

# SECTION **BCS**

## BODY CONTROL SYSTEM

A  
B  
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# PRECAUTIONS

< SERVICE INFORMATION >

## SERVICE INFORMATION

### PRECAUTIONS

#### Precaution for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER"

INFOID:000000003533595

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.

# BCM (BODY CONTROL MODULE)

< SERVICE INFORMATION >

## BCM (BODY CONTROL MODULE)

### System Description

INFOID:000000003533596

- 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 front air control, and sends signals to ECM using CAN communication.

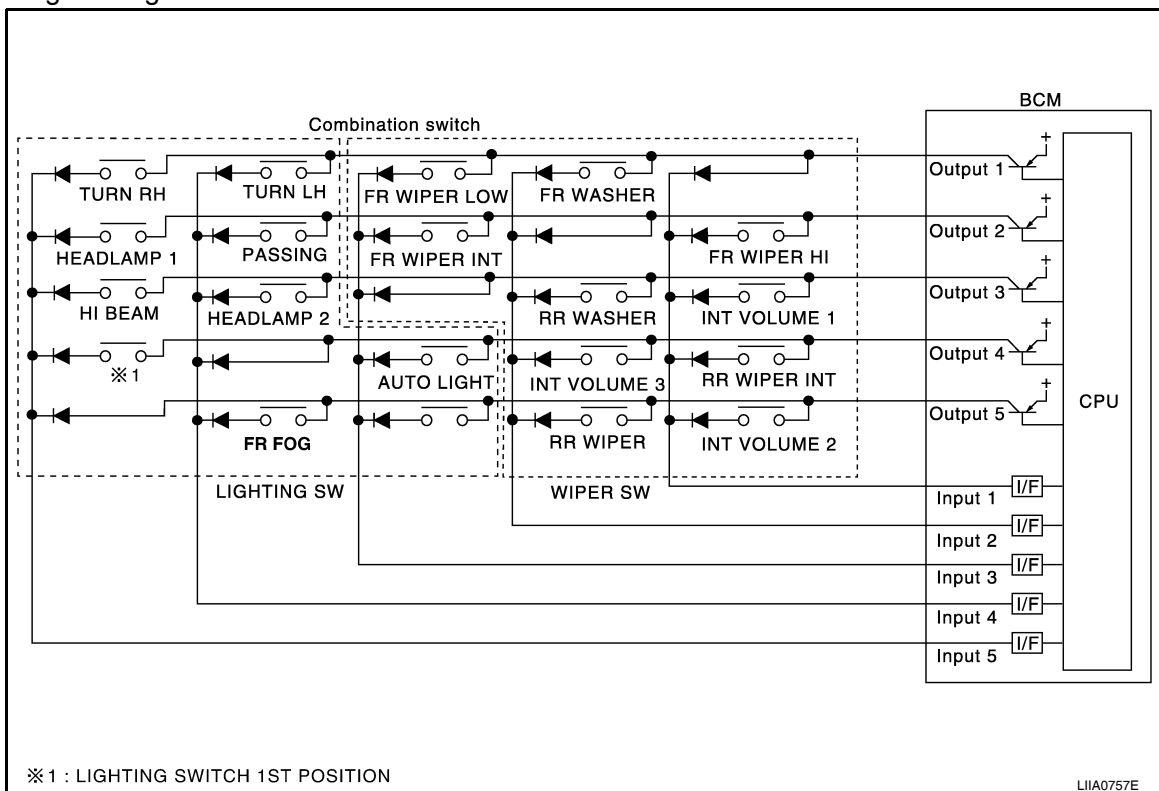
### COMBINATION SWITCH READING FUNCTION

#### 1. Description

- BCM reads combination switch (light, wiper) status, and controls various electrical components according to the results.
- BCM reads information of a maximum of 20 switches by combining five output terminals (OUTPUT 1-5) and five input terminals (INPUT 1-5).

#### 2. Operation description

- BCM activates transistors of output terminals (OUTPUT 1-5) periodically and allows current to flow in turn.
- If any (1 or more) of the switches are turned ON, circuit of output terminals (OUTPUT 1-5) and input terminals (INPUT 1-5) becomes active.
- At this time, transistors of output terminals (OUTPUT 1-5) are activated to allow current to flow. When voltage of input terminals (INPUT 1-5) corresponding to that switch changes, interface in BCM detects voltage change and BCM determines that switch is ON.



#### 3. BCM - Operation table of combination switch

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

A  
B  
C  
D  
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BCS

# BCM (BODY CONTROL MODULE)

## < SERVICE INFORMATION >

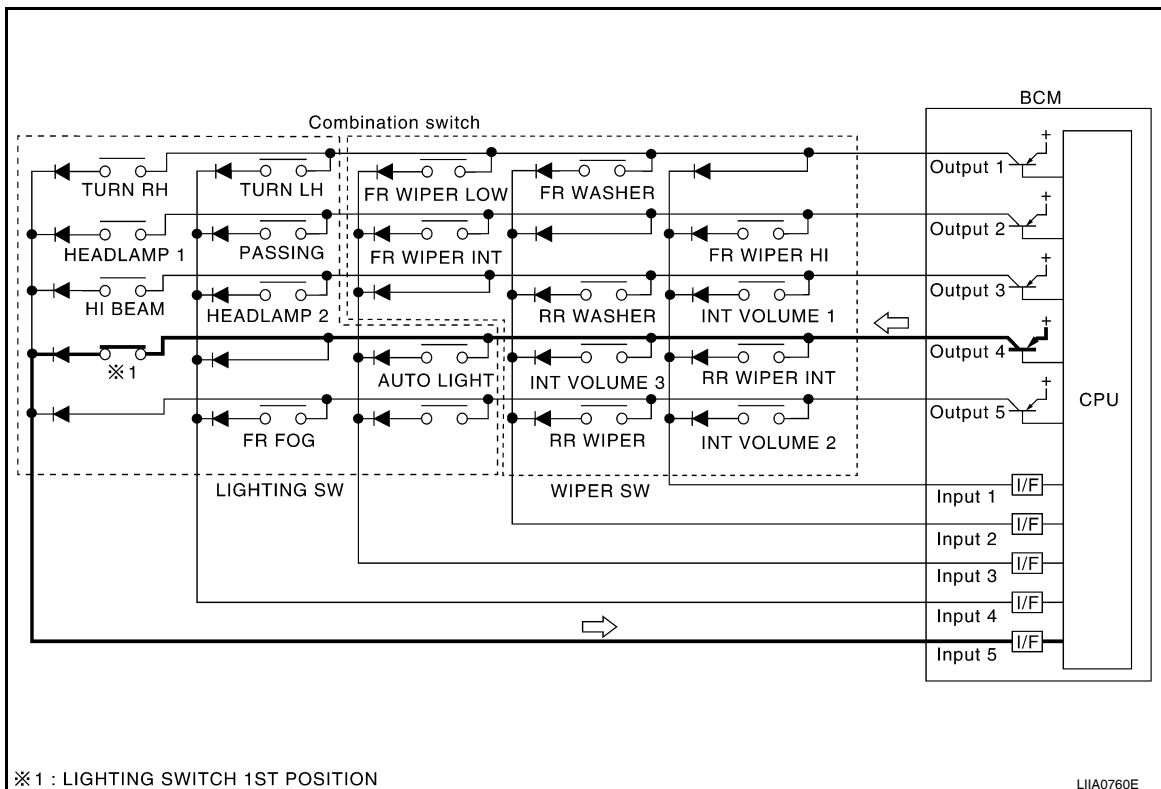
	COMB SW OUTPUT 1		COMB SW OUTPUT 2		COMB SW OUTPUT 3		COMB SW OUTPUT 4		COMB SW OUTPUT 5	
	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF
COMB SW INPUT 1	—	—	FR WIPER HI ON	FR WIPER HI OFF	INT VOLUME 1 ON	INT VOLUME 1 OFF	RR WIPER INT ON	RR WIPER INT OFF	INT VOLUME 2 ON	INT VOLUME 2 OFF
COMB SW INPUT 2	FR WASHER ON	FR WASHER OFF	—	—	RR WASHER ON	RR WASHER OFF	INT VOLUME 3 ON	INT VOLUME 3 OFF	RR WIPER ON	RR WIPER OFF
COMB SW INPUT 3	FR WIPER LOW ON	FR WIPER LOW OFF	FR WIPER INT ON	FR WIPER INT OFF	—	—	AUTO LIGHT ON	AUTO LIGHT OFF	—	—
COMB SW INPUT 4	TURN LH ON	TURN LH OFF	PASSING ON	PASSING OFF	HEAD-LAMP 2 ON	HEAD-LAMP 2 OFF	—	—	FR FOG ON	FR FOG OFF
COMB SW INPUT 5	TURN RH ON	TURN RH OFF	HEAD-LAMP 1 ON	HEAD-LAMP 1 OFF	HI BEAM ON	HI BEAM OFF	LIGHTING SW (1st) ON	LIGHTING SW (1st) OFF	—	—

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### NOTE:

Headlamp has a dual system switch.

- Example operation: (When lighting switch 1st position turned ON)
  - When lighting switch 1st position is turned ON, contact in combination switch turns ON. At this time if OUTPUT 4 transistor is activated, BCM detects that voltage changes in INPUT 5.
  - When OUTPUT 4 transistor is ON, BCM detects that voltage changes in INPUT 5, and judges lighting switch 1st position is ON. Then BCM sends tail lamp ON signal to IPDM E/R using CAN communication.
  - When OUTPUT 4 transistor is activated again, BCM detects that voltage changes in INPUT 5 and recognizes that lighting switch 1st position is continuously ON.



### NOTE:

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

- Operation mode

- Combination switch reading function has operation modes as follows:

# BCM (BODY CONTROL MODULE)

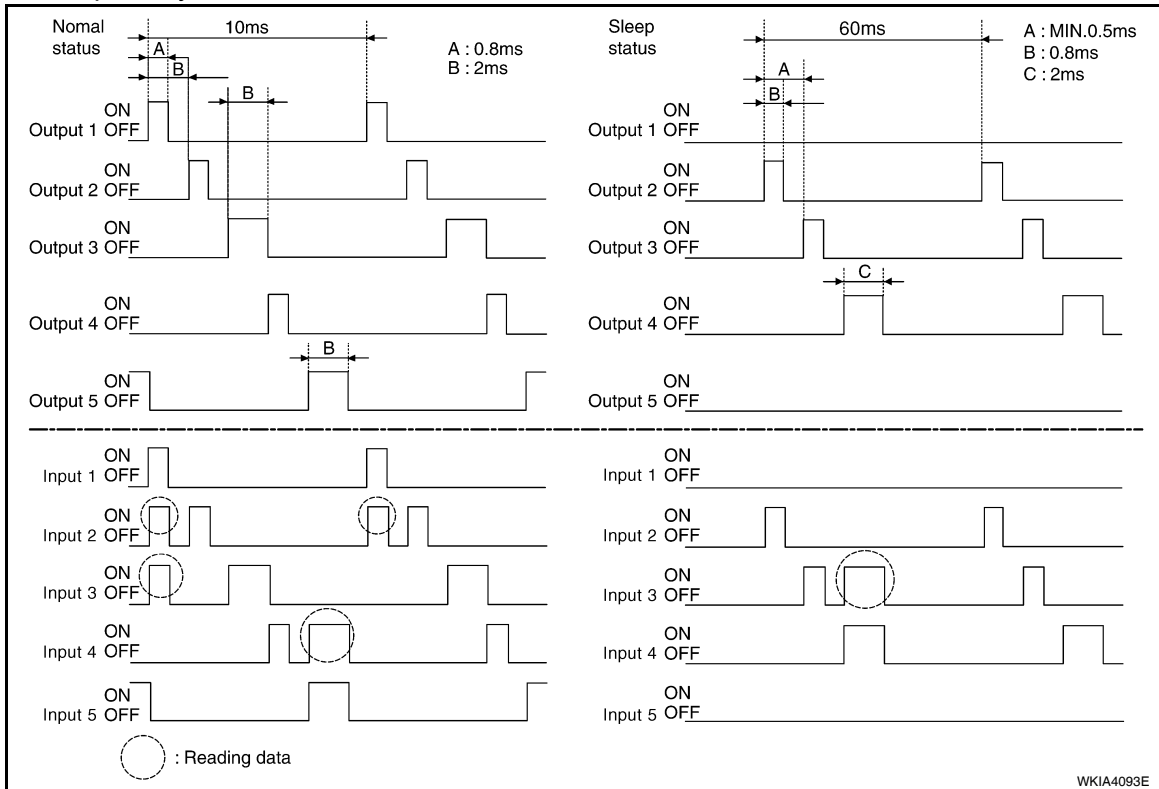
## < SERVICE INFORMATION >

### Normal status

- When BCM is not in sleep status, OUTPUT terminals (1-5) each turn ON-OFF every 10ms.

### Sleep status

- When BCM is in sleep mode, transistors of OUTPUT 1 and 5 stop the output, and BCM enters low-current-consumption mode. OUTPUTS (2, 3, and 4) turn ON-OFF at 60ms intervals, and receives lighting switch input only.



## CAN COMMUNICATION CONTROL

CAN communication allows a high rate of information through the two communication lines (CAN-L, CAN-H) connecting the various control units in the system. Each control unit transmits/receives data, but selectively reads required data only.

## BCM STATUS CONTROL

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

- 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.
- Sleep transient status**
  - This status shuts down 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 of all control units stops, CAN communication switches to inactive status.
- CAN communication inactive status**
  - With ignition switch OFF, CAN communication is not active.
  - With ignition switch OFF, control performed only by BCM is active.
  - Three seconds after CAN communication of all control units stops, CAN communication switches to inactive status.
- Sleep status**
  - BCM is activated with low current consumption mode.
  - CAN communication is not active.

# BCM (BODY CONTROL MODULE)

## < SERVICE INFORMATION >

- When CAN communication operation is detected, it switches to CAN communication status.
- When a state of the following switches changes, it switches to CAN communication state:
  - Ignition switch
  - Key switch (insert)
  - Hazard switch
  - Main door lock/unlock switch
  - Front door switch (LH, RH)
  - Rear door switch (LH, RH)
  - Back latch (door ajar switch)
  - Glass hatch ajar switch
  - Combination switch (passing, lighting switch 1st position, front fog lamp)
  - Keyfob (lock/unlock signal)
  - Front door lock assembly LH (key cylinder switch)
- When control performed only by BCM is required by switch, it shifts to CAN communication inactive mode.
- Status of combination switch reading function is changed.

### SYSTEMS CONTROLLED BY BCM DIRECTLY

- Power door lock system. Refer to [BL-15](#).
- Remote keyless entry system. Refer to [BL-37](#).
- Power window system. Refer to [GW-15](#). <sup>NOTE</sup>
- Sunroof system. Refer to [RF-10](#). <sup>NOTE</sup>
- Room lamp timer. Refer to [LT-101](#).
- Warning chime system. Refer to [DI-36](#).
- Turn signal and hazard warning lamps system. Refer to [LT-57](#).
- Trailer turn signal and hazard warning lamps system (if equipped). Refer to [LT-94](#).
- Rear wiper and washer system. Refer to [WW-26](#).

#### NOTE:

Power supply only. No system control.

### SYSTEMS CONTROLLED BY BCM AND IPDM E/R

- Panic system. Refer to [BL-37](#).
- Vehicle security system. Refer to [BL-60](#).
- IVIS (NATS) system. Refer to [BL-116](#).
- Headlamp, tail lamp, front fog lamp, auto light and battery saver control systems. Refer to [LT-5](#), [LT-24](#), [LT-82](#), [LT-49](#) or [LT-34](#).
- Front wiper and washer system. Refer to [WW-3](#).
- Rear window defogger system. Refer to [GW-68](#).

### MAJOR COMPONENTS AND CONTROL SYSTEM

System	Input	Output
Remote keyless entry system	Remote keyless entry receiver (keyfob)	<ul style="list-style-type: none"> <li>• All door locking actuators</li> <li>• Back door opener actuator</li> <li>• Turn signal lamps</li> </ul>
Power door lock system	<ul style="list-style-type: none"> <li>• Front power door lock/unlock switch (LH, RH)</li> <li>• All door switches</li> <li>• Key switch</li> </ul>	All door locking actuators
Power supply [ignition (IGN)/retained accessory power (RAP)] to power window and sunroof	IGN/RAP supply	Power supply to power window and sunroof system
Power supply (BAT) to power window and sunroof	Battery power supply	Power supply to power window and sunroof system
Panic alarm	<ul style="list-style-type: none"> <li>• Key switch</li> <li>• Remote keyless entry receiver (keyfob)</li> </ul>	IPDM E/R
Auto light system	<ul style="list-style-type: none"> <li>• Optical sensor</li> <li>• Combination switch</li> </ul>	IPDM E/R
Battery saver control	<ul style="list-style-type: none"> <li>• Ignition switch</li> <li>• Combination switch</li> <li>• Front door switch LH and RH</li> </ul>	IPDM E/R

# BCM (BODY CONTROL MODULE)

## < SERVICE INFORMATION >

System	Input	Output	
Headlamp	Combination switch	IPDM E/R	A
Tail lamp	Combination switch	IPDM E/R	
Front fog lamp	Combination switch	IPDM E/R	B
Turn signal lamp	Combination switch	<ul style="list-style-type: none"> <li>• Turn signal lamp</li> <li>• Combination meter</li> </ul>	
Hazard lamp	Hazard switch	<ul style="list-style-type: none"> <li>• Turn signal lamp</li> <li>• Combination meter</li> </ul>	C
Room lamp timer	<ul style="list-style-type: none"> <li>• Key switch</li> <li>• Remote keyless entry receiver (keyfob)</li> <li>• Main power window and door lock/unlock switch</li> <li>• Front door lock assembly LH (key cylinder switch)</li> <li>• All door switches</li> </ul>	Interior room lamp	D
Key warning chime	<ul style="list-style-type: none"> <li>• Key switch</li> <li>• Front door switch LH</li> </ul>	Combination meter (warning buzzer)	E
Light warning chime	<ul style="list-style-type: none"> <li>• Combination switch</li> <li>• Key switch</li> <li>• Front door switch LH</li> </ul>	Combination meter (warning buzzer)	F
Vehicle-speed-sensing intermittent wiper	<ul style="list-style-type: none"> <li>• Combination switch</li> <li>• Combination meter</li> </ul>	IPDM E/R	G
Rear window defogger	Rear window defogger switch	IPDM E/R	
Air conditioner switch signal	Front air control	ECM	
Blower fan switch signal	Front air control	ECM	H
Low tire pressure warning system	Remote keyless entry receiver	<ul style="list-style-type: none"> <li>• Combination meter</li> <li>• Display control unit</li> </ul>	I
Trailer tow (if equipped)	Combination switch	Trailer turn signal relays	
Vehicle security system	<ul style="list-style-type: none"> <li>• Remote keyless entry receiver (keyfob)</li> <li>• Main power window and door lock/unlock switch</li> <li>• Power window and door lock/unlock switch RH</li> <li>• Front door lock assembly LH (key cylinder switch)</li> <li>• All door switches</li> <li>• Back door latch (door ajar switch)</li> </ul>	<ul style="list-style-type: none"> <li>• IPDM E/R</li> <li>• Security indicator lamp</li> </ul>	J

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## CAN Communication System Description

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Refer to [LAN-4](#).

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