DTC CONFIRMATION PROCEDURE With CONSULT 1. Turn power switch ON and wait at least 5 seconds. 2. Check DTC. Is DTC detected? YES >> Proceed to EVC-283, "Diagnosis Procedure". NO >> INSPECTION END Diagnosis Procedure INFOLX000000000000000000000000000000000000	F
With CONSULT Turn power switch ON and wait at least 5 seconds. Check DTC. Is DTC detected? YES >> Proceed to EVC-283. "Diagnosis Procedure". NO >> INSPECTION END Diagnosis Procedure I.REPLACE LBC Replace LBC. Refer to EVB-214. "LI-ION BATTERY CONTROLLER : Exploded View". Turn power switch ON and erase DTC. Perform DTC confirmation procedure. Refer to EVC-283. "DTC Logic". Is DTC "P3183" detected again? YES >> Replace VCM. Refer to EVC-426. "Removal and Installation". 	
 Turn power switch ON and wait at least 5 seconds. Check DTC. Is DTC detected? YES >> Proceed to EVC-283, "Diagnosis Procedure". NO >> INSPECTION END Diagnosis Procedure INFORCOMMENTATION END Diagnosis Procedure 1. Replace LBC. Refer to EVB-214, "LI-ION BATTERY CONTROLLER : Exploded View". Turn power switch ON and erase DTC. Perform DTC confirmation procedure. Refer to EVC-283, "DTC Logic". Is DTC "P3183" detected again? YES >> Replace VCM. Refer to EVC-426, "Removal and Installation". 	G
Is DTC detected? YES >> Proceed to EVC-283. "Diagnosis Procedure". NO >> INSPECTION END Diagnosis Procedure INFOLCONDEND I. REPLACE LBC 1. Replace LBC. Refer to EVB-214. "LI-ION BATTERY CONTROLLER : Exploded View". 2. Turn power switch ON and erase DTC. 3. Perform DTC confirmation procedure. Refer to EVC-283, "DTC Logic". Is DTC "P3183" detected again? YES YES >> Replace VCM. Refer to EVC-426, "Removal and Installation".	
NO >> INSPECTION END Diagnosis Procedure INFOLD:00000008747 1. REPLACE LBC Interplace LBC. Refer to EVB-214, "LI-ION BATTERY CONTROLLER : Exploded View". 2. Turn power switch ON and erase DTC. Interplace Confirmation procedure. Refer to EVC-283, "DTC Logic". 3. Perform DTC confirmation procedure. Refer to EVC-283, "DTC Logic". Is DTC "P3183" detected again? YES >> Replace VCM. Refer to EVC-426, "Removal and Installation".	Н
Diagnosis Procedure INFORMATION 1. REPLACE LBC Information procedure to EVB-214, "LI-ION BATTERY CONTROLLER : Exploded View". 2. Turn power switch ON and erase DTC. Inform DTC confirmation procedure. Refer to EVC-283, "DTC Logic". 3. Perform DTC confirmation procedure. Refer to EVC-283, "DTC Logic". Is DTC "P3183" detected again? YES >> Replace VCM. Refer to EVC-426, "Removal and Installation".	
 REPLACE LBC Replace LBC. Refer to EVB-214, "LI-ION BATTERY CONTROLLER : Exploded View". Turn power switch ON and erase DTC. Perform DTC confirmation procedure. Refer to EVC-283, "DTC Logic". Is DTC "P3183" detected again? YES >> Replace VCM. Refer to EVC-426, "Removal and Installation". 	162
 Replace LBC. Refer to <u>EVB-214</u>, "<u>LI-ION BATTERY CONTROLLER</u>: Exploded View". Turn power switch ON and erase DTC. Perform DTC confirmation procedure. Refer to <u>EVC-283</u>, "<u>DTC Logic</u>". <u>Is DTC "P3183" detected again?</u> YES >> Replace VCM. Refer to <u>EVC-426</u>, "<u>Removal and Installation</u>". 	702
 Turn power switch ON and erase DTC. Perform DTC confirmation procedure. Refer to <u>EVC-283, "DTC Logic"</u>. <u>Is DTC "P3183" detected again?</u> YES >> Replace VCM. Refer to <u>EVC-426, "Removal and Installation"</u>. 	J
<u>Is DTC "P3183" detected again?</u> YES >> Replace VCM. Refer to <u>EVC-426, "Removal and Installation"</u> .	
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< DTC/CIRCUIT DIAGNOSIS >

P3187 ELECTRIC SHIFT

DTC Logic

INFOID:000000009314808

DTC DETECTION LOGIC

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	Possible cause
P3187	ELECTRIC SHIFT SYSTEM (Electric shift system)	VCM receives a DTC detection signal sent from electric shift control module.	Electric shift control mod- ule (built in to VCM)

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

• Turn power switch ON and wait at least 20 seconds.

• Make sure that 12V battery voltage is 11 V or more.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT

Turn power switch ON and wait at least 5 seconds.

2. Check DTC.

Is DTC detected?

YES >> Proceed to EVC-284, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000009314809

1. CHECK SELF-DIAGNOSTIC RESULT IN ELECTRIC SHIFT CONTROL MODULE

With CONSULT

Check self-diagnostic result in "SHIFT".

Is any DTC detected?

YES >> Check the DTC. Refer to <u>TM-50, "DTC Index"</u>.

NO >> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE AGAIN

With CONSULT

- 1. Erase DTC.
- 2. Perform DTC confirmation procedure again. Refer to EVC-284, "DTC Logic".

Is the DTC "P3187" detected again?

- YES >> Replace VCM. Refer to EVC-426, "Removal and Installation".
- NO >> INSPECTION END

P3188 ELECTRIC SHIFT

< DTC/CIRCUIT DIAGNOSIS >

P3188 ELECTRIC SHIFT

DTC Logic

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INFOID:000000009328752

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DTC DETECTION LOGIC

CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	Possible cause
ELECTRIC SHIFT SYSTEM (Electric shift system)	VCM receives a DTC detection signal sent from electric shift control module.	Electric shift control mod- ule (built in to VCM)
NFIRMATION PROCEDU	JRE	
ONDITIONING		
are that 12 v battery voltage		
>> GO TO 2.		
	N PROCEDURE	
	at least 5 seconds	
	ia manaia Daga a duna "	
	lagnosis Procedure".	
sis Procedure		INFOID:0000000093287
K SELF-DIAGNOSTIC RES	SULT IN ELECTRIC SHIFT CONTROL MODULE	E
-	1″.	
> Check the DTC. Refer to	<u>TM-50, "DTC Index"</u> .	
	N PROCEDURE AGAIN	
	dure again. Refer to <u>EVC-284, "DTC Logic"</u> .	
C "P3188" detected again?		
C "P3188" detected again?	EVC-426. "Removal and Installation".	
C "P3188" detected again? >> Replace VCM. Refer to I	EVC-426. "Removal and Installation".	
	(Trouble diagnosis content) ELECTRIC SHIFT SYSTEM (Electric shift system) NFIRMATION PROCEDU ONDITIONING wer switch ON and wait at 1 ure that 12V battery voltage >> GO TO 2. DRM DTC CONFIRMATION ONSULT power switch ON and wait at k DTC. etected? >> Proceed to EVC-285, "D >> INSPECTION END sis Procedure K SELF-DIAGNOSTIC RES ONSULT If-diagnostic result in "SHIF C detected? >> Check the DTC. Refer to >> GO TO 2. DRM DTC CONFIRMATION ONSULT = DTC.	(Trouble diagnosis content) DTC detecting condition ELECTRIC SHIFT SYSTEM (Electric shift system) VCM receives a DTC detection signal sent from electric shift control module. NFIRMATION PROCEDURE ONDITIONING VCM receives a DTC detection signal sent from electric shift control module. wer switch ON and wait at least 20 seconds. ure that 12V battery voltage is 11 V or more.

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< DTC/CIRCUIT DIAGNOSIS >

P3189 ELECTRIC SHIFT

DTC Logic

INFOID:000000009314810

DTC DETECTION LOGIC

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	Possible cause
P3189	ELECTRIC SHIFT SYSTEM (Electric shift system)	VCM receives a DTC detection signal sent from electric shift control module.	Electric shift control mod- ule (built in to VCM)

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

• Turn power switch ON and wait at least 20 seconds.

• Make sure that 12V battery voltage is 11 V or more.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE-1

With CONSULT

1. Turn power switch ON and wait at least 5 seconds.

2. Check DTC.

Is DTC detected?

YES >> Proceed to EVC-286, "Diagnosis Procedure".

NO >> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE-2

With CONSULT

- 1. Set the vehicle to READY.
- 2. Check DTC.

Is DTC detected?

YES >> Proceed to EVC-286, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000009314811

1.CHECK SELF-DIAGNOSTIC RESULT IN ELECTRIC SHIFT CONTROL MODULE

(B) With CONSULT

Check self-diagnostic result in "SHIFT".

Is any DTC detected?

YES >> Check the DTC. Refer to TM-50, "DTC Index".

NO >> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE AGAIN

With CONSULT

1. Erase DTC.

2. Perform DTC confirmation procedure again. Refer to EVC-286, "DTC Logic".

Is the DTC "P3189" detected again?

YES >> Replace VCM. Refer to EVC-426, "Removal and Installation".

NO >> INSPECTION END

P318A ELECTRIC SHIFT

< DTC/CIRCUIT DIAGNOSIS >

P318A ELECTRIC SHIFT

DTC Logic

INFOID:000000008747165

DTC DETECTION LOGIC

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DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	Possible cause
P318A	ELECTRIC SHIFT SYSTEM (Electric shift system)	Difference between target shift position signal and current shift position signal for 1.6 seconds.	 Electric shift system Electric shift control module (built in to VCM)
DTC C	ONFIRMATION PROCI	EDURE	
1.PRE	CONDITIONING		
	ower switch OFF and wa		
• Make	sure that 12V battery vol		
-	>> GO TO 2.		
2.per	FORM DTC CONFIRMAT	TION PROCEDURE-1	
9		weit at least 20 accords	
2. Tur	n power switch OFF and n power switch ON.		
	ft selector lever in N rang eck DTC.	e and wait at least 20 seconds.	
	detected?		
YES NO	>> Proceed to <u>EVC-287</u> >> GO TO 3.	, "Diagnosis Procedure".	
•	FORM DTC CONFIRMAT	TION PROCEDURE-2	
	CONSULT		
1. Shit		entire position from P to D, and shift it to N position	on.
Hol	d the lever at each position	on for 3 seconds or more.	
	eck DTC. <u>detected?</u>		
YES	>> Proceed to EVC-287	. "Diagnosis Procedure".	
NO	>> INSPECTION END		
Diagno	osis Procedure		INFOID:00000008747166
1. CHE	CK SELF-DIAGNOSTIC	RESULT IN VCM	
	CONSULT		
	elf-diagnostic result in "E detected other than P318		
YES	>> Check the DTC. Refe	er to <u>EVC-102, "DTC_Index"</u> .	
NO 2	>> GO TO 2.		
		RESULT IN ELECTRIC SHIFT CONTROL MODU	ILE
	elf-diagnostic result in "S <u>OTC detected?</u>	HIF I".	
YES	>> Check the DTC. Refe	er to <u>TM-50, "DTC Index"</u> .	
	>> GO TO 3.	TION PROCEDURE AGAIN	
U.PER			

1. Erase DTC.

P318A ELECTRIC SHIFT

< DTC/CIRCUIT DIAGNOSIS >

2. Perform DTC confirmation procedure again. Refer to EVC-287, "DTC Logic".

Is the DTC "P318A" detected again?

YES

>> Replace VCM. Refer to <u>EVC-426</u>, "<u>Removal and Installation</u>".
>> Check intermittent incident. Refer to <u>GI-53</u>, "<u>Intermittent Incident</u>". NO

< DTC/CIRCUIT DIAGNOSIS >

P318B ELECTRIC SHIFT

DTC Logic

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INFOID:000000008747167

DTC DETECTION LOGIC

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	Possible cause
P318B	ELECTRIC SHIFT SYSTEM (Electric shift system)	 VCM detects invalid signal of shift position signal sent from electric shift control module. VCM receives abnormal shift position signal for 0.1 sec- onds or more. 	 Electric shift system Electric control module (built in to VCM)
DTC CO	ONFIRMATION PROCI	EDURE	
1.PRE	CONDITIONING		
• Make	ower switch OFF and wa sure that 12V battery volt >> GO TO 2.	age is 11 V or more.	
2.PERI	FORM DTC CONFIRMAT	TION PROCEDURE	
1. Turr 2. Che	CONSULT n power switch ON and w eck DTC. <u>detected?</u> >> Proceed to <u>EVC-289</u> >> INSPECTION END	vait at least 5 seconds. 	
Diagno	osis Procedure		INFOID:00000009328922
1 .CHE	CK SELF-DIAGNOSTIC	RESULT IN ELECTRIC SHIFT CONTROL MODU	ILE

•••		9
<u>Is any E</u>	DTC det	tected?

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

2.PERFORM DTC CONFIRMATION PROCEDURE AGAIN

With CONSULT

1. Erase DTC.

Perform DTC confirmation procedure again. Refer to EVC-289, "DTC Logic". 2.

Is the DTC "P318B" detected again?

YES >> Replace VCM. Refer to EVC-426, "Removal and Installation".

NO >> INSPECTION END

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< DTC/CIRCUIT DIAGNOSIS >

P318C ELECTRIC SHIFT

DTC Logic

INFOID:000000009314812

DTC DETECTION LOGIC

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	Possible cause
P318C	ELECTRIC SHIFT SYS- TEM (Electric shift system)	Differ between current shift position and shift position sig- nal sent from the electric shift control module.	Electric shift control module (built in to VCM)

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

• Turn power switch ON and wait at least 20 seconds.

• Make sure that 12V battery voltage is 11 V or more.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE-1

With CONSULT

- Turn power switch ON and wait at least 5 seconds.
- 2. Check DTC.

Is DTC detected?

- YES >> Proceed to EVC-291, "Diagnosis Procedure".
- NO >> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE-2

With CONSULT

 $\widetilde{1.}$ Shift the selector lever to the entire position from R to D, and shift it to P position.

CAUTION:

Hold the lever at each position for 15 seconds or more.

2. Check DTC.

Is DTC detected?

YES >> Proceed to EVC-291, "Diagnosis Procedure".

NO >> GO TO 4.

4.PERFORM DTC CONFIRMATION PROCEDURE-3

With CONSULT

- 1. Set the vehicle to READY.
- 2. Drive the vehicle at 15 km/h (10 MPH) with the selector lever in D range. From this condition, shift the selector lever in R range.

CAUTION:

Always drive vehicle at safe speed.

- 3. Stop the vehicle.
- 4. Check DTC.

Is DTC detected?

YES >> Proceed to EVC-291, "Diagnosis Procedure".

NO >> GO TO 5.

5. PERFORM DTC CONFIRMATION PROCEDURE-4

With CONSULT

- Drive the vehicle at 15 km/h (10 MPH) with the selector lever in R range. From this condition, shift the selector lever in D range.
 CAUTION:
 - Always drive vehicle at safe speed.
- 2. Stop the vehicle.

P318C ELECTRIC SHIFT

F310C ELECTRIC SHIFT	
< DTC/CIRCUIT DIAGNOSIS >	
3. Check DTC.	
Is DTC detected?	А
YES >> Proceed to <u>EVC-291, "Diagnosis Procedure"</u> . NO >> GO TO 6.	
6.PERFORM DTC CONFIRMATION PROCEDURE-5	В
(P)With CONSULT	
1. Shift the selector lever to P range and turn power switch OFF.	EVC
 Connect EVSE and start normal charge. Turn power switch ON. 	
 Shift the selector lever to other than P range. Check DTC. 	D
Is DTC detected?	
YES >> Proceed to EVC-291, "Diagnosis Procedure".	_
NO >> INSPECTION END	E
Diagnosis Procedure	
1.PERFORM DTC CONFIRMATION PROCEDURE AGAIN	F
1. Erase DTC.	
 Perform DTC confirmation procedure again. Refer to <u>EVC-290, "DTC Logic"</u>. <u>Is the DTC "P318C" detected again?</u> 	G
YES >> Peplace VCM. Refer to EVC-426, "Removal and Installation".	
NO >> INSPECTION END	Н
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P318D CAN COMMUNICATION

< DTC/CIRCUIT DIAGNOSIS >

P318D CAN COMMUNICATION

DTC Logic

INFOID:000000008747169

DTC DETECTION LOGIC

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	Possible cause
P318D	COMMUNICATION ERROR (Communication error)	When VCM is not transmitting CAN communication signal for 2 seconds or more.	VCM

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

• Turn power switch OFF and wait at least 20 seconds.

• Make sure that 12V battery voltage is 11 V or more.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn power switch ON and wait at least 10 seconds.

2. Check DTC.

Is DTC detected?

YES >> Proceed to EVC-292, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000008747170

1.PERFORM CONFIRMATION PROCEDURE AGAIN

1. Erase DTC.

- 2. Perform confirmation procedure again. Refer to EVC-292, "DTC Logic".
- Is DTC "P318D" detected again?
- YES >> Replace VCM. Refer to EVC-426. "Removal and Installation".
- NO >> Check intermittent incident. Refer to GI-53. "Intermittent Incident".

P3191, P319C, P31A7 EV SYSTEM CAN COMMUNICATION

< DTC/CIRCUIT DIAGNOSIS >

P3191, P319C, P31A7 EV SYSTEM CAN COMMUNICATION

DTC Logic

INFOID:000000008747171

DTC DETECTION LOGIC

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	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	Possible cause
P3191 P319C P31A7	COMMUNICATION ER- ROR (Communication error)	When VCM detects an error signal that is received from traction motor inverter via CAN communication	 CAN communication Traction motor inverter VCM
	ONFIRMATION PROCI	EDURE	
1.PRE	CONDITIONING		
	ower switch OFF and wa sure that 12V battery vol		
າ	>> GO TO 2.		
_	FORM DTC CONFIRMAT	ION PROCEDURE	
	CONSULT n power switch ON and w	ait at least 10 seconds.	
	eck DTC.		
YES	detected? >> Proceed to EVC-293	, "Diagnosis Procedure".	
NO	>> INSPECTION END		
Diagno	osis Procedure		INFOID:00000008747172
1.PER	FORM TROUBLE DIAGN	IOSIS FOR CAN COMMUNICATION	
Perform	trouble diagnosis for CA	N communication. Refer to LAN-16, "Trouble Diagnos	is Flow Chart".
	spection result normal?		
YES NO	>> GO TO 2.>> Repair or replace err	or-detected parts.	
NO			
NO 2.CHE	>> Repair or replace err CK SELF-DIAGNOSTIC CONSULT	RESULT IN VCM	
NO 2.CHE With Check s	>> Repair or replace err CK SELF-DIAGNOSTIC CONSULT elf-diagnostic result in "E	RESULT IN VCM	147 detected?
NO 2.CHE With Check s	>> Repair or replace err CK SELF-DIAGNOSTIC CONSULT elf-diagnostic result in "E V system CAN error (U10 >> GO TO 3.	RESULT IN VCM	1A7 detected?
NO 2.CHE With Check s Is any E YES NO	>> Repair or replace err CK SELF-DIAGNOSTIC CONSULT elf-diagnostic result in "E V system CAN error (U1) >> GO TO 3. >> GO TO 4.	RESULT IN VCM	1A7 detected?
NO 2.CHE With Check s Is any E YES NO 3.REPI	>> Repair or replace err CK SELF-DIAGNOSTIC CONSULT elf-diagnostic result in "E V system CAN error (U10 >> GO TO 3. >> GO TO 4. LACE VCM	RESULT IN VCM	1A7 detected?
NO 2.CHE With Check s Is any E YES NO 3.REP	>> Repair or replace err CK SELF-DIAGNOSTIC CONSULT elf-diagnostic result in "E V system CAN error (U10 >> GO TO 3. >> GO TO 3. >> GO TO 4. LACE VCM CONSULT	RESULT IN VCM V/HEV". 000 excluded) other than DTC P3191, P319C, and P3	1A7 detected?
NO 2.CHE With Check s Is any E YES NO 3.REPI 1. Rep 2. Per	>> Repair or replace err CK SELF-DIAGNOSTIC elf-diagnostic result in "E <u>V system CAN error (U10</u> >> GO TO 3. >> GO TO 4. LACE VCM CONSULT blace VCM. Refer to <u>EVC</u> form DTC confirmation pr	RESULT IN VCM V/HEV". 200 excluded) other than DTC P3191, P319C, and P3 -426, "Removal and Installation". rocedure again. Refer to EVC-293, "DTC Logic".	1A7 detected?
NO 2.CHE With Check s Is any E YES NO 3.REP 0 With 1. Rep 2. Per Is DTC	>> Repair or replace err CK SELF-DIAGNOSTIC elf-diagnostic result in "E <u>V system CAN error (U10</u> >> GO TO 3. >> GO TO 4. LACE VCM CONSULT place VCM. Refer to <u>EVC</u> form DTC confirmation pr P3191, P319C, or P31A7	RESULT IN VCM V/HEV". 000 excluded) other than DTC P3191, P319C, and P3 -426, "Removal and Installation". rocedure again. Refer to EVC-293, "DTC Logic".	
NO 2.CHE With Check s Is any E YES NO 3.REPI 1. Rep 2. Per Is DTC YES NO	>> Repair or replace err CK SELF-DIAGNOSTIC elf-diagnostic result in "E <u>V system CAN error (U10</u> >> GO TO 3. >> GO TO 4. LACE VCM CONSULT place VCM. Refer to <u>EVC</u> form DTC confirmation pr P3191, P319C, or P31A7	RESULT IN VCM V/HEV". 200 excluded) other than DTC P3191, P319C, and P3 -426, "Removal and Installation". rocedure again. Refer to EVC-293, "DTC Logic". detected again? or inverter. Refer to TMS-108, "Removal and Installati	

Perform DTC confirmation procedure again. Refer to <u>EVC-293, "DTC Logic"</u>.

Is DTC P3191, P319C, or P31A7 detected again?

P3191, P319C, P31A7 EV SYSTEM CAN COMMUNICATION

< DTC/CIRCUIT DIAGNOSIS >

- YES >> Replace VCM. Refer to EVC-426, "Removal and Installation".
- NO >> INSPECTION END

P3193, P319E, P31A9 EV SYSTEM CAN COMMUNICATION

< DTC/CIRCUIT DIAGNOSIS >

P3193, P319E, P31A9 EV SYSTEM CAN COMMUNICATION

DTC Logic

INFOID:000000008747173

DTC DETECTION LOGIC

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DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	Possible cause
P3193 P319E P31A9	COMMUNICATION ERROR (Communication error)	When VCM detects an error signal that is received from LBC via CAN communication	CAN communication LBC VCM
DTC CC	ONFIRMATION PROCE	DURE	<u>.</u>
1.PREG	CONDITIONING		
	ower switch OFF and wai sure that 12V battery volta		
2	>> GO TO 2. FORM DTC CONFIRMAT		
		ION PROCEDURE	
1. Turr	n power switch ON and wa	ait at least 10 seconds.	
	ck DTC. <u>detected?</u>		
YES	>> Proceed to EVC-295.	"Diagnosis Procedure".	
NO	>> INSPECTION END		
Diagno	neie Drocoduro		
	osis Procedure		INFOID:000000008747174
1.PERF	FORM TROUBLE DIAGN	OSIS FOR CAN COMMUNICATION	
1.PERF	FORM TROUBLE DIAGN	OSIS FOR CAN COMMUNICATION N communication. Refer to <u>LAN-16, "Trouble Diagnos</u>	
1.PERF Perform Is the ins YES	FORM TROUBLE DIAGN trouble diagnosis for CAN spection result normal? >> GO TO 2.	V communication. Refer to <u>LAN-16, "Trouble Diagnos</u>	
1.PERF Perform Is the ins YES NO	FORM TROUBLE DIAGN trouble diagnosis for CAN spection result normal? >> GO TO 2. >> Repair or replace erro	N communication. Refer to <u>LAN-16, "Trouble Diagnos</u> pr-detected parts.	
1.PERF Perform Is the ins YES NO 2.CHEC	FORM TROUBLE DIAGN trouble diagnosis for CAN <u>spection result normal?</u> >> GO TO 2. >> Repair or replace erro CK SELF-DIAGNOSTIC F	N communication. Refer to <u>LAN-16, "Trouble Diagnos</u> pr-detected parts. RESULT IN VCM	
1.PERF Perform Is the ins YES NO 2.CHEC Check s	FORM TROUBLE DIAGN trouble diagnosis for CAN <u>spection result normal?</u> >> GO TO 2. >> Repair or replace erro CK SELF-DIAGNOSTIC F CONSULT elf-diagnostic result in "EN	N communication. Refer to <u>LAN-16, "Trouble Diagnos</u> or-detected parts. RESULT IN VCM //HEV".	is Flow Chart".
1.PERF Perform Is the ins YES NO 2.CHEO Check s Is any E	FORM TROUBLE DIAGN trouble diagnosis for CAN <u>spection result normal?</u> >> GO TO 2. >> Repair or replace erro CK SELF-DIAGNOSTIC F CONSULT elf-diagnostic result in "EN V system CAN error (U10 >> GO TO 3.	N communication. Refer to <u>LAN-16, "Trouble Diagnos</u> pr-detected parts. RESULT IN VCM	is Flow Chart".
1.PERF Perform Is the ins YES NO 2.CHEC Check so Is any E YES NO	FORM TROUBLE DIAGNA trouble diagnosis for CAN <u>spection result normal?</u> >> GO TO 2. >> Repair or replace error CK SELF-DIAGNOSTIC F CONSULT elf-diagnostic result in "EN <u>V system CAN error (U10</u> >> GO TO 3. >> GO TO 4.	N communication. Refer to <u>LAN-16, "Trouble Diagnos</u> or-detected parts. RESULT IN VCM //HEV".	is Flow Chart".
1.PERF Perform Is the ins YES NO 2.CHEC Check so Is any E YES NO 3.REPL	FORM TROUBLE DIAGN trouble diagnosis for CAN <u>spection result normal?</u> >> GO TO 2. >> Repair or replace erro CK SELF-DIAGNOSTIC F CONSULT elf-diagnostic result in "EN V system CAN error (U10 >> GO TO 3. >> GO TO 4. _ACE VCM	N communication. Refer to <u>LAN-16, "Trouble Diagnos</u> or-detected parts. RESULT IN VCM //HEV".	is Flow Chart".
1.PERF Perform Is the ins YES NO 2.CHEC Check s Is any E YES NO 3.REPL 1. Rep	FORM TROUBLE DIAGNA trouble diagnosis for CAN <u>spection result normal?</u> >> GO TO 2. >> Repair or replace error CK SELF-DIAGNOSTIC F CONSULT elf-diagnostic result in "EN V system CAN error (U10 >> GO TO 3. >> GO TO 3. >> GO TO 4. _ACE VCM CONSULT blace VCM. Refer to EVC-	A communication. Refer to <u>LAN-16, "Trouble Diagnos</u> or-detected parts. RESULT IN VCM //HEV". 100 excluded) other than DTC P3193, P319E, and P3	is Flow Chart".
1.PERF Perform Is the ins YES NO 2.CHEC Check so Is any E YES NO 3.REPL 1. Rep 2. Perf	FORM TROUBLE DIAGNA trouble diagnosis for CAN <u>spection result normal?</u> >> GO TO 2. >> Repair or replace error CK SELF-DIAGNOSTIC F CONSULT elf-diagnostic result in "EN V system CAN error (U10 >> GO TO 3. >> GO TO 3. >> GO TO 4. _ACE VCM CONSULT blace VCM. Refer to EVC form DTC confirmation pro-	A communication. Refer to <u>LAN-16, "Trouble Diagnos</u> or-detected parts. RESULT IN VCM //HEV". <u>100 excluded) other than DTC P3193, P319E, and P3</u> 426, <u>"Removal and Installation"</u> . ocedure again. Refer to <u>EVC-295, "DTC Logic"</u> .	is Flow Chart".
1.PERF Perform Is the ins YES NO 2.CHEC Check so Is any E YES NO 3.REPL 1. Rep 2. Perf	FORM TROUBLE DIAGNA trouble diagnosis for CAN <u>spection result normal?</u> >> GO TO 2. >> Repair or replace error CK SELF-DIAGNOSTIC F CONSULT elf-diagnostic result in "EN V system CAN error (U10 >> GO TO 3. >> GO TO 3. >> GO TO 4. _ACE VCM CONSULT blace VCM. Refer to EVC- form DTC confirmation pro- 23193. P319E, or P31A9	A communication. Refer to <u>LAN-16, "Trouble Diagnos</u> or-detected parts. RESULT IN VCM //HEV". <u>100 excluded) other than DTC P3193, P319E, and P3</u> 426, <u>"Removal and Installation"</u> . ocedure again. Refer to <u>EVC-295, "DTC Logic"</u> .	is Flow Chart". 1A9 detected?

1. Replace LBC. Refer to EVB-214, "LI-ION BATTERY CONTROLLER : Removal and Installation".

2. Perform DTC confirmation procedure again. Refer to EVC-295, "DTC Logic".

Is DTC P3193, P319E, or P31A9 detected again?

P3193, P319E, P31A9 EV SYSTEM CAN COMMUNICATION

< DTC/CIRCUIT DIAGNOSIS >

- YES >> Replace VCM. Refer to EVC-426, "Removal and Installation".
- NO >> INSPECTION END

P3194, P319F, P31AA CAN COMMUNICATION

< DTC/CIRCUIT DIAGNOSIS >

P3194, P319F, P31AA CAN COMMUNICATION

DTC Logic

INFOID:000000008747175

DTC DETECTION LOGIC

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P3194 P319F P31AA COMMUNICATION ERROR (Communication error) When VCM detects an error signal that is received from ABS actuator and electric unit (control unit) via CAN communication • CAN communication ABS actuator and ele tric unit (control unit) via CAN communication DTC CONFIRMATION PROCEDURE • Turn power switch OFF and wait at least 20 seconds. • VCM • Turn power switch OFF and wait at least 20 seconds. • Make sure that 12V battery voltage is 11 V or more. >> GO TO 2. 2.PERFORM DTC CONFIRMATION PROCEDURE @With CONSULT 1. Turn power switch ON and wait at least 10 seconds. 1. Turn power switch ON and wait at least 10 seconds. 2. Check DTC. Is DTC detected? YES YES > Proceed to EVC-297. "Diagnosis Procedure". NO NO >> INSPECTION END Diagnosis Procedure seconconcert 1.PERFORM TROUBLE DIAGNOSIS FOR CAN COMMUNICATION Perform trouble diagnosis for CAN communication. Refer to LAN-16. "Trouble Diagnosis Flow Chart". Is the inspection result normal? YES > GO TO 2. NO NO >> Repair or replace error-detected parts. 2. CHECK SELF-DIAGNOSTIC RESULT IN VCM @With CONSULT Check self-diagnostic result in "EV/HEV". @With CONSULT Check self-diagnostic result in "EV/HEV".	EV
 1.PRECONDITIONING Turn power switch OFF and wait at least 20 seconds. Make sure that 12V battery voltage is 11 V or more. >> GO TO 2. 2.PERFORM DTC CONFIRMATION PROCEDURE @With CONSULT Turn power switch ON and wait at least 10 seconds. Check DTC. Is DTC detected? YES >> Proceed to EVC-297. "Diagnosis Procedure". NO >> INSPECTION END Diagnosis Procedure Image: Proceed to EVC-297. "Diagnosis Procedure". NO >> INSPECTION END Diagnosis Procedure Interform trouble Diagnosis for CAN communication. Refer to LAN-16. "Trouble Diagnosis Flow Chart". Is the inspection result normal? YES >> GO TO 2. NO >> Repair or replace error-detected parts. 2.CHECK SELF-DIAGNOSTIC RESULT IN VCM @With CONSULT 	D
 Turn power switch OFF and wait at least 20 seconds. Make sure that 12V battery voltage is 11 V or more. >> GO TO 2. 2.PERFORM DTC CONFIRMATION PROCEDURE With CONSULT Turn power switch ON and wait at least 10 seconds. Check DTC. Is DTC detected? YES >> Proceed to EVC-297. "Diagnosis Procedure". NO >> INSPECTION END Diagnosis Procedure Perform trouble Diagnosis for CAN communication. Refer to LAN-16. "Trouble Diagnosis Flow Chart". Is the inspection result normal? YES >> GO TO 2. NO >> Repair or replace error-detected parts. 2. CHECK SELF-DIAGNOSTIC RESULT IN VCM 	-
 Make sure that 12V battery voltage is 11 V or more. >> GO TO 2. 2.PERFORM DTC CONFIRMATION PROCEDURE @With CONSULT 1. Turn power switch ON and wait at least 10 seconds. 2. Check DTC. Is DTC detected? YES >> Proceed to EVC-297. "Diagnosis Procedure". NO >> INSPECTION END Diagnosis Procedure Inspection result normal? YES >> GO TO 2. NO >> Repair or replace error-detected parts. 2. CHECK SELF-DIAGNOSTIC RESULT IN VCM @With CONSULT 	E
>> GO TO 2. 2.PERFORM DTC CONFIRMATION PROCEDURE [®] With CONSULT 1. Turn power switch ON and wait at least 10 seconds. 2. Check DTC. <u>Is DTC detected?</u> YES YES >> Proceed to EVC-297. "Diagnosis Procedure". NO >> INSPECTION END Diagnosis Procedure I.PERFORM TROUBLE DIAGNOSIS FOR CAN COMMUNICATION Perform trouble diagnosis for CAN communication. Refer to LAN-16. "Trouble Diagnosis Flow Chart". Is the inspection result normal? YES >> GO TO 2. NO >> Repair or replace error-detected parts. 2.CHECK SELF-DIAGNOSTIC RESULT IN VCM @With CONSULT	-
2.PERFORM DTC CONFIRMATION PROCEDURE Image: Strain Stra	F
With CONSULT Turn power switch ON and wait at least 10 seconds. Check DTC. Is DTC detected? YES >> Proceed to EVC-297. "Diagnosis Procedure". NO >> INSPECTION END Diagnosis Procedure T.PERFORM TROUBLE DIAGNOSIS FOR CAN COMMUNICATION Perform trouble diagnosis for CAN communication. Refer to LAN-16. "Trouble Diagnosis Flow Chart". Is the inspection result normal? YES >> GO TO 2. NO >> Repair or replace error-detected parts. CHECK SELF-DIAGNOSTIC RESULT IN VCM With CONSULT	
 1. Turn power switch ON and wait at least 10 seconds. 2. Check DTC. <u>Is DTC detected?</u> YES >> Proceed to <u>EVC-297</u>, "Diagnosis Procedure". NO >> INSPECTION END Diagnosis Procedure I.PERFORM TROUBLE DIAGNOSIS FOR CAN COMMUNICATION Perform trouble diagnosis for CAN communication. Refer to <u>LAN-16</u>, "Trouble Diagnosis Flow Chart". Is the inspection result normal? YES >> GO TO 2. NO >> Repair or replace error-detected parts. 2. CHECK SELF-DIAGNOSTIC RESULT IN VCM With CONSULT 	G
2. Check DTC. Is DTC detected? YES >> Proceed to EVC-297. "Diagnosis Procedure". NO >> INSPECTION END Diagnosis Procedure INFORMATION Perform trouble diagnosis for CAN communication. Refer to LAN-16. "Trouble Diagnosis Flow Chart". Is the inspection result normal? YES >> GO TO 2. NO >> Repair or replace error-detected parts. 2. CHECK SELF-DIAGNOSTIC RESULT IN VCM (With CONSULT	
YES >> Proceed to EVC-297. "Diagnosis Procedure". NO >> INSPECTION END Diagnosis Procedure INFOLCOMMONICATION PERFORM TROUBLE DIAGNOSIS FOR CAN COMMUNICATION Perform trouble diagnosis for CAN communication. Refer to LAN-16. "Trouble Diagnosis Flow Chart". Is the inspection result normal? YES >> GO TO 2. NO >> Repair or replace error-detected parts. 2. CHECK SELF-DIAGNOSTIC RESULT IN VCM	Н
NO >> INSPECTION END Diagnosis Procedure 1.PERFORM TROUBLE DIAGNOSIS FOR CAN COMMUNICATION Perform trouble diagnosis for CAN communication. Refer to LAN-16. "Trouble Diagnosis Flow Chart". Is the inspection result normal? YES >> GO TO 2. NO >> Repair or replace error-detected parts. 2.CHECK SELF-DIAGNOSTIC RESULT IN VCM () With CONSULT	
1.PERFORM TROUBLE DIAGNOSIS FOR CAN COMMUNICATION Perform trouble diagnosis for CAN communication. Refer to LAN-16. "Trouble Diagnosis Flow Chart". Is the inspection result normal? YES >> GO TO 2. NO >> Repair or replace error-detected parts. 2.CHECK SELF-DIAGNOSTIC RESULT IN VCM (B) With CONSULT	
Perform trouble diagnosis for CAN communication. Refer to <u>LAN-16. "Trouble Diagnosis Flow Chart"</u> . <u>Is the inspection result normal?</u> YES >> GO TO 2. NO >> Repair or replace error-detected parts. 2. CHECK SELF-DIAGNOSTIC RESULT IN VCM (B) With CONSULT	6
Perform trouble diagnosis for CAN communication. Refer to <u>LAN-16</u> , "Trouble Diagnosis Flow Chart". <u>Is the inspection result normal?</u> YES >> GO TO 2. NO >> Repair or replace error-detected parts. 2. CHECK SELF-DIAGNOSTIC RESULT IN VCM (B)With CONSULT	J
Is the inspection result normal? YES >> GO TO 2. NO >> Repair or replace error-detected parts. 2.CHECK SELF-DIAGNOSTIC RESULT IN VCM (B)With CONSULT	-
NO >> Repair or replace error-detected parts. 2.CHECK SELF-DIAGNOSTIC RESULT IN VCM	K
2.CHECK SELF-DIAGNOSTIC RESULT IN VCM	
	L
Check self-diagnostic result in "EV/HEV"	-
-	M
Is any CAN error (U1000 excluded) other than DTC P3194. P319F. and P31AA detected? YES >> GO TO 3.	
NO >> GO TO 4.	N
3.REPLACE VCM	_
 With CONSULT Replace VCM. Refer to <u>EVC-426, "Removal and Installation"</u>. Perform DTC confirmation procedure again. Refer to <u>EVC-297, "DTC Logic"</u>. 	С
Is DTC P3194, P319F, or P31AA detected again?	
YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-176</u> , "Removal and Instal	
NO >> INSPECTION END	<u> </u>
4. REPLACE ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)	<u>-</u> F

- With CONSULT
 Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-176</u>, "<u>Removal and Installation</u>".
- 2. Perform DTC confirmation procedure again. Refer to EVC-297, "DTC Logic".

P3194, P319F, P31AA CAN COMMUNICATION

< DTC/CIRCUIT DIAGNOSIS >

Is DTC P3194, P319F, or P31AA detected again?

- YES >> Replace VCM. Refer to EVC-426, "Removal and Installation".
- NO >> INSPECTION END

P3195, P31A0, P31AB CAN COMMUNICATION

< DTC/CIRCUIT DIAGNOSIS >

P3195, P31A0, P31AB CAN COMMUNICATION

DTC Logic

INFOID:000000008747177

DTC DETECTION LOGIC

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	Possible cause
P3195 P31A0 P31AB	COMMUNICATION ERROR (Communication error)	When VCM detects an error signal that is received from electri- cally-driven intelligent brake unit via CAN communication	 CAN communication Electrically-driven intelligent brake unit VCM
	NFIRMATION PROCE		
		DURE	
	ower switch OFF and wai	t at least 20 seconds.	
Make s	sure that 12V battery volta	age is 11 V or more.	
	>> GO TO 2.		
2.PERF	ORM DTC CONFIRMAT	ION PROCEDURE	
	power switch ON and wa	ait at least 10 seconds.	
	ck DTC. letected?		
YES	>> Proceed to EVC-299.	"Diagnosis Procedure".	
	>> INSPECTION END		
	sis Procedure		INFOID:00000008747178
		OSIS FOR CAN COMMUNICATION	
		I communication. Refer to <u>LAN-16, "Trouble Diagnos</u>	is Flow Chart".
	<pre>spection result normal? >> GO TO 2.</pre>		
\sim	>> Repair or replace erro	•	
	CK SELF-DIAGNOSTIC F	RESULT IN VCM	
	CONSULT elf-diagnostic result in "E\	//HEV".	
-	,	d) other than DTC P3195, P31A0, and P31AB detect	ed?
YES NO	>> GO TO 3. >> GO TO 4.		
-	ACE VCM		
	CONSULT		
		426, "Removal and Installation". Decedure again. Refer to <u>EVC-299, "DTC Logic"</u> .	
	23195, P31A0, or P31AB		
YES NO	>> Replace electrically-d >> INSPECTION END	riven intelligent brake unit. Refer to <u>BR-533, "Remov</u>	al and installation".
4		RIVEN INTELLIGENT BRAKE UNIT	
	CONSULT		
		elligent brake unit. Refer to <u>BR-533, "Removal and ir</u> ocedure again. Refer to <u>EVC-299, "DTC Logic"</u> .	<u>istallation"</u> .
	23195, P31A0, or P31AB		
VEC	>> Poplage VCM Defer	to EV/C 426 "Domoval and Installation"	

YES >> Replace VCM. Refer to EVC-426, "Removal and Installation".

EVC-299

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P3195, P31A0, P31AB CAN COMMUNICATION

< DTC/CIRCUIT DIAGNOSIS >

NO >> INSPECTION END

P3196, P31A1, P31AE EV SYSTEM CAN COMMUNICATION

< DTC/CIRCUIT DIAGNOSIS >

P3196, P31A1, P31AE EV SYSTEM CAN COMMUNICATION

DTC Logic

INFOID:000000008747179

DTC DETECTION LOGIC

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DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	Possible cause	EVC
P3196 P31A1 P31AE	COMMUNICATION ER- ROR (Communication error)	When VCM detects an error signal that is received from PDM (Power Delivery Module) via CAN communication	 CAN communication PDM (Power Delivery Module) VCM 	D
	ONFIRMATION PROCE	EDURE		
1.PRE	CONDITIONING			E
	ower switch OFF and wa sure that 12V battery volt			
				F
2	>> GO TO 2.			
	FORM DTC CONFIRMAT	ION PROCEDURE		G
	CONSULT n power switch ON and w	ait at least 10 seconds.		
2. Che	eck DTC.			Н
<u>IS DTC</u> YES	detected? >> Proceed to <u>EVC-301</u>	"Diagnosis Procedure"		
NO	>> INSPECTION END	<u> </u>		I
Diagn	osis Procedure		INFOID:00000008747180	
1.PER	FORM TROUBLE DIAGN	OSIS FOR CAN COMMUNICATION		J
Perform	trouble diagnosis for CA	N communication. Refer to LAN-16, "Trouble Diagnos	sis Flow Chart".	
	spection result normal?			К
YES NO	>> GO TO 2.>> Repair or replace error	or-detected parts.		
2. сне	CK SELF-DIAGNOSTIC I	RESULT IN VCM		L
		× //I LEX //		
	elf-diagnostic result in "E' V system CAN error (U10	V/HEV .)00 excluded) other than DTC P3196, P31A1, and P3	31AE detected?	M
YES	>> GO TO 3.			
	>> GO TO 4. LACE VCM			Ν
1. Rep	CONSULT blace VCM. Refer to <u>EVC-</u>	426, "Removal and Installation".		0
	form DTC confirmation pr <u>P3196, P31A1, or P31AE</u>	ocedure again. Refer to <u>EVC-301, "DTC Logic"</u> .		
YES NO		r Delivery Module). Refer to <u>VC-119. "Removal and Ir</u>	nstallation".	Ρ
	LACE PDM (POWER DE	LIVERY MODULE)		
		ry Module). Refer to <u>VC-119, "Removal and Installatic</u>		

blace PDM (Power Delivery Module). Refer to 2. Perform DTC confirmation procedure again. Refer to EVC-301, "DTC Logic".

Is DTC P3196, P31A1, or P31AE detected again?

P3196, P31A1, P31AE EV SYSTEM CAN COMMUNICATION

< DTC/CIRCUIT DIAGNOSIS >

- YES >> Replace VCM. Refer to EVC-426, "Removal and Installation".
- NO >> INSPECTION END

P3197, P31A2, P31AD EV SYSTEM CAN COMMUNICATION

< DTC/CIRCUIT DIAGNOSIS >

P3197, P31A2, P31AD EV SYSTEM CAN COMMUNICATION

DTC Logic

INFOID:000000008747181

DTC DETECTION LOGIC

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DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	Possible cause
P3197			CAN communication
P31A2	COMMUNICATION ERROR (Communication error)	When VCM detects an error signal that is received from electric shift control module via CAN communication	 Electric shift control module (built in to VCM)
P31AD	. (• VCM
DTC CC	ONFIRMATION PROCE	EDURE	
1.PREC	CONDITIONING		E
	ower switch OFF and wa sure that 12V battery volt		
i wake s			F
_	>> GO TO 2.		
2.PERF	FORM DTC CONFIRMAT	ION PROCEDURE	G
	CONSULT		
) power switch ON and w ck DTC.	ait at least 10 seconds.	H
	letected?		
YES	>> Proceed to EVC-303	"Diagnosis Procedure".	
NO	>> INSPECTION END		
Diagno	osis Procedure		INFOID:00000008747182
1. CHE	CK SELF-DIAGNOSTIC F	RESULT IN ELECTRIC SHIFT CONTROL MODULE	J
()) With	CONSULT		
	elf-diagnostic result in "Sl	HIFT".	K
	DTC detected?		
YES NO	>> GO TO 2.	er to <u>TM-50, "DTC Index"</u> .	1
2.PERF	FORM TROUBLE DIAGN	OSIS FOR CAN COMMUNICATION	L
Perform	trouble diagnosis for CAI	N communication. Refer to LAN-16, "Trouble Diagnos	is Flow Chart".
Is the ins	spection result normal?		N
	>> GO TO 3.		
	>> Repair or replace erro		Ν
J.PERF	FORM DTC CONFIRMAT	ION PROCEDURE	
	CONSULT Se DTC.		
		ocedure again. Refer to <u>EVC-303, "DTC Logic"</u> .	C
	P3197, P31A2, or P31AD		
YES		to EVC-426. "Removal and Installation".	P
NO	>> Repair or replace erro	pr-detected parts.	

P31AF, P31B3 EV SYSTEM CAN COMMUNICATION

< DTC/CIRCUIT DIAGNOSIS >

P31AF, P31B3 EV SYSTEM CAN COMMUNICATION

DTC Logic

INFOID:000000008747183

DTC DETECTION LOGIC

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	Possible cause
P31AF	COMMUNICATION ERROR	When VCM detects an error signal that is received from A/C auto	CAN communication
P31B3	(Communication error)	amp. via CAN communication	A/C auto amp.VCM

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

• Turn power switch OFF and wait at least 20 seconds.

• Make sure that 12V battery voltage is 11 V or more.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT

Ti. Turn power switch ON and wait at least 10 seconds.

2. Check DTC.

Is DTC detected?

- YES >> Proceed to EVC-304. "Diagnosis Procedure".
- NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000008747184

1.PERFORM TROUBLE DIAGNOSIS FOR CAN COMMUNICATION

Perform trouble diagnosis for CAN communication. Refer to LAN-16, "Trouble Diagnosis Flow Chart".

Is the inspection result normal?

- YES >> GO TO 2.
- NO >> Repair or replace error-detected parts.

2.CHECK SELF-DIAGNOSTIC RESULT IN VCM

With CONSULT

Check self-diagnostic result in "EV/HEV".

Is any EV system CAN error (U1000 excluded) other than DTC P31AF and P31B3 detected?

YES >> GO TO 3.

NO >> GO TO 4.

3.REPLACE VCM

With CONSULT

1. Replace VCM. Refer to EVC-426, "Removal and Installation".

Perform DTC confirmation procedure again. Refer to <u>EVC-304</u>, "DTC Logic".

Is DTC P31AF or P31B3 detected again?

- YES >> Replace A/C auto amp. Refer to <u>HAC-194</u>, "Removal and Installation" (with heat pump), <u>HAC-362</u>, "Removal and Installation" (without heat pump).
- NO >> INSPECTION END

4.REPLACE A/C AUTO AMP.

With CONSULT

- 1. Replace A/C auto amp. Refer to <u>HAC-194</u>, "<u>Removal and Installation</u>" (with heat pump), <u>HAC-362</u>, <u>"Removal and Installation</u>" (without heat pump).
- 2. Perform DTC confirmation procedure again. Refer to EVC-304, "DTC Logic".

P31AF, P31B3 EV SYSTEM CAN COMMUNICATION

< DTC/CIRCUIT DIAGNOSIS >

Is DTC	P31AF or P31B3 detected again?	
YES NO	>> Replace VCM. Refer to EVC-426, "Removal and Installation". >> INSPECTION END	А
		В
		EVC
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P31B0, P31B4 CAN COMMUNICATION

< DTC/CIRCUIT DIAGNOSIS >

P31B0, P31B4 CAN COMMUNICATION

DTC Logic

INFOID:000000008747185

DTC DETECTION LOGIC

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	Possible cause
P31B0	COMMUNICATION ERROR	When VCM detects an error signal that is received from AV con-	CAN communication
P31B4	(Communication error)	trol unit via CAN communication	AV control unitVCM

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

• Turn power switch OFF and wait at least 20 seconds.

• Make sure that 12V battery voltage is 11 V or more.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT

Ti. Turn power switch ON and wait at least 10 seconds.

2. Check DTC.

Is DTC detected?

- YES >> Proceed to EVC-306. "Diagnosis Procedure".
- NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000008747186

1.PERFORM TROUBLE DIAGNOSIS FOR CAN COMMUNICATION

Perform trouble diagnosis for CAN communication. Refer to LAN-16, "Trouble Diagnosis Flow Chart".

Is the inspection result normal?

- YES >> GO TO 2.
- NO >> Repair or replace error-detected parts.

2.CHECK SELF-DIAGNOSTIC RESULT IN VCM

With CONSULT

Check self-diagnostic result in "EV/HEV".

Is any CAN error (U1000 excluded) other than DTC P31B0 and P31B4 detected?

YES >> GO TO 3.

NO >> GO TO 4.

3.REPLACE VCM

With CONSULT

1. Replace VCM. Refer to EVC-426. "Removal and Installation".

2. Perform DTC confirmation procedure again. Refer to EVC-306, "DTC Logic".

Is DTC P31B0 or P31B4 detected again?

YES >> Replace AV control unit. Refer to <u>AV-205. "Removal and Installation"</u> (navigation without BOSE), <u>AV-377. "Removal and Installation"</u> (navigation with BOSE), <u>AV-503. "Removal and Installation"</u> (with telematics).

NO >> INSPECTION END

4.REPLACE AV CONTROL UNIT

With CONSULT

 Replace AV control unit. Refer to <u>AV-205, "Removal and Installation"</u> (navigation without BOSE), <u>AV-377,</u> <u>"Removal and Installation"</u> (navigation with BOSE), <u>AV-503, "Removal and Installation"</u> (with telematics).

P31B0, P31B4 CAN COMMUNICATION < DTC/CIRCUIT DIAGNOSIS >	
 Perform DTC confirmation procedure again. Refer to <u>EVC-306, "DTC Logic"</u>. 	
Is DTC P31B0 or P31B4 detected again?	A
YES >> Replace VCM. Refer to EVC-426, "Removal and Installation". NO >> INSPECTION END	
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P31B2, P31B5 CAN COMMUNICATION

< DTC/CIRCUIT DIAGNOSIS >

P31B2, P31B5 CAN COMMUNICATION

DTC Logic

INFOID:000000008747187

DTC DETECTION LOGIC

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	Possible cause
P31B2		VCM detects an error signal that is received from combination	CAN communication
P31B5	COMMUNICATION ERROR	neter via CAN communication	Combination meterVCM

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

• Turn power switch OFF and wait at least 20 seconds.

• Make sure that 12V battery voltage is 11 V or more.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT

- 1. Turn power switch OFF.
- 2. Turn power switch ON and wait at least 10 seconds.
- 3. Check DTC.

Is DTC detected?

- YES >> Proceed to EVC-308. "Diagnosis Procedure".
- NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000008747188

1.PERFORM TROUBLE DIAGNOSIS FOR CAN COMMUNICATION

Perform trouble diagnosis for CAN communication. Refer to <u>LAN-16</u>, "Trouble Diagnosis Flow Chart". Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

2.CHECK SELF-DIAGNOSTIC RESULT IN VCM

With CONSULT

Check self-diagnostic result in "EV/HEV".

Is any CAN error (U1000 excluded) other than DTC P31B2 and P31B5 detected?

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

3.REPLACE VCM

With CONSULT

- Replace VCM. Refer to <u>EVC-426</u>, "Removal and Installation".
- 2. Perform DTC confirmation procedure again. Refer to EVC-308, "DTC Logic".

Is DTC P31B2 or P31B5 detected again?

- YES >> Replace combination meter. Refer to MWI-107, "Removal and Installation".
- NO >> INSPECTION END

4.REPLACE COMBINATION METER

With CONSULT

- 1. Replace combination meter. Refer to <u>MWI-107, "Removal and Installation"</u>.
- Perform DTC confirmation procedure again. Refer to <u>EVC-308, "DTC Logic"</u>.

Is DTC P31B2 or P31B5 detected again?

P31B2, P31B5 CAN COMMUNICATION

< DTC/	CIRCUIT DIAGNOSIS >
YES	>> Replace VCM. Refer to EVC-426, "Removal and Installation".

NO >> INSPECTION END

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P31B6 CAN COMMUNICATION

< DTC/CIRCUIT DIAGNOSIS >

P31B6 CAN COMMUNICATION

DTC Logic

INFOID:000000008747189

DTC DETECTION LOGIC

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	Possible cause
P31B6	COMMUNICATION ERROR (Communication error)	When VCM detects an error signal that is received from IPDM E/ R via CAN communication	 CAN communication IPDM E/R VCM

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

• Turn power switch OFF and wait at least 20 seconds.

• Make sure that 12V battery voltage is 11 V or more.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT

Ti. Turn power switch ON and wait at least 10 seconds.

2. Check DTC.

Is DTC detected?

- YES >> Proceed to EVC-310. "Diagnosis Procedure".
- NO >> INSPECTION END

Diagnosis Procedure

1.PERFORM TROUBLE DIAGNOSIS FOR CAN COMMUNICATION

Perform trouble diagnosis for CAN communication. Refer to LAN-16, "Trouble Diagnosis Flow Chart".

Is the inspection result normal?

- YES >> GO TO 2.
- NO >> Repair or replace error-detected parts.

2.CHECK SELF-DIAGNOSTIC RESULT IN VCM

With CONSULT

Check self-diagnostic result in "EV/HEV".

Is any CAN error (U1000 excluded) other than DTC P31B6 detected?

YES >> GO TO 3.

NO >> GO TO 4.

3.REPLACE VCM

(B) With CONSULT

1. Replace VCM. Refer to EVC-426, "Removal and Installation".

2. Perform DTC confirmation procedure again. Refer to EVC-310, "DTC Logic".

Is DTC P31B6 detected again?

- YES >> Replace IPDM E/R. Refer to PCS-29, "Removal and Installation".
- NO >> INSPECTION END

4.REPLACE IPDM E/R

With CONSULT

- 1. Replace IPDM E/R. Refer to PCS-29, "Removal and Installation".
- 2. Perform DTC confirmation procedure again. Refer to EVC-310, "DTC Logic".

Is DTC P31B6 detected again?

YES >> Replace VCM. Refer to EVC-426, "Removal and Installation".

INFOID:000000008747190

P31B6 CAN COMMUNICATION

< DTC	/CIRCUIT DIAGNOSIS >	
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P31B7 CAN COMMUNICATION

< DTC/CIRCUIT DIAGNOSIS >

P31B7 CAN COMMUNICATION

DTC Logic

INFOID:000000008747191

DTC DETECTION LOGIC

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	Possible cause
P31B7	COMMUNICATION ER- ROR (Communication error)	When VCM detects an error signal that is received from air bag diagnosis sensor unit via CAN communication	 CAN communication Air bag diagnosis sensor unit VCM

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

• Turn power switch OFF and wait at least 20 seconds.

• Make sure that 12V battery voltage is 11 V or more.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

- T. Turn power switch ON and wait at least 10 seconds.
- 2. Check DTC.

Is DTC detected?

- YES >> Proceed to EVC-312. "Diagnosis Procedure".
- NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000008747192

1.PERFORM TROUBLE DIAGNOSIS FOR CAN COMMUNICATION

Perform trouble diagnosis for CAN communication. Refer to <u>LAN-16. "Trouble Diagnosis Flow Chart"</u>. Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

2.CHECK SELF-DIAGNOSTIC RESULT IN VCM

With CONSULT

Check self-diagnostic result in "EV/HEV".

Is any CAN error (U1000 excluded) other than DTC P31B7 detected?

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

3.REPLACE VCM

With CONSULT

- Replace VCM. Refer to <u>EVC-426, "Removal and Installation"</u>.
- 2. Perform DTC confirmation procedure again. Refer to EVC-312, "DTC Logic".

Is DTC P31B7 detected again?

- YES >> Replace air bag diagnosis sensor unit. Refer to SR-38, "Removal and Installation".
- NO >> INSPECTION END
- **4.**REPLACE AIR BAG DIAGNOSIS SENSOR UNIT

With CONSULT

- 1. Replace air bag diagnosis sensor unit. Refer to <u>SR-38. "Removal and Installation"</u>.
- 2. Perform DTC confirmation procedure again. Refer to EVC-312, "DTC Logic".

Is DTC P31B7 detected again?

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P31B7 CAN COMMUNICATION

< DTC/CIRCUIT	DIAGNOSIS >
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YES NO	>> Replace VCM. Refer to EVC-426, "Removal and Installation". >> INSPECTION END	А
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P31B8 EV SYSTEM CAN COMMUNICATION

< DTC/CIRCUIT DIAGNOSIS >

P31B8 EV SYSTEM CAN COMMUNICATION

DTC Logic

INFOID:000000008747193

DTC DETECTION LOGIC

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	Possible cause
P31B8	COMMUNICATION ERROR (Communication error)	When VCM detects an error signal that is received from TCU via CAN communication	 CAN communication TCU VCM

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

• Turn power switch OFF and wait at least 20 seconds.

• Make sure that 12V battery voltage is 11 V or more.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT

Turn power switch ON and wait at least 10 seconds.

2. Check DTC.

Is DTC detected?

- YES >> Proceed to EVC-314. "Diagnosis Procedure".
- NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000008747194

1.CHECK TCU CONDITION

Check that the TCU activation is performed normally. Refer to <u>AV-485, "ADDITIONAL SERVICE WHEN</u> USING TELEMATICS SYSTEM FOR THE FIRST TIME/RE-SUBSCRIPTION : Description".

Is TCU activation performed normally?

YES >> GO TO 2.

NO >> Perform TCU activation. Refer to <u>AV-485, "ADDITIONAL SERVICE WHEN USING TELEMATICS</u> <u>SYSTEM FOR THE FIRST TIME/RE-SUBSCRIPTION : Work Procedure"</u>.

2.PERFORM TROUBLE DIAGNOSIS FOR CAN COMMUNICATION

Perform trouble diagnosis for CAN communication. Refer to <u>LAN-16</u>, "Trouble Diagnosis Flow Chart". Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected parts.

3.CHECK SELF-DIAGNOSTIC RESULT IN VCM

With CONSULT

Check self-diagnostic result in "EV/HEV".

Is any EV system CAN error (U1000 excluded) other than DTC P31B8 detected?

YES >> GO TO 4.

NO >> GO TO 5.

4.REPLACE VCM

With CONSULT

1. Replace VCM. Refer to EVC-426, "Removal and Installation".

2. Perform DTC confirmation procedure again. Refer to EVC-314, "DTC Logic".

Is DTC P31B8 detected again?

YES >> Replace TCU. Refer to <u>AV-504</u>, "Removal and Installation".

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EVC-314

P31B8 EV SYSTEM CAN COMMUNICATION

< DTC/CIRCUIT DIAGNOSIS >	
NO >> INSPECTION END	
5.REPLACE TCU	A
 With CONSULT Replace TCU. Refer to <u>AV-504</u>, "<u>Removal and Installation</u>". Perform DTC confirmation procedure again. Refer to <u>EVC-314</u>, "<u>DTC Logic</u>". <u>Is DTC P31B8 detected again?</u> 	В
YES >> Replace VCM. Refer to <u>EVC-426, "Removal and Installation"</u> . NO >> INSPECTION END	EVC
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P31BA CAN COMMUNICATION

< DTC/CIRCUIT DIAGNOSIS >

P31BA CAN COMMUNICATION

DTC Logic

INFOID:000000009314814

DTC DETECTION LOGIC

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	Possible cause
P31BA	COMMUNICATION ER- ROR (Communication error)	When VCM detects an error signal that is received from BCM via CAN communication	CAN communicationBCMVCM

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

• Turn power switch OFF and wait at least 20 seconds.

• Make sure that 12V battery voltage is 11 V or more.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT

Ti. Turn power switch ON and wait at least 10 seconds.

2. Check DTC.

Is DTC detected?

- YES >> Proceed to EVC-316. "Diagnosis Procedure".
- NO >> INSPECTION END

Diagnosis Procedure

1.PERFORM TROUBLE DIAGNOSIS FOR CAN COMMUNICATION

Perform trouble diagnosis for CAN communication. Refer to LAN-16, "Trouble Diagnosis Flow Chart".

Is the inspection result normal?

- YES >> GO TO 2.
- NO >> Repair or replace error-detected parts.

2.CHECK SELF-DIAGNOSTIC RESULT IN VCM

With CONSULT

Check self-diagnostic result in "EV/HEV".

Is any CAN error (U1000 excluded) other than DTC P31BA detected?

YES >> GO TO 3.

NO >> GO TO 4.

3.REPLACE VCM

With CONSULT

- 1. Replace VCM. Refer to EVC-426, "Removal and Installation".
- 2. Perform DTC confirmation procedure again. Refer to EVC-316, "DTC Logic".

Is DTC P31BA detected again?

- YES >> Replace BCM. Refer to <u>BCS-86, "Removal and Installation"</u>.
- NO >> INSPECTION END

4.REPLACE BCM

With CONSULT

- 1. Replace BCM. Refer to BCS-86, "Removal and Installation".
- 2. Perform DTC confirmation procedure again. Refer to EVC-316, "DTC Logic".

Is DTC P31BA detected again?

YES >> Replace VCM. Refer to EVC-426, "Removal and Installation".

Revision: October 2013

INFOID:000000009314815

P31BA CAN COMMUNICATION

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< DTC/CIRCUIT DIAGNOSIS >

P31C5, P31C6 VCM

DTC Logic

INFOID:000000008747203

DTC DETECTION LOGIC

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	Possible cause
P31C5	VCM	VCM malfunction is detected	VCM
P31C6	(VCM)		

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

Turn power switch OFF and wait at least 20 seconds.

• Make sure that 12V battery voltage is 11 V or more.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE-1

With CONSULT

T. Turn power switch ON and wait at least 10 seconds.

2. Check DTC.

Is DTC detected?

YES >> Proceed to EVC-318, "Diagnosis Procedure".

NO >> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE-2

With CONSULT

- 1. Turn power switch OFF and wait at least 20 seconds.
- 2. Turn power switch ON and wait at least 60 seconds.
- 3. Check DTC.

Is DTC detected?

- YES >> Proceed to EVC-318, "Diagnosis Procedure".
- NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000008747204

1.CHECK VCM-1

With CONSULT

- 1. Erase DTC.
- 2. Turn power switch OFF and wait at least 20 seconds.
- 3. Disconnect 12V battery negative terminal and wait at least 1 minute. Refer to <u>EVC-10</u>, "<u>Precautions for</u> <u>Removing of Battery Terminal</u>".
- 4. Reconnect 12V battery negative terminal.
- 5. Turn power switch ON and wait at least 5 minutes.
- 6. Check DTC.
- Is DTC "P31C5" or P31C6" detected again?

YES >> Replace VCM. Refer to EVC-426, "Removal and Installation".

NO >> GO TO 2.

2.CHECK VCM-2

With CONSULT

- 1. Turn power switch OFF and wait at least 20 seconds.
- 2. Turn power switch ON and wait at least 60 seconds.
- 3. Check DTC.
- Is DTC "P31C5" or P31C6" detected again?

P31C5, P31C6 VCM

< DTC/CIRCUIT DIAGNOSIS >

YES	>> Replace VCM. Refer to EVC-426. "Removal and Installation".
NO	>> INSPECTION END

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P31C7 VCM

< DTC/CIRCUIT DIAGNOSIS >

P31C7 VCM

DTC Logic

INFOID:000000008747205

DTC DETECTION LOGIC

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	Possible cause
P31C7	VCM (VCM)	VCM malfunction is detected	VCM

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

- Turn power switch OFF and wait at least 20 seconds.
- Make sure that 12V battery voltage is 11 V or more.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE-1

With CONSULT

- Turn power switch ON and wait at least 10 seconds.
- 2. Check DTC.

Is DTC detected?

- YES >> Proceed to EVC-320, "Diagnosis Procedure".
- NO >> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE-2

With CONSULT

- 1. Set timer charge start time to 5 minutes later.
- 2. Turn power switch OFF.
- 3. Connect EVSE (With AC power input) and wait until battery charge starts.
- 4. Wait at least 10 minutes after starting timer charge.
- 5. Turn the power switch ON while charging.
- 6. Check DTC.

Is DTC detected?

- YES >> Proceed to EVC-320, "Diagnosis Procedure".
- NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000008747206

1.CHECK VCM

With CONSULT

- 1. Erase DTC.
- 2. Turn power switch OFF and wait at least 20 seconds.
- 3. Disconnect 12V battery negative terminal and wait at least 1 minute. Refer to <u>EVC-10. "Precautions for</u> <u>Removing of Battery Terminal"</u>.
- 4. Reconnect 12V battery negative terminal.
- 5. Turn power switch ON and wait at least 6 minutes.
- 6. Check DTC.

Is DTC "P31C7" detected again?

YES >> Replace VCM. Refer to EVC-426, "Removal and Installation".

NO >> GO TO 2.

2.PERFORM CONFIRMATION PROCEDURE AGAIN

(B) With CONSULT

Perform confirmation procedure again. Refer to EVC-320, "DTC Logic".

P31C7 VCM

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Is DTC "	P31C7"	detected	again?

- >> Replace VCM. Refer to <u>EVC-426, "Removal and Installation"</u>. >> INSPECTION END YES
- NO

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P31CA, P31CB QUICK CHARGE RELAY

< DTC/CIRCUIT DIAGNOSIS >

P31CA, P31CB QUICK CHARGE RELAY

DTC Logic

INFOID:000000008747209

DTC DETECTION LOGIC

NOTE:

If DTC P31CA or P31CB is displayed with DTC P3101, first perform diagnosis for DTC P3101.

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	Possible cause
P31CA	PD MODULE (Power Delivery Module)	VCM received quick charge relay (-) stuck signal from PDM (Power Delivery Module).	 Harness or connectors Quick charge relay
P31CB		VCM received quick charge relay (+) stuck signal from PDM (Power Delivery Module).	PDM (Power Delivery Module)

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

• Turn power switch OFF and wait at least 20 seconds.

• Make sure that 12V battery voltage is 11 V or more.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT

- 1. Start quick charge and wait at least 30 seconds.
- 2. Stop quick charge and wait at least 30 seconds.
- 3. Turn power switch ON.
- 4. Check DTC.

Is DTC detected?

- YES >> Proceed to EVC-322. "Diagnosis Procedure".
- NO >> INSPECTION END

Diagnosis Procedure

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.
- 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 EVC-11, "High Voltage Precautions".

CAUTION:

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

1.PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT

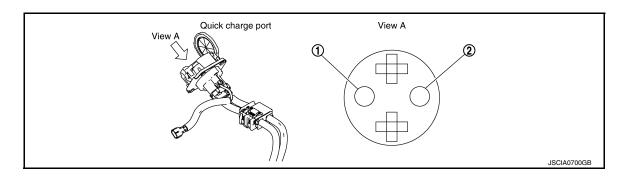
INFOID:000000008747210

P31CA, P31CB QUICK CHARGE RELAY

< DTC/CIRCUIT DIAGNOSIS >				
 Erase DTC. Perform the DTC confirmation procedure again using a quick charger other than the one that is used for A the initial confirmation procedure. Refer to <u>EVC-322, "DTC Logic"</u>. 				
Is DTC "P31CA" or "P31CB" detected again?				
YES >> GO TO 2. NO >> INSPECTION END (Quick charger malfunction)				
NO >> INSPECTION END (Quick charger malfunction) 2.PERFORM SELF-DIAGNOSIS OF PDM (POWER DELIVERY MODULE)				
	EVC			
Perform self-diagnosis of PDM (Power Delivery Module). <u>Is any DTC detected?</u>				
YES >> Perform diagnosis procedure of detected DTC. Refer to <u>VC-34, "DTC Index"</u> . NO >> GO TO 3.				
3. PRECONDITIONING				
WARNING: Disconnect high voltage. Refer to <u>GI-33, "How to Disconnect High Voltage"</u> . Check voltage in high voltage circuit. (Check that condenser are discharged.)	Ε			
1. Lift up the vehicle and remove the Li-ion battery under covers. Refer to EVB-194, "Removal and Installa-	F			
 tion". Disconnect high voltage harness connector and PTC heater harness connector from front side of Li-ion battery. Refer to <u>EVB-194</u>, "<u>Removal and Installation</u>". Measure voltage between high voltage harness connector terminals and PTC heater harness connector 	G			
terminals.	Н			
	 J			
JPCIA0296ZZ				
Touching high voltage components without using the appropriate protective equipment will cause electrocution.	Κ			
	L			
Standard : 5 V or less	\mathbb{M}			
CAUTION: For voltage measurements, use a tester which can measure to 500 V or higher.	Ν			
>> GO TO 4.	6			
4. CHECK QUICK CHARGE RELAY				
 Disconnect Li-ion battery harness connector (H3). Check the continuity between Li-ion battery harness connector and quick charge port terminal (plug-in side). 	Ρ			

P31CA, P31CB QUICK CHARGE RELAY

< DTC/CIRCUIT DIAGNOSIS >



(1): #11 terminal (plug-in side)

(2): #12 terminal (plug-in side)

+		_		
Li-ion battery		battery Quick charge port (plug-in side)		
Connector	Terminal	Terminal		
НЗ	38	11	Not existed	
	37	12	NOT EXISTED	

Is the inspection result normal?

YES >> Replace VCM. Refer to EVC-426, "Removal and Installation".

NO >> Replace PDM (Power Delivery Module). Refer to <u>VC-119, "Removal and Installation"</u>.

P31D3 M/C RELAY

< DTC/CIRCUIT DIAGNOSIS >

P31D3 M/C RELAY

DTC Logic

А

INFOID:000000009314816

DTC DETECTION LOGIC

DTC	CONSULT screen terr (Trouble diagnosis cont		DTC detecting	condition	Possible cause	EVC
P31D3	M/C RELAY (Motor control relay)	put to A/C		r READY), a voltage is in- VCM even though VCM y.	 Harness or connectors M/C relay (stuck ON) 	D
DTC CON	FIRMATION PROC	EDURE				D
1.PRECO	NDITIONING					_
	ver switch OFF and wa					E
 Make sur 	e that 12V battery vol	age is 11 V o	or more.			
>>	> GO TO 2.					F
2.PERFO	RM DTC CONFIRMA		EDURE			
(P)With CC	NSULT					G
	ower switch ON and v ower switch OFF.	ait at least 5	seconds.			
3. Turn p	ower switch ON and v	ait at least 5	seconds.			Н
4. Check Is DTC det	-					
	Proceed to EVC-325	, "Diagnosis	Procedure".			
	> INSPECTION END					
Diagnosi	s Procedure				INFOID:00000009314817	J
1.снеск	A/C RELAY DRIVE C	IRCUIT VOL	TAGE			
	ower switch OFF.					K
	nect A/C relay. the voltage between <i>i</i>	VC relay har	ness connector t	erminals		
<u> </u>		to rolay har				L
	+		Voltage			
	A/C relay	-	(Approx.)			в. Л
Connecto F52	or Terminal	Ground	0.V			Μ
	ection result normal?	Cround	0.1			
YES >>	> GO TO 5.					Ν
•	> GO TO 2. M/C RELAY					
		De "Compo	ant loggestion (0
	relay. Refer to <u>EVC-3</u> ection result normal?	26, Compor	<u>ient inspection (i</u>	<u>vi/C Relay)</u> .		
YES >>	> GO TO 3.					Ρ
•	> Replace M/C relay.					
J.CHECK	A/C RELAY DRIVE C	IRCUIT				

Check harness for short to power, between M/C relay harness connector and A/C relay harness connector.

P31D3 M/C RELAY

< DTC/CIRCUIT DIAGNOSIS >

+			
M/C	M/C relay		Voltage
Connector	Terminal		
E65	5	Ground	0 V

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace error-detected parts.

4. CHECK M/C RELAY DRIVE CIRCUIT

- 1. Disconnect VCM harness connector.
- 2. Check harness for short to ground, between M/C relay harness connector and VCM harness connector.

+			
M/C relay		_	Continuity
Connector	Terminal		
E65	1	Ground	Not existed

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace error-detected parts.

CHECK A/C RELAY DRIVE CIRCUIT

1. Disconnect VCM harness connector.

2. Check harness for short to power, between A/C relay harness connector and VCM harness connector.

	+		
A/C relay		_	Voltage
Connector	Terminal		
E52	2	Ground	0 V
		10	

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace error-detected parts.

6.CHECK INTERMITTENT INCIDENT

Check intermittent incident. Refer to GI-53, "Intermittent Incident".

Is the inspection result normal?

- YES >> Replace VCM. Refer to EVC-426, "Removal and Installation".
- NO >> Repair or replace error-detected parts.

Component Inspection (M/C Relay)

INFOID:000000009314818

1.CHECK M/C RELAY

1. Turn power switch OFF.

2. Disconnect M/C relay.

P31D3 M/C RELAY

< DTC/CIRCUIT DIAGNOSIS >

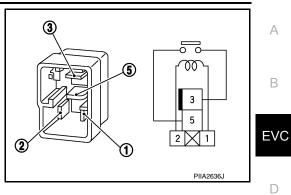
3. Check the continuity between M/C relay terminals under the following conditions.

Termi- nals	Conditions	Continu- ity
	12 V direct current supply between terminals 1 and 2	Existed
3 – 5	No current supply	Not ex- isted

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace M/C relay.



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< DTC/CIRCUIT DIAGNOSIS >

P31D4 PRE-CHARGE RELAY

DTC Logic

INFOID:000000008747211

DTC DETECTION LOGIC

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	Possible cause
P31D4	PRE CHARGE RELAY (Pre-charge relay)	After operating the power switch from OFF to READY, a break occurs in the pre-charge relay drive circuit or resistance remains extremely high for 2.5 seconds or more.	 Harness or connectors Li-ion battery J/B VCM

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

• Turn power switch OFF and wait at least 20 seconds.

• Make sure that 12V battery voltage is 11 V or more.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

(B) With CONSULT

- Turn power switch OFF and wait at least 60 seconds.
- 2. Turn power switch ON and wait at least 10 seconds.
- 3. Check DTC.

Is DTC detected?

YES >> Proceed to EVC-328, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000008747212

1.CHECK PRE-CHARGE RELAY GROUND CIRCUIT

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

Li-ion	battery	Ground	Continuity	
Connector	Connector Terminal		Continuity	
B24	10	Ground	Existed	

Is inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

2.CHECK PRE-CHARGE RELAY DRIVE CIRCUIT-1

Check the resistance between Li-ion battery connector terminals.

Li-ion		
+	_	Resistance
Terr		
10	11	Less than 5 k Ω

Is the inspection result normal?

YES >> GO TO 3.

P31D4 PRE-CHARGE RELAY

< DTC/CIRCUIT DIAGNOSIS >

NO >> Check the relay circuit of Li-ion battery for malfunction. If no malfunction is found, replace battery junction box. Refer to EVB-219, "BATTERY JUNCTION BOX AND BATTERY HARNESS : Disassembly and Assembly".

3.CHECK PRE-CHARGE RELAY DRIVE CIRCUIT-2

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

	+		_	
V	CM	Li-ion battery		Continuity
Connector	Terminal	Connector	Terminal	
E61	40	B24	11	Existed

3. Also check harness for short to power.

Is inspection result normal?

١

YES	>> Check intermittent incident. R	Refer to <u>GI-53,</u>	"Intermittent Incident".
-----	-----------------------------------	------------------------	--------------------------

NO >> Repair or replace error-detected parts.

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< DTC/CIRCUIT DIAGNOSIS >

P31D5 PRE-CHARGE RELAY

DTC Logic

INFOID:000000008747213

DTC DETECTION LOGIC

NOTE:

If DTC P31D5 is displayed with DTC P0AA2, P31D4, P31DB, or P31DD, perform diagnosis for DTC P0AA2, P31D4, P31DB, or P31DD.

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	Possible cause
P31D5	PRE CHARGE RELAY (Pre-charge relay)	 The voltage of the traction motor inverter is 100 V or more immediately before starting charging or immediately before READY. The voltage of the traction motor inverter is 100 V or more when only the system main relay 2 is ON. 	 Harness or connectors Battery J/B Traction motor inverter VCM

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

• Turn power switch OFF and wait at least 20 seconds.

• Make sure that 12V battery voltage is 11 V or more.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT

- 1. Set the vehicle to READY and perform test drive.
- 2. Turn power switch OFF and wait at least for 60 seconds.
- 3. Check self-diagnostic result.

Is DTC detected?

- YES >> Proceed to EVC-330, "Diagnosis Procedure".
- NO >> INSPECTION END

Diagnosis Procedure

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.
- 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 EVC-11, "High Voltage Precautions".

CAUTION:

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

1.PERFORM SELF-DIAGNOSIS OF TRACTION MOTOR INVERTER

INFOID:000000008747214

P31D5 PRE-CHARGE RELAY

< DTC/CIRCUIT DIA	AGNOSIS >					
With CONSULT Perform self-diagnos	is of traction r	notor inverter				А
Is DTC detected?						
YES >> Perform NO >> GO TO 2 2.CHECK SYSTEM	2.	- .		fer to <u>TMS-28, "DTC Index</u>	<u>"</u> -	В
			5011			
 Turn power switc Disconnect Li-ior Check the voltag 	n battery harn			ector and ground.		EVC
	+	-				D
Check item	Li-ion b	pattery	_	Voltage		
·	Connector	Terminal				E
System main relay 1		17				
System main relay 2	B24	14	Ground	0 V		
Pre-charge relay		11				F
Is the inspection resu	ult normal?					
YES >> GO TO 3	3. arness for sho	ort to power.				G
J.PRECONDITIONI	NG					
WARNING:						Н
Disconnect high vo						
Check voltage in high						
 Lift up the vehicle tion". 	e and remove	the Li-Ion ba	attery under o	covers. Refer to <u>EVB-194.</u>	"Removal and Installa-	I
	voltage harne	ess connecto	r and PTC h	eater harness connector fi	om front side of Li-ion	
battery. Refer to	<u>EVB-194, "Re</u>	emoval and In	<u>stallation"</u> .			J
	between hig	h voltage har	ness connec	tor terminals and PTC heat	ater harness connector	0
terminals.					<u> </u>	
7767						K
						L
L E					JPCIA0296ZZ	Μ
DANGER:						NI
cause electrocu		e component	ts without u	sing the appropriate prot	ective equipment will	Ν
) C					0
Standard		: 5 V or less	i.			Ρ

CAUTION:

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

>> GO TO 4.

< DTC/CIRCUIT DIAGNOSIS >

4. CHECK ELECTRIC COMPRESSOR

- 1. Disconnect electric compressor high voltage harness connector.
- 2. Check the short circuit between electric compressor terminals.

With heat pump system		
Electric c	ompressor	
+	_	Resistance
Terr	minal	
1	2	3 k Ω or more
Without heat pump syste	em	
Electric c	ompressor	
+	_	Resistance
Terr	minal	
1	3	3 k Ω or more

Is the inspection result normal?

YES >> GO TO 5.

NO >> Replace electric compressor. And then, GO TO 10. Refer to <u>HA-37</u>, "<u>Removal and Installation</u>" (with heat pump system) or <u>HA-95</u>, "<u>Removal and Installation</u>" (without heat pump system).

5.CHECK PTC HEATER

- 1. Disconnect Li-ion battery harness connector (H19).
- 2. Check the short circuit between Li-ion battery terminals.

With heat pump system

		Li-ion battery		
Connected to: Connector	Connector	+	_	Resistance
	Connector	Terminal		
PTC heater	H19	40	41	3 kΩ or more

Without heat pump system

Connected to:	Connector	+	_	Resistance
	Connector	Terminal		
PTC heater	H19	40	41	3 k Ω or more

Is the inspection result normal?

YES >> GO TO 6.

NO >> Replace PTC heater. And then, GO TO 10. Refer to <u>HAC-208</u>, "<u>Removal and Installation</u>" (with heat pump system) or <u>HAC-374</u>, "<u>Removal and Installation</u>" (without heat pump system).

6.CHECK HIGH VOLTAGE HARNESS-1

- 1. Disconnect Li-ion battery harness connector (H3).
- 2. Check the short circuit between Li-ion battery harness connector terminals.

With heat pump system

Connected to:	Connector	+	_	Resistance
	Connector	Terr		
PDM (Power Delivery Module)	H3	37	38	3 k Ω or more

P31D5 PRE-CHARGE RELAY

< DTC/CIRCUIT DIAGNOSIS >

Without heat pump system	m			
		Li-ion battery		
Connected to:		+		Resistance
Connected to.	Connector	' Terminal	-	Resistance
PDM (Power Delivery Module)	НЗ	37	38	3 kΩ or more
s the inspection result	normal?			
YES >> The high v then, GO T NO >> GO TO 7.	O 10.	Li-ion battery may be s	shorted. Check th	e related circuits. A
		Refer to <u>VC-119, "Remo</u>	wal and Installatio	n"
	ircuit between traction : more than 3 kΩ			
				JSCIA0696Z
tion". CHECK HIGH VOLT Remove high voltag lation". Check the short circ	AGE HARNESS-2 ge harness from PDM (nd then, GO TO 10. Re Power Delivery Module ge harness connector (odule) side].). Refer to <u>VC-118</u>	9, "Removal and Inst
With heat pump system				
		PDM (Power Delivery Mod	ule)	
Connected to:	Connector	+	-	
	115	38	minal	Resistance
Li-ion battery		30	20	
Addition of the second second	H5		39	Resistance 3 kΩ or more
Without heat pump system				
		PDM (Power Delivery Mod		3 kΩ or more
Without heat pump system Connected to:		PDM (Power Delivery Mod +	ule) 	
Connected to:	m Connector	PDM (Power Delivery Mod + Ter	ule) minal	3 kΩ or more Resistance
Connected to: Li-ion battery	m Connector H5	PDM (Power Delivery Mod + Ter 38	ule) - minal 39	Resistance 3 kΩ or more
Connected to: Li-ion battery 3. Check the short cir age harness conne	m Connector H5	PDM (Power Delivery Mod + Ter 38 age harness connector	ule) - minal 39	3 kΩ or more Resistance 3 kΩ or more
Connected to: Li-ion battery 3. Check the short cir	m Connector H5 cuit between high volta	PDM (Power Delivery Mod + Ten 38 age harness connector very Module) side].	ule) minal 39 (electric comprese	Resistance 3 kΩ or more
Connected to: Li-ion battery 3. Check the short cir age harness conne	m Connector H5 cuit between high volta	PDM (Power Delivery Mod + 38 age harness connector very Module) side]. PDM (Power Delivery Mod +	ule) minal 39 (electric compress ule) –	Resistance 3 kΩ or more
Connected to: Li-ion battery 6. Check the short cir age harness conne with heat pump system	m Connector H5 cuit between high volta ector [PDM (Power Deli	PDM (Power Delivery Mod + 38 age harness connector very Module) side]. PDM (Power Delivery Mod +	ule) minal 39 (electric comprese	3 kΩ or more Resistance 3 kΩ or more 3 kΩ or more sor side) and high vertice

Electric compressor

42

41

H6

 $3 \ k\Omega$ or more

P31D5 PRE-CHARGE RELAY

< DTC/CIRCUIT DIAGNOSIS >

with heat pump system

	PI			
Connected to:	Connector	+	_	Resistance
	Connector	Terminal		
Electric compressor	H7	41	42	3 kΩ or more

Is the inspection result normal?

YES >> GO TO 9.

NO >> Replace malfunctioning harness. And then, GO TO 10.

9. CHECK PDM (POWER DELIVERY MODULE)

Check the short circuit between PDM (Power Delivery Module) terminals.

PDM (Power D	PDM (Power Delivery Module)		
+	_	Resistance	
Terr	minal		
38	39	3 k Ω or more	

Is the inspection result normal?

YES >> GO TO 10.

NO >> Replace PDM (Power Delivery Module). And then, GO TO 10. Refer to <u>VC-119. "Removal and</u> <u>Installation"</u>.

10.REPLACE BATTERY JUNCTION BOX

Replace battery junction box. Refer to EVB-219, "BATTERY JUNCTION BOX AND BATTERY HARNESS : Disassembly and Assembly".

>> INSPECTION END

P31D6 F/S RELAY

< DTC/CIRCUIT DIAGNOSIS >

P31D6 F/S RELAY

DTC Logic

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INFOID:000000008747215

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DTC DETECTION LOGIC

DTC	CONSULT screen terms		DTC detecting cor	odition	Possible cause	
	(Trouble diagnosis content)		Die delecting cor			EVC
P31D6	F/S RELAY (Fail-safe relay)	VCM detec	ted the F/S relay stu	ıck	 Harness or connectors IPDM E/R VCM 	D
DTC CON	FIRMATION PROCE	DURE				D
1.PRECO	NDITIONING					
	er switch OFF and wait e that 12V battery voltag					E
>>	• GO TO 2.					F
2.PERFOR	RM DTC CONFIRMATIC	ON PROCE	DURE			
With CO 1. Turn po 2. Check	ower switch ON and wai	t at least 5	seconds.			G
Is DTC dete						Н
YES >>	Proceed to EVC-335, "	Diagnosis	Procedure".			
NO >>	INSPECTION END					I
Diagnosi	s Procedure				INFOID:00000008747216	
1.снеск	F/S RELAY OUTPUT V	OLTAGE-1				
	ower switch OFF. the voltage between IPI	DM E/R ha	rness connector	and ground.		K
	+					
	IPDM E/R	-	Voltage			1
Connecto						L
E15	55	Ground	0 V			
	ection result normal? Check intermittent incident	lant Rafar	to GL-53 "Inter	mittent Incident'		M
	• GO TO 2.		to <u>01-55, men</u>			
2.снеск	F/S RELAY DRIVE CIR		TAGE-1			Ν
Check the	voltage between IPDM E	E/R harnes	s connector and	ground.		
						0
	+					0
	IPDM E/R	-	Voltage			
Connecto	or Terminal		10) (bottom (volt			Ρ
E15	60	Ground	12V battery volt- age			
Is the inspe	ection result normal?		·			
NO >>	• GO TO 5. • GO TO 3.					
3.CHECK	F/S RELAY DRIVE CIR	CUIT VOL	TAGE-2			

P31D6 F/S RELAY

< DTC/CIRCUIT DIAGNOSIS >

1. Disconnect VCM harness connector.

2. Check the voltage between IPDM E/R harness connector and ground.

IPDN	+ // E/R	_	Voltage
Connector	Terminal	•	
E15	60	Ground	12V battery volt- age

Is the inspection result normal?

YES >> Replace VCM. Refer to EVC-426, "Removal and Installation".

NO >> GO TO 4.

4.CHECK F/S RELAY DRIVE CIRCUIT

- 1. Disconnect IPDM E/R harness connector.
- 2. Check harness for short to ground, between VCM harness connector and IPDM E/R harness connector.

	+			
IPDN	/I E/R	_	Continuity	
Connector	Terminal	*		
E15	60	Ground	Not existed	

Is the inspection result normal?

YES >> Check intermittent incident. Refer to GI-53, "Intermittent Incident".

NO >> Repair or replace error-detected parts.

5.CHECK F/S RELAY OUTPUT VOLTAGE-2

1. Disconnect IPDM E/R harness connector.

2. Check the voltage between IPDM E/R harness connector and ground.

	+			
IPDN	/I E/R	_	Voltage	
Connector	Terminal			
E15	55	Ground	0 V	

Is the inspection result normal?

YES >> Replace IPDM E/R. Refer to PCS-29, "Removal and Installation".

NO >> GO TO 6.

6.CHECK F/S RELAY OUTPUT VOLTAGE-3

1. Disconnect VCM harness connector.

2. Check the voltage between IPDM E/R harness connector and ground.

	+		
IPDN	IPDM E/R		Voltage
Connector	Terminal		
E15	55	Ground	0 V

Is the inspection result normal?

YES >> Replace VCM. Refer to EVC-426, "Removal and Installation".

NO >> Check harness for short to power, between VCM harness connector and IPDM E/R harness connector.

P31D7 F/S RELAY

< DTC/CIRCUIT DIAGNOSIS >

P31D7 F/S RELAY

DTC Logic

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INFOID:000000008747217

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DTC DETECTION LOGIC

DTC	CONSULT screen terms (Trouble diagnosis content)		DTC detecting condition	Possible cause	E
P31D7	F/S RELAY (Fail-safe relay)	VCM dete	cted the F/S relay open	Harness or connectors IPDM E/R VCM	
TC CON	FIRMATION PROCE	DURE			
.PRECO	NDITIONING				
	er switch OFF and wait e that 12V battery volta				
>>	GO TO 2.				
.PERFO	RM DTC CONFIRMATIO	ON PROC	EDURE		
With CO					
Set the Check	vehicle to READY and DTC.	wait at lea	ast 5 seconds.		
DTC dete					
	 Proceed to EVC-337, ' INSPECTION END 	<u>'Diagnosis</u>	<u>Procedure"</u> .		
iagnosi	s Procedure			INFOID:000000	0008747218
.CHECK					
	ower switch OFF.				
Pull ou	t #64 fuse. sure that fuse is not fusi				
	ction result normal?	ıy.			
/ES >>	GO TO 2.		the evention to since it		
	Replace the fuse after 12V BATTERY POWER	•			
	he fuse which pulled ou				
Discon	nect IPDM E/R harness	connecto		und	
Check	the voltage between iPi		arness connector and gro	una.	
	+				
	IPDM E/R	_	Voltage		
Connecto	or Terminal		12V battery volt-		
E9	2	Ground	age		
	ection result normal?				

3.check f/s relay output voltage

1. Reconnect IPDM E/R harness connector (E15).

2. Turn power switch ON.

3. Check the voltage between IPDM E/R harness connector and ground.

EVC-337

P31D7 F/S RELAY

< DTC/CIRCUIT DIAGNOSIS >

	+		
	/IE/R	-	Voltage
Connector	Terminal		
E15	55	Ground	12V battery volt- age

Is the inspection result normal?

YES >> GO TO 9. NO >> GO TO 4.

4. CHECK F/S RELAY DRIVE CIRCUIT VOLTAGE-1

Check the voltage between IPDM E/R harness connector and ground.

	+		
IPDN	/IE/R	_	Voltage (Approx.)
Connector	Terminal		
E15	E15 60		0 V

Is the inspection result normal?

YES >> GO TO 7.

NO >> GO TO 5.

5. CHECK F/S RELAY DRIVE CIRCUIT

- 1. Turn power switch OFF.
- 2. Disconnect VCM harness connector and IPDM E/R harness connector.
- 3. Check continuity between VCM harness connector and IPDM E/R harness connector.

	+		_	
V	СМ	IPDN	/IE/R	Continuity
Connector	Terminal	Connector	Terminal	
E61	21	E15	60	Existed

Is inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace error-detected parts.

6.CHECK VCM GROUND CIRCUIT

Check the continuity between VCM harness connector and ground.

	+			
V	CM	—	Continuity	
Connector	Terminal	*		
E61	58			
EOT	65	Ground	Existed	
E62	118	Giouna	Existed	
E02	126			

Is the inspection result normal?

YES >> Replace VCM. Refer to EVC-426, "Removal and Installation".

NO >> Repair or replace error-detected parts.

7. CHECK F/S RELAY DRIVE CIRCUIT VOLTAGE-2

1. Turn power switch OFF.

- 2. Disconnect IPDM E/R harness connector (E15).
- 3. Check the voltage between IPDM E/R connector and ground.

EVC-338

P31D7 F/S RELAY

< DTC/CIRCUIT DIAGNOSIS >

+					
IPDM E	/R	-		Voltage	
Termin	al				
60		Ground	12V b	attery voltage	-
he inspec	tion result r	ormal?			
	GO TO 8.				
	-			<u>9, "Removal</u>	and Installation".
CHECK F	S RELAY	OUTPUT CIR	CUIT		
		rness connec			
Спеск п	arness for s	snort to groun	a, between	IPDIVI E/R r	arness connector and VCM harness connector
	+				
	PDM E/R		_	Continuity	
Connector	Term	inal		,	
E15	55	i G	round	Not existed	-
the inspec	tion result r	ormal?			
-			r to <u>PCS-2</u>	9, "Removal	and Installation".
		place error-d			
.CHECK F	S RELAY	OUTPUT CIR	CUIT		
Turn po	ver switch (OFF.			
					ess connector.
Спеск с	ontinuity be		lamess cor	inector and i	PDM E/R harness connector.
	÷	-			
VC	CM	IPDN	I E/R	Continuity	
Connector	Terminal	Connector	Terminal		
E61	5	E15	55	Existed	
inspection	result norm	nal?			
-			nt. Refer to	GI-53, "Inte	mittent Incident".
0 >>	Repair or re	place error-d	etected par	ts.	

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P31D8 CHARGE CONNECTOR LOCK RELAY

< DTC/CIRCUIT DIAGNOSIS >

P31D8 CHARGE CONNECTOR LOCK RELAY

DTC Logic

INFOID:000000009314819

DTC DETECTION LOGIC

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	Possible cause
P31D8	CHARGING CONNECTOR LOCK RLY (Charge connector lock relay)	Voltage of 5 V or more is input from the charge connector lock relay to VCM even when the charge connector lock relay is not ON.	 Harness or connectors Charge connector lock relay (stuck ON)

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

• Turn power switch OFF and wait at least 20 seconds.

• Make sure that 12V battery voltage is 11 V or more.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT

- 1. Turn power switch OFF.
- 2. Connect EVSE.
- Press the charge connector lock switch at the "LOCK" position. (Check that the charge connector lock is operating.)
- 4. Press the charge connector lock switch at the "OFF" position.
- 5. Disconnect EVSE.
- 6. Turn power switch ON and wait at least 5 seconds.
- 7. Check DTC.

Is DTC detected?

- YES >> Proceed to EVC-340, "Diagnosis Procedure".
- NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000009314820

1. CHECK CHARGE CONNECTOR LOCK RELAY OUTPUT VOLTAGE-1

- 1. Turn power switch OFF.
- 2. Check the voltage between IPDM E/R harness connector and ground.

-	+		
IPDM E/R		_	Voltage
Connector	Terminal	•	
E14	35	Ground	0 V
		1	

Is the inspection result normal?

YES >> GO TO 6.

NO >> GO TO 2.

2. CHECK CHARGE CONNECTOR LOCK RELAY DRIVE CIRCUIT-1

Check the voltage between IPDM E/R harness connector and ground.

P31D8 CHARGE CONNECTOR LOCK RELAY

< DTC/CIRCUIT DIAGNOSIS >

	+			
IPDI	M E/R	_	Voltage	
Connector	Terminal		Ŭ	
E14	41	Ground	12V battery volt- age	
s the inspectio	n result normal'	?		
) TO 4.	-		
NO >> GC) TO 3.			
\mathbf{B} . CHECK CH.	ARGE CONNE	CTOR LOCK R	ELAY DRIVE CI	RCUIT-2
. Disconnec	IPDM E/R hari	ness connector		
	VCM harness			
 Check han harness co 		o ground, betw	veen charge coi	nector lock relay harness connector and VCM
namess co				
	+			
IPDI	M E/R	_	Continuity	
Connector	Terminal			
E14	41	Ground	Not existed	
s the inspectio	n result normal'	2		
) TO 6.	<u>-</u>		
	pair or replace	error-detected	parts.	
.снеск сн	ARGE CONNE	CTOR LOCK R	ELAY OUTPUT	VOLTAGE-2
	+ M E/R		Voltage	
Connector	Terminal	_	vollage	
E14	35			
		Ground	0.V	
		Ground	0 V	
s the inspectio	n result normal	<u>?</u>		nd Installation"
<u>s the inspectio</u> YES >> Re	n result normal	<u>?</u>	0 V S-29, "Removal a	nd Installation".
<u>s the inspectio</u> YES >> Re NO >> GC	<u>n result normal</u> place IPDM E/F) TO 5.	? R. Refer to <u>PCS</u>	S-29, "Removal a	
s the inspectio YES >> Re NO >> GC CHECK CH,	n result normal place IPDM E/F) TO 5. ARGE CONNE	? R. Refer to <u>PCS</u> CTOR LOCK R		
the inspection YES >> Re NO >> GC CHECK CH	n result normal place IPDM E/F) TO 5. ARGE CONNE t VCM harness	2 R. Refer to <u>PCS</u> CTOR LOCK R connector.	S-29, "Removal a	
s the inspectio YES >> Re NO >> GC CHECK CH	n result normal place IPDM E/F) TO 5. ARGE CONNE t VCM harness	2 R. Refer to <u>PCS</u> CTOR LOCK R connector.	S-29, "Removal a	CIRCUIT
s the inspectio YES >> Re NO >> GC CHECK CH Disconnect Check harr	n result normal place IPDM E/F) TO 5. ARGE CONNE t VCM harness	2 R. Refer to <u>PCS</u> CTOR LOCK R connector.	S-29, "Removal a	CIRCUIT
s the inspectio YES >> Re NO >> GC D.CHECK CH, Disconnec Check harr	n result normal place IPDM E/F O TO 5. ARGE CONNE VCM harness ness for short to	2 R. Refer to <u>PCS</u> CTOR LOCK R connector.	S-29, "Removal a	CIRCUIT
s the inspectio YES >> Re NO >> GC D.CHECK CH, Disconnec Check harr	n result normal place IPDM E/F) TO 5. ARGE CONNE t VCM harness ness for short to	2 R. Refer to <u>PCS</u> CTOR LOCK R connector.	S-29, "Removal a ELAY OUTPUT en IPDM E/R ha	CIRCUIT
s the inspectio YES >> Re NO >> GC .CHECK CH . Disconnect . Check harr	n result normal place IPDM E/F TO 5. ARGE CONNE VCM harness ness for short to + M E/R	2 R. Refer to <u>PCS</u> CTOR LOCK R connector.	S-29, "Removal a ELAY OUTPUT en IPDM E/R ha	CIRCUIT
s the inspectio YES >> Re NO >> GC D.CHECK CH Disconnect Check harr IPDI Connector E14	n result normal place IPDM E/F) TO 5. ARGE CONNE t VCM harness ness for short to + M E/R Terminal	2 R. Refer to <u>PCS</u> CTOR LOCK R connector. power, betwee –	S-29, "Removal a ELAY OUTPUT en IPDM E/R ha Voltage	CIRCUIT
s the inspectio YES >> Re NO >> GO D.CHECK CH, Disconnect Check harr IPDI Connector E14 s the inspectio YES >> GO	n result normal' place IPDM E/F) TO 5. ARGE CONNE(t VCM harness ness for short to + M E/R Terminal 35 n result normal') TO 6.	2 R. Refer to <u>PCS</u> CTOR LOCK R connector. power, betwee 	S-29, "Removal a ELAY OUTPUT en IPDM E/R ha Voltage 0 V	CIRCUIT
s the inspectio YES >> Re NO >> GC D.CHECK CH Disconnect Check harr IPDI Connector E14 s the inspectio YES >> GC NO >> Re	n result normal' place IPDM E/F D TO 5. ARGE CONNE(t VCM harness ness for short to + M E/R Terminal 35 n result normal' D TO 6. pair or replace	2 R. Refer to <u>PCS</u> CTOR LOCK R connector. power, betwee 	S-29, "Removal a ELAY OUTPUT en IPDM E/R ha Voltage 0 V	CIRCUIT
s the inspectio YES >> Re NO >> GC D.CHECK CH Disconnect Check harr IPDI Connector E14 s the inspectio YES >> GC NO >> Re	n result normal' place IPDM E/F) TO 5. ARGE CONNE(t VCM harness ness for short to + M E/R Terminal 35 n result normal') TO 6.	2 R. Refer to <u>PCS</u> CTOR LOCK R connector. power, betwee 	S-29, "Removal a ELAY OUTPUT en IPDM E/R ha Voltage 0 V	CIRCUIT
s the inspectio YES >> Re NO >> GC D.CHECK CH Disconnect Check harr IPDI Connector E14 s the inspectio YES >> GC NO >> Re D.CHECK INT	n result normal' place IPDM E/F D TO 5. ARGE CONNEC VCM harness ness for short to + M E/R Terminal 35 n result normal' D TO 6. pair or replace of ERMITTENT IN	2 R. Refer to <u>PCS</u> CTOR LOCK R connector. power, betwee - Ground 2 error-detected ICIDENT	S-29, "Removal a ELAY OUTPUT en IPDM E/R ha Voltage 0 V	CIRCUIT
s the inspectio YES >> Re NO >> GO O.CHECK CH Disconnector Check harr IPDI Connector E14 s the inspectio YES >> GO NO >> Re O.CHECK INT Check intermitt	n result normal' place IPDM E/F D TO 5. ARGE CONNEC VCM harness ness for short to + M E/R Terminal 35 n result normal' D TO 6. pair or replace of ERMITTENT IN	2 R. Refer to <u>PCS</u> CTOR LOCK R connector. power, betwee Ground 2 error-detected ICIDENT ifer to <u>GI-53, "I</u>	S-29, "Removal a ELAY OUTPUT en IPDM E/R ha Voltage 0 V	CIRCUIT

P31D8 CHARGE CONNECTOR LOCK RELAY

< DTC/CIRCUIT DIAGNOSIS >

NO >> Repair or replace error-detected parts.

P31DB SYSTEM MAIN RELAY +

< DTC/CIRCUIT DIAGNOSIS >

P31DB SYSTEM MAIN RELAY +

DTC Logic

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INFOID:000000008747219

DTC DETECTION LOGIC

		010				
DTC	CONSULT scree (Trouble diagnosis		DTC detecting	g condition	Possible cause	
P31DB	HV BATT MAIN R (High voltage batt relay +)	erv main Sys	stem main relay 1 drive circuit r conds or more.	emains short to ground for 2.5	 Harness or connectors Li-ion battery J/B VCM 	
DTC CC	ONFIRMATION	I PROCED	URE			
1.PREC	CONDITIONING	i				
			t least 20 seconds.			
• Make s	sure that 12V ba	attery voltage	e is 11 V or more.			
	>> GO TO 2.					
2.PERF	FORM DTC CON	NFIRMATIO	N PROCEDURE			
1. Set 1 2. Che Is DTC d YES	ck DTC. letected?	<u>EVC-343, "D</u>	vait at least 5 seconds. Diagnosis Procedure".			
Diagno	osis Procedu	re			INFOID:00000008747220	
1. CHEC	CK SYSTEM MA	AIN RELAY 1	1 DRIVE CIRCUIT-1			
1. Turn	n power switch C	DFF.				
2. Disc	onnect Li-ion ba	attery harnes	ss connector. battery connector termin	al and ground.		
	+					
	on battery	-	Continuity			
Te	erminal					

17 Ground Is the inspection result normal?

YES >> GO TO 2.

NO >> Check short circuit between Li-ion battery harness and ground.

2. CHECK SYSTEM MAIN RELAY 1 DRIVE CIRCUIT-2

- 1. Disconnect VCM harness connector.
- 2. Check harness for short to ground, between VCM harness connector and Li-ion battery harness connec-0 tor.

Not existed

-	+		
Li-ion	battery	_	Continuity
Connector	Terminal		
B24	B24 17		Not existed

Is the inspection result normal?

YES >> Check intermittent incident. Refer to GI-53, "Intermittent Incident".

NO >> Repair or replace error-detected parts.

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P31DC SYSTEM MAIN RELAY -

< DTC/CIRCUIT DIAGNOSIS >

P31DC SYSTEM MAIN RELAY -

DTC Logic

INFOID:000000008747221

DTC DETECTION LOGIC

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	Possible cause
P31DC	HV BATT MAIN RELAY – (High voltage battery main relay –)	System main relay 2 drive circuit remains short to ground for 2.5 seconds or more.	 Harness or connectors Li-ion battery J/B VCM

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

• Turn power switch OFF and wait at least 20 seconds.

• Make sure that 12V battery voltage is 11 V or more.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

1. Set the vehicle to READY and wait at least 5 seconds.

2. Check DTC.

Is DTC detected?

YES >> Proceed to EVC-344, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000008747222

1. CHECK SYSTEM MAIN RELAY 2 DRIVE CIRCUIT-1

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

+		
Li-ion battery	_	Continuity
Terminal		
14	Ground	Not existed

Is the inspection result normal?

YES >> GO TO 2.

NO >> Check short circuit between Li-ion battery harness and ground.

2. CHECK SYSTEM MAIN RELAY 2 DRIVE CIRCUIT-2

- 1. Disconnect VCM harness connector.
- 2. Check harness for short to ground, between VCM harness connector and Li-ion battery harness connector.

	+			
Li-ion	battery	_	Continuity	
Connector	Connector Terminal			
B24	14	Ground	Not existed	

Is the inspection result normal?

YES >> Check intermittent incident. Refer to GI-53, "Intermittent Incident".

NO >> Repair or replace error-detected parts.

P31DD PRE-CHARGE RELAY

< DTC/CIRCUIT DIAGNOSIS >

P31DD PRE-CHARGE RELAY

DTC Logic

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INFOID:000000008747223

DTC DETECTION LOGIC

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	Possible cause
P31DD	PRE CHARGE RELAY (Pre-charge relay)	Pre-charge relay drive circuit remains short to ground for 2.5 seconds or more.	 Harness or connectors (Pre-charge relay drive cir- cuit is shorted) Pre-charge relay
тс со	NFIRMATION PROCE	EDURE	
.PREC	ONDITIONING		
	ower switch OFF and wa ure that 12V battery volt		
Marce 6			
	>> GO TO 2.		
	ORM DTC CONFIRMAT		
	ne venicle to READY and ck DTC.	d wait at least 5 seconds.	
	etected?		
	>> Proceed to EVC-345, >> INSPECTION END	"Diagnosis Procedure".	
iagno	sis Procedure		INFOID:00000000874
.CHEC	K PRE-CHARGE RELA	Y DRIVE CIRCUIT-1	
	power switch OFF.		
	onnect Li-ion battery har	ness connector. ion battery connector terminal and ground.	
	+	Continuity	
	n battery –	Continuity	
	11 Ground	d Not existed	
	pection result normal?		
	>> GO TO 2. >> Check short circuit be	etween Li-ion battery harness and ground.	
	K PRE-CHARGE RELA		
. Disc	onnect VCM harness cor		on battery harness conne
	1		
	+		

	+		
Li-ion battery		_	Continuity
Connector	Terminal		
B89	11	Ground	Not existed

Is the inspection result normal?

>> Check intermittent incident. Refer to GI-53, "Intermittent Incident". YES

NO >> Repair or replace error-detected parts.

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P31DE SYSTEM MAIN RELAY

< DTC/CIRCUIT DIAGNOSIS >

P31DE SYSTEM MAIN RELAY

DTC Logic

DTC DETECTION LOGIC

NOTE:

This DTC shows a forced system main relay disconnection by fail-safe.

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	Possible cause	
P31DE	HV BATT MAIN RELAY (High voltage battery main re- lay)	When the system main relay is shut off, VCM accumulates high voltage current value, and the accumulated value reaches the specified value.	Li-ion battery J/BEV control system	
DTC CC				

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

• Turn power switch OFF and wait at least 20 seconds.

• Make sure that 12V battery voltage is 11 V or more.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT

- 1. Turn power switch ON and wait at least 10 seconds.
- 2. Check DTC.

Is DTC detected?

YES >> Proceed to EVC-346, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

1.PERFORM SELF-DIAGNOSIS OF VCM

With CONSULT

Perform self-diagnosis of VCM.

Is DTC detected other than P31DE?

- YES >> Perform diagnosis procedure of detected DTC and then replace battery J/B. Refer to <u>EVB-219</u>, <u>"BATTERY JUNCTION BOX AND BATTERY HARNESS : Disassembly and Assembly"</u>.
- NO >> Replace Li-ion battery J/B. Refer to EVB-219. "BATTERY JUNCTION BOX AND BATTERY HAR-NESS : Disassembly and Assembly".

INFOID:000000008747226

INFOID:000000008747225

< DTC/CIRCUIT DIAGNOSIS >

P31E0 HIGH VOLTAGE CIRCUIT INTERLOCK ERROR

Description

The connection detecting circuit is used to detect the connection status of the PDM (Power Delivery Module) B cover and the bus bar cover of PDM (Power Delivery Module).

The connection detecting circuit consists of two circuits (i.e. power supply circuit and signal input circuit). When the PDM (Power Delivery Module) cover and the bus bar cover are installed normally, their protrusions press the internal switch of PDM (Power Delivery Module). Accordingly, the connection detecting circuit is energized and a voltage signal is input.

DTC Logic

INFOID:000000008747228

INFOID:00000009329364

DTC DETECTION LOGIC

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	Possible cause
50450	HV SYSTEM INTERLOCK ERROR	VCM detects an excessively low voltage of the connection detecting circuit for 2.5 seconds during READY.	Harness or connectors (Connection detection circuit
P31E0	(High voltage system inter- lock error)	VCM detects an excessively low voltage of the connection detecting circuit for 0.5 seconds during power switch ON.	is open or shorted.) PDM (Power Delivery Mod- ule)
DTC CO	ONFIRMATION PROCI	EDURE	
1.PRE	CONDITIONING		
	ower switch OFF and wa sure that 12V battery vol		
• Make			
_	>> GO TO 2.		
2.peri	FORM DTC CONFIRMAT	TION PROCEDURE-1	
9			
	n power switch ON at lea eck self-diagnostic result.	st 5 seconds.	
<u>Is DTC (</u>	detected?		
YES NO	>> Proceed to <u>EVC-347</u> >> GO TO 3.	<u>', "Diagnosis Procedure"</u> .	
•	FORM DTC CONFIRMAT		
	CONSULT		
1. Set	the vehicle to READY at	least 10 seconds.	
	eck self-diagnostic result.		
YES NO	detected? >> Proceed to <u>EVC-347</u> >> INSPECTION END	, "Diagnosis Procedure".	
Diagno	osis Procedure		INFOID:00000009329738

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.

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< DTC/CIRCUIT DIAGNOSIS >

- 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 EVC-11, "High Voltage Precautions".

CAUTION:

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

1.OVERALL FUNCTION CHECK

() With CONSULT

- 1. On the CONSULT screen, select "EV/HEV" >> "DATA MONITOR" >> "HV INTERLOCK (DC/DC)".
- 2. Check that "On" is displayed.

Is the inspection result normal?

YES >> Check intermittent incident. Refer to GI-53, "Intermittent Incident".

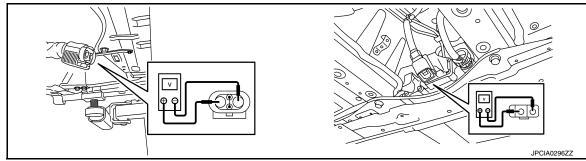
NO >> GO TO 2.

2. PRECONDITIONING

WARNING:

Disconnect high voltage. Refer to GI-33, "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 <u>ÉVB-194, "Exploded View"</u>.
- Disconnect high voltage harness connector and PTC heater harness connector from front side of Li-ion battery. Refer to <u>EVB-194</u>, "<u>Removal and Installation</u>".
- 3. Measure voltage between high voltage harness connector terminals and PTC heater harness connector terminals.



DANGER:

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

Standard

: 5 V or less

CAUTION:

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

>> GO TO 3.

3. CHECK CONNECTION DETECTING CIRCUIT POWER SUPPLY

- 1. Disconnect PDM (Power Delivery Module) harness connector.
- 2. Reconnect 12V battery negative terminal.
- 3. Turn power switch ON.

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< DTC/CIRCUIT DIAGNOSIS >

	-	× ×		e) harness connector and ground.
+				_
PDM (Power De		-	Voltage	
Connector	Terminal			_
F23	12	Ground	3 – 7 V	-
s the inspection		-		
YES >> GO NO >> GO				
•				SUPPLY CIRCUIT
6. Check the h	VCM harness		etween PDM	Power Delivery Module) harness connector and
+				-
PDM (Power De		_	Voltage	
Connector	Terminal		-	
F23	12	Ground	0 V	-
s the inspection				-
YES >> GO		-		
		error-detected p	arts.	
5. CHECK INTE	ERMITTENT IN	CIDENT		
Check intermitte	ent incident. Re	fer to GI-53, "In	termittent Inci	dent".
nspection result		<u>.</u>		
YES >> Rep	lace VCM. Ref	er to <u>EVC-426,</u>		Installation".
YES >> Rep NO >> Rep	blace VCM. Ref	error-detected p	arts.	
YES >> Rep	blace VCM. Ref	error-detected p	arts.	
YES >> Rep NO >> Rep CHECK CON	blace VCM. Ref pair or replace e INECTION DE switch OFF.	error-detected p	arts.	
YES >> Rep NO >> Rep CHECK CON Turn power Disconnect	olace VCM. Ref pair or replace of INECTION DE switch OFF. VCM harness of	error-detected p TECTING CIRC	oarts. CUIT SIGNAL	CIRCUIT
YES >> Rep NO >> Rep CHECK CON . Turn power . Disconnect . Check the h	olace VCM. Ref pair or replace of INECTION DE switch OFF. VCM harness of	error-detected p TECTING CIRC	oarts. CUIT SIGNAL	
YES >> Rep NO >> Rep CHECK CON . Turn power . Disconnect . Check the h	blace VCM. Ref pair or replace of INECTION DE switch OFF. VCM harness of harness for sho	error-detected p TECTING CIRC	oarts. CUIT SIGNAL	CIRCUIT
YES >> Rep NO >> Rep CHECK CON . Turn power . Disconnect . Check the h	blace VCM. Ref pair or replace of INECTION DE switch OFF. VCM harness of harness for sho ss connector.	error-detected p TECTING CIRC	oarts. CUIT SIGNAL	CIRCUIT
YES >> Rep NO >> Rep CHECK CON Turn power Disconnect Check the P VCM harnes	blace VCM. Ref pair or replace of INECTION DE switch OFF. VCM harness of harness for sho ss connector.	error-detected p TECTING CIRC	oarts. CUIT SIGNAL	CIRCUIT
YES >> Rep NO >> Rep CHECK CON Turn power Disconnect Check the h VCM harnes	blace VCM. Ref pair or replace of INECTION DE switch OFF. VCM harness of harness for sho ss connector.	error-detected p TECTING CIRC	earts. CUIT SIGNAL	CIRCUIT
YES >> Rep NO >> Rep D.CHECK CON Disconnect Disconnect Check the H VCM harnes + PDM (Power De	elivery Module)	error-detected p TECTING CIRC	earts. CUIT SIGNAL	CIRCUIT
YES >> Rep NO >> Rep D.CHECK CON . Turn power Disconnect . Check the h VCM harnes + PDM (Power De Connector	A place VCM. Ref pair or replace of INECTION DE switch OFF. VCM harness for ss connector.	error-detected p TECTING CIRC connector. ort to power, be 	oarts. CUIT SIGNAL etween PDM Voltage	CIRCUIT
YES >> Rep NO >> Rep D.CHECK CON . Turn power Disconnect . Check the h VCM harnes + PDM (Power De Connector F23 s the inspection YES >> GO	olace VCM. Ref pair or replace of INECTION DE switch OFF. VCM harness of harness for sho ss connector. elivery Module) Terminal 15 result normal? TO 7.	error-detected p TECTING CIRC connector. ort to power, be Ground	oarts. CUIT SIGNAL etween PDM Voltage 0 V	CIRCUIT
YES >> Rep NO >> Rep D.CHECK CON . Turn power . Disconnect . Check the h VCM harnes + PDM (Power De Connector F23 s the inspection YES >> GO NO >> Rep	blace VCM. Ref pair or replace of INECTION DE switch OFF. VCM harness of harness for sho ss connector. elivery Module) Terminal 15 n result normal? TO 7. pair or replace of	error-detected p TECTING CIRC connector. ort to power, be Ground error-detected p	oarts. CUIT SIGNAL etween PDM Voltage 0 V	CIRCUIT
YES >> Rep NO >> Rep D.CHECK CON . Turn power Disconnect . Check the h VCM harnes + PDM (Power De Connector F23 s the inspection YES >> GO	blace VCM. Ref pair or replace of INECTION DE switch OFF. VCM harness of harness for sho ss connector. elivery Module) Terminal 15 n result normal? TO 7. pair or replace of	error-detected p TECTING CIRC connector. ort to power, be Ground error-detected p	oarts. CUIT SIGNAL etween PDM Voltage 0 V	CIRCUIT
YES >> Rep NO >> Rep D.CHECK CON . Turn power . Disconnect . Check the h VCM harnes + PDM (Power De Connector F23 s the inspection YES >> GO NO >> Rep	olace VCM. Ref pair or replace of INECTION DE switch OFF. VCM harness of harness for sho ss connector. elivery Module) Terminal 15 nesult normal? TO 7. pair or replace of ERMITTENT IN	error-detected p TECTING CIRC connector. ort to power, be Ground connector. ort to power, be cround cround	oarts. CUIT SIGNAL etween PDM Voltage 0 V	CIRCUIT Power Delivery Module) harness connector and -
YES >> Rep NO >> Rep O.CHECK CON Disconnect Disconnect Check the h VCM harnes + PDM (Power De Connector F23 the inspection YES >> GO NO >> Rep CHECK INTE	A place VCM. Ref pair or replace of INECTION DE switch OFF. VCM harness of harness for sho ss connector. elivery Module) Terminal 15 Terminal 15 To 7. pair or replace of ERMITTENT IN ent incident. Re	error-detected p TECTING CIRC connector. ort to power, be Ground connector. ort to power, be cround cround	oarts. CUIT SIGNAL etween PDM Voltage 0 V	CIRCUIT Power Delivery Module) harness connector and -
YES >> Rep NO >> Rep O.CHECK CON . Turn power . Disconnect . Check the h VCM harnes + PDM (Power De Connector F23 s the inspection YES >> GO NO >> Rep CHECK INTE Check intermittee nspection result YES >> GO	place VCM. Ref pair or replace of INECTION DE switch OFF. VCM harness of harness for sho ss connector. elivery Module) Terminal 15 TO 7. pair or replace of ERMITTENT IN ent incident. Re t normal? TO 8.	error-detected p TECTING CIRC connector. ort to power, be Ground 2 error-detected p CIDENT fer to <u>GI-53, "In</u>	oarts. CUIT SIGNAL etween PDM Voltage 0 V oarts.	CIRCUIT Power Delivery Module) harness connector and -
YES >> Rep NO >> Rep O.CHECK CON Turn power Disconnect Check the H VCM harnes + PDM (Power De Connector F23 sthe inspection YES >> GO NO >> Rep CHECK INTE Check intermitte nspection result YES >> GO NO >> Rep	blace VCM. Ref pair or replace of INECTION DE switch OFF. VCM harness of harness for sho ss connector. elivery Module) Terminal 15 Tersult normal? TO 7. pair or replace of ERMITTENT IN ent incident. Re t normal? TO 8. pair or replace of	error-detected p TECTING CIRC connector. ort to power, be Ground connector. ort to power, be cround cround	oarts. CUIT SIGNAL etween PDM Voltage 0 V oarts.	CIRCUIT Power Delivery Module) harness connector and -
YES >> Rep NO >> Rep O.CHECK CON . Turn power . Disconnect . Check the h VCM harnes + PDM (Power De Connector F23 s the inspection YES >> GO NO >> Rep CHECK INTE Check intermittee nspection result YES >> GO	blace VCM. Ref pair or replace of INECTION DE switch OFF. VCM harness of harness for sho ss connector. elivery Module) Terminal 15 Tersult normal? TO 7. pair or replace of ERMITTENT IN ent incident. Re t normal? TO 8. pair or replace of	error-detected p TECTING CIRC connector. ort to power, be Ground 2 error-detected p CIDENT fer to <u>GI-53, "In</u>	oarts. CUIT SIGNAL etween PDM Voltage 0 V oarts.	CIRCUIT Power Delivery Module) harness connector and -
YES >> Rep NO >> Rep D.CHECK CON Turn power Disconnect Check the H VCM harnes + PDM (Power De Connector F23 sthe inspection YES >> GO NO >> Rep CHECK INTE Check intermitten spection result YES >> GO NO >> Rep CHECK INTE Check intermitten SPECTON POWER NO >> Rep CHECK INTE Check intermitten SPECTON POWER NO >> Rep CHECK INTE	A place VCM. Ref pair or replace of INECTION DE switch OFF. VCM harness for sho ss connector. elivery Module) Terminal 15 Tersult normal? TO 7. pair or replace of ERMITTENT IN ent incident. Re t normal? TO 8. pair or replace of CM CM. Refer to EV	error-detected p TECTING CIRC connector. ort to power, be Ground 2 error-detected p CIDENT fer to <u>GI-53, "In</u>	etween PDM of Voltage 0 V voltage 0 V	CIRCUIT Power Delivery Module) harness connector and - - - -

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< DTC/CIRCUIT DIAGNOSIS >

Is DTC P31E0 detected again?

- YES >> Replace PDM (Power Delivery Module). Refer to <u>VC-119, "Removal and Installation"</u>.
- NO >> INSPECTION END

< DTC/CIRCUIT DIAGNOSIS >

P31E1 HIGH VOLTAGE CIRCUIT INTERLOCK ERROR

Description

VCM receives high voltage harness connector connection malfunction information via EV system CAN communication sent from Li-ion battery controller. When Li-ion battery controller detects the connection malfunction of high voltage harness or detects the connection detecting system malfunction, Li-ion battery controller sends a high voltage harness connector connection malfunction information to VCM. EVC

DTC Logic

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INFOID:00000008747230

DTC DETECTION LOGIC

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	Possible cause
P31E1	HV SYSTEM INTERLOCK ERROR (High voltage system inter- lock error)	VCM receives the connection malfunction signal via EV sys- tem CAN communication sent from Li-ion battery controller.	 Harness and connector (Connection detecting circuit within Li-ion battery) High voltage harness Service plug
		EDURE	
	CONDITIONING		
	oower switch OFF and wa sure that 12V battery vol		
	-		
0	>> GO TO 2.		
Z .PER	FORM CONFIRMATION	PROCEDURE-1	
1. Turi 2. Che	CONSULT n power switch ON at lea eck self-diagnostic result.	st 5 seconds.	
	detected?		
YES NO	>> Proceed to <u>EVC-351</u> >> GO TO 3.	<u>, "Diagnosis Procedure"</u> .	
3.PER	FORM CONFIRMATION	PROCEDURE-2	
(P)With	CONSULT		
	the vehicle to READY at eck self-diagnostic result.	least 10 seconds.	
	detected?		
		. "Diagnosis Procedure".	
YES NO	>> INSPECTION END		

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.
- 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.

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< DTC/CIRCUIT DIAGNOSIS >

- 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 EVC-11, "High Voltage Precautions".
- CAUTION:
- Never bring the vehicle into the READY status with the service plug removed unless otherwise instructed in the Service Manual. A malfunction may occur if this is not observed.
- Erase DTC after the work is completed.

1.CHECK SELF-DIAGNOSTIC RESULT IN LBC

Check self-diagnostic result in "HV BAT".

Is any DTC detected?

YES >> Check the DTC. Refer to EVB-45, "DTC Index".

NO >> GO TO 2.

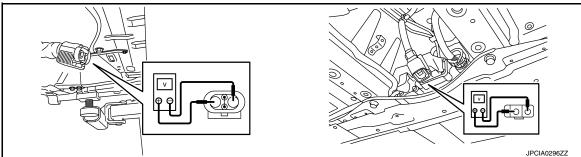
2. PRECONDITIONING

WARNING:

Disconnect high voltage. Refer to GI-33, "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-194, "Removal and Installation".
- Disconnect high voltage harness connector and PTC heater harness connector from front side of Li-ion battery. Refer to <u>EVB-194</u>, "<u>Removal and Installation</u>".
- Measure voltage between high voltage harness connector terminals and PTC heater harness connector terminals.



DANGER:

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



Standard

: 5 V or less

CAUTION:

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

>> GO TO 3.

3.CHECK SERVICE PLUG

Check that the connection detection circuit within the service plug is not open. Refer to <u>EVB-88</u>, "Diagnosis <u>Procedure"</u>.

Is the inspection result normal?

YES >> GO TO 4. NO >> Replace service plug.

Revision: October 2013

< DTC/CIRCUIT DIAGNOSIS >

A

4. CHECK HIGH VOLTAGE HARNESS CONNECTOR INSTALLATION	A
Check high voltage harness connectors installation condition visually and tactually.	
CAUTION: When reconnecting the high voltage harness connector, insert it slowly and directly.	В
Is the inspection result normal?	D
YES >> GO TO 5. NO >> Repair or replace error-detected parts.	
5. CHECK HIGH VOLTAGE HARNESS CONNECTOR	EVC
1. Disconnect high voltage harness connector from Li-ion battery.	
Check high voltage harness connector visually and tactually.	D
 Check that the connection detection circuit (connector side) is not open. Is the inspection result normal? 	
YES >> Check a circuit within the Li-ion battery.	E
NO >> Replace error-detected parts.	
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< DTC/CIRCUIT DIAGNOSIS >

P31E5 VCM POWER SUPPLY

DTC Logic

INFOID:000000009314821

DTC DETECTION LOGIC

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	Possible cause
P31E5	VCM POWER SUPPLY (VCM power supply)	The voltage of any one of two 12V battery power supplies becomes approximately 3 V or less when the power switch is ON.	Harness or connectors (Sensor power supply circuit is open or shorted)

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

• Turn power switch OFF and wait at least 20 seconds.

Make sure that 12V battery voltage is 11 V or more.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

(P)With CONSULT

Turn power switch ON and wait at least 20 seconds. 1.

2. Check DTC.

Is DTC detected?

- >> Proceed to EVC-354, "Diagnosis Procedure". YES
- >> INSPECTION END NO

Diagnosis Procedure

1.STOP LAMP FUNCTION CHECK

- 1. Depress the brake pedal.
- 2. Check that the stop lamp lights up.

Is the inspection result normal?

YES >> GO TO 6. NO >> GO TO 2.

2.CHECK FUSE

1. Turn power switch ON.

2. Pull out #77 fuse and check that the fuse is not fusing.

Is the inspection result normal?

>> GO TO 4. YES

NO >> GO TO 3.

3.CHECK 12V BATTERY POWER SUPPLY CIRCUIT

1. Disconnect VCM harness connector.

2. Check harness for short to ground, between #77 fuse terminal and VCM harness connector.

+	_	Continuity
#77 fuse terminal	Ground	Not existed

Is the inspection result normal?

YES >> Check intermittent incident. Refer to GI-53, "Intermittent Incident".

NO >> Repair or replace error-detected parts.

4.CHECK 12V BATTERY POWER SUPPLY

Check the voltage between #77 fuse terminal and ground.

INFOID:000000009314822

P31E5 VCM POWER SUPPLY

< DTC/CIRCUIT DIAGNOSIS >

#77 fuse terminal Ground 12V battery voltage Is the inspection result normal? YES >> 60 To 5. YES >> 60 To 5. NO >> Perform trouble diagnosis for 12V battery power supply. Stelenispection result normal? Image: Stelenispect	+		_	Voltage	-
YES >> GO TO 5. NO >> Perform trouble diagnosis for 12V battery power supply. 5.CHECK 12V BATTERY POWER SUPPLY CIRCUIT 1. Disconnect VCM harness connector. 2. Check the continuity between #77 fuse terminal and VCM harness connector. # VCM Connector Terminal #77 fuse terminic E62 To be the continuity E62 #77 fuse terminic E62 #77 fuse terminic E62 To be connector result normal? YES > Check intermittent incident. Refer to GL:53. "Intermittent Incident". NO >> Repair or replace error-detected parts. 6.CHECK FUSE In turp power switch ON. 2. Pull out 443 fuse and check that the fuse is not fusing. Is the inspection result normal? YES > GO TO 9. NO >> GO TO 7. 7.CHECK 12V BATTERY POWER SUPPLY CIRCUIT In turp power swith of short to ground, between IPDM E/R harness connector. 1. Disconnect IPDM E/R harness connector. In turp power swith or short to ground, between IPDM E/R harness connector and VCM harness connector. 1. Disconnect IPDM E/R tharness connector. Interminitent incident. 1. Discontect IPDM E/R tharness connector. <	#77 fuse termin	al Gro	und 1	_	-
YES >> GO TO 5. NO >> Perform trouble diagnosis for 12V battery power supply. 5.CHECK 12V BATTERY POWER SUPPLY CIRCUIT 1. Disconnect VCM harness connector. 2. Check the continuity between #77 fuse terminal and VCM harness connector. #77 fuse termi- at - Connector Terminal #77 fuse termi- at E62 79 Existed Existed Is the inspection result normal? YES YES >> Check intermittent incident. Refer to GI-53, "Intermittent Incident". NO >> Repair or replace error-detected parts. 6.CHECK FUSE 1 1. Turn power switch ON. 2 2. Pull out #43 fuse and check that the fuse is not fusing. 1 Is the inspection result normal? YES YES >> GO TO 9. NO >> GO TO 7. 7.CHECK 12V BATTERY POWER SUPPLY CIRCUIT 1 1. Disconnect IPDM E/R harness connector. 1 2. Disconnect VCM harness connector. 2 3. Check harness for short to ground, between IPDM E/R harness connector and VCM harness connector. YES >> GO TO 8. NO >> Repair or replace error	Is the inspection	result normal?	2		
5.CHECK 12V BATTERY POWER SUPPLY CIRCUIT 1. Disconnect VCM harness connector. 2. Check the continuity between #77 fuse terminal and VCM harness connector. # VCM Connector Terminal #77 fuse termi- nal E62 79 Existed Is the inspection result normal? YES > Check intermittent incident. Refer to G1-53. "Intermittent Incident". F6 O >> Repair or replace error-detected parts. F6 CHECK FUSE F7 1. Turn power switch ON. 2. Pull out #43 fuse and check that the fuse is not fusing. F7 Is the inspection result normal? YES > G0 T0 9. F7 F7 O > G0 T0 9. NO > Continuity F7 1. Disconnect I/POM E/R harness connector. 2. Disconnect/VCM harness connector. F7 2. CHECK 12V BATTERY POWER SUPPLY CIRCUIT 1. Disconnect/ VCM harness connector.					
1. Disconnect VCM harness connector. 2. Check the continuity between #77 fuse terminal and VCM harness connector. * Connector * VCM Connector Terminal #77 fuse terminal E62 #78 Loss Check intermittent incident. Refer to GI-53. "Intermittent Incident". NO >> Repair or replace error-detected parts. 6. CHECK FUSE E 1. Turn power switch ON. E 2. Pull out #43 fuse and check that the fuse is not fusing. E Is the inspection result normal? YES YES > GO TO 9. NO >> GO TO 7. 7. CHECK 12V BATTERY POWER SUPPLY CIRCUIT 1. Disconnect IPDM E/R harness connector. 2. Disconnect VCM harness connector. 3. Check harness for short to ground, between IPDM E/R harness connector and VCM harness connector. * * * * * * * * * * <t< td=""><td>-</td><td></td><td>-</td><td>• •</td><td>supply.</td></t<>	-		-	• •	supply.
2. Check the continuity between #77 fuse terminal and VCM harness connector. Image: Connector Terminal Continuity + VCM Continuity #77 fuse terminal E62 79 Existed is the inspection result normal? YES > Check intermittent incident. Refer to GI-53. "Intermittent Incident". NO NO >> Repair or replace error-detected parts. Continuity Context full states and check that the fuse is not fusing. 1. Turn power switch ON. 2. Pull out #43 fuse and check that the fuse is not fusing. Fill states inspection result normal? YES >> GO TO 9. NO >> GO TO 7. 7. CHECK 12V BATTERY POWER SUPPLY CIRCUIT 1 Disconnect IPDM E/R harness connector. 2. Disconnect VCM harness connector. 2 Continuity Connector Terminal - Continuity Connector Terminal - Continuity 1< Disconnect IPDM E/R harness connector.				CIRCUIT	ΞΞ
* VCM Continuity #77 fuse termi- nal E62 79 Existed #77 fuse termi- nal E62 79 Existed Is the inspection result normal? YES > Check intermittent incident. Refer to GL-53. "Intermittent Incident". NO YES > Check intermittent incident. Refer to GL-53. "Intermittent Incident". NO O >> Repair or replace error-detected parts. 6. CHECK FUSE 1. Turn power switch ON. 2. 2. Pull out #43 fuse and check that the fuse is not fusing. 1. Is the inspection result normal? YES >> GO TO 9. NO >> GO TO 7. 7. CHECK 12V BATTERY POWER SUPPLY CIRCUIT 1. Disconnect IPDM E/R harness connector. 3. Check harness for short to ground, between IPDM E/R harness connector and VCM harness connector. 2. Disconnector - Continuity Connector terminal - Continuity Connector terminal - Continuity Connector terminal - Continuity E14 42 Ground Not existed Is the inspec				orminal and VC	
+ VCM Continuity #77 fuse termi- nal E62 79 Existed is the inspection result normal? YES >> Check intermittent incident. Refer to GI-53, "Intermittent Incident". NO NO >> Repair or replace error-detected parts. G.CHECK FUSE G.CHECK FUSE 1. Turn power switch ON. Image: Second context in the fuse is not fusing. Figure 1 1. Turn power switch ON. Image: Second context in the fuse is not fusing. Figure 2 1. Turn power switch ON. Image: Second context in the fuse is not fusing. Figure 2 1. Turn power switch ON. Image: Second context in the fuse is not fusing. Figure 2 1. Turn power switch ON. Image: Second context in the fuse is not fusing. Figure 2 1. Turn power switch ON. Image: Second context in the fuse is not fusing. Figure 2 1. Disconnect IPDM E/R harness connector. Image: Second context in the fuse is not fusing. Figure 2 1. Disconnect VCM harness connector. Image: Second context in the fuse is not fusing. Figure 2 2. Connector Terminal Image: Connector Context in therminal Image: Connector Context in ther	2. Check the c	ontinuity betwe			
Connector Terminal #77 fuse termi- nal E62 79 Existed Is the inspection result normal? YES >> Check intermittent incident. Refer to GI-53. "Intermittent Incident". NO >> Repair or replace error-detected parts. 6.CHECK FUSE 1. Turn power switch ON. 2. Pull out #43 fuse and check that the fuse is not fusing. 6.CHECK FUSE 1. Turn power switch ON. 2. Pull out #43 fuse and check that the fuse is not fusing. 6.CHECK FUSE 1. Turn power switch ON. 2. Pull out #43 fuse and check that the fuse is not fusing. 6.CHECK FUSE 1. Turn power switch ON. 2. Pull out #43 fuse and check that the fuse is not fusing. 6.CHECK FUSE 1. Disconnect IPDM E/R harness connector. 70 CHECK 12V BATTERY POWER SUPPLY CIRCUIT 1. Disconnect VCM harness connector. 2. Disconnect VCM harness connector. 2. 2. Obeconnector Terminal - Continuity Connector Terminal - Continuity Connector Terminal - Continuity VES > GO TO 8. NO NO exepair or replace error-detected parts. 8.CHECK INTERMITTENT INCIDENT NO NO Sepair or replace eror-detected parts.		-	_		•
Connector Terminal #77 fuse terminal E62 79 Existed Is the inspection result normal? F YES >> Check intermittent incident. Refer to GL53. "Intermittent Incident". F NO >> Repair or replace error-detected parts. F 6.CHECK FUSE F 1. Turn power switch ON. E 2. Pull out #43 fuse and check that the fuse is not fusing. F Is the inspection result normal? YES YES S GO TO 9. NO >> GO TO 7. 7.CHECK 12V BATTERY POWER SUPPLY CIRCUIT 1. Disconnect IPDM E/R harness connector. 2. Disconnect VCM harness connector. 3. Check harness for short to ground, between IPDM E/R harness connector and VCM harness connector. * * IPDM E/R - Continuity Connector * Continuity Connector Terminal E14 42 Ground NO >> Repair or replace eror-detected parts. 8.CHECK INTERMITTENT INCIDENT No Check intermittent incident. Refer to <u>PCS-29. "Removal and Installation".</u>	+	V	CM	Continuity	
nal E62 79 Existed Is the inspection result normal? Second	_	Connector	Terminal		
Is the inspection result normal? Is the inspection result normal? YES >> Check intermittent incident. Refer to GI-53. "Intermittent Incident". NO >> Repair or replace error-detected parts. 6. CHECK FUSE 1. Turn power switch ON. 2. Pull out #43 fuse and check that the fuse is not fusing. Is the inspection result normal? YES YES YES NO >> GO TO 9. NO NO YES YES YES YES YES YES YES YES NO YES YES YES YES YES NO YES NO YES NO	#77 fuse termi-	E62	79	Existed	-
YES >> Check intermittent incident. Refer to GI-53. "Intermittent Incident". NO >> Repair or replace error-detected parts. 6.CHECK FUSE 1. Turn power switch ON. 2. Pull out #43 fuse and check that the fuse is not fusing. Is the inspection result normal? YES >> GO TO 9. NO >> GO TO 7. 7.CHECK 12V BATTERY POWER SUPPLY CIRCUIT 1. Disconnect IPDM E/R harness connector. 2. Disconnect VCM harness connector. 3. Check harness for short to ground, between IPDM E/R harness connector and VCM harness connector. * IPDM E/R - Connector Terminal E14 42 Ground Not existed Is the inspection result normal? YES >> GO TO 8. NO >> Repair or replace error-detected parts. 8.CHECK INTERMITTENT INCIDENT Check intermittent incident. Refer to <u>GI-53. "Intermittent Incident". Is the inspection result normal? YES >> Replace IPDM E/R. Refer to <u>PCS-29. "Removal and Installation".</u> NO >> Repair or replace error-detected parts. 9.CHECK 12V BATTERY POWER SUPPLY-1 1. </u>	_		-	Existed	
NO >> Repair or replace error-detected parts. 6.CHECK FUSE 1. Turn power switch ON. 2. Pull out #43 fuse and check that the fuse is not fusing. Is the inspection result normal? YES >> GO TO 9. NO >> GO TO 7. 7.CHECK 12V BATTERY POWER SUPPLY CIRCUIT 1. Disconnect IPDM E/R harness connector. 2. Disconnect VCM harness connector. 3. Check harness for short to ground, between IPDM E/R harness connector and VCM harness connector. * IPDM E/R - Continuity Connector Terminal E14 42 Ground Not existed Is the inspection result normal? YES >> GO TO 8. NO >> Repair or replace error-detected parts. 8.CHECK INTERMITTENT INCIDENT Check intermittent incident. Refer to <u>QL-53. "Intermittent Incident". Is the inspection result normal? YES >> Replace IPDM E/R. Refer to <u>PCS-29. "Removal and Installation".</u> NO >> Repaice error-detected parts. 9.CHECK 12V BATTERY POWER SUPPLY-1 1. Insert the fuse which pulled out. </u>			-		mittant Incident"
6.CHECK FUSE 1. Turn power switch ON. 2. Pull out #43 fuse and check that the fuse is not fusing. Is the inspection result normal? YES >> GO TO 9. NO >> GO TO 7. 7.CHECK 12V BATTERY POWER SUPPLY CIRCUIT 1. Disconnect IPDM E/R harness connector. 2. Disconnect VCM harness connector. 3. Check harness for short to ground, between IPDM E/R harness connector and VCM harness connector. TPDM E/R - Continuity Connector Terminal E14 42 Ground Not existed Is the inspection result normal? YES >> GO TO 8. NO >> Repair or replace error-detected parts. 8.CHECK INTERMITTENT INCIDENT Check intermittent incident. Refer to <u>PCS-29. "Removal and Installation"</u> . NO >> Repaice IPDM E/R. Refer to <u>PCS-29. "Removal and Installation"</u> . NO >> Repaice or replace error-detected parts. 9.CHECK 12V BATTERY POWER SUPPLY-1 1. Insert the fuse which pulled out.					
1. Turn power switch ON. 2. Pull out #43 fuse and check that the fuse is not fusing. Is the inspection result normal? YES >> GO TO 9. NO >> GO TO 7. 7.CHECK 12V BATTERY POWER SUPPLY CIRCUIT 1. Disconnect IPDM E/R harness connector. 2. Disconnect VCM harness connector. 3. Check harness for short to ground, between IPDM E/R harness connector and VCM harness connector. iPDM E/R Continuity Connector Terminal E14 42 Ground Not existed Is the inspection result normal? YES YES >> GO TO 8. NO >> Repair or replace error-detected parts. 8.CHECK INTERMITTENT INCIDENT Check intermittent incident. Refer to GI-53. "Intermittent Incident". Is the inspection result normal? YES >> Repair or replace error-detected parts. 9.CHECK 12V BATTERY POWER SUPPLY-1 1. Insert the fuse which pulled out.	^ '	•			(
2. Pull out #43 fuse and check that the fuse is not fusing. Is the inspection result normal? YES >> GO TO 9. NO >> GO TO 7. 7. CHECK 12V BATTERY POWER SUPPLY CIRCUIT 1. Disconnect VCM harness connector. 2. Disconnect VCM harness connector. 3. Check harness for short to ground, between IPDM E/R harness connector and VCM harness connector. * * * * * * * * * * * * * * * * * *					
YES >> GO TO 9. NO >> GO TO 7. 7.CHECK 12V BATTERY POWER SUPPLY CIRCUIT 1 1. Disconnect IPDM E/R harness connector. 2 2. Disconnect VCM harness connector. 3 3. Check harness for short to ground, between IPDM E/R harness connector and VCM harness connector. - image: the image of the im			k that the fuse	e is not fusing.	I
NO >> GO TO 7. 7.CHECK 12V BATTERY POWER SUPPLY CIRCUIT 1. Disconnect IPDM E/R harness connector. 2. Disconnect VCM harness connector. 3. Check harness for short to ground, between IPDM E/R harness connector and VCM harness connector. IPDM E/R IPDM E/R Connector Terminal E14 42 Ground Not existed Is the inspection result normal? YES >> GO TO 8. NO >> Repair or replace error-detected parts. 8.CHECK INTERMITTENT INCIDENT Check intermittent incident. Refer to GI-53. "Intermittent Incident". Is the inspection result normal? YES >> Replace IPDM E/R. Refer to PCS-29. "Removal and Installation". NO >> Repair or replace error-detected parts. 9.CHECK 12V BATTERY POWER SUPPLY-1 1. Insert the fuse which pulled out.	Is the inspection	result normal?	2		
7.CHECK 12V BATTERY POWER SUPPLY CIRCUIT 1. Disconnect IPDM E/R harness connector. 2. Disconnect VCM harness connector. 3. Check harness for short to ground, between IPDM E/R harness connector and VCM harness connector. IPDM E/R IPDM E/R Connector Terminal E14 42 Ground Not existed Is the inspection result normal? YES >> GO TO 8. NO >> Repair or replace error-detected parts. 8.CHECK INTERMITTENT INCIDENT Check intermittent incident. Refer to GI-53, "Intermittent Incident". Is the inspection result normal? YES >> Replace IPDM E/R. Refer to PCS-29, "Removal and Installation". NO >> Repair or replace error-detected parts. 9.CHECK 12V BATTERY POWER SUPPLY-1 1. Insert the fuse which pulled out.					
1. Disconnect IPDM E/R harness connector. 2. Disconnect VCM harness connector. 3. Check harness for short to ground, between IPDM E/R harness connector and VCM harness connector.	_	-			
2. Disconnect VCM harness connector. 3. Check harness for short to ground, between IPDM E/R harness connector and VCM harness connector. + IPDM E/R - Continuity Connector Terminal E14 42 Ground Is the inspection result normal? YES YES >> GO TO 8. NO >> Repair or replace error-detected parts. 8.CHECK INTERMITTENT INCIDENT Check intermittent incident. Refer to GI-53. "Intermittent Incident". Is the inspection result normal? YES >> Replace IPDM E/R. Refer to PCS-29. "Removal and Installation". NO >> Repair or replace error-detected parts. 9.CHECK 12V BATTERY POWER SUPPLY-1 1. Insert the fuse which pulled out.	-				
3. Check harness for short to ground, between IPDM E/R harness connector and VCM harness connector. + IPDM E/R Connector Terminal E14 42 Ground Not existed Is the inspection result normal? YES >> GO TO 8. NO >> Repair or replace error-detected parts. 8.CHECK INTERMITTENT INCIDENT Check intermittent incident. Refer to GI-53. "Intermittent Incident". Is the inspection result normal? YES >> Replace IPDM E/R. Refer to PCS-29. "Removal and Installation". NO >> Repair or replace error-detected parts. 9.CHECK 12V BATTERY POWER SUPPLY-1 1. Insert the fuse which pulled out.				ır.	
+ - Continuity Connector Terminal - E14 42 Ground Not existed Is the inspection result normal? YES >> GO TO 8. NO >> Repair or replace error-detected parts. 8 CHECK INTERMITTENT INCIDENT Check intermittent incident. Refer to GI-53. "Intermittent Incident". Is the inspection result normal? YES YES >> Replace IPDM E/R. Refer to PCS-29. "Removal and Installation". NO >> Repair or replace error-detected parts. 9. CHECK 12V BATTERY POWER SUPPLY-1 F 1. Insert the fuse which pulled out. F				een IPDM E/R h	arness connector and VCM harness connector.
IPDM E/R - Continuity Connector Terminal - Continuity E14 42 Ground Not existed Is the inspection result normal? - - Not existed YES >> GO TO 8. - Not existed - NO >> Repair or replace error-detected parts. 8 CHECK INTERMITTENT INCIDENT Not existent Check intermittent incident. Refer to GI-53. "Intermittent Incident". Is the inspection result normal? Not existent YES >> Replace IPDM E/R. Refer to PCS-29. "Removal and Installation". Not existent Continuity 9. CHECK 12V BATTERY POWER SUPPLY-1 1. Insert the fuse which pulled out. F					
Connector Terminal E14 42 Ground Not existed Is the inspection result normal? YES >> GO TO 8. NO NO >> Repair or replace error-detected parts. 8. CHECK INTERMITTENT INCIDENT N Check intermittent incident. Refer to GI-53, "Intermittent Incident". Is the inspection result normal? N YES >> Replace IPDM E/R. Refer to PCS-29, "Removal and Installation". NO NO >> Repair or replace error-detected parts. 9. CHECK 12V BATTERY POWER SUPPLY-1 F 1. Insert the fuse which pulled out. F 1.					
E14 42 Ground Not existed Is the inspection result normal? YES >> GO TO 8. NO >> Repair or replace error-detected parts. NO >> Repair or replace error-detected parts. 8.CHECK INTERMITTENT INCIDENT Check intermittent incident. Refer to GI-53. "Intermittent Incident". Is the inspection result normal? YES >> Replace IPDM E/R. Refer to PCS-29. "Removal and Installation". YES >> Repair or replace error-detected parts. 9.CHECK 12V BATTERY POWER SUPPLY-1 F 1. Insert the fuse which pulled out. F			-	Continuity	
Is the inspection result normal? N YES >> GO TO 8. NO >> Repair or replace error-detected parts. 8.CHECK INTERMITTENT INCIDENT N Check intermittent incident. Refer to GI-53. "Intermittent Incident". N Is the inspection result normal? YES YES >> Replace IPDM E/R. Refer to PCS-29. "Removal and Installation". NO >> Repair or replace error-detected parts. 9.CHECK 12V BATTERY POWER SUPPLY-1 F 1. Insert the fuse which pulled out. F					-
YES >> GO TO 8. NO >> Repair or replace error-detected parts. 8.CHECK INTERMITTENT INCIDENT Check intermittent incident. Refer to GI-53, "Intermittent Incident". Is the inspection result normal? YES >> Replace IPDM E/R. Refer to PCS-29, "Removal and Installation". NO >> Repair or replace error-detected parts. 9.CHECK 12V BATTERY POWER SUPPLY-1 1. Insert the fuse which pulled out.				Not existed	
NO >> Repair or replace error-detected parts. 8.CHECK INTERMITTENT INCIDENT Intermittent incident. Refer to GI-53, "Intermittent Incident". Is the inspection result normal? YES YES >> Replace IPDM E/R. Refer to PCS-29, "Removal and Installation". NO >> Repair or replace error-detected parts. 9.CHECK 12V BATTERY POWER SUPPLY-1 F 1. Insert the fuse which pulled out.	-		2		1
8.CHECK INTERMITTENT INCIDENT N Check intermittent incident. Refer to GI-53, "Intermittent Incident". Is the inspection result normal? YES >> Replace IPDM E/R. Refer to PCS-29, "Removal and Installation". NO >> Repair or replace error-detected parts. 9.CHECK 12V BATTERY POWER SUPPLY-1 F 1. Insert the fuse which pulled out.			error-detected	parts.	
Check intermittent incident. Refer to <u>GI-53, "Intermittent Incident"</u> . <u>Is the inspection result normal?</u> YES >> Replace IPDM E/R. Refer to <u>PCS-29, "Removal and Installation"</u> . NO >> Repair or replace error-detected parts. 9. CHECK 12V BATTERY POWER SUPPLY-1 1. Insert the fuse which pulled out.	• '	•		F	
Is the inspection result normal? YES >> Replace IPDM E/R. Refer to PCS-29, "Removal and Installation". NO >> Repair or replace error-detected parts. 9.CHECK 12V BATTERY POWER SUPPLY-1 F 1. Insert the fuse which pulled out.				Intermittent Incid	
YES >> Replace IPDM E/R. Refer to PCS-29, "Removal and Installation". C NO >> Repair or replace error-detected parts. C 9.CHECK 12V BATTERY POWER SUPPLY-1 F 1. Insert the fuse which pulled out. F					<u></u> .
NO >> Repair or replace error-detected parts. 9. CHECK 12V BATTERY POWER SUPPLY-1 1. Insert the fuse which pulled out.			_	S-29, "Removal	and Installation".
1. Insert the fuse which pulled out.	NO >> Rep	air or replace	error-detected	parts.	
1. Insert the fuse which pulled out.	9.CHECK 12V	BATTERY PO	VER SUPPLY	⁄-1	

2. Check the voltage between IPDM E/R harness connector and ground.

P31E5 VCM POWER SUPPLY

< DTC/CIRCUIT DIAGNOSIS >

	+		
IPDN	M E/R	_	Voltage
Connector	Terminal		
E14	42	Ground	12V battery voltage

Is the inspection result normal?

YES >> GO TO 11.

NO >> GO TO 10.

10.CHECK 12V BATTERY POWER SUPPLY-2

Check IPDM E/R power supply circuit. Refer to PCS-28, "Diagnosis Procedure".

Is the inspection result normal?

YES >> Replace IPDM E/R. Refer to PCS-29, "Removal and Installation".

NO >> Repair or replace error-detected parts.

11. CHECK 12V BATTERY POWER SUPPLY CIRCUIT

1. Disconnect IPDM E/R harness connector.

- 2. Disconnect VCM harness connector.
- 3. Check the continuity between IPDM E/R harness connector and VCM harness connector.

	+			
IPDN	/I E/R	V	Continuity	
Connector	Terminal	Connector Terminal		
E14	42	E61	11	Existed

4. Also check harness for short to ground.

Is the inspection result normal?

- YES >> GO TO 12.
- NO >> Repair or replace error-detected parts.

12. CHECK VCM GROUND CIRCUIT

Check the continuity between VCM harness connector and ground.

	+			
V	CM	-	Continuity	
Connector	Terminal			
E61	58			
LOT	65	Ground	Existed	
E62	118	Ground	Existed	
E02	126			

Is the inspection result normal?

YES >> Check intermittent incident. Refer to <u>GI-53, "Intermittent Incident"</u>.

NO >> Repair or replace error-detected parts.

P31E7 RESTART INHIBITION

< DTC/CIRCUIT DIAGNOSIS >

P31E7 RESTART INHIBITION

DTC Logic

А

В

INFOID:000000008747236

DTC DETECTION LOGIC

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	Possible cause	E
P31E7	RESTART INHIBITION (Restart inhibition)	VCM detects DTC "P0AA6".	VCM detects DTC "P0AA6".	
TC CO	ONFIRMATION PROCI	EDURE		
.INSF	PECTION START			
		I detects DTC "P0AA6". If this DTC displayed,	perform trouble diagnosis for	
DTC "P	DAA6".			
DTC "P		, "Diagnosis Procedure".		
		, "Diagnosis Procedure".	INFOID:00000008747237	
iagno	>> Proceed to <u>EVC-357</u> osis Procedure	r <mark>, "Diagnosis Procedure"</mark> . C "P0AA6". Refer to <u>EVC-188, "DTC Logic"</u> .	INFOID:00000008747237	
viagno	>> Proceed to <u>EVC-357</u> osis Procedure		INFOID:00000008747237	
)iagno	>> Proceed to <u>EVC-357</u> osis Procedure		INFOID:00000008747237	
iagno	>> Proceed to <u>EVC-357</u> osis Procedure		INFOID:00000008747237	
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< DTC/CIRCUIT DIAGNOSIS >

P31E8 WATER PUMP

DTC Logic

INFOID:000000008747238

DTC DETECTION LOGIC

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	Possible cause
P31E8	WATER PUMP 1 (Water pump 1)	Electric water pump feedback duty keeps either of the following conditions for 30 seconds. • Less than 3% • 91% or more • Between 13% and 17%	 Harness or connectors Electric water pump VCM

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

• Turn power switch OFF and wait at least 20 seconds.

Make sure that 12V battery voltage is 11 V or more.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT

- Turn power switch OFF and wait at least 60 seconds.
- 2. Set the vehicle to READY and wait at least 60 seconds.
- 3. Check DTC.

Is DTC detected?

- YES >> Proceed to EVC-358, "Diagnosis Procedure".
- NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000008747239

1. CHECK SELF-DIAGNOSTIC RESULT IN VCM

Check self-diagnostic result in "EV/HEV".

Is DTC detected other than P31E8?

- YES >> Perform diagnosis procedure of detected DTC. Refer to EVC-102, "DTC Index".
- NO >> GO TO 2.
- 2.CHECK WATER PUMP FEEDBACK DUTY-1

With CONSULT

- 1. Set the vehicle to READY.
- 2. On the CONSULT screen, select "EV/HEV" >> "DATA MONITOR" >> "W/P 1 CRNT SPD DUTY".
- 3. Check "W/P 1 CRNT SPD DUTY" value.

Is value more than 91%?

YES >> GO TO 5. NO >> GO TO 3.

3.CHECK WATER PUMP FEEDBACK DUTY-2

With CONSULT

Check "W/P 1 CRNT SPD DUTY" value.

Is value less than 3%?

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

4.CHECK WATER PUMP FEEDBACK DUTY-3

With CONSULT

P31E8 WATER PUMP

< DTC/CIRCUIT DIAGNOSIS >

- 1. On the CONSULT screen, select "EV/HEV" >> "DATA MONITOR" >> "W/P 1 CRNT SPD DUTY" and "WATER PUMP 1 TRG DUTY".
- Check that "W/P 1 CRNT SPD DUTY" and "WATER PUMP 1 TRG DUTY" agree with the values listed below.

W/P 1 CRNT SPD DUTY	17 – 82%
WATER PUMP 1 TRG DUTY	20 – 80%

Are the above values satisfied?

YES >> GO TO 5.

NO >> Check intermittent incident. Refer to <u>GI-53, "Intermittent Incident"</u>.

5. CHECK WATER PUMP SIGNAL CIRCUIT

- 1. Turn power switch OFF.
- 2. Disconnect electric water pump harness connector and VCM harness connector.
- 3. Check the continuity between electric water pump harness connector and VCM harness connector.

Electric water pump		VCM		Continuity	
Connector Terminals		Connector	Terminals	Continuity	
E67	3	E61	20	Existed	
LUT	4	LUI	19	LAISIEU	

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

Is the inspection result normal?

- YES >> GO TO 6.
- NO >> Repair or replace error-detected parts.

6.CHECK FUSE

- 1. Turn power switch OFF.
- 2. Pull out #71 fuse.
- 3. Make sure that the fuse is not fusing.
- Is the inspection result normal?

YES >> GO TO 7.

NO >> Replace the fuse after repairing the applicable circuit.

7.CHECK WATER PUMP INPUT POWER VOLTAGE

1. Insert the fuse which pulled out.

- 2. Disconnect water pump harness connector.
- 3. Turn power switch ON.

4. Check the voltage between water pump harness connector and ground.

YES >> Replace electric water pump. Refer to <u>HCO-25, "Removal and Installation"</u>.

NO >> GO TO 8.

8. CHECK WATER PUMP INPUT POWER CIRCUIT-1

1. Turn power switch OFF.

2. Pull out #71 fuse.

3. Check the continuity between electric water pump harness connector and fuse terminal.

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P31E8 WATER PUMP

< DTC/CIRCUIT DIAGNOSIS >

<u>Floatrio</u>	+		Continuity
Connector	ater pump Terminal	_	Continuity
E67	1	#71 fuse termi- nal	Existed

4. Also check harness for short to ground.

Is the inspection result normal?

YES >> GO TO 9.

NO >> Repair or replace error-detected parts.

9. CHECK WATER PUMP INPUT POWER CIRCUIT-2

1. Remove M/C relay.

2. Check the continuity between M/C relay harness connector and fuse terminal.

	+		
M/C	relay	_	Continuity
Connector	Terminal	•	
E65	5	#71 fuse termi- nal	Existed

3. Also check harness for short to ground.

Is the inspection result normal?

YES >> Perform trouble diagnosis for M/C relay routing circuit. Refer to EVC-374, "Diagnosis Procedure".

NO >> Repair or replace error-detected parts.

P31E9 WATER PUMP

< DTC/CIRCUIT DIAGNOSIS >

P31E9 WATER PUMP

DTC Logic

INFOID:00000008747240

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DTC DETECTION LOGIC

DTC DE	TECTION LOGIC			В
DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	Possible cause	EVC
P31E9	WATER PUMP 1 (Water pump 1)	Electric water pump feedback duty keeps between 82% and 91% for 30 seconds.	Harness or connectorsElectric water pumpVCM	D
	ONFIRMATION PROC	EDURE		D
• Turn po	ower switch OFF and was sure that 12V battery vol			E
2.PERF	>> GO TO 2. FORM DTC CONFIRMA	TION PROCEDURE		F
2. Set f		wait at least 60 seconds. Id wait at least 60 seconds.		G
YES	letected? >> Proceed to <u>EVC-361</u> >> INSPECTION END	<u>, "Diagnosis Procedure"</u> .		Η
Diagno	sis Procedure		INFOID:00000008747241	
1 .CHEC	CK DTC			J
<u>Is DTC d</u> YES	self-diagnosis of VCM. letected other than P31E >> Perform diagnosis pi >> GO TO 2.	<u>59?</u> rocedure of detected DTC. Refer to <u>EVC-102, "DTC_Ir</u>	ndex".	K
•	CK WATER PUMP FEED	BACK DUTY		
On the C	CONSULT CONSULT screen, select between 82% and 91%?	"EV/HEV" >> "DATA MONITOR" >> "W/P 1 CRNT SP	DUTY".	L

Is value between 82% and 9 YES >> GO TO 3.

NO >> Check intermittent incident. Refer to GI-53, "Intermittent Incident".

3.CHECK FUSE

- 1. Turn power switch OFF.
- 2. Pull out #71 fuse.

3. Make sure that the fuse is not fusing.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Replace the fuse after repairing the applicable circuit.

4.CHECK WATER PUMP INPUT POWER VOLTAGE

1. Insert the fuse which pulled out.

Disconnect water pump harness connector. 2.

Turn power switch ON. 3.

4. Check the voltage between water pump harness connector and ground. Ν

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P31E9 WATER PUMP

< DTC/CIRCUIT DIAGNOSIS >

	÷		
Electric w	ater pump	_	Voltage
Connector	Connector Terminal		
E67	1	Ground	12V battery volt- age

Is the inspection result normal?

YES >> Replace electric water pump. Refer to <u>HCO-25</u>, "Removal and Installation".

NO >> GO TO 5.

5. CHECK WATER PUMP INPUT POWER CIRCUIT-1

- 1. Turn power switch OFF.
- 2. Pull out #71 fuse.
- 3. Check the continuity between electric water pump harness connector and fuse terminal.

	÷		
Electric w	ater pump	_	Continuity
Connector	Terminal	*	
E67	1	#71 fuse termi- nal	Existed

4. Also check harness for short to ground.

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace error-detected parts.

6.CHECK WATER PUMP INPUT POWER CIRCUIT-2

- 1. Remove M/C relay.
- 2. Check the continuity between M/C relay harness connector and fuse terminal.

	+		
M/C	relay	_	Continuity
Connector	Terminal		
F65	5	#71 fuse termi- nal	Existed

3. Also check harness for short to ground.

Is the inspection result normal?

YES >> Perform trouble diagnosis for M/C relay routing circuit. Refer to EVC-374, "Diagnosis Procedure".

NO >> Repair or replace error-detected parts.

P31EC WATER PUMP

< DTC/CIRCUIT DIAGNOSIS >

P31EC WATER PUMP

DTC Logic

DTC DETECTION LOGIC

NOTE:

This DTC may be detected where there is the mixing of air into coolant.

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	Possible cause
P31EC	WATER PUMP 1 (Water pump 1)	Electric water pump feedback duty keeps between 3% and 7% for 30 seconds.	Harness or connectorsElectric water pumpVCM
DTC CC	NFIRMATION PROC	EDURE	
1.PREC	CONDITIONING		
	ower switch OFF and was sure that 12V battery vol		
	>> GO TO 2.		
2.PERF	ORM DTC CONFIRMA	TION PROCEDURE	
2. Set f		wait at least 60 seconds. nd wait at least 60 seconds.	
YES	letected? >> Proceed to EVC-363 >> INSPECTION END	3, "Diagnosis Procedure".	
Diagno	sis Procedure		INFOID:00000008747247
1. CHEC	CK DTC		
Perform	self-diagnosis of VCM.		
	letected other than P31E		
	>> Perform diagnosis p >> GO TO 2.	rocedure of detected DTC Refer to EVC-102, "DTC In	<u>dex"</u> .
•	CK WATER PUMP FEEL	DBACK DUTY	
		"EV/HEV" >> "DATA MONITOR" >> "W/P 1 CRNT SP	D DUTY".
	between 3% and 7%?		
-	>> GO TO 3. >> GO TO 4.		
-	CK COOLANT		
-	power switch OFF.		
2. Che	ck that the coolant is fre	e from air mixture.	
	spection result normal?		
	>> GO TO 4. >> Perform the air blee	ding. Refer to <u>HCO-12, "Refilling"</u> .	
		TION PROCEDURE AGAIN	
	CONSULT		
1. Turn	power switch ON and e		
		rocedure again. Refer to <u>EVC-363, "DTC Logic"</u> .	
	P31EC" detected again? >> Replace VCM, Refe	r to EVC-426, "Removal and Installation".	
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EVC-363

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INFOID:000000008747246

P31EC WATER PUMP

< DTC/CIRCUIT DIAGNOSIS >

NO >> INSPECTION END

P31EE REFRIGERANT PRESSURE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

P31EE REFRIGERANT PRESSURE SENSOR

DTC Logic

DTC DETECTION LOGIC

В

EVC

INFOID:000000008747250

NOTE: If DTC P31EE is displayed with DTC P31E5, first perform the trouble diagnosis for DTC P31E5. Refer to <u>EVC-354, "DTC Logic"</u>.

1		1		
DTC	CONSULT screen terms (Trouble diagnosis content)		DTC detecting condition	Possible cause
P31EE	REFRIGERANT PRES- SURE SENSOR Refrigerant pressure sen- sor)	Approx. 0 V Signal voltage 	ge from refrigerant pressure sensor remains for 2.5 seconds or more ge from refrigerant pressure sensor remains V or more for 2.5 seconds or more	 Harness or connectors (Refrigerant pressure sensor circuit is open or shorted.) Refrigerant pressure sensor VCM
отс со	NFIRMATION PROC	EDURE		
1.PREC	ONDITIONING			
	wer switch OFF and wa			
 Make s 	ure that 12V battery vol	tage is 11 V o	r more.	
:	>> GO TO 2.			
2.perf	ORM CONFIRMATION	PROCEDUR	E	
1. Turn 2. Chec	ONSULT power switch ON at lea k self-diagnostic result.	ist 20 seconds	5.	
I <u>s DTC de</u> YES	Proceed to EVC-365	5 "Diagnosis I	Procedure"	
	>> INSPECTION END		<u>loocdule</u> .	
Diagno	sis Procedure			INFOID:00000008747251
1. CHEC	K REFRIGERANT PRE	ESSURE SEN	SOR POWER SUPPLY-1	
	power switch OFF.			
	nnect refrigerant press power switch ON.	ure sensor ha	irness connector.	
		refrigerant pre	essure sensor harness connector ter	minals.
	Define and an and an			
	Refrigerant pressure sens		Voltage	
Conne	ctor Termir	nal	(Approx.)	
E49	3	1	5 V	
	pection result normal?			
	>> GO TO 7. >> GO TO 2.			
-		SSURE SEN	SOR POWER SUPPLY-2	

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P31EE REFRIGERANT PRESSURE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

	+				
Refrigerant pr	essure sensor	_	Voltage (Approx.)		
Connector	Connector Terminal				
E49	3	Ground	5 V		

Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 3.

$\mathbf{3}$.check refrigerant pressure sensor power supply circuit

- 1. Turn power switch OFF.
- 2. Disconnect VCM harness connector.
- 3. Check the continuity between refrigerant pressure sensor and VCM harness connector.

+				
Refrigerant pr	efrigerant pressure sensor		VCM	
Connector	Terminal	Connector	Terminal	
E49	3	E62	98	Existed

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

Is the inspection result normal?

YES >> Check power supply circuit for sensor power supply. Refer to EVC-354. "Diagnosis Procedure".

NO >> Repair or replace error-detected parts.

4. CHECK REFRIGERANT PRESSURE SENSOR GROUND CIRCUIT

1. Turn power switch OFF.

- 2. Disconnect VCM harness connector.
- 3. Check the continuity between refrigerant pressure sensor and VCM harness connector.

	+		_	
Refrigerant pressure sensor		VCM		Continuity
Connector	Terminal	Connector Terminal		
E49	1	E62	123	Existed

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace error-detected parts.

5. CHECK VCM GROUND CIRCUIT

Check the continuity between VCM harness connector and ground.

	+			
V	СМ	-	Continuity	
Connector	Terminal	-		
E61	58			
EOI	65	Ground	Existed	
F63	118	Giouna		
E62	126	-		

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace error-detected parts.

6.CHECK INTERMITTENT INCIDENT

P31EE REFRIGERANT PRESSURE SENSOR

Image: Contract of the contract			FUILE KE			SOURE SENSOR	
the inspection result normal? IS >> Replace VCM. Refer to EVC-426. "Removal and Installation". IO >> Repair or replace error-detected parts. CHECK REFRIGERANT PRESSURE SENSOR SIGNAL CIRCUIT Turn power switch OFF. Disconnect VCM harness connector. Check the continuity between refrigerant pressure sensor harness connector and VCM harness connector.	DTC/CIRC	UIT DIAGN	10SIS >				
** For the control of the control o	Check intermi	ittent incide	nt. Refer to	GI-53, "Inter	mittent Incid	<u>nt"</u> .	
10 >> Repair or replace error-detected parts. 12 CHECK REFRIGERANT PRESSURE SENSOR SIGNAL CIRCUIT Turn power switch OFF. Disconnect VCM harness connector. Check the continuity between refrigerant pressure sensor harness connector and VCM harness connector. Continuity	s the inspect	<u>ion result n</u>	ormal?				
CHECK REFRIGERANT PRESSURE SENSOR SIGNAL CIRCUIT Turn power switch OFF. Disconnect VCM harness connector. Check the continuity between refrigerant pressure sensor harness connector and VCM harness connector. 						nstallation".	
Turn power switch OFF. Disconnect VCM harness connector. Check the continuity between refrigerant pressure sensor harness connector and VCM harness connector. 	-	•	•	•			
Disconnect VCM harness connector. Check the continuity between refrigerant pressure sensor harness connector and VCM harness connector. 	.CHECK R	EFRIGERA	NT PRESSL	JRE SENSO	OR SIGNAL (IRCUIT	
the continuity between refrigerant pressure sensor harness connector and VCM harness connector. * - efrigerant pressure sensor VCM Connector Terminal 249 3 E62 98 Also check harness for short to power and short to ground. the DTC detected again? ES >> Replace refrigerant pressure sensor. Refer to HA-43, "HIGH-PRESSURE FLEXIBLE HOSE : Removal and Installation". IO >> Repair or replace error-detected parts.							
the continuity between reingerant pressure sensor namess connector and vCM namess connector to.							H
+ - efrigerant pressure sensor VCM Continuity Connector Terminal Connector E49 3 E62 98 Existed Also check harness for short to power and short to ground. the DTC detected again? ES >> Replace refrigerant pressure sensor. Refer to HA-43. "HIGH-PRESSURE FLEXIBLE HOSE : Removal and Installation". IO >> Repair or replace error-detected parts. E		e continuity	between rei	rigerant pre	essure senso	namess connector and VCM namess connec-	
effigerant pressure sensor VCM Continuity Connector Terminal Connector E49 3 E62 98 Existed Also check harness for short to power and short to ground. the DTC detected again? ES >> Replace refrigerant pressure sensor. Refer to HA-43, "HIGH-PRESSURE FLEXIBLE HOSE ; Removal and Installation". IO >> Repair or replace error-detected parts.							
Connector Terminal E49 3 E62 98 Existed Also check harness for short to power and short to ground. the DTC detected again? TES >> Replace refrigerant pressure sensor. Refer to HA-43, "HIGH-PRESSURE FLEXIBLE HOSE : Removal and Installation". IO >> Repair or replace error-detected parts.	+		-	_			
Connector Terminal E49 3 E62 98 Existed Also check harness for short to power and short to ground. the DTC detected again? TES >> Replace refrigerant pressure sensor. Refer to HA-43, "HIGH-PRESSURE FLEXIBLE HOSE : Removal and Installation". IO >> Repair or replace error-detected parts.	Refrigerant pre	essure sensor	VC	M	Continuity		
E49 3 E62 98 Existed Also check harness for short to power and short to ground. the DTC detected again? 'ES >> Replace refrigerant pressure sensor. Refer to HA-43, "HIGH-PRESSURE FLEXIBLE HOSE : Removal and Installation". IO >> Repair or replace error-detected parts.							
Also check harness for short to power and short to ground. the DTC detected again? TES >> Replace refrigerant pressure sensor. Refer to <u>HA-43, "HIGH-PRESSURE FLEXIBLE HOSE :</u> <u>Removal and Installation"</u> . IO >> Repair or replace error-detected parts.	F49	3		98	Existed		
the DTC detected again? 'ES >> Replace refrigerant pressure sensor. Refer to <u>HA-43, "HIGH-PRESSURE FLEXIBLE HOSE : Removal and Installation".</u> IO >> Repair or replace error-detected parts.		-					
 YES >> Replace refrigerant pressure sensor. Refer to <u>HA-43, "HIGH-PRESSURE FLEXIBLE HOSE :</u> <u>Removal and Installation"</u>. Yepair or replace error-detected parts. 			-		non to groun		
Removal and Installation". IO >> Repair or replace error-detected parts.		-			r Dofor to I		
IO >> Repair or replace error-detected parts.					n. Reler lo	A-43, HIGH-PRESSURE FLEXIBLE HUSE .	
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P31F2 AV INFORMATION MISMATCH

< DTC/CIRCUIT DIAGNOSIS >

P31F2 AV INFORMATION MISMATCH

DTC Logic

INFOID:000000008747254

DTC DETECTION LOGIC

DTC	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	Possible cause
P31F2	AV SET INFORMATION (AV set information)	Setting of timer charge does not succeed for 5 seconds after VCM receives a timer charge set signal.	AV control unit VCM

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

• Turn power switch OFF and wait at least 20 seconds.

• Make sure that 12V battery voltage is 11 V or more.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE-1

With CONSULT

- Turn power switch OFF and wait at least 20 seconds.
- 2. Turn power switch ON.
- 3. Change the timer charge setting 1 on navigation display and wait at least 10 seconds.
- 4. Check DTC.

Is DTC detected?

- YES >> Proceed to EVC-369, "Diagnosis Procedure".
- NO >> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE-2

With CONSULT

- I. Turn power switch OFF and wait at least 20 seconds.
- 2. Turn power switch ON.
- 3. Change the timer charge setting 2 on navigation display and wait at least 10 seconds.
- 4. Check DTC.

Is DTC detected?

- YES >> Proceed to EVC-369, "Diagnosis Procedure".
- NO >> GO TO 4.

4.PERFORM DTC CONFIRMATION PROCEDURE-3

With CONSULT

- Turn power switch OFF and wait at least 20 seconds.
- 2. Turn power switch ON.
- 3. Change the Climate Ctrl. Timer setting 1 on navigation display and wait at least 10 seconds.
- 4. Check DTC.

Is DTC detected?

YES >> Proceed to EVC-369, "Diagnosis Procedure".

NO >> GO TO 5.

5.PERFORM DTC CONFIRMATION PROCEDURE-4

- 1. Turn power switch OFF and wait at least 20 seconds.
- 2. Turn power switch ON.
- 3. Change the Climate Ctrl. Timer setting 2 on navigation display and wait at least 10 seconds.
- 4. Check DTC.

Is DTC detected?

- YES >> Proceed to EVC-369, "Diagnosis Procedure".
- NO >> INSPECTION END

< DTC/CIRCUIT DIAGNOSIS >	
Diagnosis Procedure	INFOID:00000008747255
1. REPLACE AV CONTROL UNIT	Λ
 Replace AV control unit. Refer to <u>AV-205, "Removal and Installation"</u>. Erase DTC. Perform DTC confirmation procedure again. Refer to <u>EVC-368, "DTC Logic"</u> <u>Is the DTC detected again?</u> YES >> Replace VCM. Refer to <u>EVC-426, "Removal and Installation"</u>. 	B EVO
YES >> Replace VCM. Refer to <u>EVC-426, "Removal and Installation"</u> . NO >> INSPECTION END	
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< DTC/CIRCUIT DIAGNOSIS >

COOLING FAN

Component Function Check

1. CHECK COOLING FAN FUNCTION

(I) WITH CONSULT

- 1. Turn power switch ON.
- 2. Perform "COOLING FAN" in "ACTIVE TEST" mode with CONSULT.
- 3. Check that cooling fan speed varies according to the percentage.

Is the inspection result normal?

- YES >> INSPECTION END
- NO >> Proceed to EVC-370, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:000000008747257

INFOID:00000008747256

1. CHECK COOLING FAN CONTROL MODULE POWER SUPPLY

- 1. Turn power switch OFF.
- 2. Disconnect cooling fan control module harness connector.
- 3. Turn power switch ON.
- 4. Check the voltage between cooling fan control module harness connector and ground.

	+		
Cooling fan c	ontrol module	-	Voltage
Connector	Terminal		
E19	3	Ground	12V battery volt- age

Is the inspection result normal?

YES >> GO TO 11.

NO >> GO TO 2.

2.CHECK 12V BATTERY POWER SUPPLY

- 1. Turn power switch OFF.
- 2. Remove cooling fan relay.
- 3. Check the voltage between cooling fan relay harness connector and ground.

	+		
Cooling	fan relay	_	Voltage
Connector	Terminal	*	
E18	3	Ground	12V battery volt- age

Is the inspection result normal?

YES >> GO TO 3.

NO >> Check power supply circuit for 12V battery power supply.

3.CHECK COOLING FAN RELAY OUTPUT VOLTAGE-1

- 1. Turn power switch ON.
- 2. Check the voltage between cooling fan relay harness connector and ground.

	+		
Cooling	fan relay	-	Voltage
Connector	Terminal	*	
E18	1	Ground	12V battery volt- age

COOLING FAN

	T DIAGNOSIS				
	n result normal	<u>?</u>			
YES >> GO NO >> GO					
CHECK FUS	-				
. Turn power	switch OFF.				—
. Pull out #73	3 fuse.	6			
	the fuse is not n result normal	-			
YES >> GO		<u>.</u>			
		after repairing t	he applicable c	ircuit.	
CHECK CO	oling fan Re	ELAY OUTPUT	VOLTAGE-2		
	switch ON. voltage betwee	en fuse terminal	and ground.		_
+		_	Voltage	-	
			12V battery volt-	-	
#73 fuse t		Ground	age	_	
-	n result normal	?			
YES >> GO NO >> GO					
	RELAY OUTF				
	switch OFF.				
. Remove M	/C relay.	een M/C relay l	narness connec	ctor terminal and fuse harness connector.	
. Remove M . Check the o	/C relay. continuity betw	een M/C relay I	narness conneo	ctor terminal and fuse harness connector.	
. Remove M. . Check the o	/C relay. continuity betw +	een M/C relay I		ctor terminal and fuse harness connector.	
. Remove M. . Check the o	/C relay. continuity betw	een M/C relay I	Continuity	ctor terminal and fuse harness connector.	
Remove M Check the o	/C relay. continuity betw + ^{relay}	een M/C relay I 		ctor terminal and fuse harness connector.	
. Remove M Check the o M/C Connector F65	/C relay. continuity betw + relay Terminal 5		Continuity Existed	-	
Remove M Check the o M/C Connector F65 Also check	/C relay. continuity betw + relay Terminal 5	#73 fuse termi- nal	Continuity Existed	-	
Remove M Check the of M/C Connector F65 Also check the inspection YES >> Che	/C relay. continuity betw + relay Terminal 5 harness for sh <u>n result normal</u> eck M/C relay r	#73 fuse termi- nal port to ground an ? routing circuit. F	Continuity Existed nd short to pow Refer to <u>EVC-33</u>	-	
Remove M/ Check the of M/C Connector F65 Also check the inspection YES >> Che NO >> Re	/C relay. continuity betw + relay Terminal 5 harness for sh <u>n result normal</u> eck M/C relay r pair or replace	#73 fuse termi- nal fort to ground an <u>?</u> routing circuit. F error-detected	Continuity Existed and short to pow Refer to EVC-37 parts.	– er. 7 <u>4. "Diagnosis Procedure"</u> .	
Remove M/ Check the of M/C Connector F65 Also check the inspection YES >> Che NO >> Rej .CHECK COO	/C relay. continuity betw + relay Terminal 5 harness for sh <u>n result normal</u> eck M/C relay r pair or replace OLING FAN CO	#73 fuse termi- nal fort to ground an <u>?</u> routing circuit. F error-detected	Continuity Existed and short to pow Refer to EVC-37 parts.	– – er.	
Remove M Check the of M/C Connector F65 Also check the inspection (ES >> Che NO >> Rej .CHECK COO Turn power	/C relay. continuity betw + relay Terminal 5 harness for sh <u>n result normal</u> eck M/C relay r pair or replace DLING FAN CO	#73 fuse termi- nal fort to ground an routing circuit. F error-detected	Continuity Existed and short to pow Refer to <u>EVC-37</u> parts. JLE POWER S	- er. 7 <u>4. "Diagnosis Procedure"</u> . UPPLY CIRCUIT	
Remove M Check the of M/C Connector F65 Also check the inspection (ES >> Che NO >> Rej .CHECK COO Turn power	/C relay. continuity betw + relay Terminal 5 harness for sh <u>n result normal</u> eck M/C relay r pair or replace DLING FAN CO	#73 fuse termi- nal fort to ground an routing circuit. F error-detected	Continuity Existed and short to pow Refer to <u>EVC-37</u> parts. JLE POWER S	– er. 7 <u>4. "Diagnosis Procedure"</u> .	
Remove M/ Check the of M/C Connector F65 Also check the inspection YES >> Che YES >> Che YES >> Che O >> Rej .CHECK COO Turn power Check the of	/C relay. continuity betw + relay Terminal 5 harness for sh <u>n result normal</u> eck M/C relay r pair or replace DLING FAN CO	#73 fuse termi- nal fort to ground an routing circuit. F error-detected	Continuity Existed and short to pow Refer to <u>EVC-37</u> parts. JLE POWER S	- er. 7 <u>4. "Diagnosis Procedure"</u> . UPPLY CIRCUIT	
Remove M Check the of M/C Connector F65 Also check the inspection YES >> Che NO >> Rep CHECK COO Turn power Check the of	/C relay. continuity betw + relay Terminal 5 harness for sh <u>n result normal</u> eck M/C relay r pair or replace DLING FAN CC switch OFF. continuity betw	#73 fuse termi- nal fort to ground an routing circuit. F error-detected	Continuity Existed and short to pow Refer to <u>EVC-37</u> parts. JLE POWER S	- er. 7 <u>4. "Diagnosis Procedure"</u> . UPPLY CIRCUIT	
Remove M Check the of M/C Connector F65 Also check the inspection YES >> Che NO >> Rep CHECK COO Turn power Check the of	/C relay. continuity betw + relay Terminal 5 harness for sh <u>n result normal</u> eck M/C relay r pair or replace DLING FAN CC * switch OFF. continuity betw	#73 fuse termi- nal fort to ground an routing circuit. F error-detected	Continuity Existed and short to pow Refer to <u>EVC-33</u> parts. JLE POWER S	- er. 7 <u>4. "Diagnosis Procedure"</u> . UPPLY CIRCUIT	
Remove M Check the of M/C Connector F65 Also check the inspection YES >> Che NO >> Re CHECK COO Turn power Check the of Cooling	/C relay. continuity betw relay Terminal 5 harness for sh <u>n result normal</u> eck M/C relay r pair or replace DLING FAN CC switch OFF. continuity betw fan relay	#73 fuse termi- nal fort to ground an routing circuit. F error-detected	Continuity Existed and short to pow Refer to <u>EVC-33</u> parts. JLE POWER S	- er. 7 <u>4. "Diagnosis Procedure"</u> . UPPLY CIRCUIT	
 Remove M. Check the one of the connector F65 Also check the inspection YES >> Check YES >> Check CHECK COO Turn power Check the one of the connector Cooling Connector E18 	/C relay. continuity betw + relay Terminal 5 harness for sh n result normal eck M/C relay r pair or replace DLING FAN CC switch OFF. continuity betw + fan relay Terminal 1	#73 fuse termi- nal port to ground an prouting circuit. F error-detected ONTROL MODU reen cooling fan #73 fuse termi- nal	Continuity Existed and short to pow Refer to EVC-37 parts. JLE POWER S relay harness Continuity Existed	- - - - - - - - - - - -	
 Remove M, Check the of M/C Connector F65 Also check the inspection YES >> Che NO >> Rep CHECK COO Turn power Check the of Cooling Connector E18 Also check 	/C relay. continuity betw + relay Terminal 5 harness for sh n result normal eck M/C relay r pair or replace DLING FAN CC switch OFF. continuity betw + fan relay Terminal 1	#73 fuse termi- nal port to ground al prouting circuit. F error-detected DNTROL MODU reen cooling fan #73 fuse termi- nal	Continuity Existed and short to pow Refer to EVC-37 parts. JLE POWER S relay harness Continuity Existed	- - - - - - - - - - - -	
 Remove M. Check the operation of the connector F65 Also check the inspection YES >> Check the operation CHECK COO Turn power Check the operation Cooling Connector E18 Also check the inspection YES >> Check Turn power Cooling Connector E18 Also check the inspection YES >> Check 	/C relay. continuity betw relay Terminal 5 harness for sh <u>n result normal</u> eck M/C relay r pair or replace OLING FAN CO switch OFF. continuity betw t fan relay Terminal 1 harness for sh <u>n result normal</u> eck intermittent	#73 fuse termi- nal port to ground an error-detected DNTROL MODU eeen cooling fan #73 fuse termi- nal port to ground an ? t incident. Refer	Continuity Existed and short to pow Refer to EVC-37 parts. JLE POWER S relay harness Continuity Existed and short to pow r to <u>GI-53, "Inte</u>	- - - - - - - - - - - -	
 Remove M. Check the orgen of the connector F65 Also check the inspection YES >> Check the orgen of the connector CHECK COO Turn power Check the orgen of the connector E18 Also check the inspection YES >> Check the inspection Cooling Connector E18 Also check the inspection YES >> Check Section 	/C relay. continuity betw relay Terminal 5 harness for sh <u>n result normal</u> eck M/C relay r pair or replace DLING FAN CC switch OFF. continuity betw fan relay Terminal 1 harness for sh <u>n result normal</u> eck intermittent pair or replace	#73 fuse termi- nal port to ground an error-detected DNTROL MODU reen cooling fan #73 fuse termi- nal port to ground an ?	Continuity Existed and short to pow Refer to EVC-37 parts. JLE POWER S relay harness Continuity Existed and short to pow r to <u>GI-53, "Inter</u> parts.	- - - - - - - - - - - - - -	

COOLING FAN

< DTC/CIRCUIT DIAGNOSIS >

2. Check the continuity between cooling fan relay harness connector and ground.

	+		
Cooling	fan relay	_	Continuity
Connector	Terminal	*	
E18	2	Ground	Existed

Is the inspection result normal?

YES >> GO TO 9.

NO >> Repair or replace error-detected parts.

9.CHECK COOLING FAN CONTROL MODULE POWER SUPPLY CIRCUIT

 Check the continuity between cooling fan relay harness connector and cooling fan control module harness connector.

	+		_	
Cooling fan o	ontrol module	Cooling	fan relay	Continuity
Connector	Terminal	Connector	Terminal	
E19	3	E18	5	Existed

2. Also check harness for short to ground.

Is the inspection result normal?

YES >> GO TO 10.

NO >> Repair or replace error-detected parts.

10. CHECK COOLING FAN RELAY

Refer to EVC-373, "Component Inspection (Cooling Fan Relay)".

Is the inspection result normal?

- YES >> Check intermittent incident. Refer to GI-53, "Intermittent Incident".
- NO >> Replace cooling fan relay.

11. CHECK COOLING FAN CONTROL MODULE GROUND CIRCUIT

- 1. Turn power switch OFF.
- 2. Check the continuity between cooling fan control module harness connector and ground.

	+		
Cooling fan c	ontrol module	—	Continuity
Connector	Terminal	*	
E19	1	Ground	Existed

Is the inspection result normal?

YES >> GO TO 12.

NO >> Repair or replace error-detected parts.

12. CHECK COOLING FAN MOTOR 1 AND 2

Check cooling fan motor. Refer to EVC-373, "Component Inspection (Cooling Fan Motor)".

Is the inspection result normal?

YES >> GO TO 13.

NO >> Replace malfunctioning cooling fan motor. Refer to HCO-22, "Exploded View".

13. CHECK COOLING FAN CONTROL SIGNAL CIRCUIT

1. Disconnect VCM harness connector.

2. Check the continuity between cooling fan control module harness connector and VCM harness connector.

COOLING FAN

< DTC/CIRCUIT DIAGNOSIS >

	+		_					А
Cooling fan	control module		VCN	1	Contir	nuity		
Connector		Connec	ctor	Terminal	-	,		5
E19	2	E62		128	Exist	ted		В
3. Also cl	neck harness	for short	to gro	ound and s	short to	power.		
Is the inspe	ection result r	ormal?	-					EVC
	> GO TO 14.							
	Repair or re	-						D
	ACE COOLII							D
	ce cooling fan the DTC.	control r	modul	e. Refer to	<u>HCO-2</u>	22, "Exploded	<u>View"</u> .	
		function	checl	k. Refer to	EVC-3	70, "Compone	ent Function Check".	E
	ection result r							
-	> INSPECTIC							F
NO >>	Replace VC	M. Refer	r to <u>E\</u>	<u>/C-426, "R</u>	emoval	l and Installati	<u>on"</u> .	I
Compon	ent Inspec	tion (C	oolin	ig Fan M	lotor)		INFOID:00000000	8747258
	COOLING F							G
			UK					
	ower switch (inect cooling		ol mo	dule harne	ss conr	nectors		Н
3. Supply	cooling fan o	control m					th 12V battery voltage as per the fol	
ing, an	d check oper	ation.						
	aling for control	modulo						
	oling fan contro	Termi	nal	Oner	ration			
Motor	Connector -	+		Орег	allon			J
1	E301	4	5					
2	E302	6	7	Cooling far	n operate	S.		
	ection result r	-						K
-	> INSPECTIC							
			ing co	oling fan r	notor. R	Refer to <u>HCO-</u>	22, "Removal and Installation".	L
Compon	ent Inspec	tion (C	oolin	ia Fan R	(elav		INFOID:00000000	8747259
	-			0	,			
I.CHECK	COOLING F	AN RELA	۹Y					M
	ower switch (
	e cooling far the continuit		n coo	ling fan re	lav tern	ninals under	Γ	N
	owing conditi				lay torn			
Terminals		Cond	ditions			Continuity		0
3 and 5	12 V direct cur	rent supply	betwee	en terminals	1 and 2	Existed	5	
	No current sup	ply				Not existed	3 9 9 5	ר P
•	ection result r							
	> INSPECTIC		rolov					
NU >,	Replace code	Jilly lall	reidy.				MBIB0057	E

< DTC/CIRCUIT DIAGNOSIS >

M/C RELAY

Diagnosis Procedure

INFOID:000000008747260

1.CHECK BATTERY POWER SUPPLY-1

1. Turn power switch OFF.

- 2. Disconnect M/C relay.
- 3. Check the voltage between M/C relay harness connector and ground.

+		
relay	_	Voltage
Terminal		
2	Ground	12V battery volt-
3	Glodina	age
	Terminal 2	Terminal 2 Ground

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 2.

2. CHECK FUSIBLE LINK

1. Remove #G fusible link.

2. Check that the fusible link is not fusing.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Replace the fusible link after repairing the applicable circuit.

3.CHECK BATTERY POWER SUPPLY-2

Check the voltage between fusible link harness connector and ground.

+	_	Voltage
#G fusible link terminal	Ground	12V battery volt- age

Is the inspection result normal?

YES >> GO TO 4.

NO >> Check power supply circuit for battery power supply.

4.CHECK BATTERY POWER SUPPLY CIRCUIT

1. Check the continuity between M/C relay harness connector and fusible link harness connector.

+	M/C	Continuity	
	Connector		
#G fusible link	E65	2	Existed
terminal	E03	3	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-53, "Intermittent Incident".

NO >> Repair or replace error-detected parts.

5.CHECK M/C RELAY

Check M/C relay. Refer to EVC-375. "Component Inspection (M/C Relay)".

Is the inspection result normal?

YES >> GO TO 6.

M/C RELAY

	M/C RELAY							А
2. Discon	ower switch C nect VCM ha the continuity	rness conneo		arness co	onnector and	d VCM harness connec	tor.	В
	+	-	-					EVC
M/0	C relay	VC	M	Conti	tinuity			
Connector	Terminal	Connector	Terminal	1				
E65	1	E62	88	Exis	sted			D
	eck harness	-	round an	d short to	o power.			
	ction result n	ormal?						Е
	· GO TO 7. · Repair or re	place error-d	etected p	arts.				
_	VCM GROU		-					
	continuity bet			nnector	and around			F
	Somminuity Det				and ground.			
	+							G
	VCM		_	Continu	uity			
Connecto	or Termi	nal						Н
E61	58							11
	65		round	Existe	ed			
E62	118		lound	Exiot	64			
	126							
-	ction result n							J
	 INSPECTIO Repair or re 		etected n	arts				
	•		•	unto.				
Compone	ent Inspec		Relay)				INFOID:000000008747261	K
1. CHECK	M/C RELAY							
1. Turn po	ower switch C	DFF.						L
	e M/C relay.				under the fo			
	the continuity conditions.		C relay te	erminais (under the to	3		в. Л
5								Μ
Terminals		Conditions	6		Continuity	5		
3 and 5	12 V direct curr	ent supply betw	een termina	lls 1 and 2	Existed			Ν
	No current supp	bly			Not existed		5	
	ction result n							0
	· INSPECTIO · Replace M/(0
NO //	ivehiace in/(Jiciay.					PIIA2636J	
							1 11/ 20000	

< DTC/CIRCUIT DIAGNOSIS >

< DTC/CIRCUIT DIAGNOSIS >

F/S CHG RELAY

Diagnosis Procedure

INFOID:000000008747262

1.CHECK F/S CHG RELAY POWER SUPPLY-1

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

	+		
F/S CH	lG relay	_	Voltage
Connector	Terminal		
E64	2	Ground	12V battery volt- age

Is the inspection result normal?

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

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

Check the voltage between IPDM E/R harness connector and ground.

IPDN	+ // E/R		Voltage
Connector			voltage
E15	55	Ground	12V battery volt- age

Is the inspection result normal?

YES >> GO TO 3.

NO >> Check F/S relay routing circuit. Refer to EVC-337, "Diagnosis Procedure".

3.CHECK F/S CHG RELAY POWER SUPPLY CIRCUIT

1. Turn power switch OFF.

- 2. Disconnect IPDM E/R harness connector.
- 3. Check the continuity between F/S CHG relay harness connector and IPDM E/R harness connector.

	+			
F/S CH	IG relay	IPDM E/R		Continuity
Connector	Terminal	Connector	Terminal	
E64	2	E15	55	Existed

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

Is the inspection result normal?

YES >> Check intermittent incident. Refer to <u>GI-53, "Intermittent Incident"</u>.

NO >> Repair or replace error-detected parts.

4.CHECK 12V BATTERY POWER SUPPLY-1

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

F/S CHG RELAY

< DTC/CIRCUIT DIAGNOSIS >

-	F			
F/S CH	G relay		Voltage	
Connector	Terminal	-		
E64	3	Ground	12V battery volt- age	
Is the inspection	n result normal	?		
YES >> GC	TO 8.	_		
NO >> GC				
5. CHECK FUS	SE			
	switch OFF.			
 Pull out #33 Check that 	3 fuse. the fuse is not	fucing		
Is the inspection		-		
YES >> GC		<u>.</u>		
		after repairing t	he applicable cir	uit.
6.CHECK 12V	BATTERY PO	WER SUPPLY	-2	
Check the volta	ge between #3	3 fuse harness	connector and	ound.
	-			
+		-	Voltage	
#33 fuse termi	nal Gro	ound 12	2V battery voltage	
Is the inspection	a rocult normal	<u> </u>		
	T TESUIL HOITIAI	<u>?</u>		
YES >> GC	TO 7.			
YES >> GC NO >> Ch	TO 7. eck power supp	bly circuit for ba	attery power sup	γ.
YES >> GC	TO 7. eck power supp	bly circuit for ba	• • •	y.
YES >> GC NO >> Ch 7.CHECK 12V	TO 7. eck power supp BATTERY PO	bly circuit for ba	CIRCUIT	y. nector and #33 fuse harness connector.
YES >> GC NO >> Ch 7.CHECK 12V	TO 7. eck power supp BATTERY PO	bly circuit for ba	CIRCUIT	
YES >> GC NO >> Ch 7.CHECK 12V 1. Check the	TO 7. eck power supp BATTERY PO continuity betwo	bly circuit for ba WER SUPPLY een F/S CHG r	CIRCUIT elay harness co	
YES >> GC NO >> Ch 7.CHECK 12V	TO 7. eck power supp BATTERY PO continuity betwo F/S CF	bly circuit for ba WER SUPPLY een F/S CHG r - IG relay	CIRCUIT	
YES >> GC NO >> Ch 7.CHECK 12V 1. Check the +	TO 7. eck power supp BATTERY PO continuity betwo	bly circuit for ba WER SUPPLY een F/S CHG r	CIRCUIT elay harness co	
YES >> GC NO >> Ch 7.CHECK 12V 1. Check the	TO 7. eck power supp BATTERY PO continuity betwo F/S CF	bly circuit for ba WER SUPPLY een F/S CHG r - IG relay	CIRCUIT elay harness co	
YES >> GC NO >> Cho 7.CHECK 12V 1. Check the o + #33 fuse termi- nal	PTO 7. Eck power supp BATTERY PO continuity betwo F/S CH Connector E64	oly circuit for ba WER SUPPLY een F/S CHG r - IG relay Terminal 3	CIRCUIT elay harness co Continuity Existed	
YES >> GC NO >> Che 7.CHECK 12V 1. Check the + #33 fuse termi- nal 2. Also check	PTO 7. Eck power supp BATTERY PO continuity betwo F/S CH Connector E64 harness for sho	oly circuit for ba WER SUPPLY een F/S CHG r 	CIRCUIT relay harness co	
YES >> GC NO >> Ch 7.CHECK 12V 1. Check the + #33 fuse termi- nal 2. Also check Is the inspection	TO 7. eck power supp BATTERY PO continuity betwo F/S CF Connector E64 harness for sho	bly circuit for ba WER SUPPLY een F/S CHG r 	CIRCUIT elay harness co Continuity Existed	nector and #33 fuse harness connector.
YES >> GC NO >> Ch 7.CHECK 12V 1. Check the #33 fuse termi- nal 2. Also check Is the inspection YES >> Che NO >> Re	TO 7. eck power supp BATTERY PO continuity betwo F/S CH Connector E64 harness for sho n result normal eck intermittent pair or replace	oly circuit for ba WER SUPPLY een F/S CHG r 	CIRCUIT relay harness co Continuity Existed nd short to powe	nector and #33 fuse harness connector.
YES >> GC NO >> Ch 7.CHECK 12V 1. Check the #33 fuse termi- nal 2. Also check Is the inspection YES >> Ch	TO 7. eck power supp BATTERY PO continuity betwo F/S CH Connector E64 harness for sho n result normal eck intermittent pair or replace	oly circuit for ba WER SUPPLY een F/S CHG r 	CIRCUIT relay harness co Continuity Existed nd short to powe	nector and #33 fuse harness connector.
YES >> GC NO >> Ch 7.CHECK 12V 1. Check the + #33 fuse termi- nal 2. Also check Is the inspection YES >> Ch NO >> Re 8.CHECK F/S	PTO 7. eck power supp BATTERY PO continuity betwo F/S CH Connector E64 harness for sho n result normal eck intermittent pair or replace CHG RELAY	oly circuit for ba WER SUPPLY een F/S CHG r 	CIRCUIT relay harness co Continuity Existed nd short to powe r to <u>GI-53. "Inter</u> parts.	nector and #33 fuse harness connector.
YES >> GC NO >> Ch 7.CHECK 12V 1. Check the + #33 fuse termi- nal 2. Also check Is the inspection YES >> Ch NO >> Re 8.CHECK F/S	TO 7. eck power supp BATTERY PO continuity betwo F/S CF Connector E64 harness for sho n result normal eck intermittent bair or replace CHG RELAY Frelay. Refer to	bly circuit for ba WER SUPPLY een F/S CHG r 	CIRCUIT relay harness co Continuity Existed nd short to powe r to <u>GI-53. "Inter</u> parts.	ittent Incident".
YES >> GC NO >> Che 7.CHECK 12V 1. Check the #33 fuse termi- nal 2. Also check Is the inspection YES >> Che NO >> Re 8.CHECK F/S Check F/S CHC Is the inspection YES >> GC	TO 7. eck power supp BATTERY PO continuity betwo F/S CH Connector E64 harness for sho n result normal eck intermittent bair or replace of CHG RELAY Frelay. Refer to n result normal TO 9.	oly circuit for ba WER SUPPLY een F/S CHG r 	CIRCUIT relay harness co Continuity Existed nd short to powe r to <u>GI-53. "Inter</u> parts.	ittent Incident".
YES >> GC NO >> Che 7.CHECK 12V 1. Check the #33 fuse termi- nal 2. Also check Is the inspection YES >> Che NO >> Re 8.CHECK F/S Check F/S CHC Is the inspection YES >> GC NO >> Re	TO 7. Eck power supp BATTERY PO continuity betwo F/S CF Connector E64 harness for sho n result normal ck intermittent bar or replace of CHG RELAY Frelay. Refer to n result normal D 70 9. blace F/S CHG	oly circuit for ba WER SUPPLY een F/S CHG r 	CIRCUIT relay harness co Continuity Existed nd short to powe r to <u>GI-53, "Inter</u> parts.	ittent Incident".
YES >> GC NO >> Che 7.CHECK 12V 1. Check the #33 fuse termi- nal 2. Also check Is the inspection YES >> Che NO >> Re 8.CHECK F/S Check F/S CHC Is the inspection YES >> GC	TO 7. Eck power supp BATTERY PO continuity betwo F/S CF Connector E64 harness for sho n result normal ck intermittent bar or replace of CHG RELAY Frelay. Refer to n result normal D 70 9. blace F/S CHG	oly circuit for ba WER SUPPLY een F/S CHG r 	CIRCUIT relay harness co Continuity Existed nd short to powe r to <u>GI-53, "Inter</u> parts.	ittent Incident".
YES >> GC NO >> Che 7.CHECK 12V 1. Check the #33 fuse termi- nal 2. Also check Is the inspection YES >> Che NO >> Re 8.CHECK F/S Check F/S CHC Is the inspection YES >> GC NO >> Re 9.CHECK F/S 1. Turn power	TO 7. Eck power supp BATTERY PO continuity betwo F/S CF Connector E64 harness for sho n result normal ck intermittent bar or replace of CHG RELAY Frelay. Refer to n result normal D 70 9. blace F/S CHG	oly circuit for ba WER SUPPLY een F/S CHG r 	CIRCUIT relay harness co Continuity Existed nd short to powe r to <u>GI-53, "Inter</u> parts.	ittent Incident".

3. Check the continuity between F/S CHG relay harness connector and VCM harness connector.

F/S CHG RELAY

< DTC/CIRCUIT DIAGNOSIS >

+					
F/S CH	F/S CHG relay		VCM		
Connector	Terminal	Connector Terminal			
E64	1	E61	8	Existed	

4. Also check harness for short to ground and short to power. <u>Is the inspection result normal?</u>

YES >> GO TO 10.

NO >> Repair or replace error-detected parts.

 $10. {\sf check vcm ground circuit}$

Check the continuity between VCM harness connector and ground.

	+		Continuity	
V	CM	-		
Connector	Terminal	•		
E61	58		Eviated	
EOT	65	Ground		
E62	118	Giouna	Existed	
E02	E62 126			

Is the inspection result normal?

YES >> INSPECTION END

NO >> Repair or replace error-detected parts.

Component Inspection (F/S CHG Relay)

1. CHECK F/S CHG RELAY

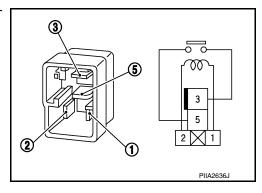
- 1. Turn power switch OFF.
- 2. Remove F/S CHG relay.
- 3. Check the continuity between F/S CHG relay terminals under the following conditions.

Terminals	Conditions	Continuity			
3 and 5	12 V direct current supply between terminals 1 and 2	Existed			
No current supply		Not existed			
le the inen	le the increation result normal?				

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace F/S CHG relay.



INFOID:000000008747263

CHARGE CONNECTOR LOCK RELAY

< DTC/CIRCUIT DIAGNOSIS >

CHARGE CONNECTOR LOCK RELAY

							А
Diagnosis	Proced	ure				INFOID:00000009330061	
1. CHECK F	USE						В
2. Pull out = 3. Check th Is the inspect YES >> 0 NO >> 1 2.CHECK O 1. Insert th 2. Press ch 3. Connect	tion resul GO TO 2. Replace t CHARGE e fuse wh narge con EVSE.	se is not fi <u>t normal?</u> he fuse af CONNEC iich pulled nector loc	fter repairing th TOR LOCK R put. k switch at the	ne applicable cir ELAY OUTPUT e "OFF" position rness connector	VOLTAGE	der the following conditions.	EVO D
	0				<u> </u>	<u> </u>	F
+ IPDM	E/R	_		Condition		Voltage	
Connector	Terminal						G
E14	35	Ground			nector lock switch	12V battery voltage	Н
1. Disconn	ect EVSE		VER SUPPLY- IPDM E/R ha	1 rness connector	and ground.		J
	+						K
IF Connector	PDM E/R	rminal	-	Voltage			L
E14		41	Ground	12V battery volt- age			
	GO TO 6. GO TO 4.						M
				s connector and	ground.		0
	+						0
	PDM E/R	unain a l	-	Voltage			Р
Connector E9	le	rminal 2	Ground	12V battery volt- age			
Is the inspec	tion resul	t normal?		~3~			

YES >> GO TO 5.

NO >> Check IPDM E/R power supply circuit. Refer to <u>PCS-28. "Diagnosis Procedure"</u>.

CHARGE CONNECTOR LOCK RELAY

< DTC/CIRCUIT DIAGNOSIS >

5. CHECK CHARGE CONNECTOR LOCK RELAY DRIVE CIRCUIT

- 1. Disconnect VCM harness connector.
- 2. Check harness for short to ground, between IPDM E/R harness connector and VCM harness connector.

	+			
IPDN	/I E/R	_	Continuity	
Connector	Connector Terminal			
E14	41	Ground	Not existed	

Is the inspection result normal?

YES >> Replace IPDM E/R. Refer to <u>PCS-29, "Removal and Installation"</u>.

NO >> Repair or replace error-detected parts.

6.CHECK CHARGE CONNECTOR LOCK RELAY DRIVE CIRCUIT

1. Disconnect VCM harness connector.

2. Check the continuity between IPDM E/R harness connector and VCM harness connector.

+				
IPDN	/I E/R	V	СМ	Continuity
Connector	Terminal	Connector	Terminal	
E14	41	E62 78		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 VCM GROUND CIRCUIT

Check the continuity between VCM harness connector and ground.

	+			
V	CM	-	Continuity	
Connector	Connector Terminal			
E61	58			
EOT	65	Ground	Existed	
E62	118	Ground		
LOZ	126			

Is the inspection result normal?

YES >> Check intermittent incident. Refer to <u>GI-53, "Intermittent Incident"</u>.

NO >> Repair or replace error-detected parts.

8. CHECK CHARGE CONNECTOR LOCK RELAY OUTPUT CIRCUIT

1. Disconnect EVSE.

2. Disconnect VCM harness connector.

3. Check the continuity between IPDM E/R harness connector and VCM harness connector.

	+ _		-	
IPDN	/I E/R	VCM		Continuity
Connector	Terminal	Connector Terminal		
E14	35	E123	104	Existed

4. Also check harness for short to ground and short to power. <u>Is the inspection result normal?</u>

	CHARGE CONNECTOR LOCK RELAY	
< DTC	/CIRCUIT DIAGNOSIS >	
YES NO	>> INSPECTION END >> Repair or replace error-detected parts.	A
		В
		EVC
		D
		E
		F
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CHARGE PORT LID OPENER RELAY

< DTC/CIRCUIT DIAGNOSIS >

CHARGE PORT LID OPENER RELAY

Diagnosis Procedure

INFOID:000000009330062

1. CHECK CHARGE PORT LID OPENER ACTUATOR RELAY POWER SUPPLY-1

- 1. Turn power switch OFF.
- 2. Disconnect charge port lid opener actuator relay.
- 3. Check the voltage between charge port lid opener actuator relay harness connector and ground.

	+		
	pener actuator re- ay	_	Voltage
Connector	Terminal	*	
E88 5		Ground	12V battery volt- age

Is the inspection result normal?

YES >> GO TO 6. NO >> GO TO 2.

2.CHECK CHARGE PORT LID OPENER ACTUATOR RELAY POWER SUPPLY-2

Check the voltage between IPDM E/R harness connector and ground.

	+		
IPDI	/IE/R	_	Voltage
Connector	Terminal		
E14	42	Ground	12V battery volt- age

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 3.

3.CHECK IPDM E/R POWER SUPPLY

Check the voltage between IPDM E/R harness connector and ground.

IPDN	+ /I E/R	_	Voltage
Connector	Terminal		
E9	2	Ground	12V battery volt- age

Is the inspection result normal?

YES >> GO TO 4.

NO >> Check 12V battery power supply circuit.

4.CHECK FUSE

- 1. Pull out #43 fuse.
- 2. Check that the fuse is not fusing.

Is the inspection result normal?

YES >> Replace IPDM E/R. Refer to <u>PCS-29. "Removal and Installation"</u>.

NO >> Replace the fuse after repairing the applicable circuit.

5.CHECK CHARGE PORT LID OPENER ACTUATOR RELAY POWER SUPPLY CIRCUIT

- 1. Disconnect IPDM E/R harness connector.
- Check the continuity between IPDM E/R harness connector and charge port lid opener actuator relay harness connector.

EVC-382

CHARGE PORT LID OPENER RELAY

< DTC/CIRCUIT DIAGNOSIS >

	+	Oharra ("	-		
IPDN	M E/R		d opener actu- relay	Continuity	
Connector	Terminal	Connector	Terminal		
E14	42	E88	5	Existed	
		-	ground and s	hort to power.	
	ction result n				
		nittent incide place error-d		<u>GI-53, "Intermittent Incident"</u> .	
•	•	•	•	ELAY CONTROL SIGNAL V	OLTAGE
					nector under the following cor
on.	ollage betwe	en onarge p			
+					
Charge port					
actuato		-		Condition	Voltage
Connector	Terminal				
E88	1		nediately after the sed.	ne charge port lid opener switch is	12V battery voltage
the increa	tion regult n	ormal?			
5 แทว แทรมอเ	JUON TESULL N	Ullial			
	<u>ction result n</u> GO TO 9.				
YES >>	GO TO 9. GO TO 7.				
YES >> NO >>	GO TO 9. GO TO 7.		ENER ACTU	IATOR RELAY DRIVE CIRCU	JIT
YES >> NO >> CHECK (GO TO 9. GO TO 7. CHARGE PO			IATOR RELAY DRIVE CIRCU	JIT
YES >> NO >> CHECK (Disconn Check t	GO TO 9. GO TO 7. CHARGE PO nect VCM ha he continuity	DRT LID OPE	ctor.		JIT d opener actuator relay harne
YES >> NO >> CHECK (GO TO 9. GO TO 7. CHARGE PO nect VCM ha he continuity	DRT LID OPE	ctor.		
YES >> NO >> CHECK (Disconn Check t connect	GO TO 9. GO TO 7. CHARGE PO nect VCM ha he continuity or.	DRT LID OPE	ctor.		
YES >> NO >> CHECK (Disconn Check t connect	GO TO 9. GO TO 7. CHARGE PO nect VCM ha he continuity or.	DRT LID OPE rness conne / between V(ctor. CM harness -	connector and charge port li	
YES >> NO >> CHECK (Disconn Check t connect	GO TO 9. GO TO 7. CHARGE PO nect VCM ha he continuity or.	DRT LID OPE rness conne / between V(Charge port li	ctor.		
YES >> NO >> CHECK (Disconn Check t connect	GO TO 9. GO TO 7. CHARGE PO nect VCM ha he continuity or.	DRT LID OPE rness conne / between V(Charge port li	ctor. CM harness - d opener actu-	connector and charge port li	
YES >> NO >> CHECK (Disconn Check t connect	GO TO 9. GO TO 7. CHARGE PO nect VCM ha he continuity or. +	DRT LID OPE rness conner between V(Charge port li ator	ctor. CM harness - d opener actu- relay	connector and charge port li	
YES >> NO >> CHECK (Disconn Check t connect	GO TO 9. GO TO 7. CHARGE PO nect VCM ha he continuity or. + CM Terminal 23	DRT LID OPE rness conne / between VC Charge port li ator Connector E88	ctor. CM harness d opener actu- relay Terminal 1	connector and charge port li	
YES >> NO >> CHECK (Disconnect Check t connector E61 Connector E61	GO TO 9. GO TO 7. CHARGE PO nect VCM ha he continuity or. + CM Terminal 23	DRT LID OPE rness conne y between VC Charge port li ator Connector E88 for short to g	ctor. CM harness d opener actu- relay Terminal 1	connector and charge port liv Continuity Existed	
YES >> NO >> CHECK (Disconnect Check t connect V(Connector E61 Also che s the inspec YES >>	GO TO 9. GO TO 7. CHARGE PO nect VCM ha he continuity or. + CM Terminal 23 eck harness ction result n GO TO 8.	DRT LID OPE rness conner between VC Charge port lin ator Connector E88 for short to g ormal?	ctor. CM harness d opener actu- relay Terminal 1 ground and s	connector and charge port liv Continuity Existed short to power.	
YES >> NO >> CHECK (Disconn Check t connect V(Connector E61 Connector E61 Connector E61 Connector E61 Connector E61 Connector E61 Connector E61 Connector E61 Connector E61 Connector E61 Connector E61 Connector E61 Connector E61 Connector E61 Connector Connector E61 Connector Connector E61 Connector Conn	GO TO 9. GO TO 7. CHARGE PO nect VCM ha he continuity or. + CM Terminal 23 eck harness ction result n GO TO 8. Repair or re	DRT LID OPE rness conner between VC Charge port lin ator Connector E88 for short to g ormal? place error-d	ctor. CM harness 	connector and charge port lie Continuity Existed short to power.	
YES >> NO >> CHECK (Disconn Check t connect V(Connector E61 Connector E61 Connector E61 Connector E61 Connector E61 Connector E61 Connector E61 Connector E61 Connector E61 Connector E61 Connector E61 Connector E61 Connector E61 Connector E61 Connector Connector E61 Connector Connector E61 Connector Conn	GO TO 9. GO TO 7. CHARGE PO nect VCM ha he continuity or. + CM Terminal 23 eck harness ction result n GO TO 8. Repair or re	DRT LID OPE rness conner between VC Charge port lin ator Connector E88 for short to g ormal? place error-d	ctor. CM harness 	connector and charge port liv Continuity Existed short to power.	
YES >> NO >> CHECK (Disconn Check t connect V(Connector E61 Connector E61 Connector E61 Connector E61 Connector E61 Connector E61 Connector E61 Connector E61 Connector E61 Connector E61 Connector E61 Connector E61 Connector E61 Connector E61 Connector E61 Connector E61 Connector Connector E61 Connector Connector E61 Connector Connector E61 Connector Co	GO TO 9. GO TO 7. CHARGE PC nect VCM ha he continuity or. + CM Terminal 23 eck harness ction result n GO TO 8. Repair or re CHARGE PC	DRT LID OPE rness conner between VC Charge port lin ator Connector E88 for short to g ormal? place error-d DRT LID OPE	ctor. CM harness 	connector and charge port lie Continuity Existed short to power.	d opener actuator relay harne
YES >> NO >> CHECK (Disconn Check t connect V(Connector E61 Also che s the inspec YES >> NO >> CHECK (Check charge	GO TO 9. GO TO 7. CHARGE PC nect VCM ha he continuity or. + CM Terminal 23 eck harness ction result n GO TO 8. Repair or re CHARGE PC	DRT LID OPE rness conner between VC Charge port lin ator Connector E88 for short to g ormal? place error-d DRT LID OPE	ctor. CM harness 	connector and charge port li Continuity Existed short to power. S. CH RELATED CIRCUIT	d opener actuator relay harne
YES >> NO >> CHECK (Disconnect Check t connect V(Connector E61 Also che s the inspec YES >> NO >> CHECK (Check charge yES >>	GO TO 9. GO TO 7. CHARGE PC hect VCM ha he continuity or. + CM Terminal 23 eck harness ction result n GO TO 8. Repair or re CHARGE PC ge port lid op ction result n Check interr	DRT LID OPE rness conner / between VC Charge port li ator Connector E88 for short to g ormal? place error-d DRT LID OPE pener switch iormal? mittent incide	ctor. CM harness 	connector and charge port lie Continuity Existed short to power. S. CH RELATED CIRCUIT it. Refer to EVC-406, "Diagno GI-53, "Intermittent Incident".	d opener actuator relay harne
YES >> NO >> CHECK (Disconn Check t connect V(Connector E61 Check charged YES >> NO >> CHECK (Check charged YES >> NO >>	GO TO 9. GO TO 7. CHARGE PO hect VCM ha he continuity for. + CM Terminal 23 eck harness ction result n GO TO 8. Repair or re CHARGE PO ge port lid op ction result n Check interr Repair or re	DRT LID OPE rness conner / between VC Charge port lin ator Connector E88 for short to g ormal? place error-d DRT LID OPE pener switch ormal? mittent incide place error-d	ctor. CM harness d opener actu- relay Terminal 1 ground and s letected part ENER SWIT related circu	connector and charge port lie Continuity Existed short to power. S. CH RELATED CIRCUIT it. Refer to EVC-406, "Diagno GI-53, "Intermittent Incident".	d opener actuator relay harne

CHARGE PORT LID OPENER RELAY

< DTC/CIRCUIT DIAGNOSIS >

	+			
• •	pener actuator re- ay	—	Continuity	
Connector Terminal				
E88 2		Ground	Existed	

Is the inspection result normal?

YES >> GO TO 10.

NO >> Repair or replace error-detected parts.

10. CHECK CHARGE PORT LID OPENER ACTUATOR RELAY

Check charge port lid opener actuator relay. Refer to EVC-384, "Component Inspection (Charge Port Lid Opener Actuator Relay)".

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace charge port lid opener actuator relay.

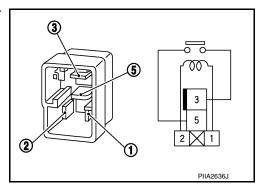
Component Inspection (Charge Port Lid Opener Actuator Relay)

INFOID:000000009330063

1. CHECK CHARGE PORT LID OPENER ACTUATOR RELAY

- 1. Turn power switch OFF.
- 2. Disconnect charge port lid opener actuator relay.
- 3. Check the continuity between charge port lid opener actuator relay terminals under the following conditions.

Termi- nals	Conditions	Continuity
3 and 5	12 V direct current supply between terminals 1 and 2	Existed
5 and 5	No current supply	Not existed



Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace charge port lid opener actuator relay.

				RELAI		
<pre>< DTC/CIRCUI</pre>						
REVERSE	LAIVIP RE	LAY				А
Component	Function Ch	neck			INFOID:00000008747266	
1.CHECK REV	/ERSE LAMP F	RELAY FUNCT	ION			В
1. Turn power) position				
 Shift the selector lever in R position. Check that the reverse lamp turns ON. 						EVC
Is the inspection						
	SPECTION ENE beed to EVC-3		Procedure".			D
Diagnosis P		-			INFOID:000000008747267	
1.CHECK PO		ER SUPPLY-1				Е
	elector lever in F					
2. Turn power	^r switch OFF. verse lamp rela	-				F
4. Turn power	switch ON.	-				
5. Check the	voltage betweer	n reverse lamp	relay harness c	onnector and ground.		G
	+					
Reverse I	amp relay	-	Voltage			Н
Connector	Terminal					
E27	1	Ground	12V battery volt- age			I
Is the inspection		?				
) TO 5.) TO 2.					I
2.CHECK PO		ER SUPPLY-2				0
Check the volta	ge between IPI	DM E/R harnes	ss connector and	ground.		K
						TX.
	+ // E/R	_	Voltage			I
Connector	Terminal		, energe			L
E15	58	Ground	12V battery volt- age			Μ
Is the inspection	n result normal	?				
) TO 4.) TO 3.					Ν
3.CHECK FUS	SE					
	switch OFF.					0
	2. Pull out #56 fuse.					
Is the inspection	n result normal?	2				Р
			ower ON power s he applicable cir			
4.CHECK PO		• •				
·						

1. Turn power switch OFF.

2. Disconnect IPDM E/R harness connector.

3. Check the continuity between reverse lamp relay harness connector and IPDM E/R harness connector.

REVERSE LAMP RELAY

< DTC/CIRCUIT DIAGNOSIS >

+				
Reverse	lamp relay	IPDM E/R		Continuity
Connector	Terminal	Connector Terminal		
E27	1	E15	58	Existed

Is the inspection result normal?

YES >> Check intermittent incident. Refer to <u>GI-53, "Intermittent Incident"</u>.

NO >> Repair or replace error-detected parts.

5.CHECK POWER ON POWER SUPPLY-2

Check the voltage between reverse lamp relay harness connector and ground.

	+		
Reverse	amp relay	_	Voltage
Connector	Terminal		
E27	3	Ground	12V battery volt- age

Is the inspection result normal?

YES >> GO TO 7.

NO >> GO TO 6.

6.CHECK POWER ON POWER SUPPLY CIRCUIT

1. Turn power switch OFF.

2. Disconnect IPDM E/R harness connector.

3. Check the continuity between reverse lamp relay harness connector and IPDM E/R harness connector.

+				
Reverse	Reverse lamp relay		IPDM E/R	
Connector	Terminal	Connector Terminal		
 E27	3	E15	58	Existed

Is the inspection result normal?

YES >> Check intermittent incident. Refer to <u>GI-53, "Intermittent Incident"</u>.

NO >> Repair or replace error-detected parts.

7. CHECK REVERSE LAMP RELAY

Refer to EVC-387, "Component Inspection (Reverse Lamp Relay)".

Is the inspection result normal?

YES >> GO TO 8.

NO >> Replace reverse lamp relay.

8.CHECK REVERSE LAMP RELAY CONTROL SIGNAL CIRCUIT

- 1. Turn power switch OFF.
- 2. Disconnect VCM harness connector.
- 3. Check the continuity between reverse lamp relay harness connector and VCM harness connector.

	+		_	
Reverse	lamp relay	VCM		Continuity
Connector	Terminal	Connector Terminal		
E27	2	E62	70	Existed

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

Is the inspection result normal?

YES >> GO TO 9.

REVERSE LAMP RELAY

< DTC/CIRCUIT DIAGNOSIS >

NO >> Repair or replace error-detected parts.

9.CHECK VCM GROUND CIRCUIT

Check the continuity between VCM harness connector and ground.

	+			
V	CM	—	Continuity	
Connector	Terminal			
E61	58			
LUI	65	Ground	Existed	
E62	118	Giouna	LAISteu	
E02	126			

Is the inspection result normal?

YES >> INSPECTION END

NO >> Repair or replace error-detected parts.

Component Inspection (Reverse Lamp Relay)

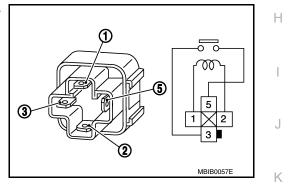
1.CHECK REVERSE LAMP RELAY

- 1. Turn power switch OFF.
- 2. Remove reverse lamp relay.
- Check the continuity between reverse lamp relay terminals under the following conditions.

Terminals	Conditions	Continuity
3 and 5	12 V direct current supply between terminals 1 and 2	Existed
5 and 5	No current supply	Not existed

Is the inspection result normal?

- YES >> INSPECTION END
- NO >> Replace reverse lamp relay.



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< DTC/CIRCUIT DIAGNOSIS >

A/C RELAY

Diagnosis Procedure

INFOID:000000008747269

1.CHECK A/C RELAY POWER SUPPLY

- 1. Turn power switch OFF.
- 2. Remove A/C relay.
- 3. Turn power switch ON.
- 4. Check the voltage between A/C relay harness connector and ground.

	+		
A/C	relay	_	Voltage
Connector	Terminal		
E52	1	Ground	12V battery volt- age

Is the inspection result normal?

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

2. CHECK A/C RELAY POWER SUPPLY CIRCUIT

- 1. Turn power switch OFF.
- 2. Disconnect M/C relay.
- 3. Check the continuity between A/C relay harness connector and M/C relay harness connector.

	+		_	
M/C	relay	A/C relay		Continuity
Connector	Terminal	Connector Terminal		
E65	5	E52	1	Existed

Is the inspection result normal?

YES >> Perform trouble diagnosis for M/C relay related circuit. Refer to EVC-374, "Diagnosis Procedure".

NO >> Repair or replace error-detected parts.

3.CHECK 12V BATTERY POWER SUPPLY

Check the voltage between A/C relay harness connector and ground.

	+		
A/C	relay	—	Voltage
Connector	Terminal		
E52	3	Ground	12V battery volt-
E32	6	Glound	age

Is the inspection result normal?

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

10 -- 0010

4.CHECK FUSE

1. Turn power switch OFF.

2. Pull out #32 fuse.

3. Check that the fuse is not fusing.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Replace the fuse after repairing the applicable circuit.

5.CHECK 12V BATTERY POWER SUPPLY CIRCUIT

A/C RELAY

< DTC/CIRCUIT DIAGNOSIS >

Check the continuit	v between A/C rela	v harness connecto	r and fuse terminal.
	<i>y</i> both both <i>i</i> a b i bib	<i>y</i> nannooc connooc	

	+				•
A/	C relay		_	Continuity	
Connector	Termi	nal		,	
E52	3	#32 fi	use termi- nal	Existed	-
the inspecti YES >> C NO >> R CHECK A/	heck 12V l epair or re	ormal? battery powe place error-d	r supply c letected pa	ircuit. arts.	
efer to <u>EVC</u> -	-389, "Com	ponent Insp	ection (A/	<u>C Relay)"</u> .	
NO >> R	O TO 7. eplace A/C			DOUIT	
. Disconne	ct VCM ha	rness conne	ctor.		or and VCM harness connector.
+			_		
A/C re	-		CM	Continuity	
Connector E52	Terminal 2	Connector E62	Terminal 116	Existed	-
				d short to pow	er.
<u>s the inspecti</u> YES >> G NO >> R	<u>on result n</u> O TO 8. epair or re		letected pa		
				onnector and g	round.
	+				
IPD	M E/R		_	Continuity	
Connector	Termir	nal		, , , , , , , , , , , , , , , , , , ,	
E61	58				
LUT	65		ound	Existed	
E62	118				
	SPECTIO		letected pa	arts.	
Componen	t Inspec	tion (A/C I	Relay)		INFOID:00000008747270
-	-	-			
.CHECK A/					

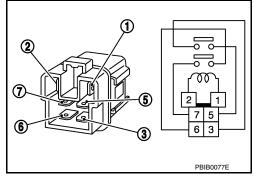
2. Remove A/C relay.

A/C RELAY

< DTC/CIRCUIT DIAGNOSIS >

3. Check the continuity between A/C relay terminals under the following conditions.

Conditions	Terminals	Continuity	
12 V direct current supply between terminals 1 and 2	3 – 5	Existed	
	6 – 7		
No current supply	3 – 5	Not existed	
No current supply	6 – 7	NUL EXISTED	



Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace A/C relay.

CHARGING STATUS INDICATOR

< DTC/CIRCL					
CHARGIN	IG STATI	JS INDICA	TOR		А
Componen	t Function	Check			INFOID:00000008747271
1. СНЕСК СН	HARGING ST	ATUS INDICAT	OR FUNCTION		В
 Select "CH Activate th 	er switch ON HARGE STA ne charging s	F INDICATOR ²		T" mode in "EV/HEV" with CONSU ne indicator illuminates. /.	ULT. EVO
Is the inspection					D
	ISPECTION roceed to <u>EV</u>		sis Procedure".		
Diagnosis F					INFOID:000000008747272
1.снеск сн	HARGING ST	ATUS INDICAT	OR POWER SUP	PLY	
	er switch OFI				F
			arness connector.	ness connector and ground.	
o. oncontand	, voltago boti	loon onarging (nood connoctor and ground.	G
+				-	
Charging statu		-	Voltage		Н
Connector	Terminal			-	
M201	4		12V battery voltage	-	1
<u>Is the inspection</u> YES >> G	on result norr O TO 4.	<u>nal?</u>			I
	0 TO 2.				
2.CHECK FU	JSE				J
Pull out #11 fu	se and checl	< that the fuse i	s not fusing.		
Is the inspection		mal?			K
	O TO 3. eplace the fu	se after repair t	he applicable circu	it.	
-	•	•	OR POWER SUP		L
				ind the fuse terminal.	
				_	Μ
	+				
	atus indicator		Continuity		
Connector M201	Terminal 4	#11 fuse termir	Existed	_	Ν
			al Existed	- er	
Is the inspection				u.	0
YES >> C	heck 12V bat	tery power sup			
4	• •	ice error-detect	•		Р
			OR GROUND CIF	RCUIT	
1. Disconneo	ct VCM harne	ess connector.			

1. Disconnect VCM harness connector.

2. Check the continuity between charging status indicator harness connector and VCM harness connector.

CHARGING STATUS INDICATOR

< DTC/CIRCUIT DIAGNOSIS >

	+		_			
Items	Charging status indicator		VCM		Continuity	
	Connector	Terminal	Connector	Terminal		
Charging status indicator 1		1		115		
Charging status indicator 2	M201	2	E62	89	Existed	
Charging status indicator 3	_	3		90		

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

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace error-detected parts.

5. CHECK VCM GROUND CIRCUIT

Check the continuity between VCM harness connector and ground.

	+		
V	VCM		Continuity
Connector	Terminal		
E61	58		
Loi	65	Ground	Existed
E62	118	Ground	LAISIEU
L02	126		

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace error-detected parts.

6. CHECK INTERMITTENT INCIDENT

Check intermittent incident. Refer to GI-53, "Intermittent Incident".

Is the inspection result normal?

YES >> Replace charging status indicator. Refer to VC-154, "Removal and Installation".

NO >> Repair or replace error-detected parts.

< DTC/CIRCU			E CHARGI	NG SWITCH	
		NG SWITC	СН		
Diagnosis P	rocedure			INFOID:00000008747273	A
1. СНЕСК ІММ	IEDIATE CHAR	GING SWITCH	IILLUMINATIC	ON FUNCTION	В
2. Turn ON th 3. Check that <u>Is the inspectio</u> YES >> GC NO >> GC	<u>n result normal′</u>) TO 6.) TO 2.			ghts up. ON POWER SUPPLY	EVC D
Check the volta	age between im	mediate chargin	ig switch and g	jround.	Ε
	+ harging switch Terminal	-	Voltage	-	F
M65	1	Ground	Battery voltage	-	G
YES >> GC NO >> GC 3. CHECK FUS 1. Turn powe	<u>n result normal'</u>) TO 5.) TO 3. SE r switch OFF. the headlamp.	<u>·</u>			Н
 3. Pull out #4 4. Check that <u>Is the inspectio</u> YES >> GC NO >> Re 	6 fuse. the fuse is not <u>n result normal</u> OTO 4. place the fuse a	? after repair the a	••		J
				ON POWER SUPPLY CIRCUIT	Κ
		een immediate o		h harness connector and fuse terminal.	L
	+			-	
Immediate cl Connector	harging switch Terminal	_	Continuity		M
	1	#46 fuse termi- nal	Existed	-	NI
Is the inspectio	n result normal	?		-	Ν
NO >> Re		oly circuit. error-detected p RGING SWITCH		RCUIT	0
 Turn powe Turn OFF t Disconnect 	r switch OFF. the headlamp. t immediate cha	rging switch ha	rness connecto		Ρ

IMMEDIATE CHARGING SWITCH

< DTC/CIRCUIT DIAGNOSIS >

	+		
Immediate ch	narging switch	_	Continuity
Connector	Connector Terminal		
M65	4	Ground	Existed

Is the inspection result normal?

YES >> Replace immediate charging switch. Refer to VC-152, "Removal and Installation".

NO >> Repair or replace error-detected parts.

6. CHECK IMMEDIATE CHARGING SWITCH POWER SUPPLY

- 1. Turn power switch OFF.
- 2. Turn OFF the headlamp.
- 3. Disconnect immediate charging switch harness connector.
- 4. Check the voltage between immediate charging switch harness connector and ground.

 -	+		
Immediate ch	narging switch	_	Voltage
Connector	Terminal		
M65	6	Ground	12V battery volt- age

Is the inspection result normal?

YES >> GO TO 8.

NO >> GO TO 7.

7. CHECK IMMEDIATE CHARGING SWITCH SIGNAL CIRCUIT

1. Disconnect VCM harness connector.

2. Check the continuity between immediate charging switch harness connector and VCM harness connector.

	+			
Immediate ch	Immediate charging switch		VCM	
Connector	Terminal	Connector	Terminal	
M65	6	E62	129	Existed

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

Is the inspection result normal?

YES >> GO TO 8.

NO >> Repair or replace error-detected parts.

8.CHECK IMMEDIATE CHARGING SWITCH GROUND CIRCUIT

Check the continuity between immediate charging switch harness connector and ground.

	+		
Immediate ch	narging switch	_	Continuity
Connector	Connector Terminal		
M65	M65 8		Existed

Is the inspection result normal?

YES >> GO TO 9.

NO >> Repair or replace error-detected parts.

9.CHECK IMMEDIATE CHARGING SWITCH

Perform component inspection. Refer to EVC-395, "Component Inspection (Immediate Charging Switch)". Is the inspection result normal?

YES >> INSPECTION END

IMMEDIATE CHARGING SWITCH

10 >> Re					
omponent	Inspection (Immediate	Charging Switch)	INFOID:000000008747274
CHECK IMM	IEDIATE CHAR	RGING SWITCH	1		
	r switch OFF.				
Disconnect Check the	t immediate cha continuity betwe	arging switch ha een immediate	rness connector. charging switch term	inals under the followi	na conditions.
Terminals	Con	dition	Continuity		
6 and 8	Immediate charging switch	Released	Not existed		
no increatio		Pressed	Existed		
-	<u>n result normal</u> SPECTION ENI				
			ch. Refer to <u>VC-152,</u>	"Removal and Installa	ation".

Check charge connector lock relay related circuit. Refer to EVC-379, "Diagnosis Procedure".

Check charge connector lock switch related circuit. Refer to EVC-400, "Diagnosis Procedure".

Check charge connector lock actuator. Refer to EVC-396, "Component Inspection (Charge Connector Lock Actuator)".

Is the inspection result normal?

YES >> GO TO 4.

+

VCM

NO >> Replace charge connector lock actuator. Refer to <u>VC-149</u>, "Removal and Installation".

 ${f 4}$. CHECK CHARGE CONNECTOR LOCK ACTUATOR CONTROL CIRCUIT

Charge connector lock actu-

ator

1. Disconnect VCM harness connector.

Check the continuity between VCM harness connector and charge connector lock actuator harness connector.

Continuity

EVC-396

Connector	Terminal	Connector	Terminal	
F60	117	E87	1	Existed
E62	130		3	

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

Is the inspection result normal?

- YES >> INSPECTION END
- NO >> Repair or replace error-detected parts.

Component Inspection (Charge Connector Lock Actuator)

1. CHECK CHARGE CONNECTOR LOCK ACTUATOR

1. Turn power switch OFF.

CHARGE CONNECTOR LOCK

CHARGE CONNECTOR LOCK

Component Function Check

< DTC/CIRCUIT DIAGNOSIS >

1. CHARGE CONNECTOR LOCK FUNCTION CHECK

- 1. Press the charge connector lock switch at the "OFF" position.
- 2. Turn power switch OFF.
- 3. Connect EVSE.
- 4. Switch the charge connector lock switch to "LOCK" position.

1. CHECK CHARGE CONNECTOR LOCK SWITCH RELATED CIRCUIT

2.CHECK CHARGE CONNECTOR LOCK RELAY RELATED CIRCUIT

5. Check that the charge connector lock operates normally.

Is the inspection result normal?

YES >> INSPECTION END

Is the inspection result normal?

>> GO TO 2.

Is the inspection result normal?

>> GO TO 3.

YES

YES

NO

NO

NO >> Proceed to EVC-396, "Diagnosis Procedure".

>> Repair or replace error-detected parts.

>> Repair or replace error-detected parts.

Diagnosis Procedure

INFOID:000000009330065

INFOID:00000009330064

INFOID:000000009330066

CHARGE CONNECTOR LOCK

< DTC/CIRCUIT DIAGNOSIS >

- 2. Remove charge connector lock actuator. Refer to VC-149, "Removal and Installation".
- 3. Check the resistance between charge connector lock actuator connector terminals.

Charge connector				
+ –		Resistance		
Terminal				
1	3	2-4Ω		
s the inspection result normal?				

YES >> INSPECTION END

NO >> Replace charge connector lock actuator. Refer to VC-149, "Removal and Installation".

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< DTC/CIRCUIT DIAGNOSIS >

CHARGE PORT LID OPENER

Component Function Check

1.CHARGE PORT LID OPENER FUNCTION CHECK

1. Close charge port lid.

2. Press charge port lid opener switch.

Does the charge port lid open?

YES >> INSPECTION END

NO >> Proceed to EVC-398, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:000000009330068

INFOID:00000009330067

1. CHECK CHARGE PORT LID OPENER ACTUATOR RELAY RELATED CIRCUIT

Check charge port lid opener actuator relay related circuit. Refer to EVC-382, "Diagnosis Procedure".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

2.CHECK CHARGE PORT LID OPENER ACTUATOR

Check charge port lid opener actuator. Refer to EVC-399. "Component Inspection (Charge Port Lid Opener Actuator)".

Is the inspection result normal?

YES >> GO TO 3.

NO >> Replace charge port lid opener actuator. Refer to <u>DLK-206, "CHARGE PORT LID OPENER</u> <u>ACTUATOR : Removal and Installation"</u>.

 $\mathbf{3}$.check charge port lid opener actuator control circuit

1. Check the continuity between charge port lid opener actuator relay harness connector and charge port lid opener actuator harness connector.

	+		_	
Charge port lid opener actu- ator relay		Charge port lid opener actu- ator		Continuity
Connector	Terminal	Connector	Terminal	
E88	3	E38	3	Existed

2. 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 CHARGE PORT LID OPENER ACTUATOR GROUND CIRCUIT

Check the continuity between charge port lid opener actuator harness connector and ground.

+			
Charge port lid opener actuator re- lay		_	Continuity
Connector Terminal		•	
E88	2	Ground	Existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> Repair or replace error-detected parts.

CHARGE PORT LID OPENER

< DTC/CIRCUIT DIAGNOSIS >			
Component Inspection (Charge F	Port Lid Opene	r Actuator)	^
1. CHECK CHARGE PORT LID OPENER	RACTUATOR		A
 Turn power switch OFF. Remove charge port lid opener actuat <u>Removal and Installation</u>". Check the resistance between charge 		06, "CHARGE PORT LID OPENER ACTUATOR : suator connector terminals.	В
			EVC
Charge port lid opener actuator	Resistance	-	
Terminal			D
1 2	1 – 4 Ω	-	
Is the inspection result normal?			Ε
YES >> INSPECTION END NO >> Replace charge port lid ope <u>ACTUATOR : Removal and Ir</u>	ner actuator. Refenstallation".	r to <u>DLK-206, "CHARGE PORT LID OPENER</u>	F
			G
			Н
			I
			J
			K
			L
			M
			Ν
			0
			Ρ

< DTC/CIRCUIT DIAGNOSIS >

CHARGE CONNECTOR LOCK SWITCH

Diagnosis Procedure

INFOID:000000009330070

1. CHARGE CONNECTOR LOCK SWITCH ILLUMINATION LAMP FUNCTION CHECK-1

1. Turn power switch ON.

2. Turn ON the headlamp.

3. Check that the charge connector lock switch illumination lamp lights up.

Is the inspection result normal?

YES >> GO TO 6.

NO >> GO TO 2.

2.CHECK CHARGE CONNECTOR LOCK SWITCH ILLUMINATION LAMP POWER SUPPLY

Check the voltage between charge connector lock switch harness connector and ground.

+			
Charge conne	Charge connector lock switch		Voltage
Connector	Terminal	*	
M94	2	ground	12V battery volt- age

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 3.

3.CHECK FUSE

1. Turn power switch OFF.

2. Turn OFF the headlamp.

- 3. Pull out the #46 fuse.
- 4. Check that the fuse is not fusing.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Replace the fusible link after repairing the applicable circuit.

4.CHECK CHARGE CONNECTOR LOCK SWITCH ILLUMINATION LAMP POWER SUPPLY CIRCUIT

- 1. Disconnect charge connector lock switch harness connector.
- 2. Check the continuity between charge connector lock switch harness connector and fuse terminal.

	+		
Charge conne	Charge connector lock switch		Continuity
Connector	Terminal	*	
M94	2	#46 fuse termi- nal	Existed

Is the inspection result normal?

YES >> Check power supply circuit.

NO >> Repair or replace error-detected parts.

5.CHECK CHARGE CONNECTOR LOCK SWITCH GROUND CIRCUIT

1. Turn power switch OFF.

2. Turn OFF the headlamp.

- 3. Disconnect charge connector lock switch harness connector.
- 4. Check the continuity between charge connector lock switch harness connector and ground.

< DTC/CIRCUIT DIAGNOSIS >

	+			
	ctor lock switch		Continuity	
Connector	Terminal	-		
M94	4	Ground	Existed	
the inspectio	n result normal	?		
		onnector lock sv error-detected p		C-153, "Removal and Installation".
	• •	•		LAMP FUNCTION CHECK-2
	he headlamp.		LEONINATION	
Press char	ge connector lo	ock switch at the	e "LOCK" positic	n.
	the "LOCK" lig	-		
	<u>n result normal</u>) TO 12.	<u>?</u>		
	D TO 7.			
.CHECK CH	ARGE CONNE	CTOR LOCK S	WITCH ILLUMI	NATION LAMP POWER SUPPLY
heck the volta	ige between ch	arge connector	lock switch hari	ness connector and ground.
		C C		<u> </u>
	+			
	ctor lock switch	_	Voltage	
Connector	Terminal			
M94	10	Ground	12V battery volt- age	
s the inspectio	n result normal	?	_	
YES >> GC) TO 10.	_		
•) TO 8.			
CHECK FUS	SE			
 Turn power Pull out #1; 	r switch OFF.			
	the fuse is not	fusing.		
s the inspectio	<u>n result normal</u>	?		
YES >> GC		ofter repairing th	a appliachta air	e uit
	•	after repairing th	••	NATION LAMP POWER SUPPLY CIRCUIT
		ctor lock switch een charge con		ch harness connector and fuse terminal.
	,	5		
	+			
Charge conne	ctor lock switch	_	Continuity	
Connector	Terminal			
M94	10	#12 fuse termi- nal	Existed	
the inspectio	n result normal	?	1	
	eck power sup			
		error-detected p		
		IECTOR LOCK	SWITCH INDIC	ATOR CIRCUIT
	r switch OFF.	otor look owitch	harness connor	tor
	t VCM harness	ctor lock switch connector.		, UT.

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EVC-401

< DTC/CIRCUIT DIAGNOSIS >

4. Check the continuity between charge connector lock switch and VCM harness connector.

+		-		
0	nnector lock itch	VCM		Continuity
Connector	Terminal	Connector	Terminal	
M94	1	E62	87	Existed

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

Is the inspection result normal?

YES >> GO TO 11.

NO >> Repair or replace error-detected parts.

11. CHECK VCM GROUND CIRCUIT

Check the continuity between VCM harness connector and ground.

	+		
V	VCM		Continuity
Connector	Terminal		
E61	58	Ground	Existed
LOT	65		
E62	118	Ground	LAISted
	126		

Is the inspection result normal?

YES >> Replace charge connector lock switch. Refer to VC-153, "Removal and Installation".

NO >> Repair or replace error-detected parts.

12. CHARGE CONNECTOR LOCK SWITCH ILLUMINATION LAMP FUNCTION CHECK-3

Press charge connector lock switch at the "AUTO" position. 1.

2. Check that the "AUTO" lights up.

Is the inspection result normal?

YES >> GO TO 18.

>> GO TO 13. NO

 $13. {\tt check\ charge\ connector\ lock\ switch\ illumination\ lamp\ power\ supply}$

Check the voltage between charge connector lock switch harness connector and ground.

+ Charge connector lock switch		_	Voltage
Connector	Terminal	1	
M94	10	Ground	12V battery volt- age

Is the inspection result normal?

YES >> GO TO 16. NO >> GO TO 14.

14.CHECK FUSE

1. Turn power switch OFF.

Pull out #12 fuse. 2.

3. Check that the fuse is not fusing.

Is the inspection result normal?

YES >> GO TO 15.

NO >> Replace the fuse after repairing the applicable circuit.

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15. CHECK CHARGE CONNECTOR LOCK SWITCH ILLUMINATION LAMP POWER SUPPLY CIRCUIT

- 1. Disconnect charge connector lock switch harness connector.
- 2. Check the continuity between charge connector lock switch harness connector and fuse terminal.

+ Charge connector lock switch – Continuity	
Connector Terminal	EVC
M94 10 #12 fuse termi- nal Existed	
Is the inspection result normal?	D
YES >> Check power supply circuit. NO >> Repair or replace error-detected parts.	Е
16. CHECK CHARGE CONNECTOR LOCK SWITCH INDICATOR CIRCUIT	
 Turn power switch OFF. Disconnect charge connector lock switch harness connector. Disconnect VCM harness connector. Check the continuity between charge connector lock switch and VCM harness connector. 	F
+	G
Charge connector lock VCM Continuity	Н
Connector Terminal Connector Terminal	
M94 5 E62 91 Existed	
5. Also check harness for short to ground and short to power.	
Is the inspection result normal? YES >> GO TO 17. NO >> Repair or replace error-detected parts.	J
17.CHECK VCM GROUND CIRCUIT	
Check the continuity between VCM harness connector and ground.	K
+	
VCM – Continuity	L
Connector Terminal	
E61 58	M
Ground Existed	
E62 118 126	Ν
Is the inspection result normal?	14
YES >> Replace charge connector lock switch. Refer to <u>VC-153, "Removal and Installation"</u> . NO >> Repair or replace error-detected parts.	0
18. CHECK CHARGE CONNECTOR LOCK SWITCH	_
Check charge connector lock switch. Refer to <u>EVC-404</u> , "Component Inspection (Charge Connector Loc <u>Switch)</u> ".	<u>k</u> P
Is the inspection result normal?	
YES >> GO TO 19. NO >> Replace charge connector lock switch. Refer to <u>VC-153, "Removal and Installation"</u> .	
19. CHECK CHARGE CONNECTOR LOCK SWITCH SIGNAL POWER SUPPLY	

1. Turn power switch ON.

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А

< DTC/CIRCUIT DIAGNOSIS >

2. Check the voltage between charge connector lock switch harness connector and ground.

+			
Charge connector lock switch		_	Voltage
Connector	Terminal		
M94	9	Ground	12V battery volt-
10154	8	Glound	age
s the inspection result normal?			

YES >> GO TO 21.

NO >> GO TO 20.

20. CHECK CHARGE CONNECTOR LOCK SWITCH SIGNAL CIRCUIT

- 1. Turn power switch OFF.
- Disconnect VCM harness connector. 2.
- 3. Check the continuity between charge connector lock switch harness connector and VCM harness connector.

+		_		
-	nnector lock itch	VCM		Continuity
Connector	Terminal	Connector	Terminal	
M94	9	E62	94	Existed
1013-	8	LUZ	81	LAISteu

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

Is the inspection result normal?

YES >> Check intermittent incident. Refer to GI-53, "Intermittent Incident".

NO >> Repair or replace error-detected parts.

21. CHECK CHARGE CONNECTOR LOCK SWITCH GROUND CIRCUIT

Check the continuity between charge connector lock switch harness connector and ground.

	+		
Charge conne	ctor lock switch	_	Continuity
Connector	Terminal	*	
M94	3	Ground	Existed

Is the inspection result normal?

YES >> INSPECTION END

>> Repair or replace error-detected parts. NO

Component Inspection (Charge Connector Lock Switch)

INFOID:000000009330071

1. CHECK CHARGE CONNECTOR LOCK SWITCH

- 1. Turn power switch OFF.
- 2. Disconnect charge connector lock switch harness connector.
- 3. Check the continuity between charge connector lock switch terminal under the following conditions.

< DTC/CIRCUIT DIAGNOSIS >

Terminal	Con	Continuity	
		LOCK position	Existed
6 – 9	Charge con-	Except LOCK position	Not existed
	switch	AUTO	Existed
6 – 8		Except AUTO position	Not existed

Is the inspection result normal?

NO >> Replace charge connector lock switch. Refer to <u>VC-153</u>, "Removal and Installation".

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CHARGE PORT LID OPENER SWITCH

< DTC/CIRCUIT DIAGNOSIS >

CHARGE PORT LID OPENER SWITCH

Diagnosis Procedure

INFOID:000000009330072

1. CHARGE PORT LID OPENER SWITCH ILLUMINATION LAMP FUNCTION CHECK

1. Turn power switch ON.

2. Turn ON the headlamp.

3. Check that the charge port lid opener switch illumination lamp lights up.

Is the inspection result normal?

YES >> GO TO 6.

NO >> GO TO 2.

2. CHECK CHARGE PORT LID OPENER SWITCH ILLUMINATION LAMP POWER SUPPLY

Check the voltage between charge port lid opener switch harness connector and ground.

	+	•	
Charge port lic	l opener switch	-	Voltage
Connector	Terminal		
M93	1	Ground	12V battery volt- age

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 3.

3.CHECK FUSE

- 1. Turn power switch OFF.
- 2. Turn OFF the headlamp.
- 3. Pull out #46 fuse.
- 4. Check that the fuse is not fusing.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Replace the fuse after repairing the applicable circuit.

4. CHECK CHARGE PORT LID OPENER SWITCH ILLUMINATION LAMP POWER SUPPLY CIRCUIT

- 1. Disconnect charge port lid opener switch harness connector.
- 2. Check the continuity between charge port lid opener switch harness connector and fuse terminal.

	+		
Charge port lic	l opener switch	_	Continuity
Connector	Terminal		
M93	1	#46 fuse termi- nal	Existed

Is the inspection result normal?

YES >> Check power supply circuit.

NO >> Repair or replace error-detected parts.

5.CHECK CHARGE PORT LID OPENER SWITCH GROUND CIRCUIT

1. Turn power switch OFF.

2. Turn OFF the headlamp.

- 3. Disconnect charge port lid opener switch harness connector.
- 4. Check the continuity between charge port lid opener switch harness connector and ground.

CHARGE PORT LID OPENER SWITCH

< DTC/CIRCUIT DIAGNOSIS >

	+				
	d opener switch		_	Continuity	
Connector	Terminal		-	Continuity	
M93	4		round	Existed	
s the inspection	-	-	Touriu	Existed	
YES >> Re NO >> Re O.CHECK CH	place charge pair or repla ARGE POR ⁻	e port lid c ce error-d ſ LID OPE	etected p		LK-225, "Removal and Installation". SUPPLY
 Turn OFF t Disconnect 		p. : lid opene		harness connec d opener switch	tor. harness connector and ground.
	+				
Charge port lic	d opener switch		_	Voltage	
Connector	Terminal				
M93	6	G	round	12V battery volt- age	
7.CHECK CH	VCM harne	ss conne	ctor.	VITCH SIGNAL	CIRCUIT h harness connector and VCM harness connec-
+		-	_		
Charge port lid switch	lopener	VC	СМ	Continuity	
Connector	Terminal (Connector	Termina	al	
M93	6	E62	93	Existed	
l <u>s the inspection</u> YES >> Cho NO >> Rej	<u>n result norn</u> eck intermitt pair or repla	n <u>al?</u> ent incide ce error-d	nt. Refer etected p		nittent Incident".
Check the conti	inuity betwe	en charge	port lid o	opener switch h	arness connector and ground.
	+				
Charge port lic	d opener switch		-	Continuity	
Connector	Terminal				
M93	8	G	round	Existed	
) TO 9. pair or repla	ce error-d			
					omponent Inspection (Charge Port Lid Opener

Revision: October 2013

CHARGE PORT LID OPENER SWITCH

< DTC/CIRCUIT DIAGNOSIS >

Is the inspection result normal? YES >> INSPECTION END

NO >> Replace charge port lid opener switch. Refer to <u>DLK-225, "Removal and Installation"</u>.

Component Inspection (Charge Port Lid Opener Switch)

INFOID:000000009330073

1. CHECK CHARGE PORT LID OPENER SWITCH

1. Turn power switch OFF.

2. Disconnect charge port lid opener switch harness connector.

3. Check the continuity between charge port lid opener switch terminals under the following condition.

Terminal	Condition	Continuity	
n – X	Charge port lid opener	Released	Not existed
	switch	Pressed	Existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace charge port lid opener switch. Refer to <u>DLK-225. "Removal and Installation"</u>.

CHARGE PORT LIGHT

< DTC/CIRCUI								
	Component Function Check							
 Close the c Press charg Open the c 	harge port lid. ge port lid open harge port lid a	er switch. nd check that t	he charge port li		B			
	SPECTION ENE beced to <u>EVC-3</u>		Procedure"		D			
Diagnosis P		bit, bitagricolo	<u>- 10000010 </u> .	INFOID:00000009330075	D			
1 .снеск сни	ARGE PORT LI	GHT POWER	SUPPLY-1		Е			
 Disconnect Check the 	-	ht harness con n charge port li	nector. ght harness con	nector harness connector and ground.	F			
	+ port light	_	Voltage		G			
Connector	Terminal							
E24	1	Ground	12V battery volt- age		Η			
$\frac{ s \text{ the inspection} }{ YES >> GC } \\ NO >> GC \\ \hline 2.CHECK CH/Check the volta$) TO 6.) TO 2. ARGE PORT LI	GHT POWER	SUPPLY-2 s connector and	l ground.	l J			
	+				K			
IPDN	/I E/R	_	Voltage					
E14	Terminal 42	Ground	12V battery volt-		L			
Is the inspection			age					
YES >> GO NO >> GO) TO 5.	-			Μ			
3.CHECK IPD	M E/R POWER	SUPPLY			Ν			
Check the volta	ge between IPI	DM E/R harnes	s connector and	ground.				
	÷				0			
IPDN Connector	/I E/R Terminal	_	Voltage					
E9	2	Ground	12V battery volt- age		Ρ			
Is the inspection YES >> GC NO >> Cho 4.CHECK FUS) TO 4. eck power supp							

CHARGE PORT LIGHT

< DTC/CIRCUIT DIAGNOSIS >

- 1. Pull out #43 fuse.
- 2. Check that the fuse is not fusing.

Is the inspection result normal?

YES >> Replace IPDM E/R. Refer to PCS-29. "Removal and Installation".

NO >> Replace the fuse after repairing applicable circuit.

5.check charge port light power supply circuit

1. Disconnect IPDM E/R harness connector.

2. Check the continuity between IPDM E/R harness connector and charge port light harness connector.

+				
IPDN	ME/R	Charge port light		Continuity
Connector	Terminal	Connector	Terminal	
E14	42	E24	1	Existed

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

Is the inspection result normal?

YES >> Check intermittent incident. Refer to GI-53, "Intermittent Incident".

NO >> Repair or replace error-detected parts.

 $\mathbf{6}.$ CHECK CHARGE PORT LIGHT CONTROL CIRCUIT

- 1. Close the charge port lid.
- 2. Press charge port lid opener switch.
- 3. Check the voltage between charge port light harness connector terminals within 3 minutes of operating the charge port lid opener switch.

Connector	+ –		Voltage
Connector	Terminal		
E24	1	2	12V battery volt- age

Is the inspection result normal?

YES >> Replace charge port light. Refer to <u>INL-79, "Removal and Installation"</u>.

NO >> GO TO 7.

7. CHECK CHARGE PORT LIGHT CONTROL CIRCUIT

1. Disconnect VCM harness connector.

2. Check the continuity between VCM harness connector and charge port light harness connector.

+		_		
V	СМ	Charge port light		Continuity
Connector	Terminal	Connector	Terminal	
E62	82	E24	2	Existed

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

Is the inspection result normal?

YES >> GO TO 8.

- NO >> Repair or replace error-detected parts.
- **8.**CHECK VCM GROUND CIRCUIT

Check the continuity between VCM harness connector and ground.

CHARGE PORT LIGHT

< DTC/CIRCUIT DIAGNOSIS >

	+					
	CM	_	Continuity			
Connector	Terminal		,			
	58					
E61	65	- Ground Existed				
E62	118					
	126					
	n result normal?					
:S >> Ch) >> Re	pair or replace e	error-detected p	arts.	mittent Incident"		

SYMPTOM DIAGNOSIS EV CONTROL SYSTEM

Symptom Index

INFOID:000000008747275

NOTE:

• Perform self-diagnoses with CONSULT before performing the symptom diagnosis.

• If any DTC is detected, perform the corresponding diagnosis.

Symptom	Reference page
READY status cannot be achieved.	EVC-413, "READY Status Cannot Be Achieved"
Unable to travel.	EVC-414, "Unable to Travel"
Low electrical consumption	EVC-415. "Low Electrical Consumption"
Power switch does not turn OFF.	EVC-416, "Power Switch Does Not Turn OFF"
No regeneration	EVC-417, "No Regeneration"
Decelerating force changes	EVC-418. "Decelerating Force Changes"
Normal charge does not start.	EVC-419, "Normal Charge Does Not Start"
Timer charge and remote charge does not start.	EVC-420, "Timer Charge and Remote Charge Does Not Start"
Immediate charge does not start.	EVC-421, "Immediate Charge Does Not Start"
Normal charge is not completed.	EVC-421, "Normal Charge Is Not Completed"
Quick charge does not start.	EVC-422, "Quick Charge Does Not Start"
Quick charge is not completed.	EVC-422. "Quick Charge Is Not Completed"
Full charge cannot be achieved.	EVC-423, "Full Charge Cannot Be Achieved"
Climate Ctrl. Timer does not start.	EVC-423, "Climate Ctrl. Timer Does Not Start"
Remote climate control does not start.	EVC-424, "Remote climate control Does Not Start"

< SYMPTOM DIAGNOSIS >

READY Status Cannot Be Achieved

INFOID:000000008747276

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	Sympto	om	Possible cause	Action	
			Abnormal stop lamp switch.	EVC-219, "Component Function Check"	•
	BCM does not output a	Abnormal stop lamp switch signal line.	Check the signal line between stop lamp switch and BCM.		
	READY signal.	Abnormal power switch	PCS-73, "Component Function Check"	•	
			Abnormal power switch sig- nal line.	Check the signal line between BCM and VCM.	
		A READY signal is not input to VCM.	Abnormal READY signal line	Check the signal line between BCM and VCM.	•
	READY condition are not	VCM recognizes that the se- lector lever is in a range oth- er than P and N.	Electric shift control system error.	Perform self-diagnosis of Electric shift control module.	-
READY condition are not satisfied	satisfied	VCM recognizes that the charge connector is connector is connected.	 Abnormal normal charge connector connection de- tection circuit. Abnormal quick charge connector connection de- tection circuit. 	Perform self-diagnosis of PDM (Power Delivery Module).	
		Fail-safe of VCM prohibits READY.	EV control system error.	Perform self-diagnosis of VCM.	
	VCM recognizes that Li-ion battery remaining energy is	Li-ion battery remaining en- ergy is low.	Charge Li-ion battery.		
		low.	Abnormal LBC.	Perform self-diagnosis of LBC.	•
	VCM recognizes that steer- ing lock is not released.	Abnormal steering lock mechanism.	Check steering lock system.	•	
	The READY to drive indicate spite READY state.	or lamp does not turn ON de-	 Abnormal combination meter. Abnormal LED. Abnormal VCM. 	Perform ACTIVE TEST of VCM to check the READY to drive indicator lamp. Refer to EVC-73, "CONSULT Function".	-

< SYMPTOM DIAGNOSIS >

Unable to Travel

	Sympto	m	Possible cause	Action
		VCM recognizes that the ac- celerator pedal is not de- pressed.	Abnormal accelerator pedal position sensor.	EVC-222. "Diagnosis Procedure"
	VCM recognizes that brake pedal is depressed.	 Abnormal stop lamp switch. Abnormal stop lamp switch signal line. 	EVC-212, "Diagnosis Procedure"	
	Drive force is not generated.	An output limit request sig- nal of TCS/VDC/ABS is re- ceiced.	TCS/VDC/ABS system er- ror.	Perform self-diagnosis of ABS actu- ator and electric unit (control unit).
avel.		Traction motor inverter re- quests the output limit.	Traction motor system error.	Check the "POWER LIMIT CAUSE"
Unable to travel.		LBC requests the output limit.	LBC system error.	in DATA MONITOR item of VCM.
Unab		Fail-safe of VCM prohibits READY.	EV control system error.	Perform self-diagnosis of VCM.
		Motor output is not con- veyed to drive wheels.	Abnormal reduction gear.	Check reduction gear.
		Brake applied.	Brake dragging.	Check for brake dragging.
	Braking force is generated	A brake signal is input to ABS actuator and electric unit (control unit).	Abnormal stop lamp switch signal line.	Check the signal line between stop lamp switch and ABS actuator and electric unit (control unit).
Braking force is generated.	Parking lock is ON.	 Abnormal electric shift control module. Abnormal parking actua- tor. 	Perform self-diagnosis of Electric shift control module.	

< SYMPTOM DIAGNOSIS >

Low Electrical Consumption

INFOID:000000008747278

Sympto	m	Possible cause	Action
	Punning registered of tires	Low tire pressure.	Adjust tire pressure.
	Running resistance of tires is high.	Tire size is not of standard size.	Install standard-size tires.
Traction motor requires a large amount of power.	Parking brake is applied.	 Abnormal electric parking brake control module. Abnormal parking brake actuator. 	Perform self-diagnosis of Electric parking brake control module.
	Parking brake is applied.	Brake dragging.	Check reduction dragging.
	Sliding resistance of reduc- tion gear is high.	Abnormal reduction gear.	Check reduction gear.
	Electric compressor re-	The set temperature is low.	Adjust the set temperature.
Air conditioner requires a	quires a large amount of power.	Abnormal A/C auto amp.	Perform self-diagnosis of A/C auto amp.
large amount of power.		The set temperature is high.	Adjust the set temperature.
	PTC heater requires a large amount of power.	Abnormal A/C auto amp.	Perform self-diagnosis of A/C auto amp.
Auxiliaries requires a large amount of power.		High-capacity auxiliaries is connected.	Check vehicle condition.
Low efficient Li-ion battery.		Incorrect service plug con- nection.	Check installation condition of the service plug.
Lower energy storage, com- pared to meter indication.	Battery charge level at full charge is low.	Low Li-ion battery cell ca- pacity.	Perform inspection according to the diagnosis procedure of DTC P33E6 of EV battery control system. Refer to EVB-160, "Diagnosis Proce-dure".
		Li-ion battery charged with its temperature low.	Charge Li-ion battery with its room temperature condition.
		Abnormal Li-ion battery.	Perform EV battery control system diagnosis by symptom. Refer to EVB-192. "Diagnosis Procedure".
Available driving range become	Available driving range becomes shorter.		Perform inspection according to the diagnosis procedure of DTC P33E6 of EV battery control system. Refer to EVB-160. "Diagnosis Proce-dure".

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< SYMPTOM DIAGNOSIS >

Power Switch Does Not Turn OFF

	Sympto	m	Possible cause	Action
not turn OFF.			Short circuit between the power ON power supply circuit of VCM and power.	Check the power ON power supply circuit.
	VCM recognizes that the power switch is not OFF.	supply terminal of VCM.	Abnormal IPDM E/R.	Perform self-diagnosis of IPDM E/ R.
			Abnormal BCM.	Perform self-diagnosis of BCM.
Itch does			Abnormal power switch.	PCS-73. "Component Function Check"
Power switch	Immediate charging switch s	ignal is continuously received.	 Abnormal immediate charging switch signal cir- cuit. Abnormal immediate charging switch. 	EVC-393, "Diagnosis Procedure"

< SYMPTOM DIAGNOSIS >

No Re

No regeneration

egeneration			INFOID:00000008747280	
Sympto	m	Possible cause	Action	
The amount of regeneration is limited.		Fail-safe of traction motor inverter.	TMS-25, "Fail-safe"	
	Drive motor inverter limits output.	The temperature of traction motor or traction motor in- verter is high.	Check the "POWER LIMIT CAUSE" in the DATA MONITOR item of VCM.	
		Fail-safe of LBC.	EVB-40, "Fail-safe"	
		Damaged bus bar (connect- ing part of Li-ion battery module).	Check bus bar.	
	LBC limits output.	Degradation in Li-ion bat- tery temperature sensor characteristics.	Check the "POWER LIMIT CAUSE" in the DATA MONITOR item of	
		The temperature of Li-ion battery is too high/low.	VCM.	
		Li-ion battery is fully charged.	Normal operation.	
	ABS actuator and electric unit (control unit) limits out- put.	ABS operates.	Normal operation.	
	Electrically-driven intelligent brake unit limits output.	Fail-safe of electrically-driv- en intelligent brake unit.	<u>BR-41, "Fail-Safe"</u>	
	ABS actuator and electric unit (control unit) limits output.	VDC operates.	Normal operation.	
The regeneration prohibit conditions are satisfied.	_	Vehicle speed is 14 km/h (9 MPH) or less.	Normal operation.	
	_	Accelerator pedal is de- pressed.	Normal operation.	
	—	Under full braking.	Normal operation.	
The annual of the state	Driving mode is changed.	ECO mode or B mode are canceled.Range changes to N.	Normal operation.	
The amount of target regeneration changes.	_	Brake applied during sharp	Normal operation.	

turn.

mode.

Slip detected during ECO

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eration changes.

Normal operation.

Normal operation.

< SYMPTOM DIAGNOSIS >

Decelerating Force Changes

	Sympton	m	Possible cause	Action
		Traction motor inverter lim-	Fail-safe of traction motor inverter.	TMS-25. "Fail-safe"
		its output.	The temperature of traction motor or traction motor in-verter is high.	Check the "POWER LIMIT CAUSE" in the DATA MONITOR of VCM.
			Fail-safe of LBC.	EVB-40, "Fail-safe".
changes.	The amount of regeneration is limited.	LBC limits output.	Damaged bus bar (connect- ing part of Li-ion battery module).	Check bus bar.
tion G			Degradation in Li-ion bat- tery temperature	Check the "POWER LIMIT CAUSE"
Deceleration G			The temperature of Li-ion battery is too high/low.	in the DATA MONITOR of VCM.
Ğ			Li-ion battery is fully charged.	Normal operation.
	The amount of target regen-	Selector lever range posi- tion is changed.	Range changes from D to ECO (or B) or from ECO (or B) to D.	Normal operation.
	eration changes.		Accelerator pedal is de- pressed.	Normal operation.

< SYMPTOM DIAGNOSIS >

Normal Charge Does Not Start

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Sympto	m	Possible cause	Action	
	VCM recognizes that the se- lector lever is in a range oth- er than P range.	Electric shift system error.	Perform self-diagnosis of Electric shift control module.	
	_	Power switch is not OFF.	Normal operation.	
	_	VCM receives a charge stop request signal from PDM (Power Delivery Module).	Check to see if charge stop condi- tions are satisfied. Refer to <u>EVC-</u> <u>53</u> , "LI-ION BATTERY CHARGE <u>CONTROL</u> : Normal Charge Con- trol".	
	VCM recognizes that quick charge connector and nor- mal charge connector are	Abnormal connection detec- tion circuit of quick charge port.	Check quick charge port.	-
	connected simultaneously.	Abnormal PDM (Power De- livery Module).	Perform self-diagnosis of PDM (Power Delivery Module).	-
	VCM prohibits charging.	Fail-safe of VCM.	EVC-97. "Fail-Safe"	-
Normal charge start condi- tions are not satisfied.	VCM recognizes that nor- mal charge connector is not connected.	Abnormal connection detec- tion circuit of normal charge port.	Check normal charge port.	-
		Abnormal PDM (Power De- livery Module).	Perform self-diagnosis of PDM (Power Delivery Module).	-
		AC power, no input. (Disconnect from outlet)	Check outlet.	-
	VCM recognizes that a	AC power, no input. (Blackout)	Check AC power.	-
	PWM signal is not received from EVSE.	EVSE does not transmit a PWM signal.	Perform self-diagnosis of PDM	-
		Abnormal PDM (Power De- livery Module).	(Power Delivery Module).	
	_	Timer charge is set.	 Cancel timer charge setting. Turn ON the immediate charging switch. 	-
Judged as fully-charged.	_	Li-ion battery is fully charged.	Normal operation.	-

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< SYMPTOM DIAGNOSIS >

	Symptom	Possible cause	Action
Normal charge does not start.	EVSE does not activate.	EVSE detects electric leak- age	 Plug EVSE alone into an outlet (AC source) and check that the "Fault" lamp on EVSE does not blink. If the lamp blinks, replace EVSE. Check that no electric leakage exists between EVSE control box and PDM (Power Delivery Mod- ule) or in the PDM (Power Deliv- ery Module) itself.
		EVSE has a malfunction	Plug EVSE alone into an outlet (AC source) and check that the "Fault" lamp of EVSE does not turn ON. If the lamp turns ON, replace EVSE.
		EVSE not energized	Plug EVSE alone into an outlet (AC source) and check that the " Ready " lamp of EVSE turns ON . If the lamp does not turn ON, re- place EVSE.
		EVSE communication line has a malfunction	Plug EVSE alone into an outlet (AC source) and check that the "Fault" lamp on EVSE does not blink . If the lamp blinks, replace EVSE.

Timer Charge and Remote Charge Does Not Start

	Symptom		Possible cause	Action
rge does not start.	The timer charge start con- ditions are not satisfied.	_	Timer charge is not set.	Set timer charge.
		Remote charge request is not sent to the Information Center (Nissan CARWINGS Data Center).	The request is sent from an out of service area.	Send a remote charge request in a service area.
Timer charge or remote charge	The remote charge start conditions are not satisfied.	Remote charge request is not sent from the Informa- tion Center (Nissan CAR- WINGS Data Center).	The vehicle is located an out of service area.	Send a remote charge request in a service area.

< SYMPTOM DIAGNOSIS >

Immediate Charge Does Not Start

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Symptom			Possible cause	Action	-
ť		_	Timer charge is set.	Turn ON the immediate charging switch.	В
not start.			Power switch is ON.	Turn power switch OFF.	-
Immediate charge does no	charging swit	The operation of immediate charging switch does not	charge connector after op- 15 minutes aft	Connect charge connector within 15 minutes after operating the im- mediate charging switch.	EVC
		start immediate charge.	 Abnormal immediate charging switch. Abnormal immediate charging switch signal cir- cuit. 	EVC-393. "Diagnosis Procedure"	E

Normal Charge Is Not Completed

INFOID:000000008747285

	Symptom	Possible cause Action	
ed.	Normal charge is not completed despite full charge.	Abnormal LBC.	Perform self-diagnosis of LBC.
arge is not completed	Timer charge is not completed.	Timer charge end time is not set.	Set timer charge end time.
Normal charge			

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< SYMPTOM DIAGNOSIS >

Quick Charge Does Not Start

INFOID:000000008747286

	Sympton	m	Possible cause	Action
		VCM recognizes that the se- lector lever is in a range oth- er than P range.	Electric shift system error.	Perform self-diagnosis of electric shift control module.
		_	Power switch is not OFF.	Normal operation.
	Quick charge start condi- tions are not satisfied.	_	VCM receives a charge stop request signal from PDM (Power Delivery Module).	Check that charging condition is normal.
Quick charge does not start.		VCM recognizes that the quick charge connector and the normal charge connec-	Abnormal connection detec- tion circuit of normal charge port.	Check normal charge port.
e does		tor are simultaneously con- nected.	Abnormal PDM (Power De- livery Module).	Perform self-diagnosis of PDM (Power Delivery Module).
larg		VCM prohibits charging.	Fail-safe of VCM.	EVC-97, "Fail-Safe"
Quick ch		VCM recognizes that the quick charge connector is	Abnormal connection detec- tion circuit of quick charge port.	Check quick charge port.
		not connected.	Abnormal PDM (Power De- livery Module).	Perform self-diagnosis of PDM (Power Delivery Module).
	Quick charger does not per- mit quick charge.	Quick charger detects insu- lation resistance degrada- tion in high voltage circuit.	Insulation resistance degra- dation between PDM (Pow- er Delivery Module) and quick charger.	 Check PDM (Power Delivery Module). Check high voltage harness. Check quick charge port. Check quick charger.

Quick Charge Is Not Completed

	Symptom	Possible cause	Action
ed.	Charging is not completed despite full charge.	Abnormal LBC.	Perform self-diagnosis of LBC.
Quick charge is not completed	VCM does not receive a quick charge stop request signal.	Quick charger communica- tion error.	Perform self-diagnosis of PDM (Power Delivery Module).

< SYMPTOM DIAGNOSIS >

EV CONTROL SYSTEM

Full Charge Cannot Be Achieved

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	Sympto	om	Possible cause	Action	
	_		The setting of the timer charge charging rate is 80%.Set charging rate to 100%	Set charging rate to 100%	В
		_	Implementation of quick charge under a low Li-ion battery level.	Perform quick charge again.	EV
÷		Power consumption is large	A/C power consumption is large.	Refer to EVC-415, "Low Electrical	D
chieved	Charge power is low or charging stops.	during charge.	Power consumption of auxil- iaries is large.	Consumption".	E
Full charge cannot be achieved.		Charge power is limited.	Charge Insulation Resis- tance Loss Protection Con- trol is active.	Perform inspection according to the diagnosis procedure of DTC P3141. Refer to EVC-259. "DTC Logic".	F
	Target charge level differs from the meter indication.	Indication decreases after the completion of charge.	Temperature change in Li- ion battery.	Normal operation. NOTE: Charge level depends on Li-ion bat- tery temperature. For meter indica- tion method, refer to <u>MWI-24, "LI-</u> <u>ION BATTERY AVAILABLE</u> <u>CHARGE GAUGE : System De-</u> <u>scription"</u> .	G
		Meter indication does not reach maximum.	LED malfunction	MWI-48, "On Board Diagnosis Function"	1
	Charge level is low.	Chargeable electricity is lim- ited.	LBC limits chargeable elec- tricity.	Check "POWER LIMIT CAUSE" of DATA MONITOR item in VCM.	

Climate Ctrl. Timer Does Not Start

	Sympto	m	Possible cause	Action
	Climate Ctrl. Timer start conditions are not satisfied.		Climate Ctrl. Timer is not set.	Set Climate Ctrl. Timer.
Timer does not start.			Remote climate control is set.	Normal operation. NOTE: If Climate Ctrl. Timer and remote climate control are requested simul- taneously, remote climate control is prioritized.
Time			EVSE is not connected.	Connect EVSE.
Climate Ctrl. 7	A/C auto amp. does not rec- ognize Climate Ctrl. Timer.	Abnormal A/C auto amp.	Perform self-diagnosis of A/C auto amp.	
	A/C system does not start.		Abnormal A/C system pow- er supply.	HAC-180, "A/C AUTO AMP. : Diag- nosis Procedure" (with heat pump) or HAC-348, "A/C AUTO AMP. : Di- agnosis Procedure" (without heat pump)

< SYMPTOM DIAGNOSIS >

Remote climate control Does Not Start

INFOID:000000008747290

	Sympton	m	Possible cause	Action
es not start.	Remote climate control start conditions are not satisfied.	_	Li-ion battery level is low.*	Connect EVSE.Charge Li-ion battery.
		A remote climate control re- quest signal cannot be re-	Service area.	Send remote climate control re- quest again in a service area.
control does		ceived.	The vehicle is located in out of service area.	
Remote climate con	A/C system does not start.	A/C auto amp. does not rec- ognize remote climate con- trol.	Abnormal A/C auto amp.	Perform self-diagnosis of A/C auto amp.
		_	Abnormal A/C system pow- er.	HAC-180, "A/C AUTO AMP. : Diag- nosis Procedure" (with heat pump) or HAC-348, "A/C AUTO AMP. : Di- agnosis Procedure" (without heat pump)

*: Only during no AC power input.

< SYMPTOM DIAGNOSIS >

NORMAL OPERATING CONDITION

Description

CHARGE INSULATION RESISTANCE LOSS PROTECTION CONTROL

When the insulation resistance of the high voltage circuit decreases while charging due to a temporary cause, VCM limits the charging energy and waits until the insulation resistance state recovers. VCM restarts charging after the recovery of the insulation resistance status. If the situation is not improved after several repetitions of this control, VCM stops charging and detects DTC P3141.

NOTE:

If the insulation resistance status does not recover despite the limitation of charging energy under protection control, DTC P0AA6 is detected.

CHARGING CONNECTOR-CONNECTING PROTECTION CONTROL

When VCM detects a vehicle speed immediately after the charging connector is connected, the electricallydriven intelligent brake system is activated.

NOTE:

This control cannot stop the vehicle completely.

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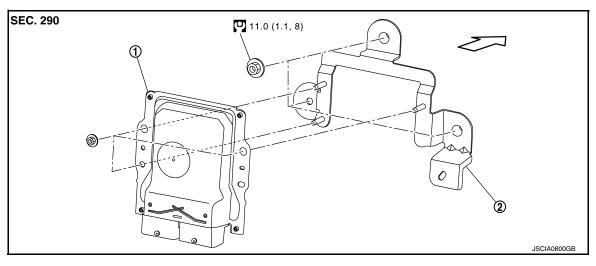
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Revision: October 2013

< REMOVAL AND INSTALLATION > REMOVAL AND INSTALLATION VCM

Exploded View

INFOID:000000008747295



1. VCM

2. VCM bracket

√ Vehicle front

⊡: N·m (kg-m, ft-lb)

Removal and Installation

INFOID:000000008747296

REMOVAL

CAUTION:

Before replacing VCM, perform "SAVE DATA FOR CPU REPLACE" in "WORK SUPPORT" of CONSULT to save the current VCM data in CONSULT. Refer to <u>EVC-144, "Work Procedure"</u>.

- 1. Turn power switch OFF and wait at least 20 seconds.
- 2. Disconnect the 12V battery negative terminal. Refer to <u>EVC-10</u>, "Precautions for Removing of Battery Terminal".
- 3. Remove the glove box cover assembly. Refer to <u>IP-16, "Exploded View"</u>.
- 4. Disconnect VCM harness connector.
- 5. Remove VCM mounting nuts.
- 6. Remove VCM.
- 7. Remove VCM bracket mounting nuts.
- 8. Remove VCM bracket.

INSTALLATION

Install in the reverse order of removal.

CAUTION:

Must be perform additional service when replacing VCM. Refer to EVC-144, "Work Procedure".