

SECTION **BCS**

BODY CONTROL SYSTEM

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PRECAUTIONS

PRECAUTIONS

PFP:00001

Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER”

AKS008YT

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

AKS003RC

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

BCM (BODY CONTROL MODULE)

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BCM (BODY CONTROL MODULE)

System Description

AKS000Z3

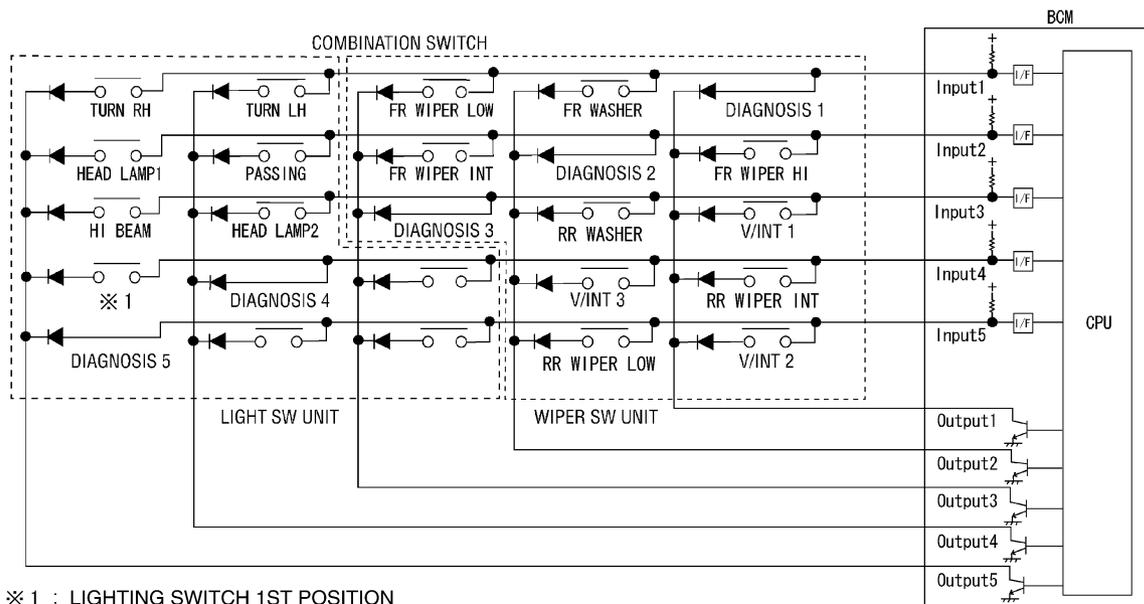
- BCM (Body Control Module) controls the operation of various electrical units installed on the vehicle.

BCM FUNCTION

BCM has a combination switch reading function for reading the operation of combination switches (light, wiper washer, turn signal) in addition to the function for controlling the operation of various electrical components. Also, it functions as an interface that receives signals from the A/C auto amplifier, and sends signals to ECM using CAN communication.

COMBINATION SWITCH READING FUNCTION

1. Description
 - BCM reads combination switch (light, wiper washer, turn signal) status, and controls various electrical components according to the results.
 - BCM reads information of 20 switches and 5 diagnostic results by combining five output terminals (OUTPUT 1 - 5) and five input terminals (INPUT 1 - 5).
2. Operation description
 - BCM outputs battery voltage from input terminals (INPUT 1 - 5) all the time. At the same time output terminals (OUTPUT 1 - 5) activate transistors in turn, and allow current to flow. At this time, if any (1 or more) of the switches are ON, the input terminals corresponding to these switches detect current flow, and the interface of BCM detects the condition. Then BCM judges switches are ON.



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3. BCM - Operation table of combination switches

- BCM reads operation status of combination switches by the combination shown in the table.

	COMB SW INPUT 1		COMB SW INPUT 2		COMB SW INPUT 3		COMB SW INPUT 4		COMB SW INPUT 5	
	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF
COMB SW OUTPUT 1	DIAGNOSIS 1 OK	DIAGNOSIS 1 NG	FR WIPER HI ON	FR WIPER HI OFF	V/INT 1 ON	V/INT 1 OFF	RR WIPER INT ON	RR WIPER INT OFF	V/INT 2 ON	V/INT 2 OFF
COMB SW OUTPUT 2	FR WASHER ON	FR WASHER OFF	DIAGNOSIS 2 OK	DIAGNOSIS 2 NG	RR WASHER ON	RR WASHER OFF	V/INT 3 ON	V/INT 3 OFF	RR WIPER ON	RR WIPER OFF
COMB SW OUTPUT 3	FR WIPER LOW ON	FR WIPER LOW OFF	FR WIPER INT ON	FR WIPER INT OFF	DIAGNOSIS 3 OK	DIAGNOSIS 3 NG	—	—	—	—
COMB SW OUTPUT 4	TURN LH ON	TURN LH OFF	PASSING ON	PASSING OFF	HEAD LAMP 2 ON	HEAD LAMP 2 OFF	DIAGNOSIS 4 OK	DIAGNOSIS 4 NG	—	—
COMB SW OUTPUT 5	TURN RH ON	TURN RH OFF	HEAD LAMP ON	HEAD LAMP OFF	HI BEAM ON	HI BEAM OFF	LIGHTING SWITCH 1ST POSITION ON	LIGHTING SWITCH 1ST POSITION OFF	DIAGNOSIS 5 OK	DIAGNOSIS 5 NG

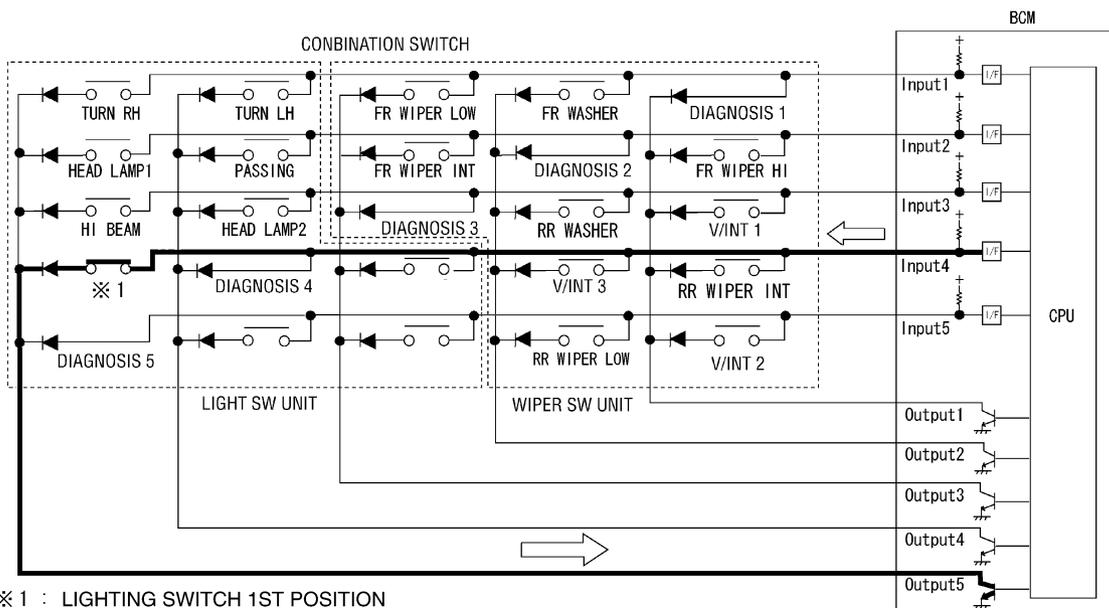
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NOTE:

Dual switches are set for head lamps.

4. Example (When lighting switch 1st position is turned ON)

- When lighting switch 1st position is turned ON, contact in combination switch turns ON. At this time if OUTPUT 5 transistor is activated, BCM detects current flow in INPUT 4.
- When OUTPUT 5 transistor is ON, BCM detects current flow in INPUT 4, and judges lighting switch 1st position is ON. Then BCM sends tail lamp ON signal to IPDM E/R using CAN communication.
- When OUTPUT 5 transistor is activated again, BCM detects current flow in INPUT 4, and confirms lighting switch 1st position is continuously ON.



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NOTE:

Each OUTPUT terminal transistor is activated at 10 ms intervals. Therefore, after a switch is turned ON, the electrical loads are activated with a time delay, but this time delay is so short that it cannot be noticed.

BCM (BODY CONTROL MODULE)

5. Operation mode

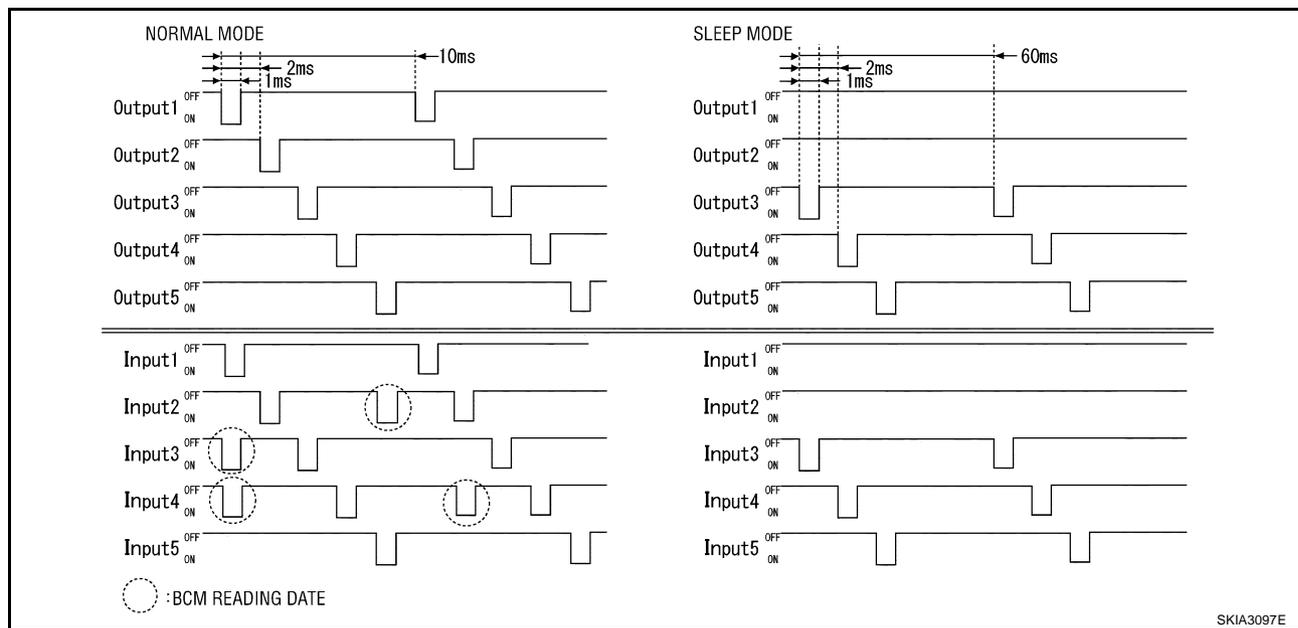
- Combination switch reading function has operation modes shown below.

a. Normal mode

- When BCM is not in sleep mode, each OUTPUT (1 - 5) terminal turns ON-OFF at 10 ms intervals.

b. Sleep mode

- When BCM is in sleep mode, transistors of OUTPUT 1 and 2 stop the output, and BCM enters low-current-consumption mode. OUTPUTS (3 - 5) turn ON-OFF at 60 ms intervals, and receive lighting switch input only.



CAN COMMUNICATION CONTROL

CAN communication is capable of dealing with a lot of information through the two communication lines (CAN L-line, CAN H-line) connecting control units in the system. Also each control unit functions to transmit and receive data, and reads necessary information only.

BCM STATUS CONTROL

BCM changes its status depending on the operation status in order to save power consumption.

1. CAN communication status

- With ignition switch ON, CAN communicates with other control units normally.
- Control by BCM is being operated properly.
- When ignition switch is OFF, switching to sleep mode is possible.
- Even when ignition switch is OFF, if CAN communication with IPDM E/R and combination meter is active, CAN communication status is active.

2. Sleep status

- This is the status to stop CAN communication when ignition switch is turned OFF.
- It transmits sleep request signal to IPDM E/R and combination meter.
- Two seconds after CAN communication with another control unit stops, it switches to CAN communication inactive status.

3. CAN communication inactive status

- With ignition switch OFF, CAN communication is not active.
- With ignition switch OFF, control performed only by BCM is active.
- Two seconds after CAN communication with another control unit stops, it switches to CAN communication inactive status.

BCM (BODY CONTROL MODULE)

4. Sleep status

- BCM is activated with low-current-consumption mode.
- CAN communication is not active.
- When CAN communication operation is detected, it switches to CAN communication status.
- When control performed only by BCM is required by switch, it shifts to CAN communication inactive mode.
- It changes combination switch reading function.

SYSTEMS CONTROLLED BY BCM DIRECTLY

- Power door lock system. Refer to [BL-18, "POWER DOOR LOCK SYSTEM"](#) .
- Remote keyless entry system. Refer to [BL-50, "REMOTE KEYLESS ENTRY SYSTEM"](#) .
- Power window system. Refer to [GW-13, "POWER WINDOW SYSTEM"](#) .^{NOTE}
- Room lamp timer. Refer to [LT-116, "INTERIOR ROOM LAMP"](#) .
- Warning chime. Refer to [DI-81, "WARNING CHIME"](#) .
- Turn signal and hazard warning lamps. Refer to [LT-57, "TURN SIGNAL AND HAZARD WARNING LAMPS"](#) .

NOTE:

Power supply only. No system control.

SYSTEMS CONTROLLED BY BCM AND IPDM E/R

- Panic alarm. Refer to [BL-50, "REMOTE KEYLESS ENTRY SYSTEM"](#) .
- Theft warning system. Refer [BL-96, "VEHICLE SECURITY \(THEFT WARNING\) SYSTEM"](#) .
- IVIS (NATS). Refer to [BL-119, "NVIS \(NISSAN VEHICLE IMMOBILIZER SYSTEM-NATS\)"](#) .
- Headlamp, tail lamp, Battery saver control.
- Wiper. Refer to [WW-4, "FRONT WIPER AND WASHER SYSTEM"](#) .
- Front washer. Refer to [WW-4, "FRONT WIPER AND WASHER SYSTEM"](#) .
- Rear window defogger. Refer to [GW-54, "REAR WINDOW DEFOGGER"](#) .

BCM (BODY CONTROL MODULE)

MAJOR COMPONENTS AND CONTROL SYSTEM

System	Input	Output
Remote keyless entry system	key fob	<ul style="list-style-type: none"> ● All-door locking actuator ● Trunk lid opener actuator ● Turn signal lamp (LH, RH)
Power door lock system	<ul style="list-style-type: none"> ● Power window main switch (door lock and unlock switch) ● Power window sub switch (passenger side) (door lock and unlock switch) 	All-door locking actuator
Power supply (IGN) to power window	Ignition power supply	Power supply to power window system
Power supply (BAT) to power window system and power seat	Battery power supply	Power supply to power window system and power seat
Panic alarm	<ul style="list-style-type: none"> ● Key switch ● Remote controller 	IPDM E/R
Theft warning system	<ul style="list-style-type: none"> ● All-door switch ● Hood switch ● Keyfob ● Power window main switch (door lock and unlock switch) ● Trunk lid opener actuator 	IPDM E/R
Battery saver control	<ul style="list-style-type: none"> ● Ignition switch ● Combination switch 	IPDM E/R
Headlamp	Combination switch	IPDM E/R
Tail lamp	Combination switch	IPDM E/R
Turn signal lamp	Combination switch	<ul style="list-style-type: none"> ● Turn signal lamp ● Combination meter
Hazard lamp	Hazard switch	<ul style="list-style-type: none"> ● Turn signal lamp ● Combination meter
Room lamp timer	<ul style="list-style-type: none"> ● Key switch ● Key fob ● Power window main switch (door lock and unlock switch) ● Front door switch driver side ● All-door switch 	Interior room lamp
Key warning chime	<ul style="list-style-type: none"> ● Key switch ● Front door switch driver side 	Combination meter (warning buzzer)
Light warning chime	<ul style="list-style-type: none"> ● Combination switch ● Key detection switch ● Front door switch driver side 	Combination meter (warning buzzer)
Seat belt warning chime	Combination meter (Seat belt buckle (driver side) switch)	Combination meter (warning buzzer)
Vehicle-speed-sensing intermittent wiper	<ul style="list-style-type: none"> ● Combination switch ● Combination meter 	IPDM E/R
Rear window defogger	Rear window defogger switch	IPDM E/R
Air conditioner switch signal	A/C auto amplifier	ECM
Blower fan switch signal	A/C auto amplifier	ECM

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BCM (BODY CONTROL MODULE)

CAN Communication System Description

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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. Modern vehicles are equipped with many electronic control units and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H 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.

CAN Communication Unit

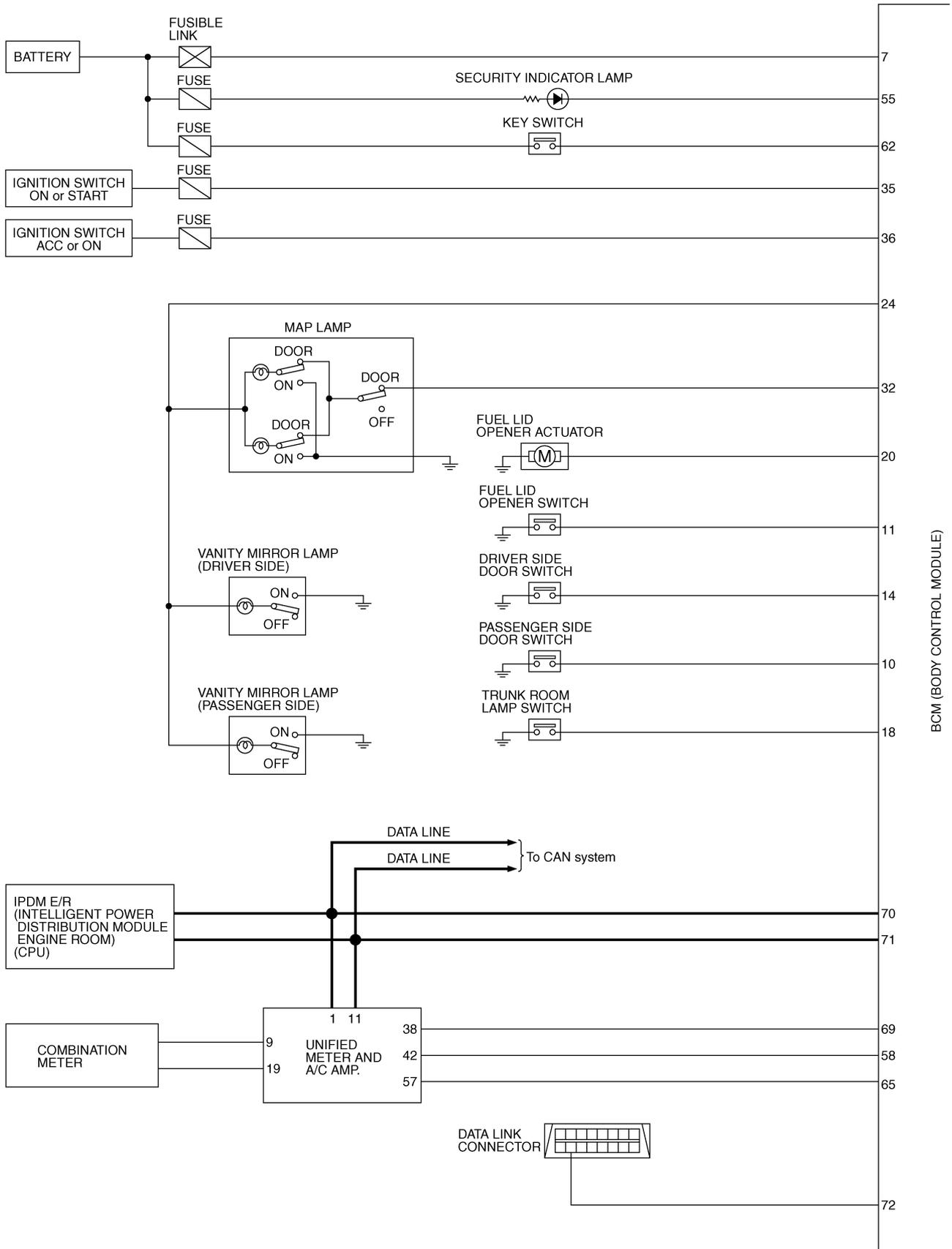
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Refer to [LAN-4, "CAN Communication Unit"](#) .

BCM (BODY CONTROL MODULE)

Schematic

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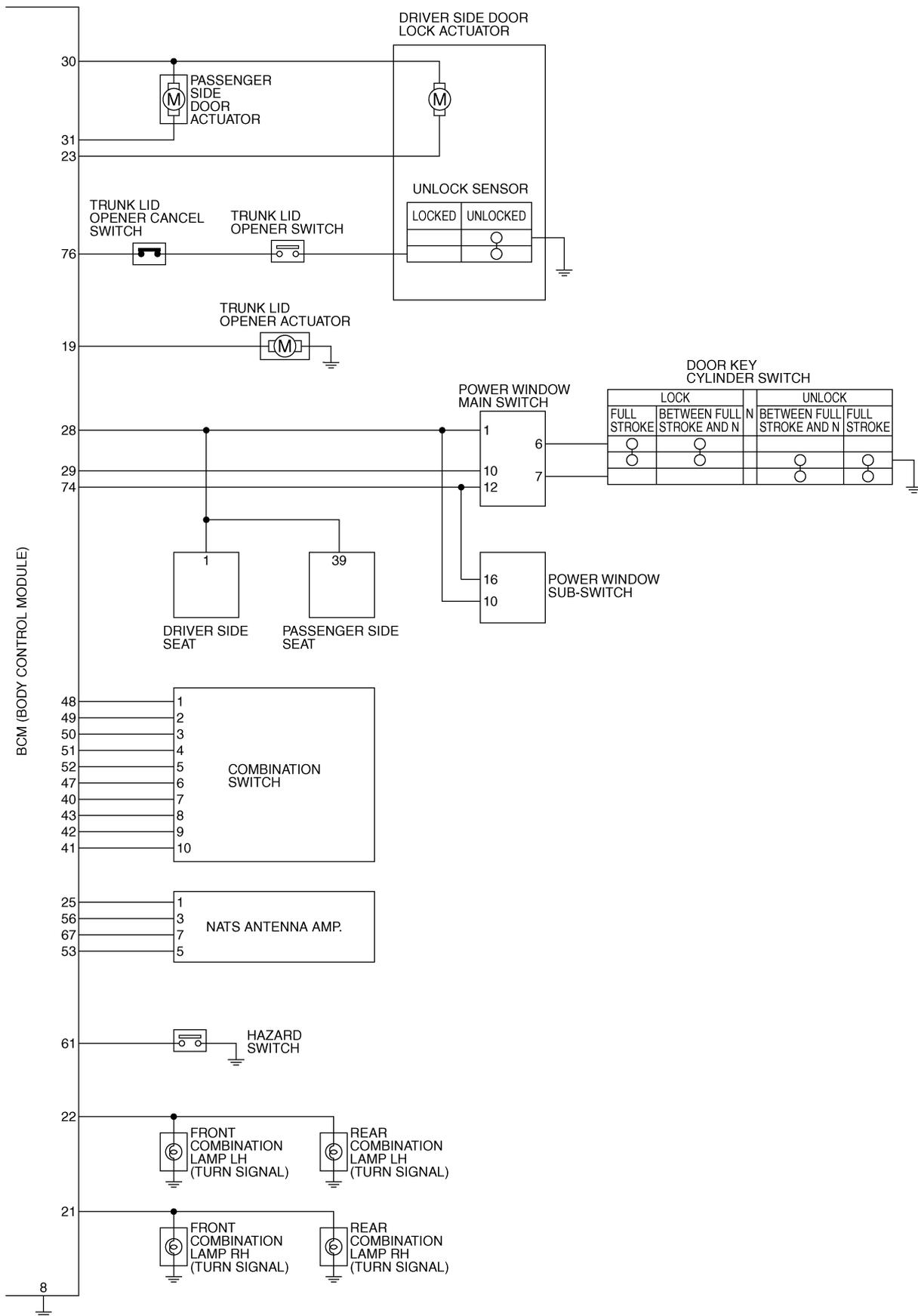
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BCM (BODY CONTROL MODULE)



TKWT1115E

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CONSULT-II

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CONSULT-II can display each diagnostic item using the following diagnostic test modes: work support, self-diagnostic results, data monitor and active test through data reception and command transmission via the BCM communication line.

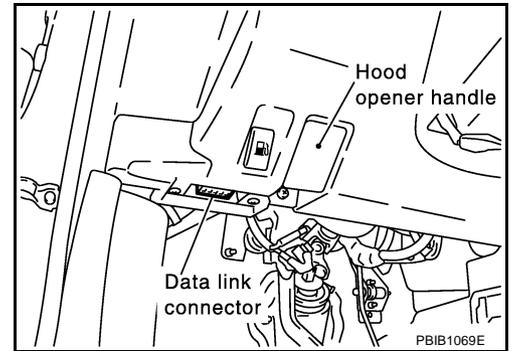
BCM diagnostic test item	Check item, diagnostic test mode	Content
Inspection by part	Work support	Changes setting of each function.
	Self-diagnosis results	BCM performs self-diagnosis of CAN communication and combination switch.
	Data monitor	Displays the input data of BCM in real time.
	CAN diagnostic support monitor	The result of transmit/receive diagnosis of CAN communication can be read.
	Active test	Gives a drive signal to a load to check the operation.

CONSULT-II INSPECTION PROCEDURE

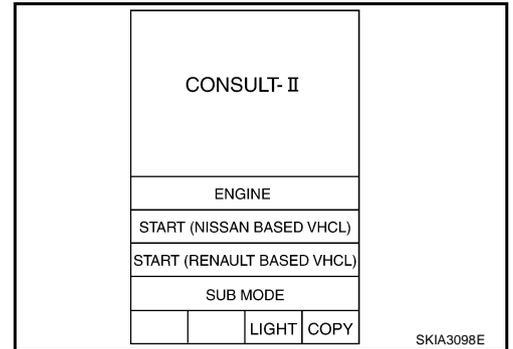
CAUTION:

If CONSULT-II is used with no connection of CONSULT-II CONVERTER, malfunctions might be detected in self-diagnosis depending on control unit which carry out CAN communication.

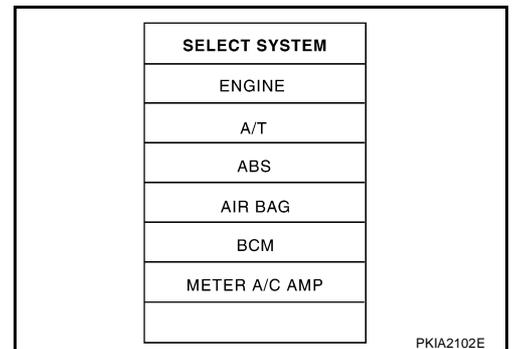
1. With the ignition switch OFF, connect CONSULT-II and CONSULT-II CONVERTER to the data link connector, then turn the ignition switch ON.



2. Touch "START(NISSAN BASED VHCL)".



3. Touch "BCM" on "SELECT SYSTEM" screen. If "BCM" is not indicated, go to [GI-39, "CONSULT-II Data Link Connector \(DLC\) Circuit"](#).



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4. Select the desired part to be diagnosed on the “SELECT TEST ITEM” screen.

SELECT TEST ITEM
MULTI REMOTE ENT
HEAD LAMP
COMB SW
WIPER
BCM C/U
FLASHER

SKIA1922E

ITEMS OF EACH PART

×:Applicable

System and item	CONSULT-II display	Diagnostic test mode (Inspection by part)				
		WORK SUPPORT	SELF-DIAG RESULTS	DATA MONITOR	CAN DIAG SUPPORT MNTR	ACTIVE TEST
Power door lock system	DOOR LOCK	×		×		×
Rear window defogger	REAR DEFOGGER			×		×
Key warning chime	KEY WARN ALM			×		×
Light warning chime	LIGHT WARN ALM			×		×
Seat belt warning chime	SEAT BELT ALM			×		×
Room lamp timer	INT LAMP	×		×		×
Interior lamp battery saver	BATTERY SAVER	×		×		×
Vehicle security system	THEFT ALM	×		×		×
Retained power control	RETAINED PWR	×		×		×
Remote keyless entry system	MULTI REMOTE ENT	×		×		×
Headlamp	HEAD LAMP	×		×		
Combination switch	COMB SW			×		
Wiper	WIPER			×		×
BCM	BCM C/U		×	×	×	
Turn signal lamp Hazard lamp	FLASHER			×		×
NVIS	IMMU			×		×
Air conditioner switch signal Blower fan switch signal	SIGNAL BUFFER			×		×NOTE
Trunk lid	TRUNK					×

NOTE:

This item is displayed, but cannot test it.

BCM (BODY CONTROL MODULE)

CAN Communication Inspection Using CONSULT-II (Self-Diagnosis)

AKS000Z7

1. SELF-DIAGNOSTIC RESULT CHECK

CAUTION:

If CONSULT-II is used with no connection of CONSULT-II CONVERTER, malfunctions might be detected in self-diagnosis depending on control unit which carry out CAN communication.

1. Connect to CONSULT-II, and select "BCM" on "SELECT SYSTEM" screen.
2. Select "BCM control unit " on "SELECT WORK ITEM" screen, and select "SELF-DIAG RESULTS".
3. Check display content in self-diagnostic results.

CONSULT-II display code	Diagnosis item
U1000	INITIAL DIAG
	TRANSMIT DIAG
	ECM
	IPDM E/R
	METER / M&A

Contents displayed

No malfunction>>Inspection End

Malfunction in CAN communication system>>After printing the monitor items, go to "CAN System". Refer to [LAN-2, "Precautions When Using CONSULT-II"](#) .

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BCM (BODY CONTROL MODULE)

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Inspection of BCM Power Supply and Ground Circuit

1. FUSE AND FUSIBLE LINK INSPECTION

Check if any of the following BCM fuses and fusible links are blown.

Terminal No.	Signal name	Fuse No., fusible link No.
7	Battery	F
35	Ignition switch ON or START	1
36	Ignition switch ACC or ON	6

- Refer to LT wiring diagram LT-H/LAMP-01, [LT-10](#).

OK or NG

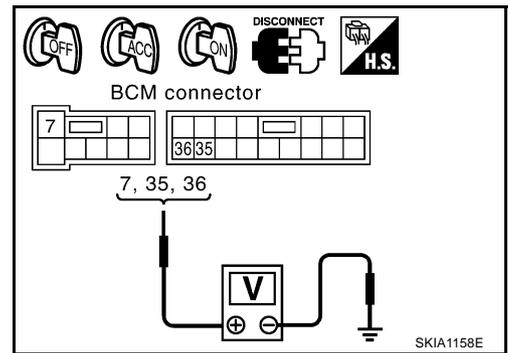
OK >> GO TO 2.

NG >> Replace fuse or fusible link.

2. POWER SUPPLY CIRCUIT INSPECTION

Disconnect BCM connector. To measure voltage, connect following harness connector terminals to positive probe and body ground to negative one.

Terminals		Power source	Ignition switch	Reference value
(+)	(-)			
Connector	Terminal (wire color)			
E105	7(R)	Battery power	OFF	Battery voltage
M1	35 (W/L)	Ignition power supply	ON	Battery voltage
	36 (LG)	ACC power supply	ACC	Battery voltage



- Refer to LT wiring diagram LT-H/LAMP-01, [LT-10](#).

OK or NG

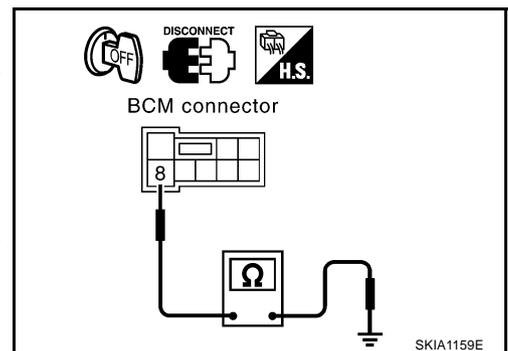
OK >> GO TO 3.

NG >> Replace BCM power supply circuit harness.

3. GROUND CIRCUIT INSPECTION

Check continuity between the following harness connector of BCM and body ground.

Terminals		Continuity
(+)	(-)	
Connector	Terminal (wire color)	
E105	8 (B)	Ground YES



- Refer to LT wiring diagram LT-H/LAMP-01, [LT-10](#).

OK or NG

OK >> Normal

NG >> Replace BCM ground circuit harness.

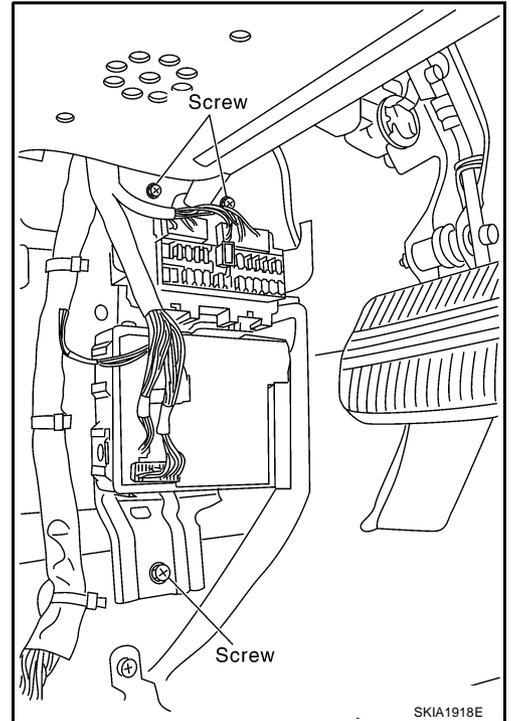
BCM (BODY CONTROL MODULE)

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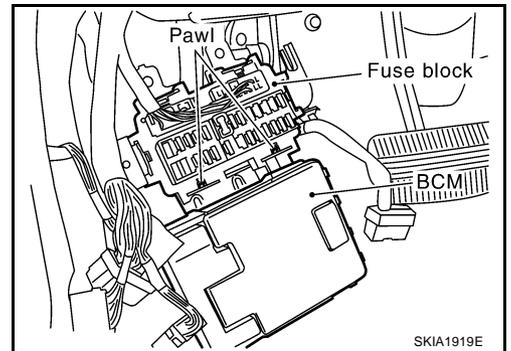
Removal and Installation of BCM

REMOVAL

1. Remove the dash side finisher (LH). Refer to [EI-29, "BODY SIDE TRIM"](#) in "EI Exterior/Interior."
2. Disconnect BCM connector.
3. Remove bracket mounting screws (3) to remove BCM and fuse block with bracket.



4. Raise the pawl of fuse block and remove bracket from fuse block to remove BCM.



INSTALLATION

- Install in the reverse order of removal.

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