SECTION BCS
BODY CONTROL SYSTEM

CONTENTS

PRECAUTIONS

PFP:00001

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

GKS00082

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. 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)

PFP:284B2

System Description

GKS00083

- 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.

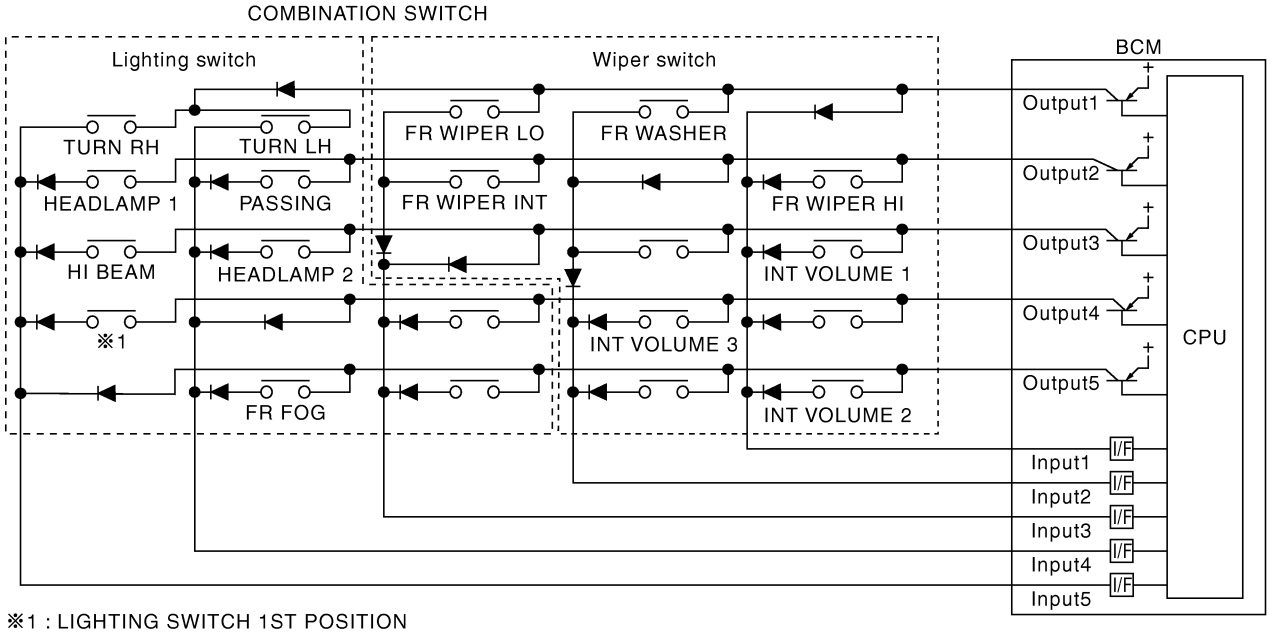
COMBINATION SWITCH READING FUNCTION

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 5output terminals (OUTPUT 1-5) and 5 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) 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.



※1 : LIGHTING SWITCH 1ST POSITION

PKIC4231E

BCM - Operation Table of Combination Switch

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

	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	—	—	INT VOLUME 2 ON	INT VOLUME 2 OFF
COMB SW INPUT 2	FR WASHER ON	FR WASHER OFF	—	—	—	—	INT VOLUME 3 ON	INT VOLUME 3 OFF	—	—
COMB SW INPUT 3	FR WIPER LO ON	FR WIPER LO OFF	FR WIPER INT ON	FR WIPER INT 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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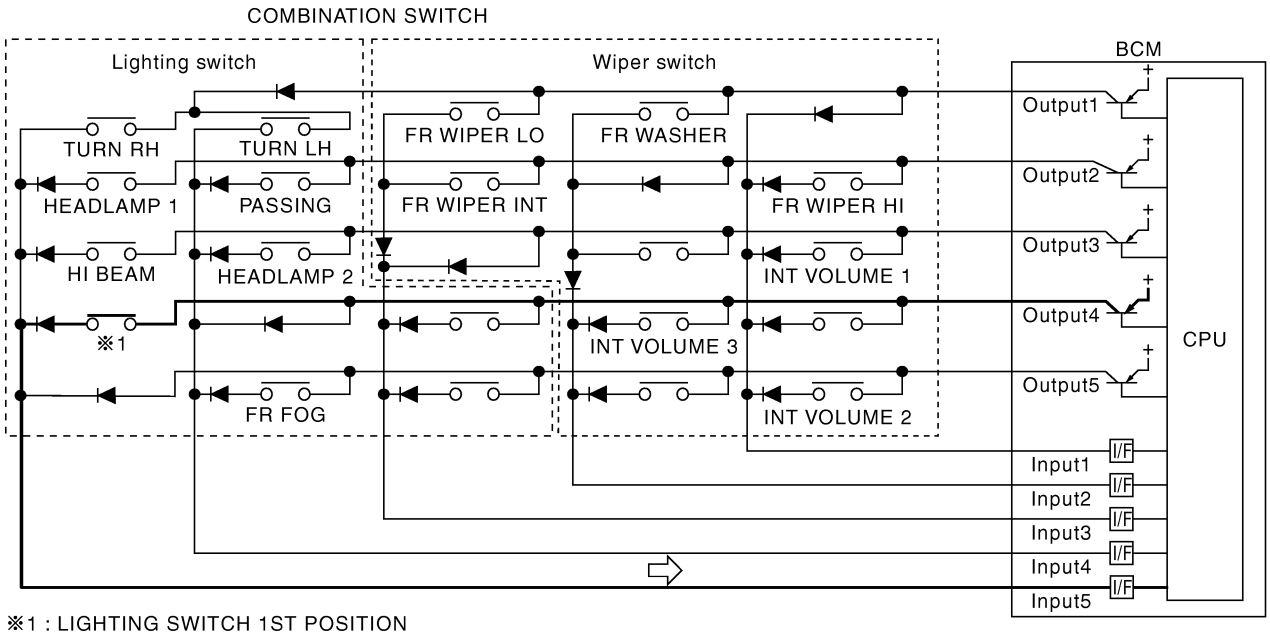
NOTE:
Headlamp system has a dual circuit.

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.



※1 : LIGHTING SWITCH 1ST POSITION

PKIC4233E

NOTE:
Each OUTPUT terminal transistor is activated at 10 ms 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

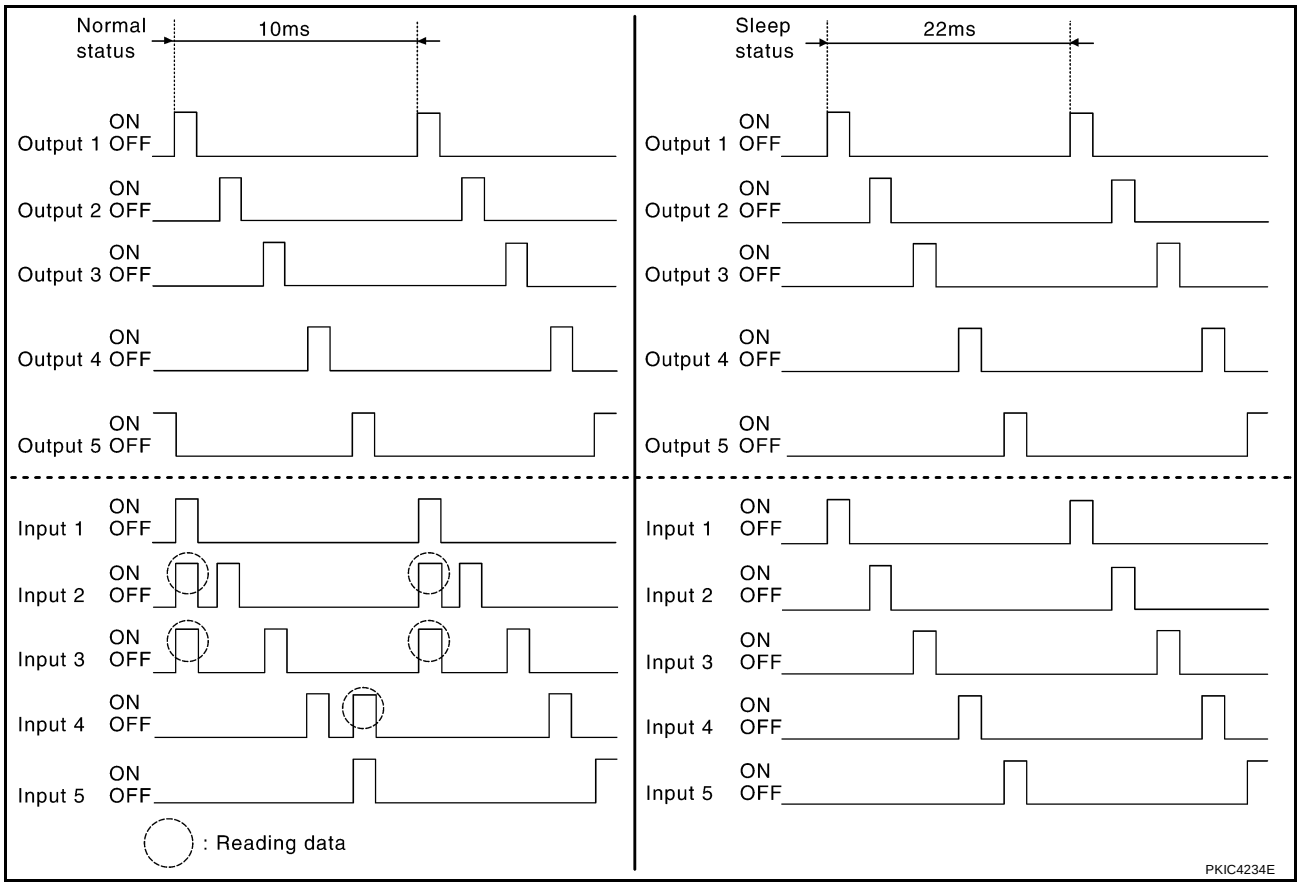
- Combination switch reading function has operation modes as follows:

Normal status

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

Sleep status

- When BCM is in sleep mode, BCM enters low power mode. OUTPUTS 1-5 turn ON-OFF at 22 ms 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 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, CAN communication switches to 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 switches to 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 a state of the following switches changes, it switches to CAN communication state:
   - Key switch
   - Hazard switch
   - Door lock/unlock switch
   - Front door switch (driver side, passenger side)
   - Rear door switch (LH, RH)
   - Combination switch (passing, lighting switch 1st position)
   - Keyfob (lock/unlock signal)
   - 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

System	Reference
Power door lock	BL-20, "POWER DOOR LOCK SYSTEM"
Remote keyless entry	BL-48, "MULTI-REMOTE CONTROL SYSTEM"
Power window NOTE	GW-15, "POWER WINDOW SYSTEM"
Room lamp timer	LT-93, "INTERIOR ROOM LAMP"

NOTE:
Power supply only. No system control.

SYSTEMS CONTROLLED BY BCM AND IPDM E/R

System	Reference
NATS	BL-81, "NATS(Nissan Anti-Theft System)"
Headlamp	LT-4, "HEADLAMP"
Parking, license plate and tail lamps	LT-78, "PARKING, LICENSE PLATE AND TAIL LAMPS"
Front fog lamp	LT-36, "FRONT FOG LAMP"
Front wiper, washer	WW-4, "FRONT WIPER AND WASHER SYSTEM"
Rear window defogger	GW-45, "REAR WINDOW DEFOGGER"

SYSTEMS CONTROLLED BY BCM AND COMBINATION METER

System	Reference
Warning chime	DI-55, "WARNING CHIME"
Turn signal and hazard warning lamps	LT-52, "TURN SIGNAL AND HAZARD WARNING LAMPS"

MAJOR COMPONENTS AND CONTROL SYSTEM

System	Input	Output
Remote keyless entry system	Keyfob	● All-door locking actuator ● Turn signal lamp ● Combination meter (Turn signal lamp)
Power door lock system	Door lock/unlock switch	All-door locking actuator
Power supply (IGN) to power window	Ignition power supply	Power window system
Power supply (BAT) to power window	Battery power supply	Power window system
Headlamp	Combination switch	IPDM E/R
Parking, license plate and tail lamp	Combination switch	IPDM E/R
Front fog lamp	Combination switch	IPDM E/R
Turn signal lamp	Combination switch	● Turn signal lamp ● Combination meter (Turn signal lamp)
Hazard lamp	Hazard switch	● Turn signal lamp ● Combination meter
Room lamp timer	● Key switch ● Keyfob ● Door lock/unlock switch ● Front door switch driver side ● All-door switch	Interior room lamp
Light warning chime	● Combination switch ● Key switch ● Front door switch driver side	Combination meter (warning buzzer)
Vehicle-speed-sensing intermittent wiper	● Combination switch ● Combination meter	IPDM E/R
Rear window defogger	● Rear window defogger switch ● Ignition switch (ACC, ON)	IPDM E/R
A/C switch signal	Front air control	ECM
Blower fan switch signal	Front air control	ECM

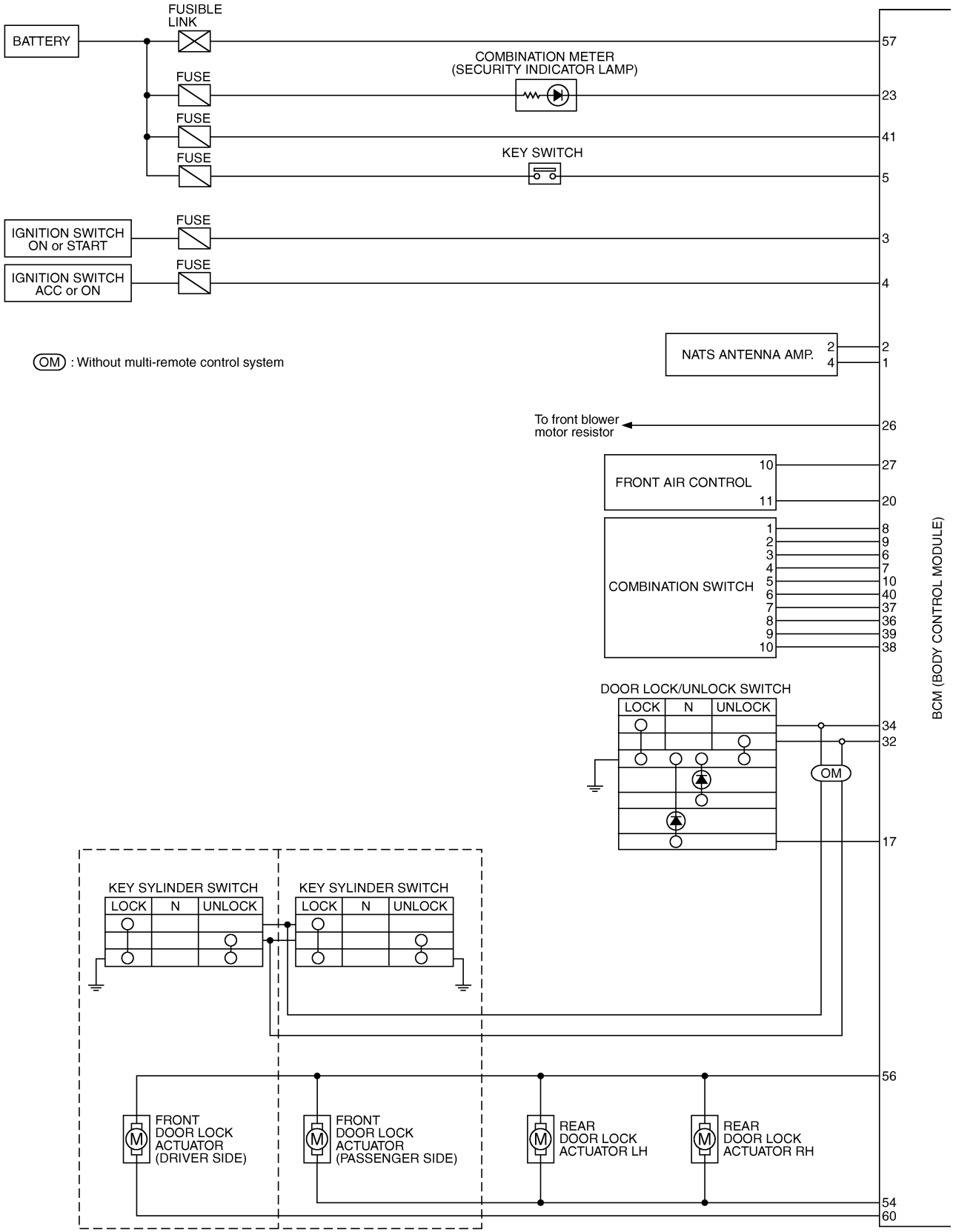
CAN Communication System Description

GKS00084

Refer to LAN-21, "CAN COMMUNICATION" .

Schematic

GKS00085



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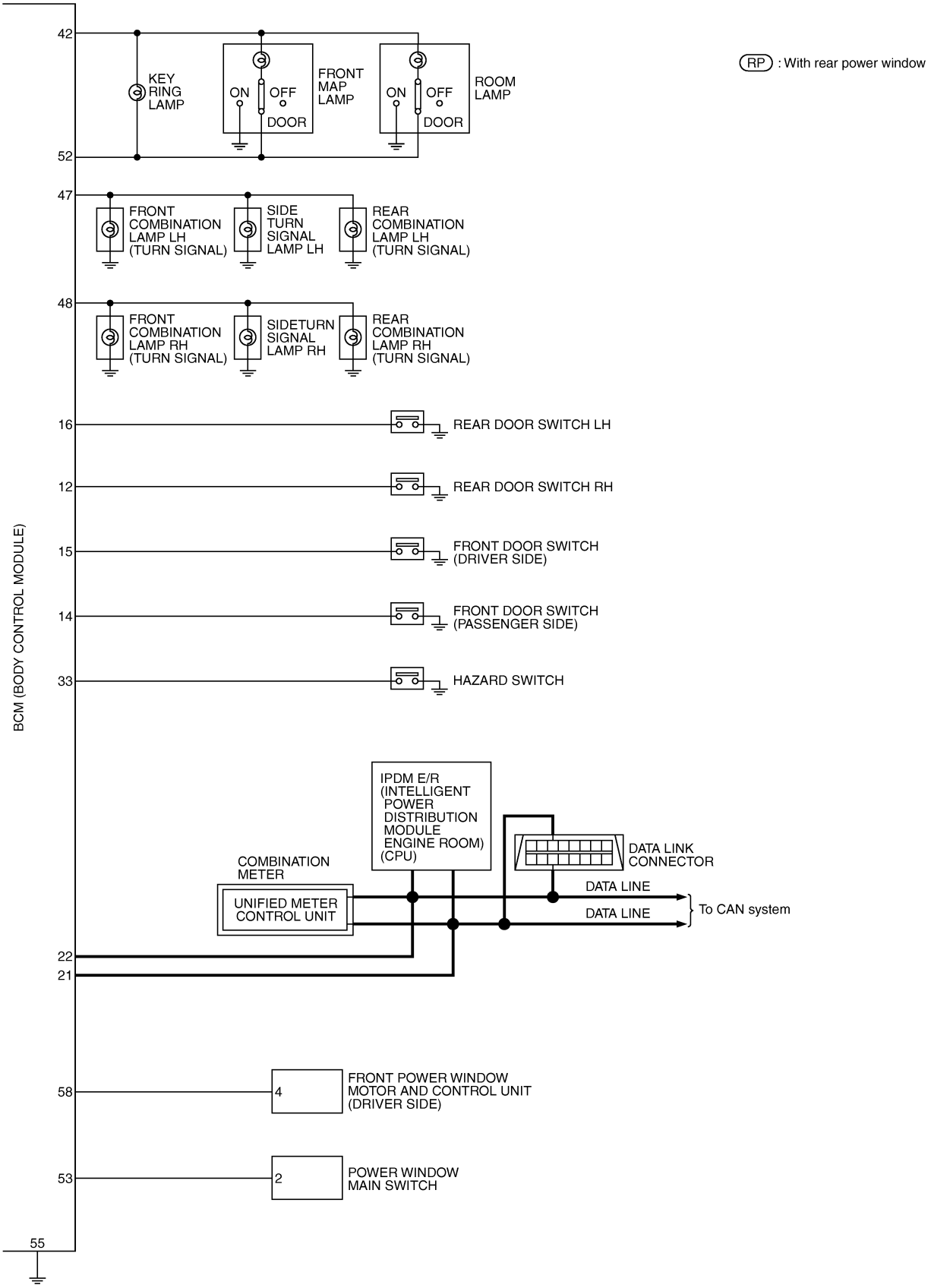

RP : With rear power window
BCM (BODY CONTROL MODULE)
42
52
KEY RING LAMP
ON
OFF
DOOR
FRONT MAP LAMP
ROOM LAMP
47
FRONT COMBINATION LAMP LH (TURN SIGNAL)
SIDE TURN SIGNAL LAMP LH
REAR COMBINATION LAMP LH (TURN SIGNAL)
48
FRONT COMBINATION LAMP RH (TURN SIGNAL)
SIDETURN SIGNAL LAMP RH
REAR COMBINATION LAMP RH (TURN SIGNAL)
16
REAR DOOR SWITCH LH
12
REAR DOOR SWITCH RH
15
FRONT DOOR SWITCH (DRIVER SIDE)
14
FRONT DOOR SWITCH (PASSENGER SIDE)
33
HAZARD SWITCH
IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM) (CPU)
DATA LINK CONNECTOR
COMBINATION METER
UNIFIED METER CONTROL UNIT
DATA LINE
DATA LINE
To CAN system
22
21
58
4
FRONT POWER WINDOW MOTOR AND CONTROL UNIT (DRIVER SIDE)
53
2
POWER WINDOW MAIN SWITCH
55

MKWA4175E

CONSULT-II Function (BCM)

GKS00086

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

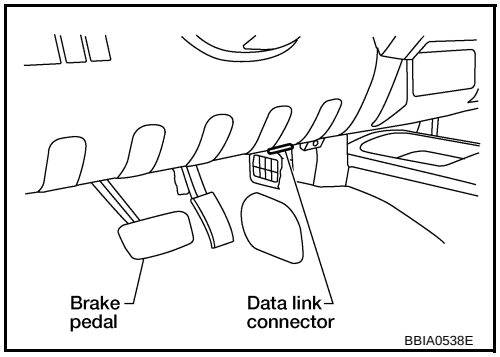
BCM diagnostic test item	Diagnostic mode	Content
Inspection by part	WORK SUPPORT	Changes setting of each function.
	DATA MONITOR	Displays BCM input/output data in real time.
	ACTIVE TEST	Operation of electrical loads can be checked by sending drive signal to them.
	SELF-DIAG RESULTS	Displays BCM self-diagnosis results.
	CAN DIAG SUPPORT MNTR	The results of transmit/receive diagnosis of CAN communication can be read.
	ECU PART NUMBER	BCM part number can be read.
	CONFIGURATION	Performs BCM configuration read/write functions.

CONSULT–II INSPECTION PROCEDURE

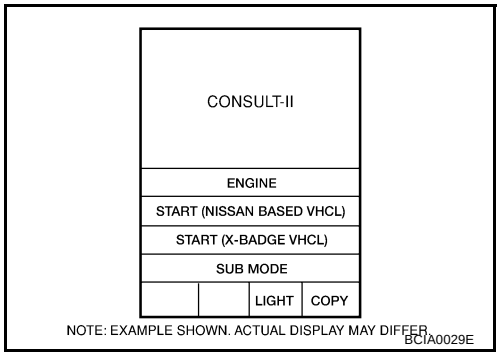
CAUTION:

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.

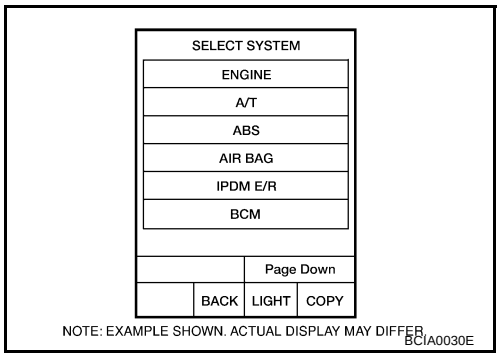
1. With the ignition switch OFF, connect CONSULT-II and CONSULT-II CONVERTER to the data link connector, and then turn ignition switch ON.



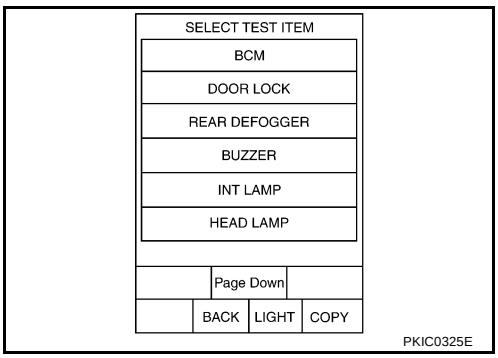
2. Touch “START (NISSAN BASED VHCL)”.



3. Touch “BCM” on “SELECT SYSTEM” screen.



4. Select item to be diagnosed on “SELECT TEST ITEM” screen.



ITEMS OF EACH PART

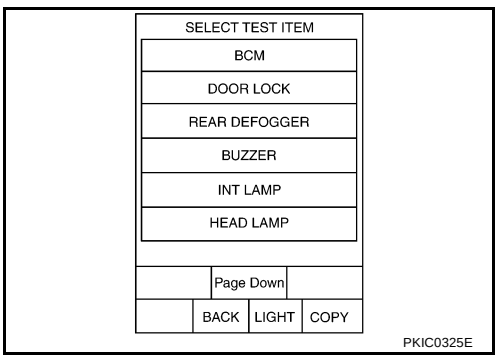
NOTE:
CONSULT-II will only display systems the vehicle possesses.

System and item	CONSULT-II display	Diagnostic test mode (Inspection by part)						
		WORK SUPPORT	SELF–DIAG RESULTS	CAN DIAG SUPPORT MNTR	DATA MONITOR	ECU PART NUMBER	ACTIVE TEST	CONFIGURATION
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				×		×	
Blower fan switch signal Air conditioner switch signal	AIR CONDITIONER				×			
Combination switch	COMB SW				×			
NATS	IMMU				×		×	
Interior lamp battery saver	BATTERY SAVER	×			×		×	
Theft alarm	THEFT ALARM	×			×		×	
Retained power control	RETAINED PWR	×			×		×	
Oil pressure switch	SIGNAL BUFFER				×		×	

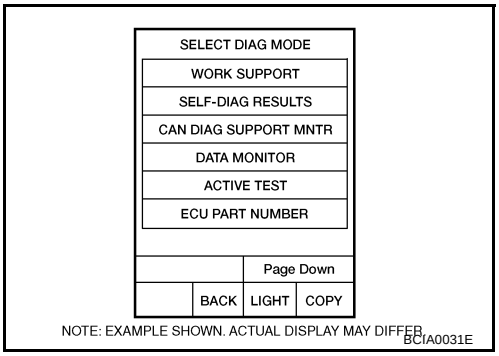
WORK SUPPORT

Operation Procedure

1. Touch “BCM” on “SELECT TEST ITEM” screen.



2. Touch “WORK SUPPORT” on “SELECT DIAG MODE” screen.
3. Touch item on “SELECT WORK ITEM” screen.
4. Touch “START”.
5. Touch “CHANGE SET”.
6. The setting will be changed and “RESETTING COMPLETED” will be displayed.
7. Touch “END”.



NOTE: EXAMPLE SHOWN. ACTUAL DISPLAY MAY DIFFER.
BCIA0031E

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 Communication Inspection Using CONSULT-II (Self-Diagnosis)

GKS00087

1. SELF-DIAGNOSTIC RESULT CHECK

NOTE:
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 TEST 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
	I-KEY

Contents displayed

No malfunction>> INSPECTION END
Malfunction in CAN communication system>> After printing the monitor items, go to “CAN System”. Refer to LAN-21, "CAN COMMUNICATION" .

Configuration

GKS00088

Refer to GI-36, "Configuration (BCM)" .

Removal and Installation of BCM

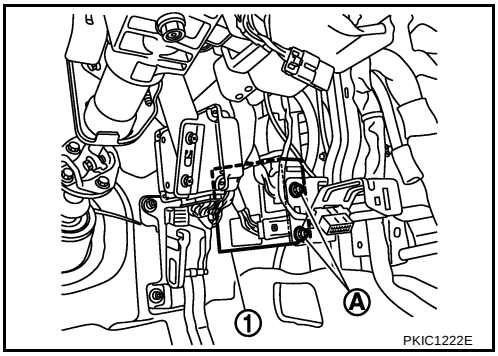
GKS00089

REMOVAL

CAUTION:

If possible, before removing BCM, retrieve current BCM configuration to use for reference when configuring brand-new BCM after installation. Refer to GI-36, "Configuration (BCM)" .

1. Disconnect the battery cable from the negative terminal.
2. Remove lower instrument panel (driver side). Refer to IP-10, "Removal and Installation" .
3. Remove nuts (A) and release BCM (1).
4. Disconnect connectors and then remove BCM (1).



INSTALLATION

Installation is the reverse order of removal.

NOTE:

- When replacing BCM, it must be configured. Refer to GI-36, "Configuration (BCM)" .
- When replacing BCM, perform initialization of NATS system and registration of all NATS ignition key IDs. Refer to BL-81, "NATS(Nissan Anti-Theft System)" .