SECTION BCS
BODY CONTROL SYSTEM

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PRECAUTIONS

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

AKS008YN

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)

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System Description

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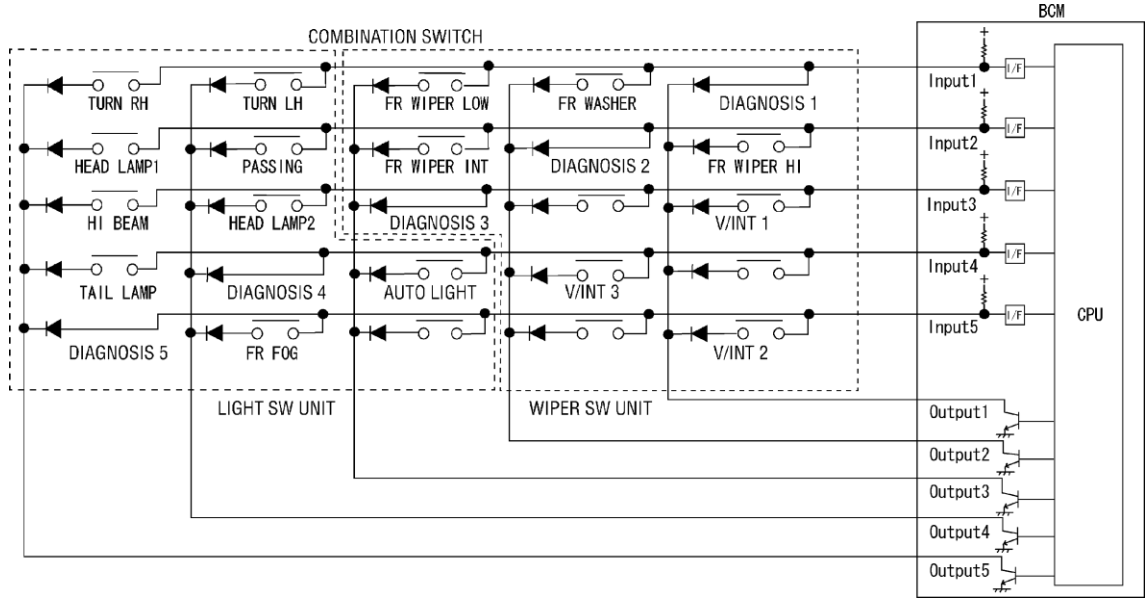
- BCM (Body Control Module) controls the operation of various electrical units installed on the vehicle.

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.



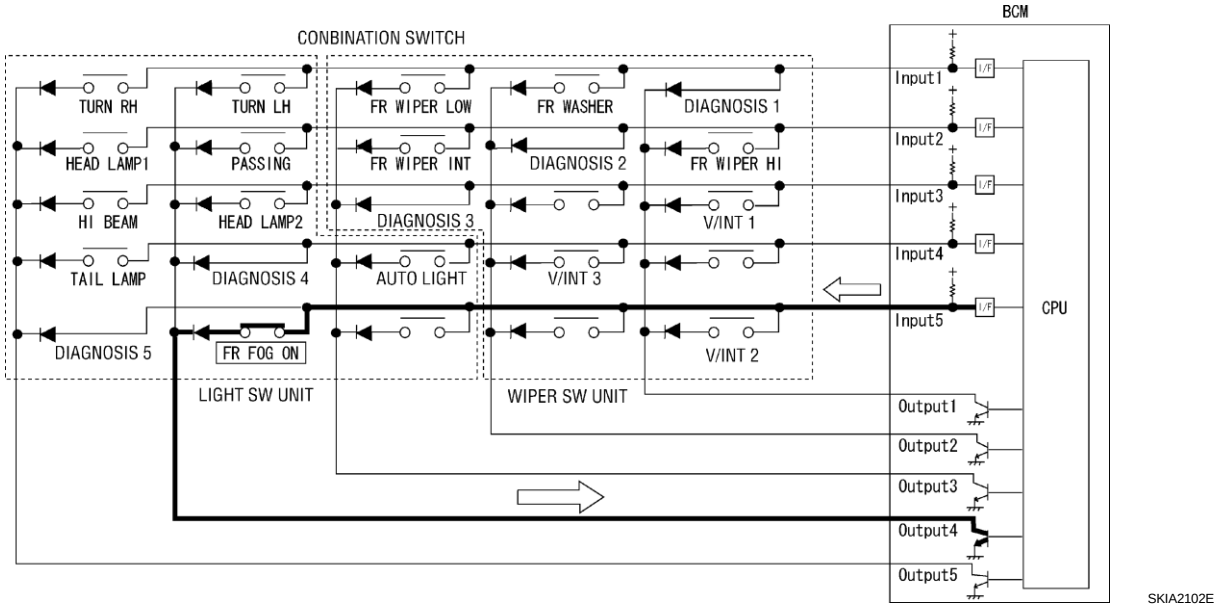
3. BCM - Operation table of combination switches
   - BCM reads operation status of combination switches by the combination shown in the table.

	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	—	—	V/INT 2 ON	V/INT 2 OFF
COMB SW OUTPUT 2	FR WASHER ON	FR WASHER OFF	DIAGNOSIS 2 OK	DIAGNOSIS 2 NG	—	—	V/INT 3 ON	V/INT 3 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	AUTO LIGHT ON	AUTO LIGHT OFF	—	—
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	FR FOG ON	FR FOG OFF
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 fog lamp switch is turned ON)
   - When fog lamp switch is turned ON, contact in combination switch turns ON. At this time if OUTPUT 4 transistor is activated, BCM detects current flow in INPUT 5.
   - When OUTPUT 4 transistor is ON, BCM detects current flow in INPUT 5, and judges fog lamp switch is ON. Then BCM sends fog lamp ON signal to IPDM E/R using CAN communication.
   - When OUTPUT 4 transistor is activated again, BCM detects current flow in INPUT 5, and confirms fog lamp switch is continuously ON.



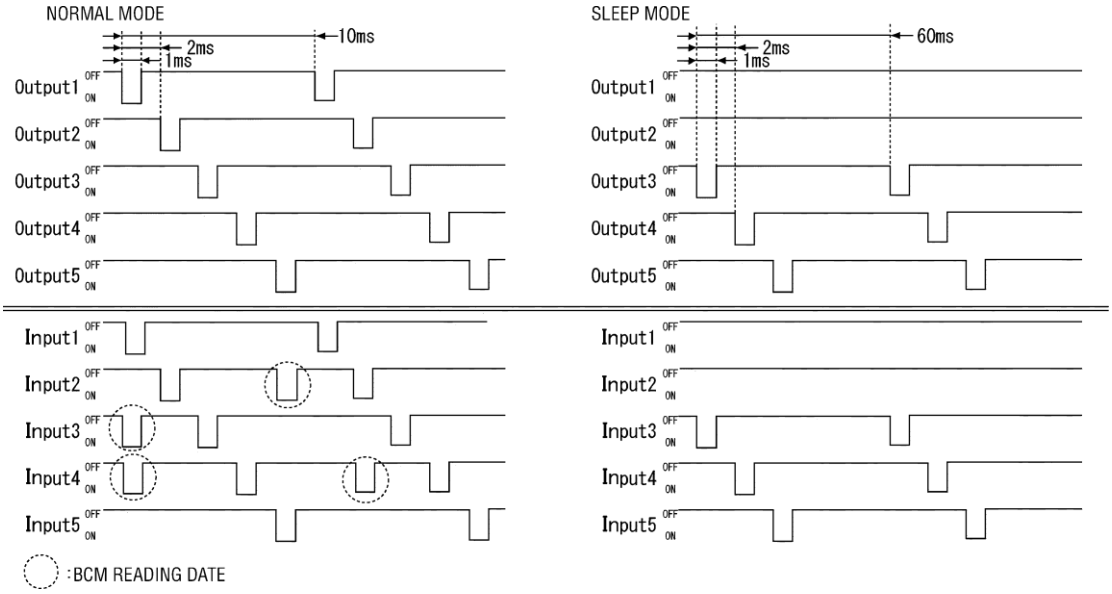
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NOTE:
Each OUTPUT terminal transistor is activated at 10 ms intervals. Therefore, after a switch is turned ON, the electrical loads are activated with a time delay, but this time delay is so short that it cannot be noticed.

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.



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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.

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-19, "POWER DOOR LOCK SYSTEM" .
- Remote keyless entry system. Refer to.BL-49, "REMOTE KEYLESS ENTRY SYSTEM" .
- Power window system. Refer to GW-16, "POWER WINDOW SYSTEM" . NOTE
- Sunroof system. Refer to RF-10, "SUNROOF" . NOTE
- Room lamp timer. Refer to LT-166, "INTERIOR ROOM LAMP" .
- Key reminder
- Warning chime
- Turn signal and hazard warning lamps

NOTE:
Power supply only. No system control.

SYSTEMS CONTROLLED BY BCM AND IPDM E/R

- Panic alarm
- Theft warning system
- IVIS (NATS)
- Headlamp, tail lamp, fog lamp, auto light system. Battery saver control
- Wiper
- Front washer
- Rear window defogger

MAJOR COMPONENTS AND CONTROL SYSTEM

System	Input	Output
Remote keyless entry system	key fob	All-door locking actuator Trunk lid opener actuator
Power door lock system	● 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, sunroof	Ignition power supply	Power supply to power window and sun-roof system
Power supply (BAT) to power window, sunroof and power seat	Battery power supply	Power supply to power window, sunroof system and power seat
Panic alarm	Key switch Remote controller	IPDM E/R
Theft warning system	All-door locking actuator Trunk lid opener actuator	IPDM E/R
Auto light system	Optical sensor Combination switch	IPDM E/R
Battery saver control	Ignition switch Combination switch	IPDM E/R
Headlamp	Combination switch	IPDM E/R
Tail lamp	Combination switch	IPDM E/R
Fog lamp	Combination switch	IPDM E/R

System	Input	Output
Turn signal lamp	Combination switch	Turn signal lamp Combination meter
Hazard lamp	Hazard switch	Turn signal lamp Combination meter
Room lamp timer	Key switch Power window main switch (door lock and unlock switch) Front door switch driver side All-door switch	Interior room lamp
Key warning chime	Key switch Front door switch driver side	Combination meter (warning buzzer)
Light warning chime	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	Combination switch Combination meter	IPDM E/R
Front washer	Combination switch	Front washer motor IPDM E/R
Rear window defogger	Rear window defogger switch	IPDM E/R
Air conditioner switch signal	Display and A/C auto amplifier	ECM
Blower fan switch signal	Display and A/C auto amplifier	ECM

CAN Communication Unit

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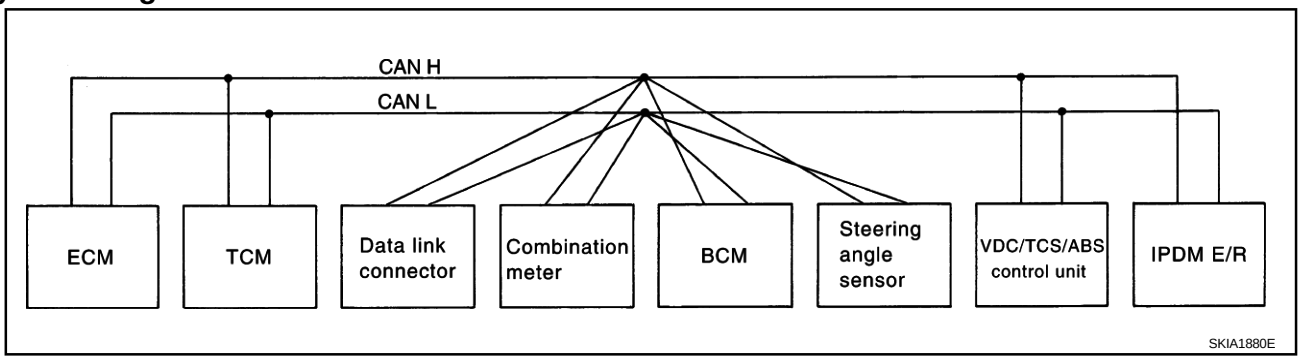
Body type	Sedan	
Axle	2WD	
Engine	VQ35DE	
Transmission	A/T	M/T
	UP to serial 329287* / From serial 329288*	
Brake control	VDC	
CAN communication unit		
ECM	×	×
TCM	×	
Data link connector	×	×
Combination meter	×	×
BCM	×	×
Steering angle sensor	×	×
VDC/TCS/ABS control unit	×	×
IPDM E/R	×	×
CAN communication type	BCS-8, "TYPE 1/TYPE 3"	BCS-10, "TYPE 2"

×: Applicable

*:For further information, refer to GI-47, "IDENTIFICATION NUMBER" .

TYPE 1/TYPE 3

System Diagram



Input/Output Signal Chart

T: Transmit R: Receive

Signals	ECM	TCM	Combination meter	BCM	Steering angle sensor	VDC/TCS/ABS control unit	IPDM E/R
Engine torque signal	T	R					
Engine speed signal	T	R	R			R	
Engine coolant temperature signal	T	R	R				
Accelerator pedal position signal	T	R				R	
Closed throttle position signal	T	R					
Wide open throttle position signal	T	R					
Battery voltage signal	T	R					
Stop lamp switch signal		R	T				
Fuel consumption monitor signal	T		R				
A/T self-diagnosis signal	R	T					
A/T CHECK indicator lamp signal		T	R				
A/T position indicator signal		T	R			R	
ABS operation signal		R				T	
A/T shift schedule change demand signal		R				T	
A/C switch signal	R			T			
A/C compressor request signal	T						R
A/C compressor feedback signal	T		R				
Blower fan motor switch signal	R			T			
Cooling fan motor operation signal	T						R
Position lights request signal			R	T			R
Low beam request signal				T			R
Low beam status signal	R						T
High beam request signal			R	T			R
High beam status signal	R						T
Front fog lights request signal				T			R
Vehicle speed signal			R			T	
	R	R	T	R			
Sleep request 1 signal			R	T			
Sleep request 2 signal				T			R
Wake up request 1 signal			R	T			R

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