

SECTION **BCS**

BODY CONTROL SYSTEM

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PRECAUTIONS

PRECAUTIONS

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

NKS003XG

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)

BCM (BODY CONTROL MODULE)

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System Description

NKS003XH

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

BCM FUNCTION

BCM has combination switch reading function for reading the operation of combination switches (light, wiper, washer, turn signal) in addition to a function for controlling the operation of various electrical components. Also it has an interface function allowing it to receive signals from the combination meter, and send signals to ECM using CAN communication.

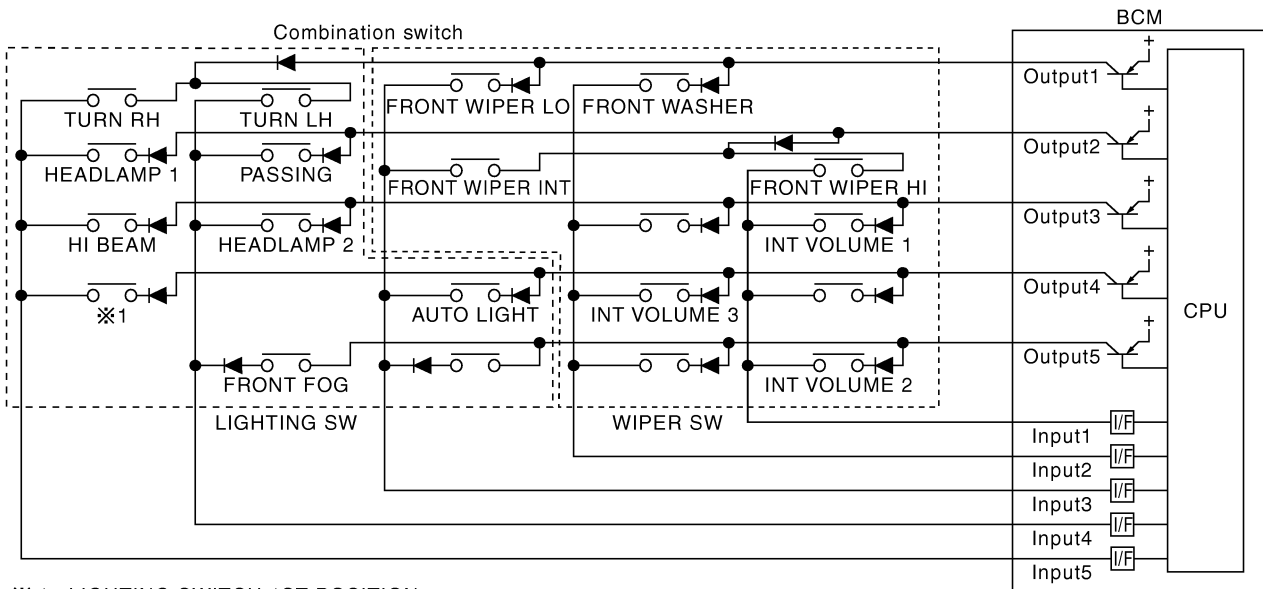
COMBINATION SWITCH READING FUNCTION

Description

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

Operation Description

- BCM activates transistors of output terminals (OUTPUT 1-5) periodically, and allows current to flow in turn.
- If any (1 or more) 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.



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BCM (BODY CONTROL MODULE)

Operation Table of BCM and Combination Switches

BCM reads operation status of combination switch using combinations shown in table below.

	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	—	—	FRONT WIPER HI ON	FRONT WIPER HI OFF	INT VOLUME 1 ON	INT VOLUME 1 OFF	—	—	INT VOLUME 2 ON	INT VOLUME 2 OFF
COMB SW INPUT 2	FRONT WASHER ON	FRONT WASHER OFF	—	—	—	—	INT VOLUME 3 ON	INT VOLUME 3 OFF	—	—
COMB SW INPUT 3	FRONT WIPER LO ON	FRONT WIPER LO OFF	FRONT WIPER INT ON	FRONT 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	—	—	FRONT FOG ON	FRONT 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	—	—

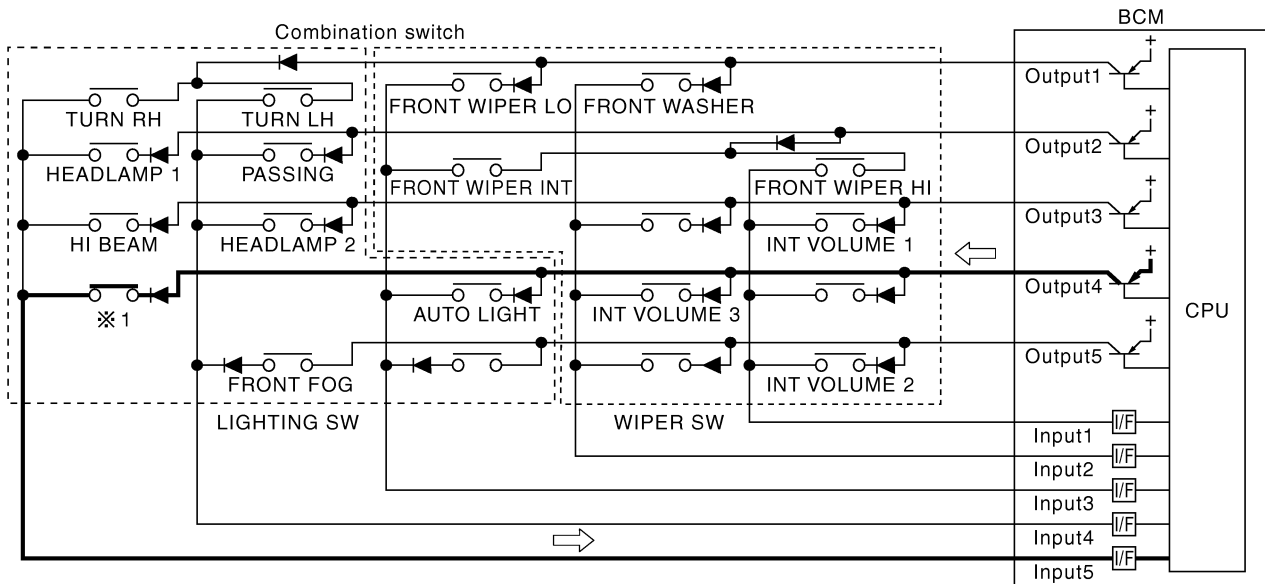
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NOTE:

Headlamp system has a dual switch.

Sample Operation:

- 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 that lighting switch 1ST position is ON. Then BCM sends tail lamp and clearance lamp request 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.



※ 1 : LIGHTING SWITCH 1ST POSITION

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NOTE:

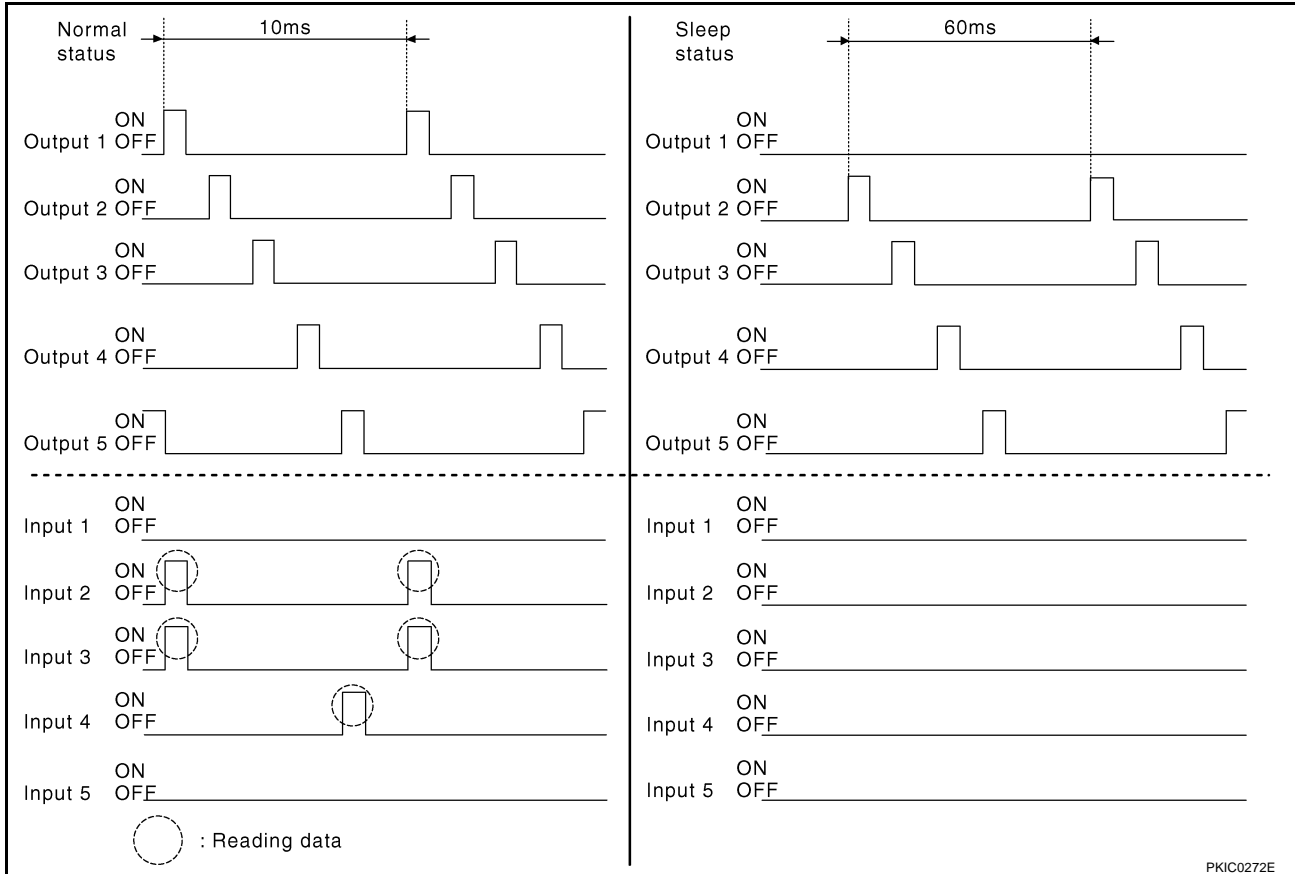
Each OUTPUT terminal transistor is activated at 10 ms intervals. Therefore after switch is turned ON, electrical loads are activated with time delay. But this time delay is so short that it cannot be detected by human senses.

BCM (BODY CONTROL MODULE)

Operation Mode

Combination switch reading function has operation modes shown below.

1. Normal status
 - When BCM is not in sleep status, OUTPUT terminals (1-5) send out ON signal every 10 ms.
2. Sleep status
 - When BCM is in sleep status, transistors of OUTPUT 1 stop the output, and BCM enters low power mode. Mean while OUTPUT 2-5 send out ON signal every 60 ms, and accept only input from lighting switch (except turn signal switch) system.



CAN COMMUNICATION CONTROL

CAN communication allows a high rate of information transmission through the two communication lines (CAN L line, CAN H line) connecting the various control units in the system. Each control unit transmits/receives data but selectively reads required data only. For details of signals that are transmitted/received by BCM via CAN communication, refer to [LAN-50, "CAN System Specification Chart"](#).

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BCM (BODY CONTROL MODULE)

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 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, sleep transient status is 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.
 - Three seconds after CAN communication of all control units stops, CAN communication inactive status is switches to sleep status.
4. Sleep status
 - BCM is activated with low power mode.
 - CAN communication is not active.
 - 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 status.
 - Key switch (ACC, ON)
 - Key slot
 - Intelligent Key (lock/unlock signal)
 - Hazard switch
 - Door lock/unlock switch
 - Front door switch (driver side, passenger side)
 - Rear door switch (LH, RH)
 - Trunk lid opener switch
 - Combination switch (passing, lighting switch 1ST position, front fog lamp)
 - 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.

BCM (BODY CONTROL MODULE)

SYSTEMS CONTROLLED BY BCM DIRECTLY

System	Reference
Power door lock	BL-24, "POWER DOOR LOCK SYSTEM"
Power window ^{NOTE}	GW-14, "POWER WINDOW SYSTEM"
Sunroof ^{NOTE}	RF-10, "SUNROOF"
Automatic drive positioner ^{NOTE}	SE-11, "AUTOMATIC DRIVE POSITIONER"
Room lamp timer	LT-266, "INTERIOR ROOM LAMP"

NOTE:

Power supply only. No system control.

SYSTEMS CONTROLLED BY BCM AND IPDM E/R

System	Reference
Panic alarm	BL-217, "VEHICLE SECURITY (THEFT WARNING) SYSTEM"
Theft warning system	BL-217, "VEHICLE SECURITY (THEFT WARNING) SYSTEM"
IVIS (NATS)	BL-244, "IVIS (INFINITI VEHICLE IMMOBILIZER SYSTEM-NATS)"
Headlamp	<ul style="list-style-type: none"> • LT-42, "HEADLAMP (FOR USA) - XENON TYPE -" • LT-8, "HEADLAMP (FOR USA) - CONVENTIONAL TYPE -" • LT-78, "HEADLAMP (FOR CANADA) - DAYTIME LIGHT SYSTEM -"
Auto light system	LT-115, "AUTO LIGHT SYSTEM"
Parking, license plate and tail lamps	LT-248, "PARKING, LICENSE PLATE AND TAIL LAMPS"
Front fog lamp	LT-194, "FRONT FOG LAMP"
Front wiper and washer system	WW-4, "FRONT WIPER AND WASHER SYSTEM"
Rear window defogger	GW-71, "REAR WINDOW DEFOGGER"

SYSTEMS CONTROLLED BY BCM AND COMBINATION METER

System	Reference
Turn signal and hazard warning lamps	LT-212, "TURN SIGNAL AND HAZARD WARNING LAMPS"
Warning chime	DI-59, "WARNING CHIME"

SYSTEMS CONTROLLED BY BCM AND INTELLIGENT KEY UNIT

System	Reference
Intelligent Key	BL-43, "INTELLIGENT KEY SYSTEM"

SYSTEMS CONTROLLED BY BCM, COMBINATION METER AND IPDM E/R

System	Reference
Oil pressure warning lamp	DI-39, "WARNING LAMPS"

SYSTEMS CONTROLLED BY BCM, LOW TIRE PRESSURE WARNING CONTROL UNIT AND COMBINATION METER

System	Reference
Low tire pressure warning lamp and buzzer	WT-9, "TIRE PRESSURE MONITORING SYSTEM"

BCM (BODY CONTROL MODULE)

MAJOR COMPONENTS AND CONTROL SYSTEM

System	Input	Output
Intelligent Key system	Intelligent Key unit	<ul style="list-style-type: none"> ● All door locking actuator ● Trunk lid opener actuator ● Turn signal lamp (LH, RH) ● Combination meter
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, sunroof	Ignition power supply	Power window and sunroof system
Power supply (BAT) to power window, sunroof and power seat	Battery power supply	Power window, sunroof system and power seat
Panic alarm	<ul style="list-style-type: none"> ● Key slot ● Intelligent Key 	IPDM E/R
Theft warning system	<ul style="list-style-type: none"> ● All-door switch ● Hood switch ● Intelligent Key ● Power window main switch (door lock and unlock switch) 	<ul style="list-style-type: none"> ● IPDM E/R ● Security indicator lamp
Auto light system	<ul style="list-style-type: none"> ● Optical sensor ● Combination switch 	IPDM E/R
Exterior lamp battery saver control	<ul style="list-style-type: none"> ● Ignition switch ● Combination switch 	IPDM E/R
<ul style="list-style-type: none"> ● Headlamp ● Tail lamp 	Combination switch	<ul style="list-style-type: none"> ● IPDM E/R ● Combination meter
Front fog lamp	Combination switch	<ul style="list-style-type: none"> ● IPDM E/R ● Combination meter
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
Interior room lamp timer	<ul style="list-style-type: none"> ● 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*1	<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 ● Front door switch driver side 	Combination meter (warning buzzer)
Tire pressure monitoring system	Low tire pressure warning control unit	Combination meter (warning buzzer) (warning lamp)
Seat belt warning chime	<ul style="list-style-type: none"> ● Combination meter [Seat belt buckle (driver side) switch] ● Ignition switch 	Combination meter (warning buzzer)
Vehicle-speed-sensing intermittent wiper	<ul style="list-style-type: none"> ● Combination switch ● Unified meter and A/C amp. 	IPDM E/R
Rear window defogger	<ul style="list-style-type: none"> ● Multifunction switch ● NAVI control unit*2 ● AV control unit*3 	IPDM E/R

BCM (BODY CONTROL MODULE)

NOTE:

*1: Functions only when the Intelligent Key is inserted in key slot.

*2: With navigation system

*3: Without navigation system

CAN Communication Unit

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Refer to [LAN-50, "CAN System Specification Chart"](#) .

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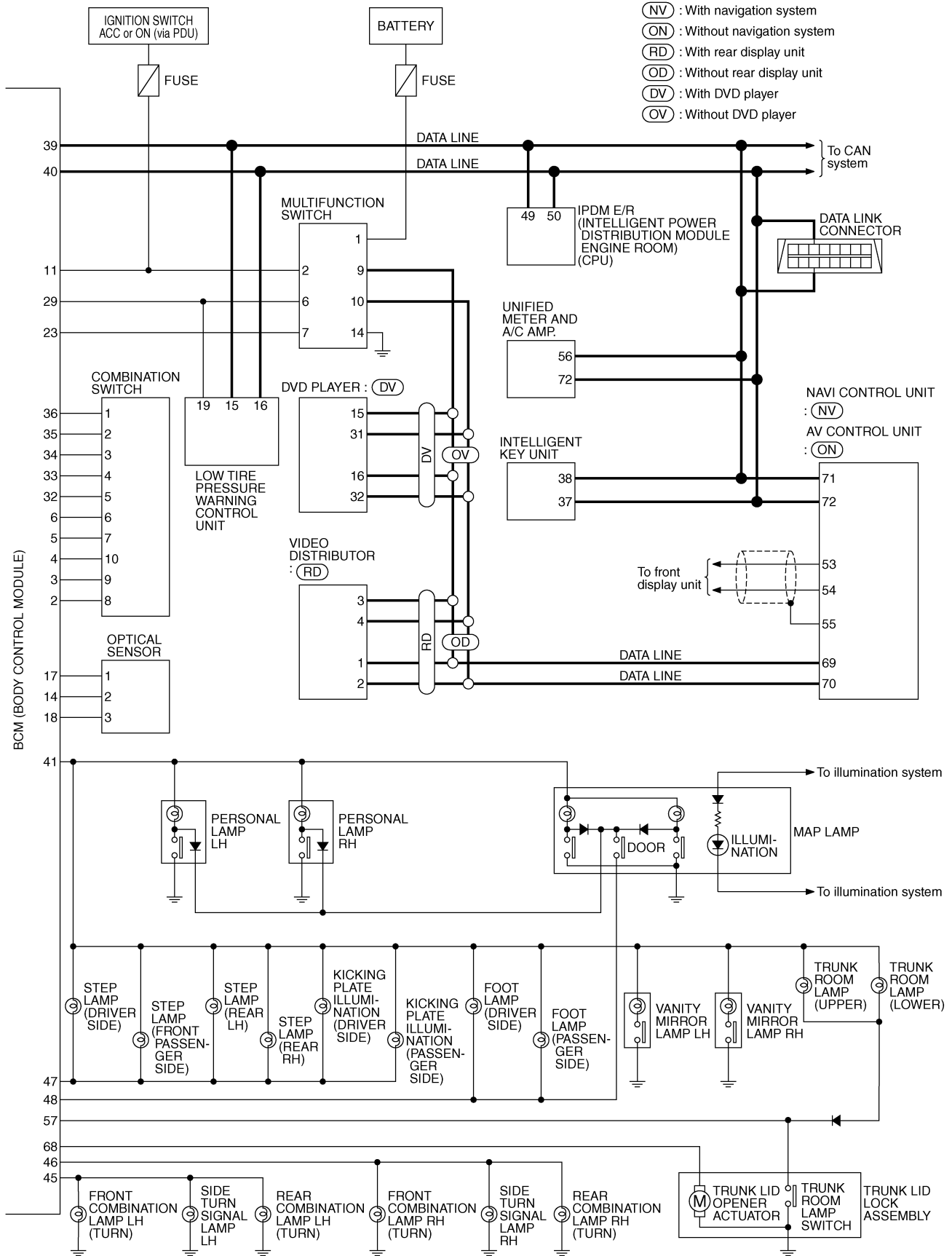
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BCM (BODY CONTROL MODULE)



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BCM (BODY CONTROL MODULE)

CONSULT-II Function (BCM)

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CONSULT-II can display each diagnostic item using the diagnostic test modes shown following.

BCM diagnostic test item	Check item, diagnostic test mode	Content
Inspection by part	WORK SUPPORT	Changes setting of each function.
	SELF- DIAG RESULTS	BCM performs self-diagnosis of CAN communication.
	DATA MONITOR	Displays the input data of BCM in real time.
	CAN DIAG SUPPORT MNTR	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.
	ECU PART NUMBER	BCM part number can be read.

CONSULT-II BASIC OPERATION

Refer to [GI-38, "CONSULT-II Start Procedure"](#) .

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	ECU PART NUMBER
BCM	BCM	×	×		×		×
Power door lock system	DOOR LOCK			×		×	
Rear window defogger	REAR DEFOGGER			×		×	
Warning chime	BUZZER			×		×	
Room lamp timer	INT LAMP	×		×		×	
Headlamp	HEAD LAMP	×		×		×	
Wiper	WIPER	×		×		×	
Turn signal lamp Hazard lamp	FLASHER			×		×	
Intelligent Key system	INTELLIGENT KEY			×		×	
Combination switch	COMB SW			×			
IVIS	IMMU			×		×	
Room lamp battery saver	BATTERY SAVER	×		×		×	
Trunk lid	TRUNK			×		×	
Vehicle security system	THEFT ALM	×		×		×	
Retained power control	RETAINED PWR	×		×			
Oil pressure switch	SIGNAL BUFFER			×		×	
Panic system	PANIC ALARM					×	

NOTE:

CONSULT-II displays systems equipped in the vehicle.

BCM (BODY CONTROL MODULE)

WORK SUPPORT

Operation Procedure

1. Touch "BCM" on "SELECT TEST ITEM" screen.
2. Touch "WORK SUPPORT" on "SELECT DIAG MODE" screen.
3. Touch "RESET SETTING VALUE" on "SELECT WORK ITEM" screen.
4. Touch "START".
5. "RESET SETTING VALUE OK?" displayed, and touch "YES".
6. The setting will be changed and "COMPLETED" will be displayed.
7. Touch "END".

Display Item List

Item	Description
RESET SETTING VALUE	Return a value set with WORK SUPPORT of each system to a default value in factory shipment.

CAN DIAG SUPPORT MNTR

Refer to [LAN-44, "CAN Diagnostic Support Monitor"](#).

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

NKS003XL

1. CHECK SELF-DIAGNOSTIC RESULT

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" on "SELECT DIAG MODE" screen, and select "SELF-DIAG RESULTS".
3. Check display content in self-diagnostic results.

CONSULT-II display code	Diagnosis item
U1000	TRANSMIT DIAG
	ECM
	METER / M&A
	MULTI AV
	IPDM E/R
	I - KEY
	TIRE-P

Contents displayed

No malfunction>>INSPECTION END

Malfunction in CAN communication system>>After printing the monitor items, go to "CAN System". Refer to [LAN-50, "CAN System Specification Chart"](#).

BCM (BODY CONTROL MODULE)

NKS003XM

Check BCM Power Supply and Ground Circuit

1. CHECK FUSES AND FUSIBLE LINK

Check for blown fuses and fusible link.

Unit	Power source	Fuse and fusible link No.
BCM	Battery	F
		21
	Ignition switch ON or START position	1
	Ignition switch ACC or ON position	6

Refer to [LT-13. "Wiring Diagram — H/LAMP —"](#) .

OK or NG

OK >> GO TO 2.

NG >> If fuse or fusible link is blown, be sure to eliminate cause of malfunction before installing new fuse or fusible link. Refer to [PG-3. "POWER SUPPLY ROUTING CIRCUIT"](#) .

2. CHECK POWER SUPPLY CIRCUIT

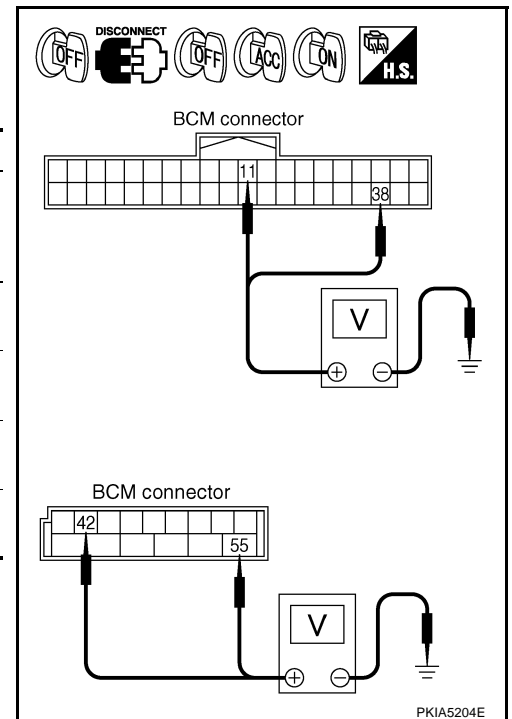
- Turn ignition switch OFF.
- Disconnect BCM connector.
- Check voltage between BCM harness connector and ground.

Terminal (+)		Terminal (-)	Ignition switch position		
BCM Connector	Terminal		OFF	ACC	ON
M1	11	Ground	Approx. 0 V	Battery voltage	Battery voltage
	38		Approx. 0 V	Approx. 0 V	Battery voltage
M2	42		Battery voltage	Battery voltage	Battery voltage
	55		Battery voltage	Battery voltage	Battery voltage

OK or NG

OK >> GO TO 3.

NG >> Repair harness or connector.



3. CHECK GROUND CIRCUIT

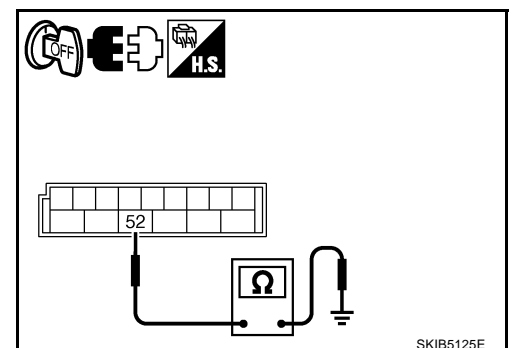
Check continuity between BCM harness connector and ground.

Terminal		Ground	Continuity
BCM Connector	Terminal		Yes
M2	52		Yes

OK or NG

OK >> INSPECTION END

NG >> Repair harness or connector.



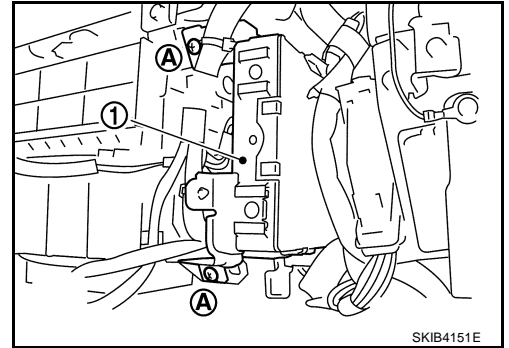
BCM (BODY CONTROL MODULE)

Removal and Installation of BCM

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REMOVAL

1. Remove glove box cover. Refer to [IP-10, "INSTRUMENT PANEL ASSEMBLY"](#) .
2. Remove screws (A), and pull out the BCM (1).
3. Disconnect connector.
4. Remove BCM (1).



INSTALLATION

Installation is the reverse order of removal.

NOTE:

When replacing BCM perform initialization of NATS system and registration of all NATS ignition key IDs.

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