SECTION BCS
BODY CONTROL SYSTEM

CONTENTS

PRECAUTIONS

PFP:00001

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

AKS007KU

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)

PFP:284B2

System Description

AKS00A42

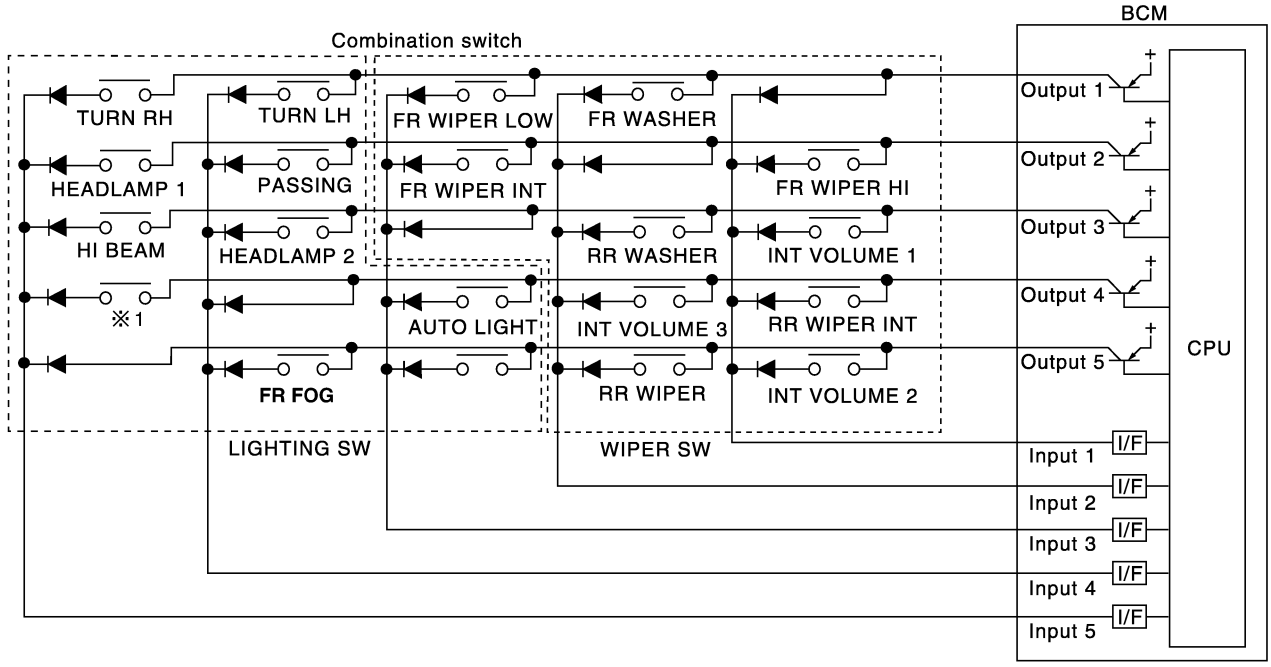
- BCM (Body Control Module) controls the operation of various electrical units installed on the vehicle.

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 unified meter and A/C amp., and send signals to ECM using CAN communication.

COMBINATION SWITCH READING FUNCTION

1. Description
   - BCM reads combination switch (light, wiper) status, and controls related systems such as head lamps and wipers, 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) 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

SKIA4958E

3. BCM - Operation table of combination switches

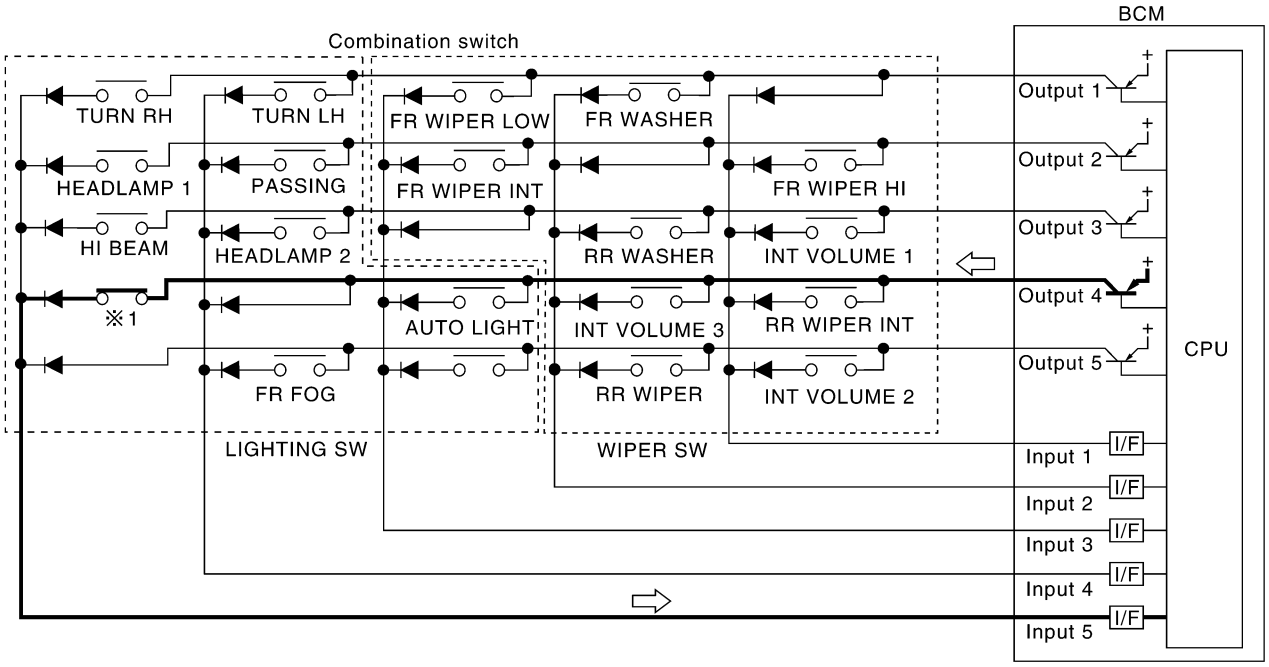
- BCM reads operation status of combination switch using combinations shown in table below.

	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	—	—	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	—	—

SKIA4959E

NOTE:
Headlamp has a dual system switch.

4. Sample 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 that 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

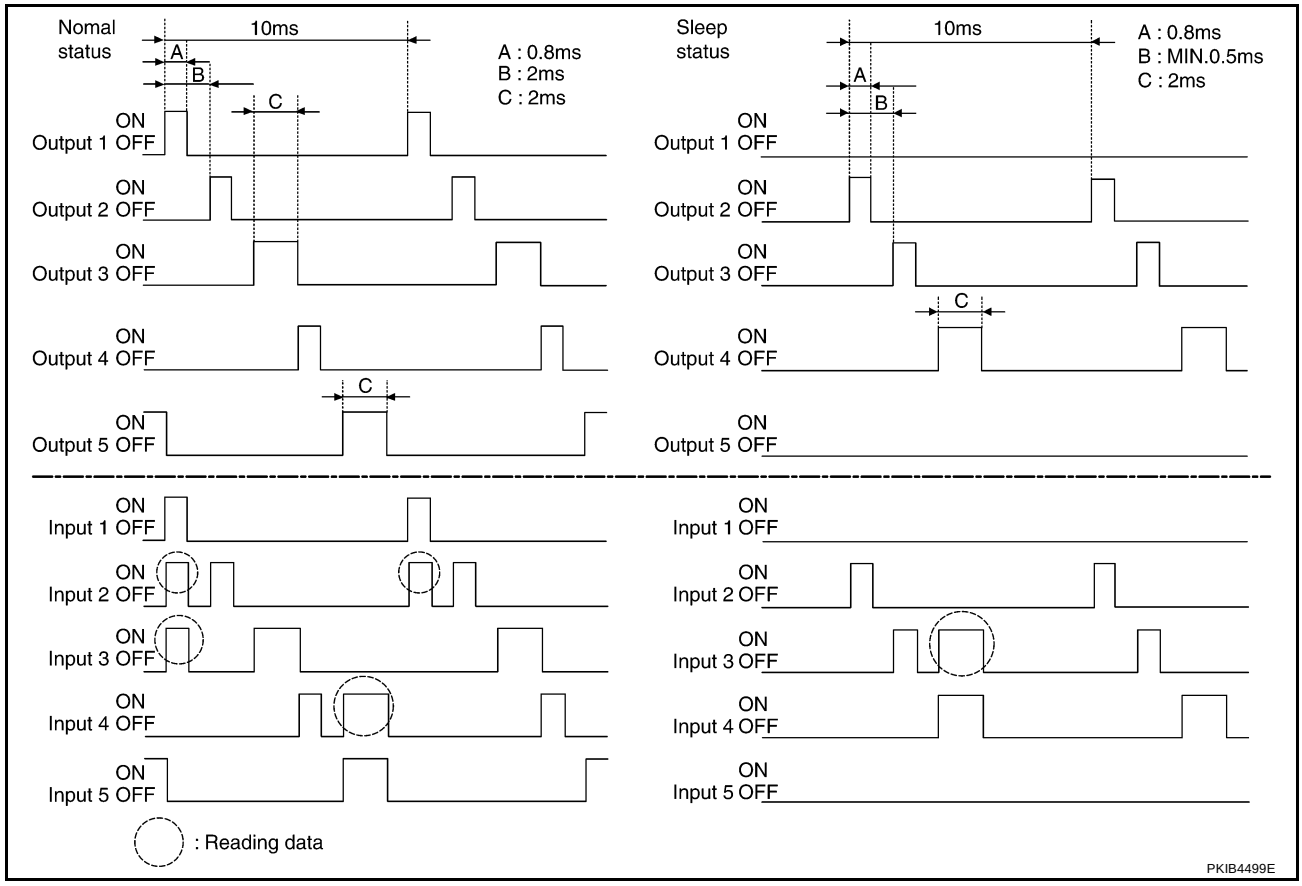
SKIA4960E

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.

5. Operation mode
   - Combination switch reading function has operation modes shown below.

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

b. Sleep status
   - When BCM is in sleep status, transistors of OUTPUT 1 and 5 stop the output, and BCM enters low current consumption mode. OUTPUT (2, 3, and 4) turn ON-OFF every 10 ms, and only input from light switch system is accepted.



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-8, "CAN Communication Unit" .

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 unified meter and A/C amp. 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 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 switches to sleep 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)
   - Back door opener switch
   - Combination switch (passing, lighting switch 1st position, Front fog lamp)
   - Key fob (lock/unlock signal)
   - 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-22, "POWER DOOR LOCK SYSTEM"
Remote keyless entry	BL-52, "REMOTE KEYLESS ENTRY SYSTEM"
Power window NOTE	GW-17, "POWER WINDOW SYSTEM"
Sunroof NOTE	RF-10, "SUNROOF"
Power seatNOTE	SE-91, "POWER SEAT"
Room lamp timer	LT-170, "INTERIOR ROOM LAMP"
Warning chime	DI-60, "WARNING CHIME"
Rear wiper	WW-37, "REAR WIPER AND WASHER SYSTEM"

NOTE:
Power supply only. No system control.

SYSTEMS CONTROLLED BY BCM AND IPDM E/R

System	Reference
Panic alarm	BL-52, "REMOTE KEYLESS ENTRY SYSTEM"
Theft warning	BL-98, "VEHICLE SECURITY (THEFT WARNING) SYSTEM"
NVIS (NATS)	BL-120, "NVIS (NISSAN VEHICLE IMMOBILIZER SYSTEM-NATS)"
Headlamp, tail lamp, auto light system, battery saver control, day time light system	● LT-7, "HEADLAMP - XENON TYPE -" ● LT-37, "HEADLAMP -CONVENTIONAL TYPE-" ● LT-67, "DAYTIME LIGHT SYSTEM" ● LT-86, "AUTO LIGHT SYSTEM"
Fog lamp	LT-107, "FRONT FOG LAMP"
Front wiper	WW-4, "FRONT WIPER AND WASHER SYSTEM"
Rear window defogger	GW-65, "REAR WINDOW DEFOGGER"

SYSTEMS CONTROLLED BY BCM AND COMBINATION METER

System	Reference
Warning chime	DI-60, "WARNING CHIME"
Turn signal and hazard warning lamps	LT-119, "TURN SIGNAL AND HAZARD WARNING LAMPS"

MAJOR COMPONENTS AND CONTROL SYSTEM

System	Input	Output
Remote control entry system	key fob	● All-door locking actuator ● Turn signal lamp (LH, RH)
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 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	● Key switch ● Key fob	IPDM E/R
Theft warning system	● All-door switch ● Key fob ● Power window main switch (door lock and unlock switch)	● IPDM E/R ● Security indicator lamp
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
Day time light system	● Engine speed signal ● Ignition switch ● Combination switch	IPDM E/R
Tail lamp	Combination switch	IPDM E/R
Fog lamp	Combination switch	IPDM E/R
Turn signal lamp	Combination switch	● Turn signal lamp ● Combination meter
Hazard lamp	Hazard switch	● Turn signal lamp ● Combination meter
Room lamp timer	● 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	● Key switch ● Front door switch driver side	Combination meter (warning buzzer)
Light warning chime	● Combination switch ● Key switch ● Front door switch driver side	Combination meter (warning buzzer)
Seat belt warning chime	● Combination meter (Seat belt buckle (driver side) switch) ● Ignition switch	Combination meter (warning buzzer)
Vehicle-speed-sensing intermittent wiper	● Combination switch ● Combination meter	IPDM E/R
Rear intermittent wiper	Combination switch	Rear wiper motor

System	Input	Output
Rear window defogger	● Rear window defogger switch ● Ignition switch	IPDM E/R
A/C switch signal	Unified meter and A/C amp.	ECM
Blower fan switch signal	Unified meter and A/C amp.	ECM

CAN Communication Unit

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Refer to LAN-8, "CAN Communication Unit" .

Schematic

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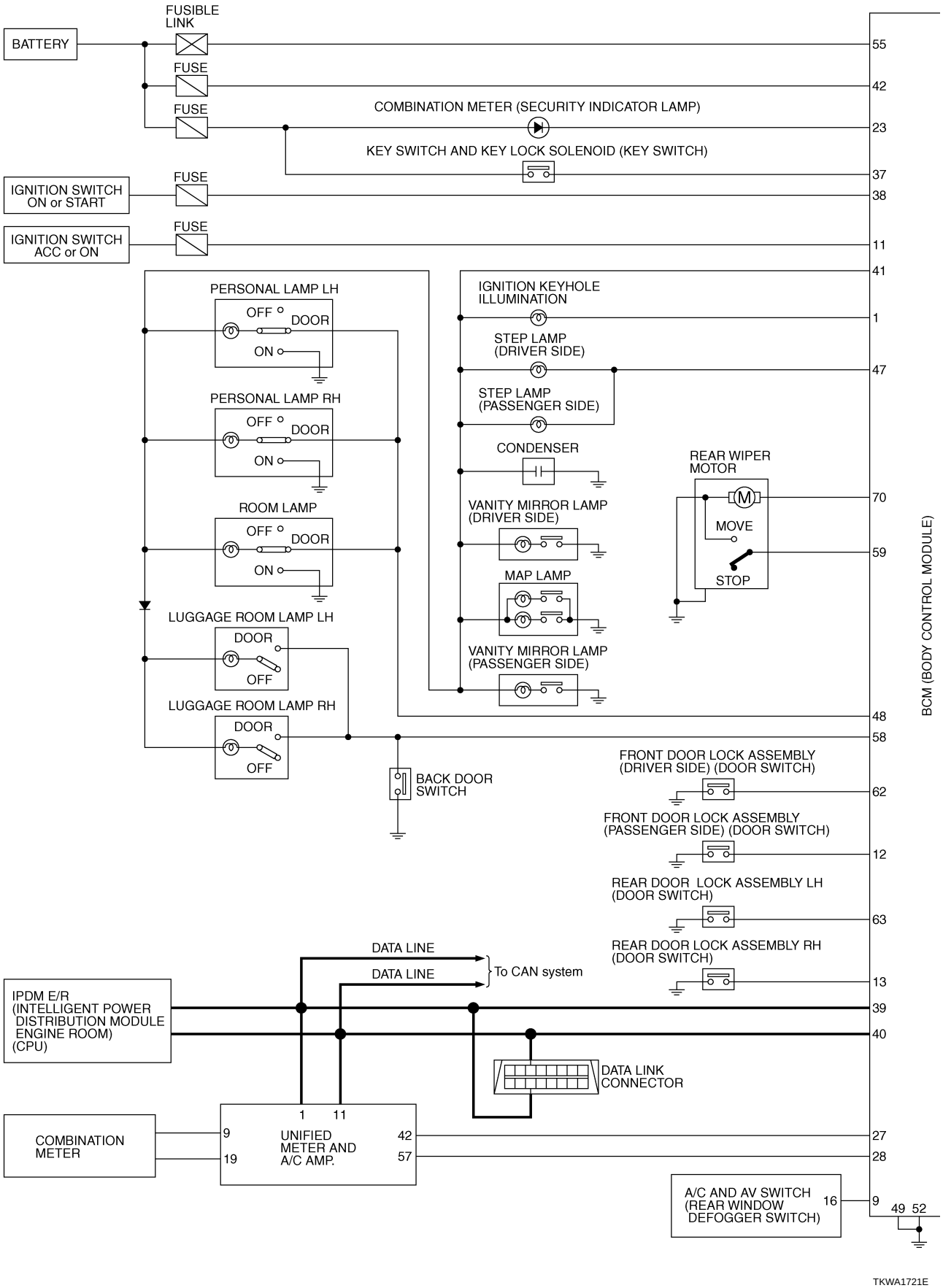
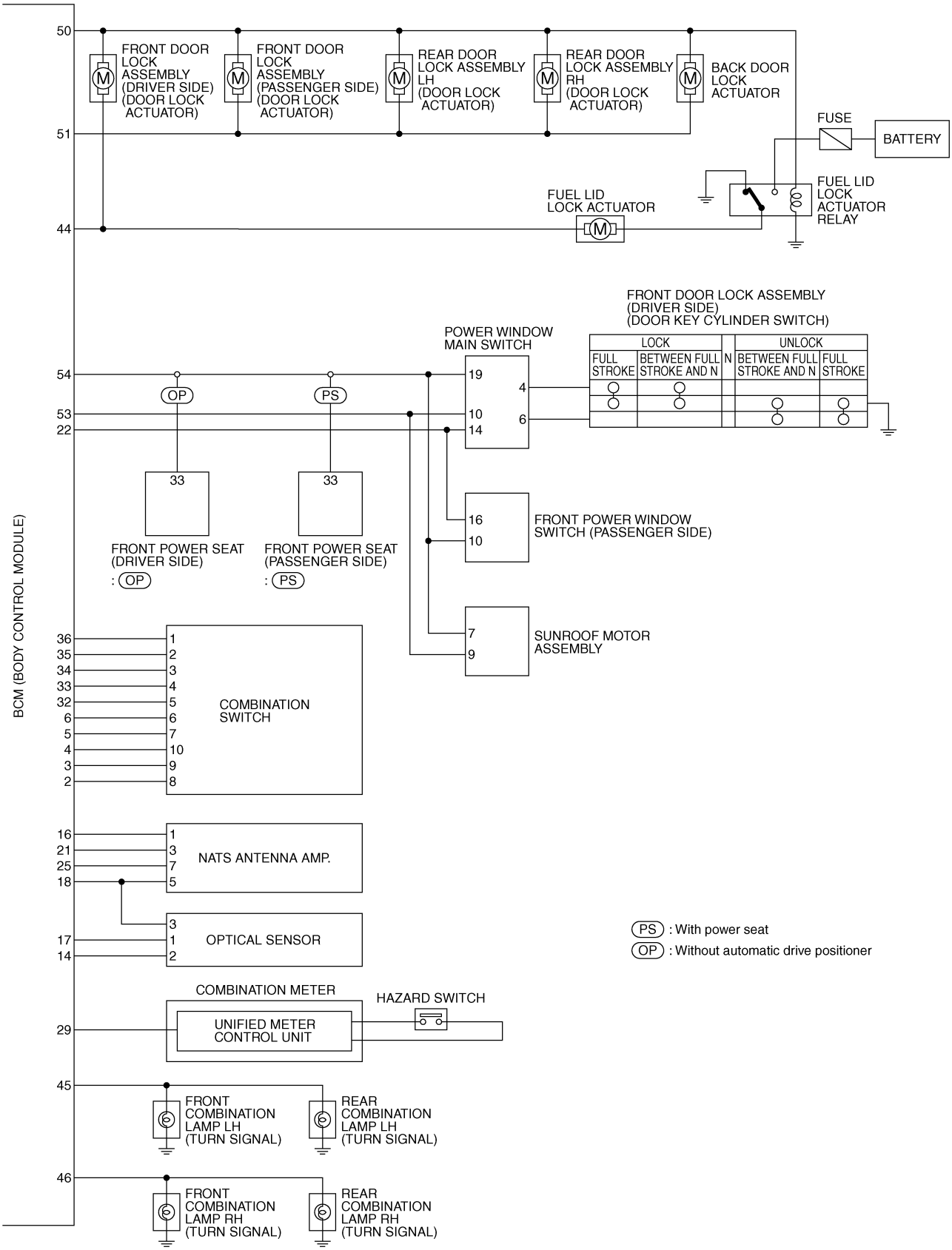



BCM (BODY CONTROL MODULE)
50
51
44
FRONT DOOR LOCK ASSEMBLY (DRIVER SIDE) (DOOR LOCK ACTUATOR)
FRONT DOOR LOCK ASSEMBLY (PASSENGER SIDE) (DOOR LOCK ACTUATOR)
REAR DOOR LOCK ASSEMBLY LH (DOOR LOCK ACTUATOR)
REAR DOOR LOCK ASSEMBLY RH (DOOR LOCK ACTUATOR)
BACK DOOR LOCK ACTUATOR
FUSE
BATTERY
FUEL LID LOCK ACTUATOR
FUEL LID LOCK ACTUATOR RELAY
FRONT DOOR LOCK ASSEMBLY (DRIVER SIDE) (DOOR KEY CYLINDER SWITCH)
LOCK
UNLOCK
FULL STROKE
BETWEEN FULL STROKE AND N
N
BETWEEN FULL STROKE AND N
FULL STROKE
POWER WINDOW MAIN SWITCH
54
53
22
OP
PS
19
10
14
4
6
33
33
FRONT POWER SEAT (DRIVER SIDE) : OP
FRONT POWER SEAT (PASSENGER SIDE) : PS
16
10
FRONT POWER WINDOW SWITCH (PASSENGER SIDE)
7
9
SUNROOF MOTOR ASSEMBLY
36
35
34
33
32
6
5
4
3
2
1
2
3
4
5
6
7
10
9
8
COMBINATION SWITCH
16
21
25
18
1
3
7
5
NATS ANTENNA AMP.
3
17
1
14
2
OPTICAL SENSOR
PS : With power seat
OP : Without automatic drive positioner
COMBINATION METER
UNIFIED METER CONTROL UNIT
HAZARD SWITCH
29
45
FRONT COMBINATION LAMP LH (TURN SIGNAL)
REAR COMBINATION LAMP LH (TURN SIGNAL)
46
FRONT COMBINATION LAMP RH (TURN SIGNAL)
REAR COMBINATION LAMP RH (TURN SIGNAL)

TKWA1722E

CONSULT-II

AKS00A46

CONSULT-II performs the following functions with combination of data receiving, command and transmission using the CAN communication line from the BCM.

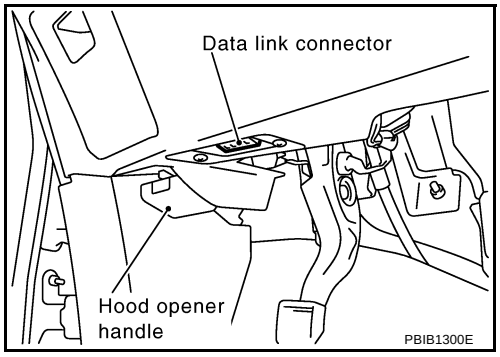
BCM diagnostic test item	Check item, diagnostic test mode	Content
Inspection by part	Work support	Changes setting of each function.
	Self-diagnosis results	BCM performs self-diagnosis of CAN communication.
	Data monitor	Displays the input data of BCM in real time.
	CAN diagnostic support monitor	The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

CONSULT–II BASIC OPERATION

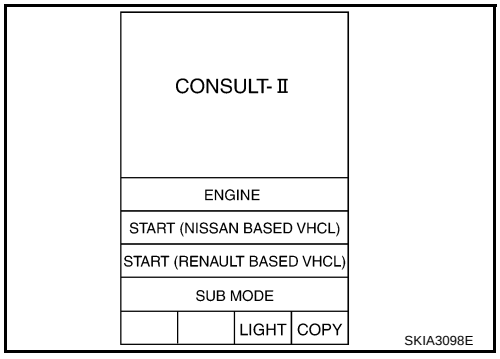
CAUTION:

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.

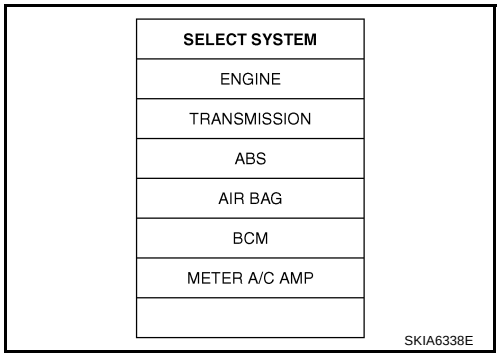
1. With the ignition switch OFF, connect CONSULT-II and CONSULT-II CONVERTER to the data link connector, then turn the ignition switch ON.



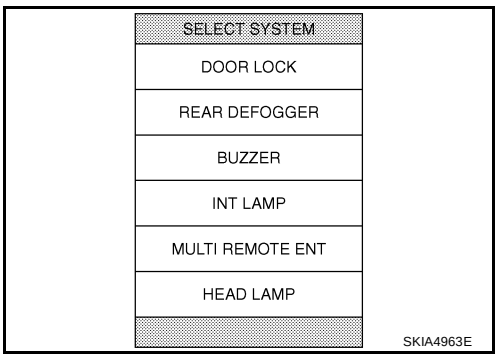
2. Touch “START (NISSAN BASED VHCL)”.



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



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



ITEMS OF EACH PART

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

×:Applicable

System and item	CONSULT-II display	Diagnostic test mode (Inspection by part)						
		WORK SUPPORT	SELF–DIAG RESULTS	DATA MONITOR	CAN DIAG SUPPORT MNTR	ECU PART NUMBER	ACTIVE TEST	CONFIGURATION
Power door lock system	DOOR LOCK	×		×			×	
Rear window defogger	REAR DEFOGGER			×			×	
Warning chime	BUZZER			×			×	
Room lamp timer	INT LAMP	×		×			×	
Remotecontrol entry system	MULTI REMOTE ENT	×		×			×	
Headlamp	HEAD LAMP	×		×			×	
Wiper	WIPER			×			×	
Turn signal lamp Hazard lamp	FLASHER			×			×	
Blower fan switch signal A/C switch signal	AIR CONDITONER			×				
Intelligent Key system	INTELLIGENT KEY			×				
Combination switch	COMB SW			×				
BCM	BCM	×	×	×	×	×		×Note
IVIS	IMMU			×			×	
Room lamp battery saver	BATTERY SAVER	×		×			×	
Trunk lidNote	TRUNK			×			×	
Vehicle security system	THEFT ALM	×		×			×	
Retained power control	RETAINED PWR	×		×			×	
Oil pressure switch	SIGNAL BUFFER			×			×	

NOTE:
This item is indicated, but it is what it does not use.

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”.

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)

AKS00A47

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 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
	I - KEY

Contents displayed

No malfunction>>INSPECTION END

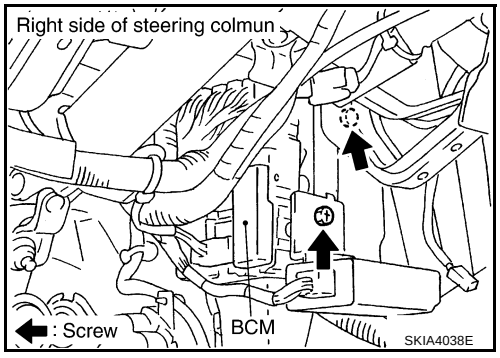
Malfunction in CAN communication system>>After printing the monitor items, go to “CAN System”. Refer to LAN-6, "Precautions When Using CONSULT-II" .

Removal and Installation of BCM

AKS00AAE

REMOVAL

1. Remove the Instrument driver lower panel. Refer to IP-11, "Removal and Installation" in “IP INSTRUMENT PANEL.”
2. Disconnect BCM connector.
3. Remove screws (2) to remove BCM.



INSTALLATION

Install in the reverse order of removal.

NOTE:

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