SECTION BCS
BODY CONTROL SYSTEM

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PRECAUTIONS

PFP:00001

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

EKS008R5

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

EKS008R6

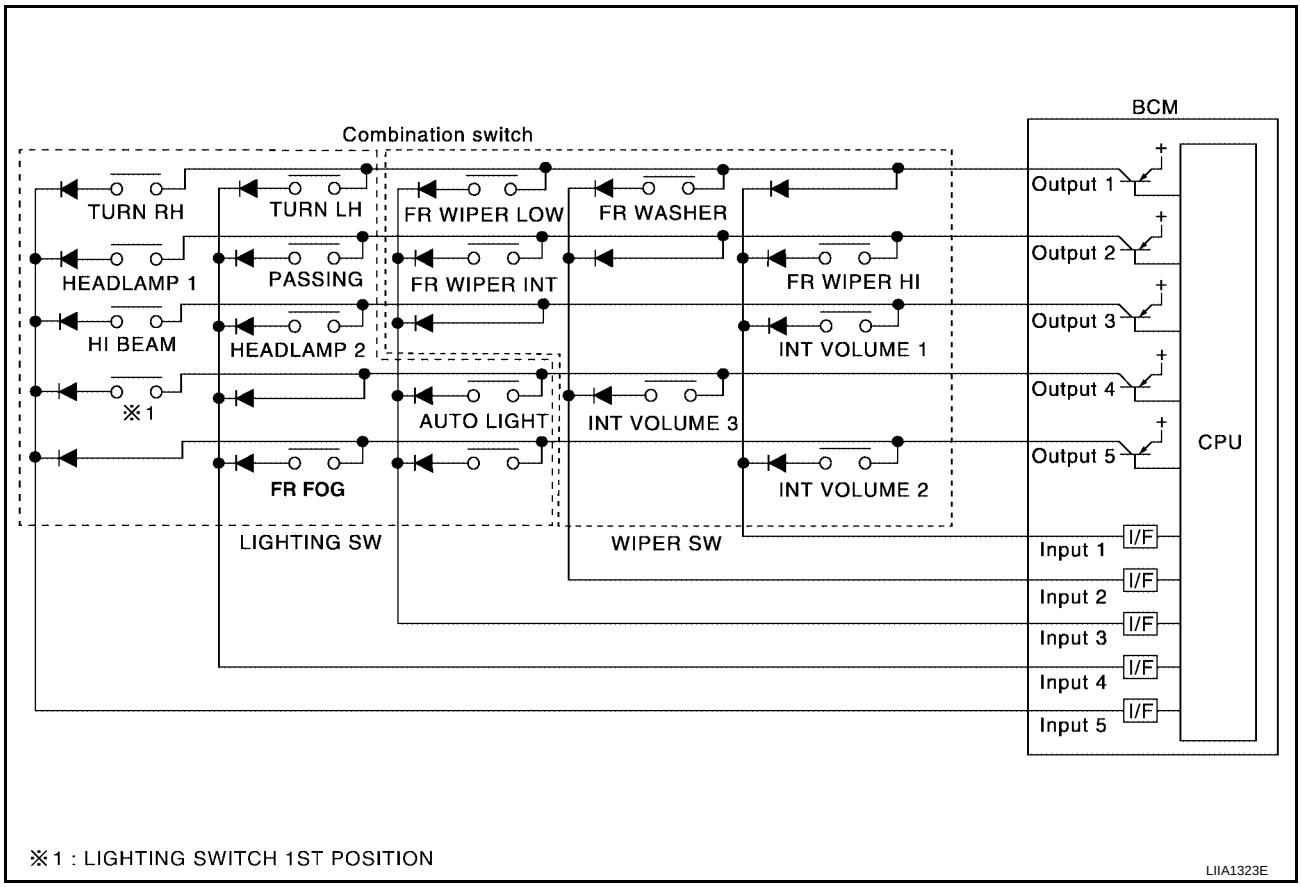
- BCM (body control module) controls the operation of various electrical units installed on the vehicle.

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.

	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 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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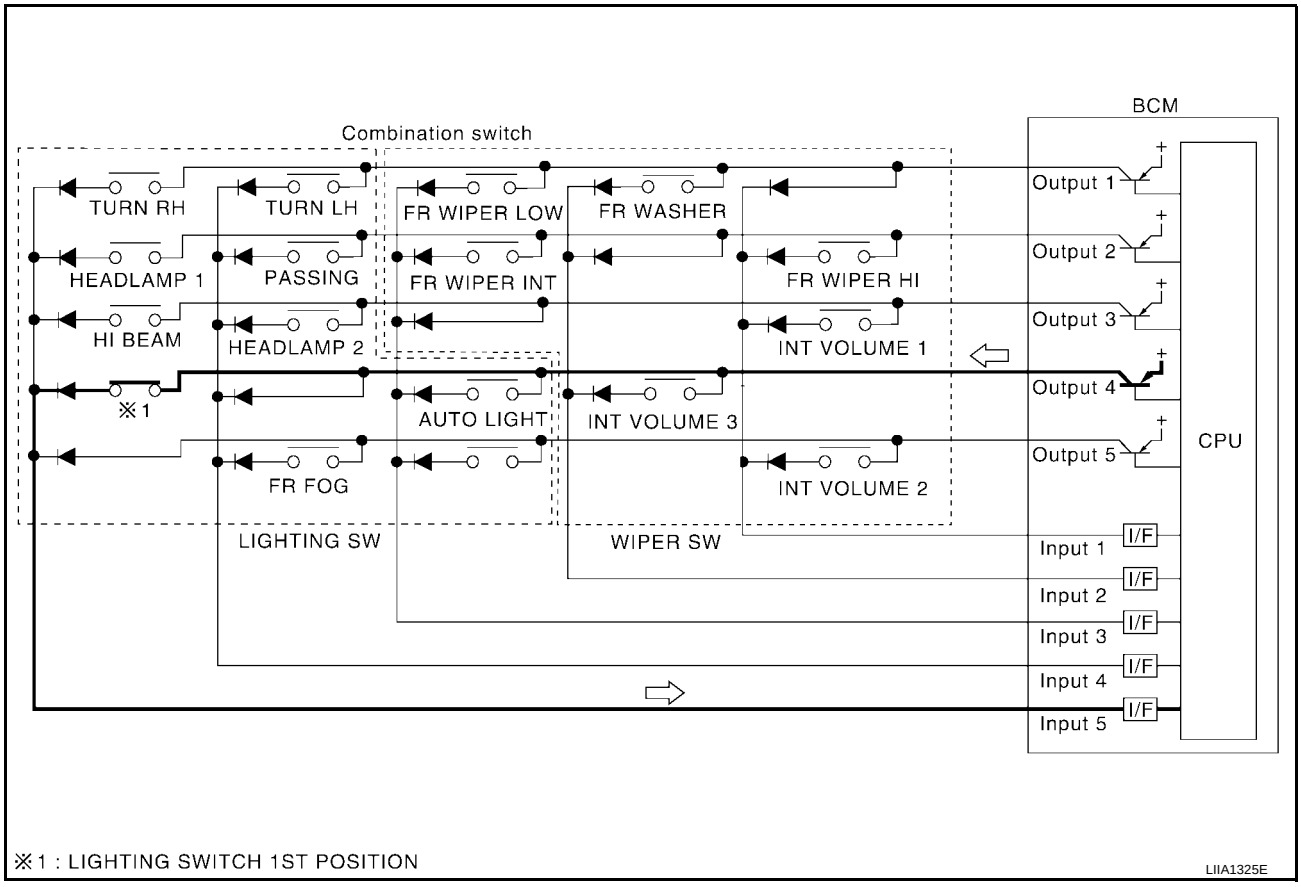
NOTE:
Headlamp has a dual system switch.

4. 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.



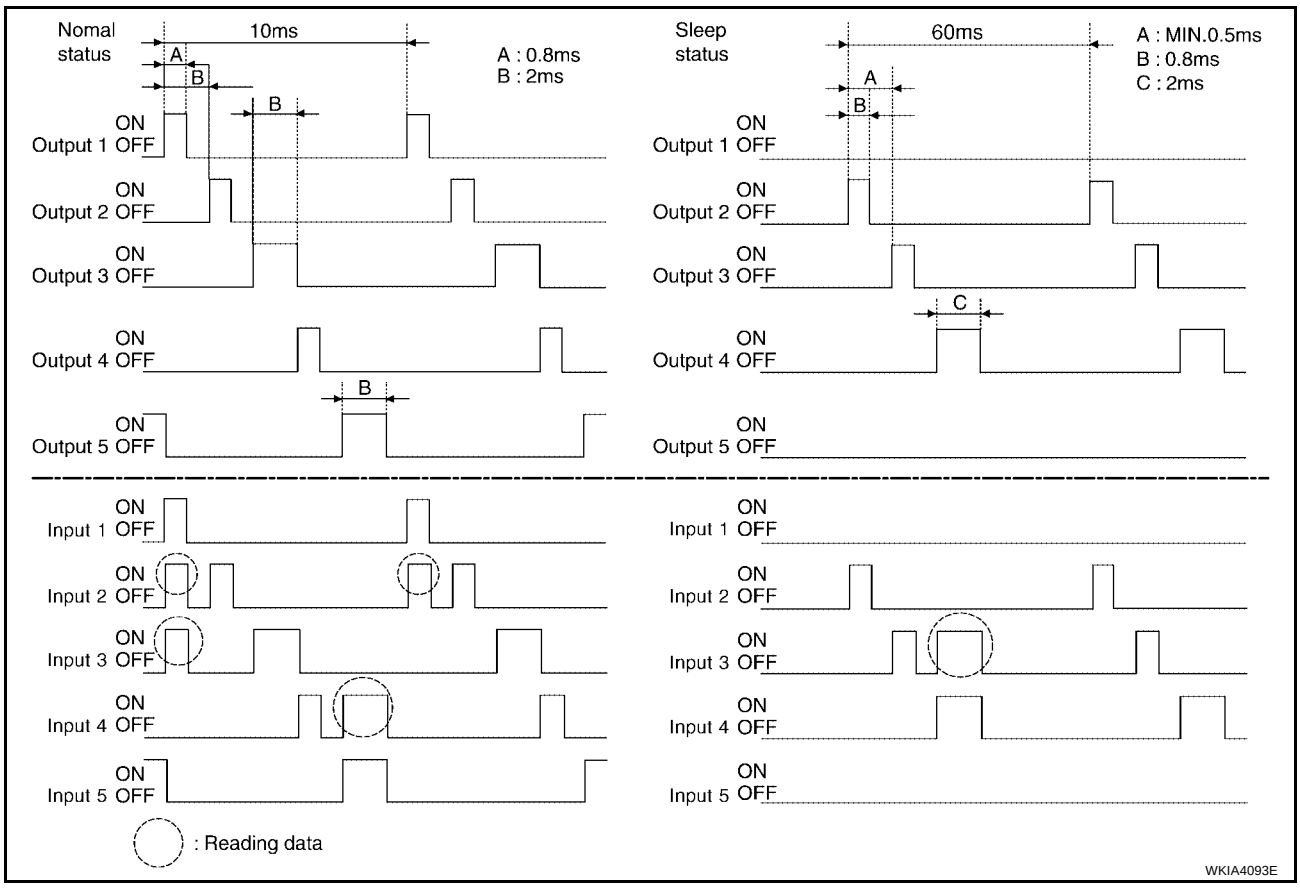
NOTE:
Each OUTPUT terminal transistor is activated at 10 ms intervals. Therefore, after a switch is turned ON, electrical loads are activated with a time delay. But this time delay is so short that it cannot be noticed.

5. 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, 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 60 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 and key lock solenoid
  - Hazard switch
  - Door lock/unlock switch
  - Front door switch (LH, RH)
  - Rear door switch (LH, RH)
  - Trunk switch and trunk release solenoid
  - Combination switch (passing, lighting switch 1st position, front fog lamp)
  - Keyfob (lock/unlock signal)
  - Front door key cylinder switch LH
- 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-17, "POWER DOOR LOCK SYSTEM" .
- Remote keyless entry system. Refer to BL-47, "REMOTE KEYLESS ENTRY SYSTEM" .
- Power window system. Refer to GW-15, "POWER WINDOW SYSTEM" .
- Sunroof system. Refer to RF-10, "SUNROOF" . NOTE
- Room lamp timer. Refer to LT-114, "INTERIOR ROOM LAMP" .
- Warning chime system. Refer to DI-46, "WARNING CHIME" .
- Turn signal and hazard warning lamps system. Refer to LT-71, "TURN SIGNAL AND HAZARD WARNING LAMPS" .

NOTE:
Power supply only. No system control.

SYSTEMS CONTROLLED BY BCM AND IPDM E/R

- Panic system. Refer to BL-47, "REMOTE KEYLESS ENTRY SYSTEM" .
- Vehicle security system. Refer to BL-85, "VEHICLE SECURITY (THEFT WARNING) SYSTEM" .
- NVIS (NATS) system. Refer to BL-108, "NVIS(NISSAN Vehicle Immobilizer System-NATS)" .
- Headlamp, daytime running lamp, tail lamp, fog lamp, auto light and battery saver control systems. Refer to LT-5, "HEADLAMP (FOR USA)" , LT-32, "HEADLAMP (FOR CANADA) - DAYTIME LIGHT SYSTEM -" , LT-99, "PARKING, LICENSE PLATE AND TAIL LAMPS" , LT-59, "FRONT FOG LAMP" or LT-43, "AUTO LIGHT SYSTEM" .
- Front wiper and washer system. Refer to WW-4, "FRONT WIPER AND WASHER SYSTEM" .
- Rear window defogger system. Refer to GW-42, "REAR WINDOW DEFOGGER" .

MAJOR COMPONENTS AND CONTROL SYSTEM

System	Input	Output
Remote keyless entry system	Remote keyless entry receiver (keyfob)	● All door locking actuators ● Trunk lid opener actuator ● Turn signal lamps
Power door lock system	● Front power door lock/unlock switch (LH, RH) ● All door switches ● Key switch	All door locking actuators
Power supply (IGN/RAP) to power window and sunroof	Ignition/retained power 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

System	Input	Output
Panic alarm	● Key switch and key lock solenoid ● Remote keyless entry receiver (keyfob)	IPDM E/R
Vehicle security system	● All door switches ● Remote keyless entry receiver (keyfob) ● Main power window and door lock/unlock switch ● Trunk lamp switch and trunk release solenoid	● IPDM E/R ● Security indicator lamp
Auto light system	● Optical sensor ● Combination switch	IPDM E/R
Battery saver control	● Ignition switch ● Combination switch ● Front door switch LH and RH	IPDM E/R
Headlamp	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 and key lock solenoid ● Remote keyless entry receiver (keyfob) ● Main power window and door lock/unlock switch ● Front door switch LH ● All door switches	Interior room lamp
Key warning chime	● Key switch and key lock solenoid ● Front door switch LH	Combination meter (warning buzzer)
Light warning chime	● Combination switch ● Key switch and key lock solenoid ● Front door switch LH	Combination meter (warning buzzer)
Vehicle-speed-sensing intermittent wiper	● Combination switch ● Combination meter	IPDM E/R
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

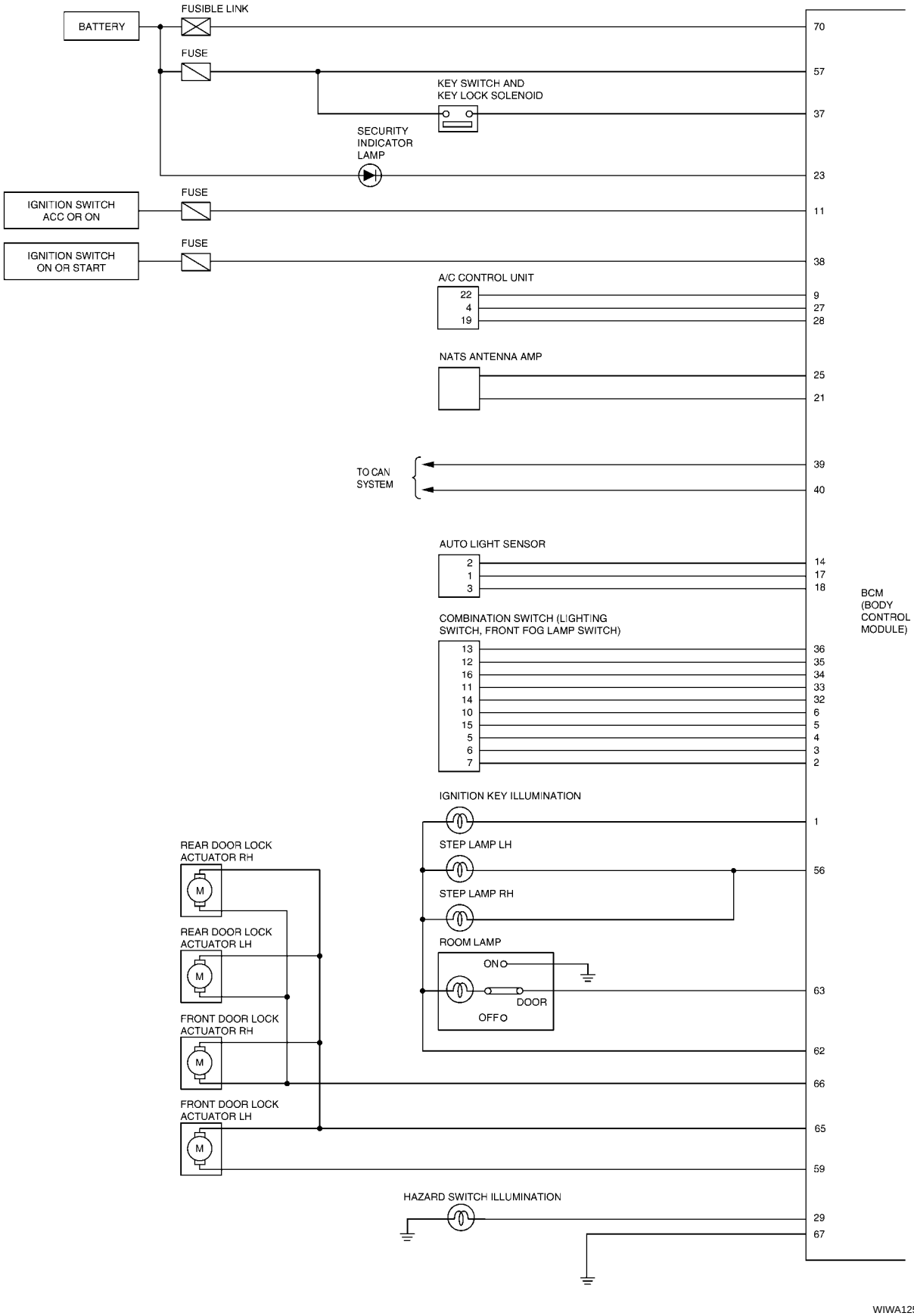
CAN Communication System Description

EKS008R7

Refer to LAN-20, "CAN COMMUNICATION" .

Schematic

EKS008R8



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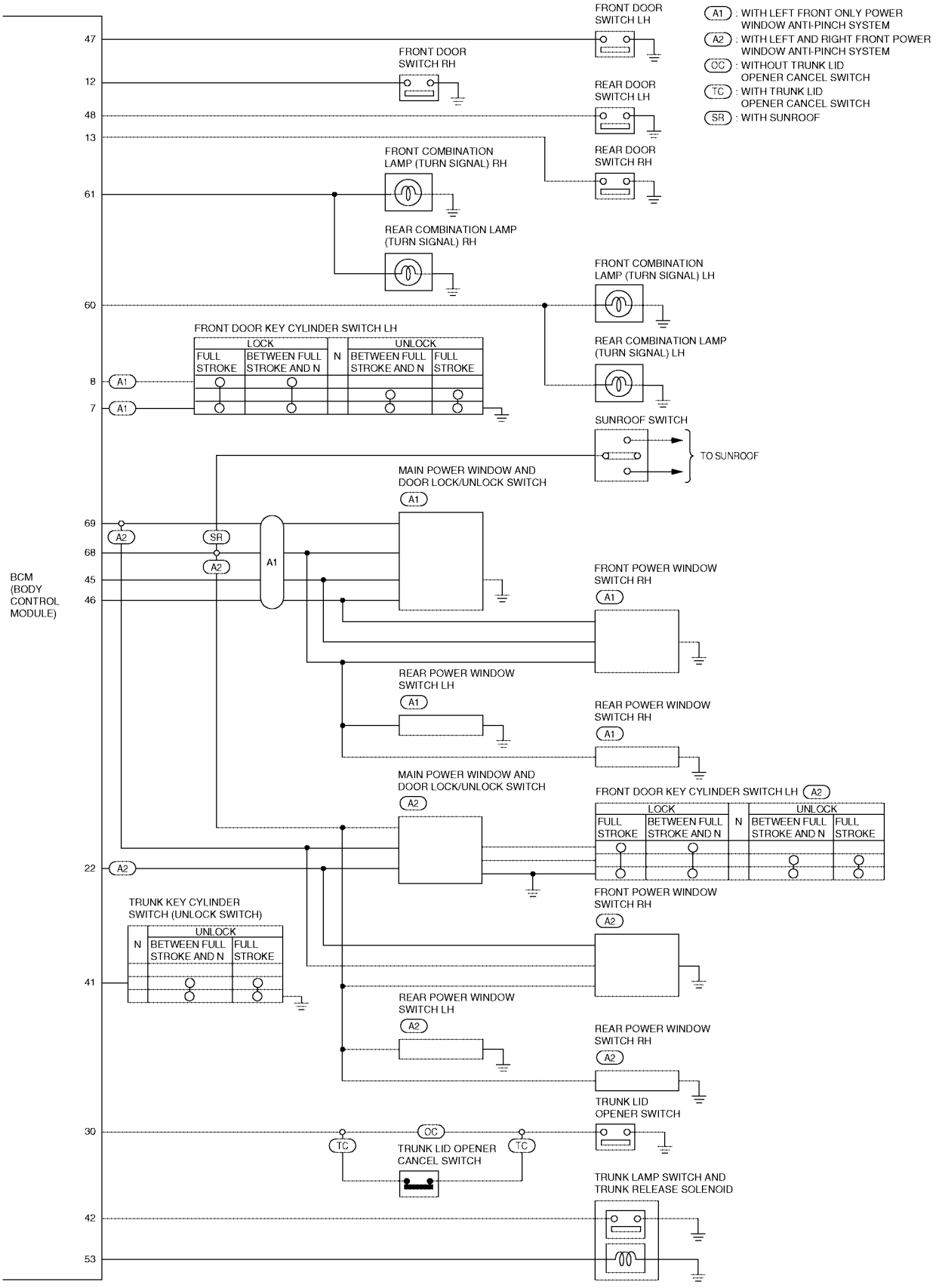
A1 : WITH LEFT FRONT ONLY POWER WINDOW ANTI-PINCH SYSTEM
A2 : WITH LEFT AND RIGHT FRONT POWER WINDOW ANTI-PINCH SYSTEM
OC : WITHOUT TRUNK LID OPENER CANCEL SWITCH
TC : WITH TRUNK LID OPENER CANCEL SWITCH
SR : WITH SUNROOF
BCM (BODY CONTROL MODULE)
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FRONT DOOR SWITCH LH
FRONT DOOR SWITCH RH
REAR DOOR SWITCH LH
REAR DOOR SWITCH RH
FRONT COMBINATION LAMP (TURN SIGNAL) RH
REAR COMBINATION LAMP (TURN SIGNAL) RH
FRONT COMBINATION LAMP (TURN SIGNAL) LH
REAR COMBINATION LAMP (TURN SIGNAL) LH
FRONT DOOR KEY CYLINDER SWITCH LH
LOCK
UNLOCK
FULL STROKE
BETWEEN FULL STROKE AND N
N
SUNROOF SWITCH
TO SUNROOF
MAIN POWER WINDOW AND DOOR LOCK/UNLOCK SWITCH
FRONT POWER WINDOW SWITCH RH
REAR POWER WINDOW SWITCH LH
REAR POWER WINDOW SWITCH RH
TRUNK KEY CYLINDER SWITCH (UNLOCK SWITCH)
TRUNK LID OPENER SWITCH
TRUNK LID OPENER CANCEL SWITCH
TRUNK LAMP SWITCH AND TRUNK RELEASE SOLENOID

WIWA0417E

CONSULT-II Function (BCM)

EKS008R9

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

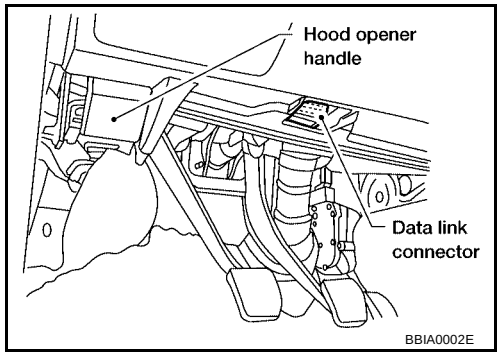
BCM diagnostic test item	Diagnostic mode	Content
Inspection by part	WORK SUPPORT	Supports inspections and adjustments. Commands are transmitted to the BCM for setting the status suitable for required operation, input/output signals are received from the BCM and received data is displayed.
	DATA MONITOR	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 OPERATION

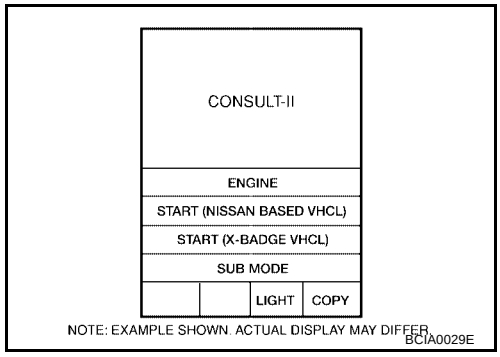
CAUTION:

If CONSULT-II is used with no connection of CONSULT-II CONVERTER, malfunctions might be detected in self-diagnosis depending on control unit which carries out CAN communication.

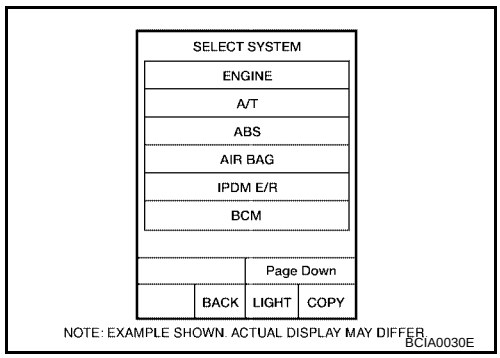
1. With ignition switch OFF, connect CONSULT-II and CONSULT-II CONVERTER to data link connector and turn ignition switch ON.



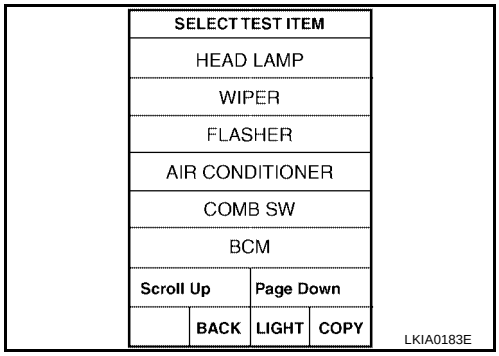
2. Touch “START (NISSAN BASED VHCL)”.



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 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	DATA MONITOR	ECU PART NUMBER	ACTIVE TEST	CONFIG-URA-TION	CAN DIAG SUPPORT MNTR
BCM	BCM	×	×		×		×	×
Power door lock system	DOOR LOCK	×		×		×		
Rear defogger	REAR DEFOGGER			×		×		
Warning chime	BUZZER			×		×		
Room lamp timer	INT LAMP	×		×		×		
Remote keyless entry system	MULTI REMOTE ENT	×		×		×		
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			×				
NVIS (NATS)	IMMU			×		×		
Interior lamp battery saver	BATTERY SAVER	×		×		×		
Trunk	TRUNK			×		×		
Vehicle security system	THEFT ALM	×		×		×		
Retained power control	RETAINED PWR	×		×		×		
Oil pressure switch	SIGNAL BUFFER			×		×		
Panic system	PANIC ALARM					×		

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?" is 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 Communication Inspection Using CONSULT-II (Self-Diagnosis)

EKS008RA

1. SELF-DIAGNOSTIC RESULT CHECK

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 carries 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 LAN-20, "CAN COMMUNICATION" .

Configuration

EKS008RB

DESCRIPTION

CONFIGURATION has two functions as follows:

- READ CONFIGURATION is the function to confirm vehicle configuration of current BCM.
- WRITE CONFIGURATION is the function to write vehicle configuration on BCM.

CAUTION:

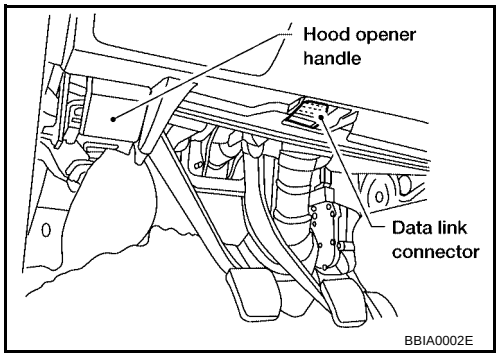
- **When replacing BCM, you must perform WRITE CONFIGURATION with CONSULT-II.**
- **Complete the procedure of WRITE CONFIGURATION in order.**
- **If you set incorrect WRITE CONFIGURATION, incidents will occur.**
- **Configuration is different for each vehicle model. Confirm configuration of each vehicle model.**

READ CONFIGURATION PROCEDURE

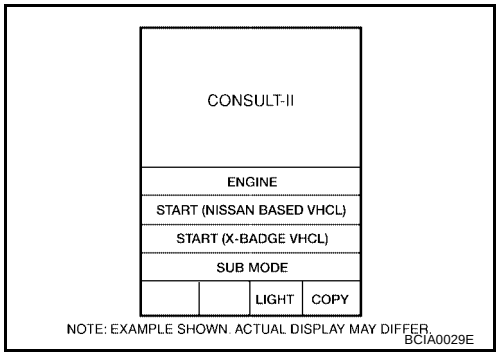
CAUTION:

If CONSULT-II is used with no connection of CONSULT-II CONVERTER, malfunctions might be detected in self-diagnosis depending on control unit which carries out CAN communication.

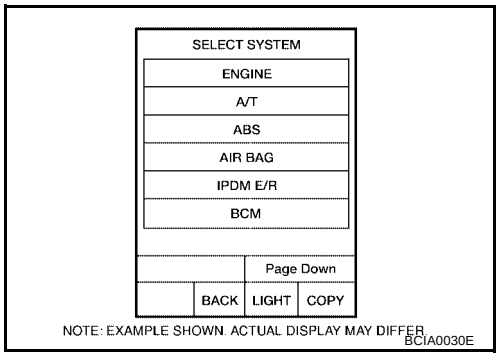
1. With ignition switch OFF, connect CONSULT-II and CONSULT-II CONVERTER to data link connector and turn ignition switch ON.



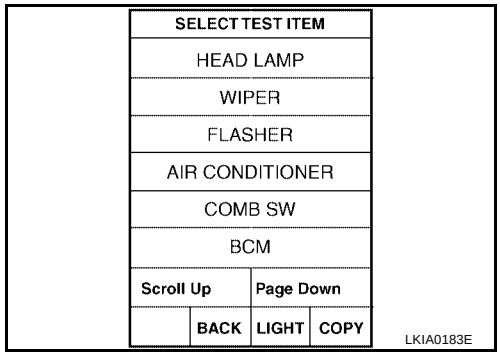
2. Touch “START (NISSAN BASED VHCL)”.



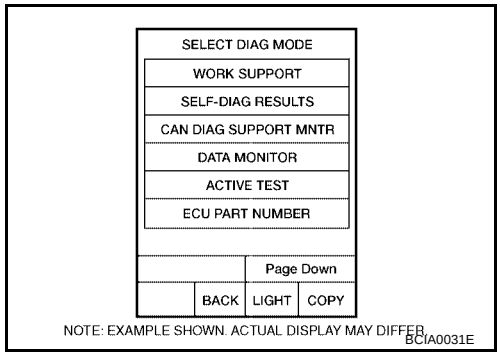
3. Touch “BCM” on “SELECT SYSTEM” screen.
   If "BCM" is not indicated, go to GI-39, "Consult-II Data Link Connector (DLC) Circuit" .



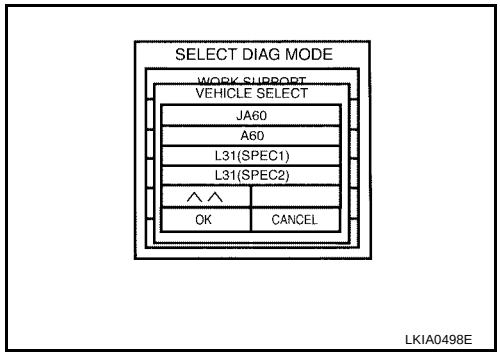
4. Touch “BCM” on “SELECT TEST ITEM” screen.



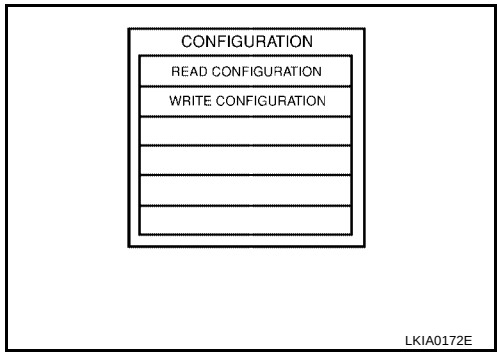
5. Touch “CONFIGURATION” on “SELECT DIAG MODE” screen.



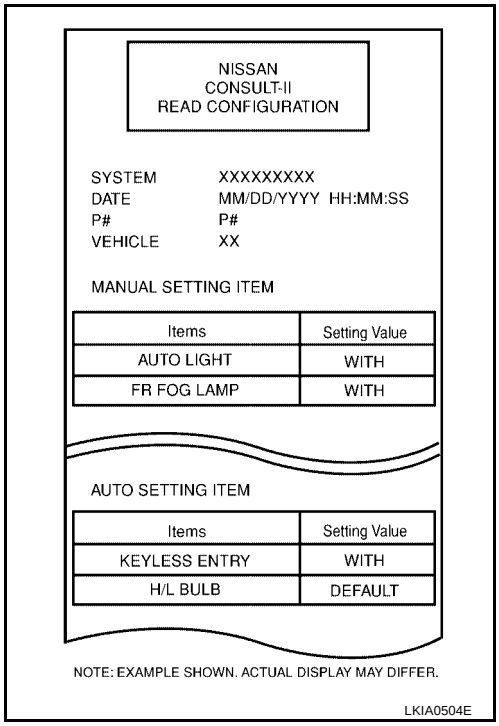
6. Touch “L31 (SPEC1)” and "OK" on “VEHICLE SELECT” screen. For canceling, touch "CANCEL" on "VEHICLE SELECT" screen.
   NOTE:
   Confirm vehicle model. Refer to GI-46, "Model Variation" in GI section.



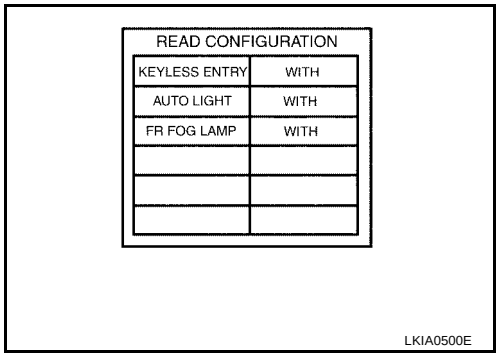
7. Touch “READ CONFIGURATION” on “CONFIGURATION” screen.



8. Configuration of current BCM is printed out automatically. A listing of manual setting items and auto setting items will be displayed. Auto setting items are preset and cannot be changed. Manual setting items can be set by using WRITE CONFIGURATION PROCEDURE. Refer to BCS-16, "WRITE CONFIGURATION PROCEDURE" .



9. Touch “BACK” on “READ CONFIGURATION” screen.

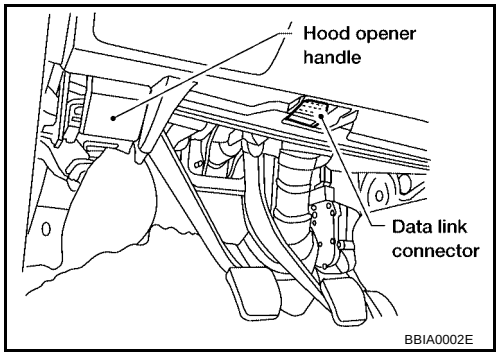


WRITE CONFIGURATION PROCEDURE

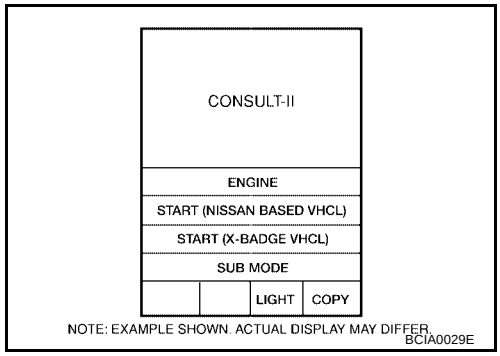
CAUTION:

If CONSULT-II is used with no connection of CONSULT-II CONVERTER, malfunctions might be detected in self-diagnosis depending on control unit which carries out CAN communication.

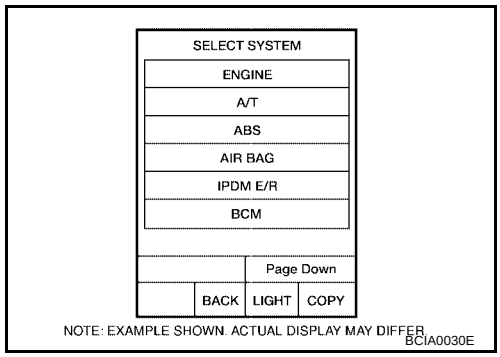
1. With ignition switch OFF, connect CONSULT-II and CONSULT-II CONVERTER to data link connector and turn ignition switch ON.



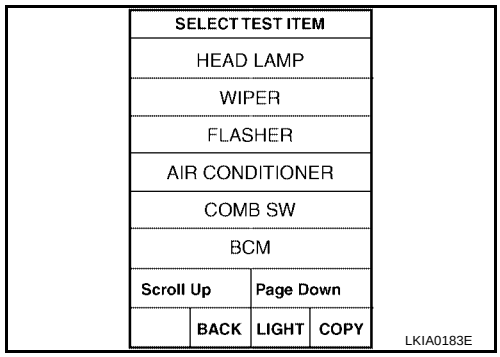
2. Touch “START (NISSAN BASED VHCL)”.



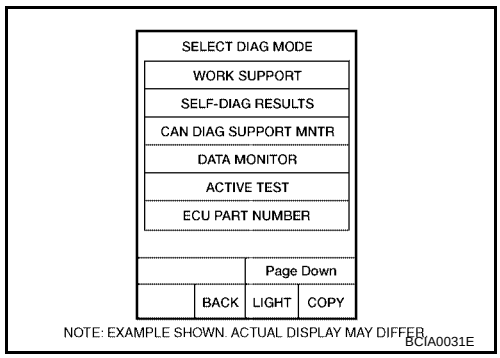
3. Touch “BCM” on “SELECT SYSTEM” screen.
If "BCM" is not indicated, go to GI-39, "Consult-II Data Link Connector (DLC) Circuit" .



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

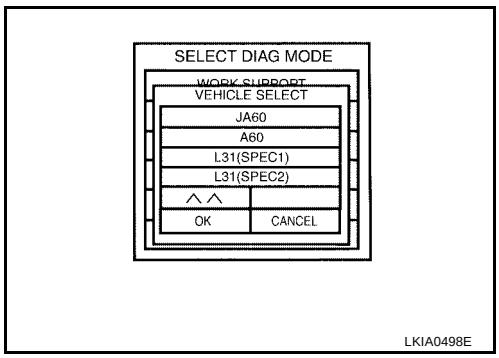


5. Touch “CONFIGURATION” on “SELECT DIAG MODE” screen.

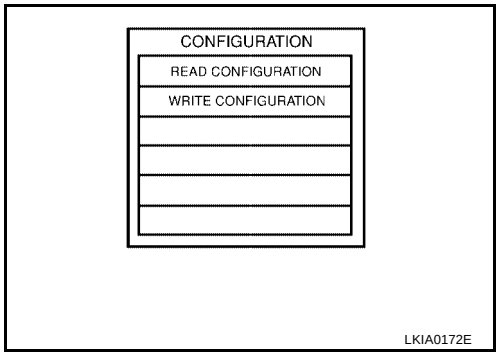


6. Touch “L31 (SPEC1)” and "OK" on “VEHICLE SELECT” screen. For canceling, touch "CANCEL" on "VEHICLE SELECT" screen.

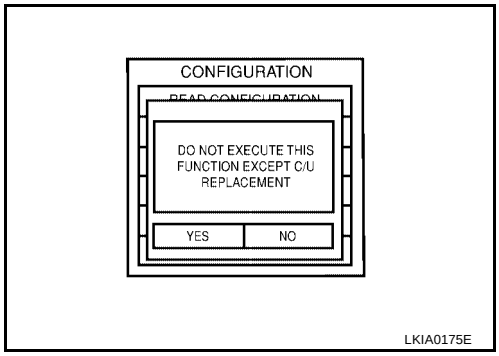
   NOTE:
   Confirm vehicle model. Refer to GI-46, "Model Variation" in GI section.



7. Touch “WRITE CONFIGURATION” on “CONFIGURATION” screen.



8. Touch "YES”. For canceling, touch "NO".



9. Touch "WITH" or "WITHOUT" on "WRITE CONFIGURATION" screen based on the following ITEM LIST.

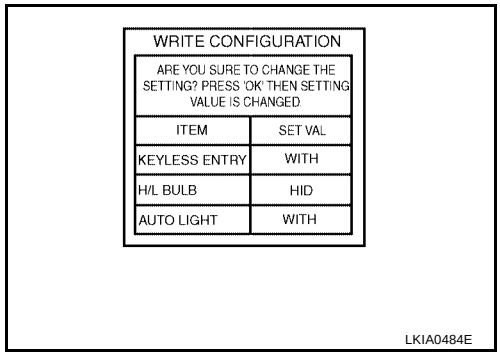
ITEM	SET VAL
KEYLESS ENTRY	WITH ⇔ WITHOUT
AUTO LIGHT	WITH ⇔ WITHOUT
DTRL	WITH ⇔ WITHOUT
THEFT ALARM	WITH ⇔ WITHOUT

   NOTE:
   Confirm vehicle model. Refer to GI-46, "Model Variation" in GI section.

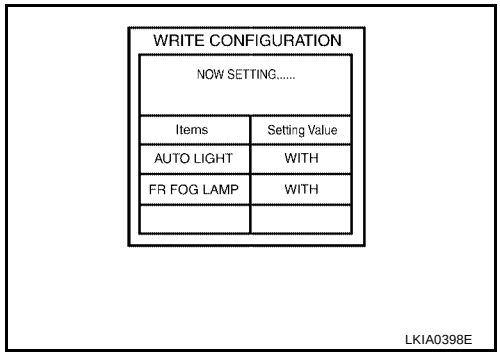
10. Touch "CHNG SETTING" on "WRITE CONFIGURATION" screen.

    CAUTION:
    Make sure to touch "CHNG SETTING" even if the indicated configuration of new BCM is same as the desirable configuration.
    If not, configuration which is set automatically by selecting vehicle model cannot be memorized.

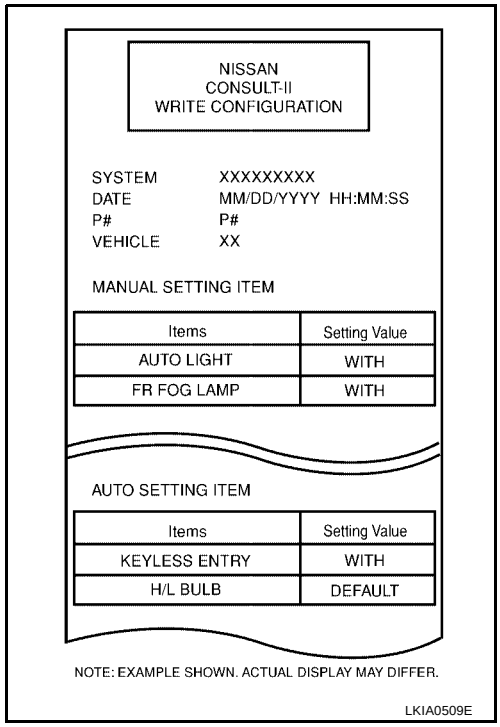
11. Touch “OK” on "WRITE CONFIGURATION" screen.
If "CANCEL" is touched, it will return to previous screen.



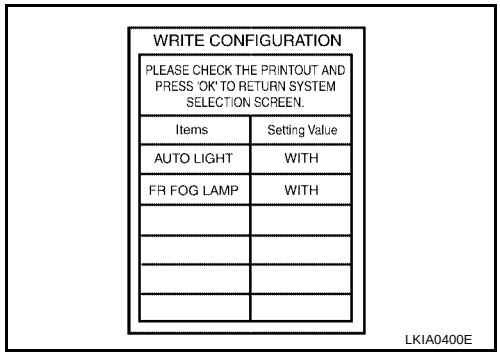
12. Wait until the next screen during setting.



13. WRITE CONFIGURATION results are printed out automatically. Confirm "WRITE CONFIGURATION" is correctly executed by comparing sheet automatically printed out with applicable configuration list shown in step 9.



14. Touch "OK" on "WRITE CONFIGURATION" screen.
WRITE CONFIGURATION is completed.



Removal and Installation of BCM

EKS008RC

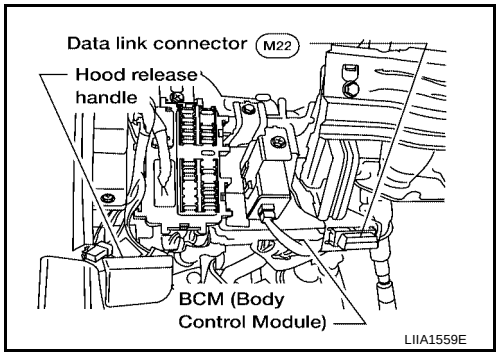
BCM

Removal

NOTE:

If possible, before removing BCM, retrieve current BCM configuration to use for reference when configuring brand-new BCM after installation. Refer to BCS-14, "Configuration" .

1. Disconnect negative battery cable.
2. Remove driver lower instrument panel. Refer to IP-11, "WORK STEPS" .
3. Remove screws (2) and release BCM from steering member.
4. Disconnect connectors and then remove BCM.



Installation

Install in the reverse order of removal.

NOTE:

- When replacing BCM, it must be configured. Refer to BCS-14, "Configuration" .
- When replacing BCM, perform initialization of NATS system and registration of all NATS ignition key IDs. Refer to BL-108, "NVIS(NISSAN Vehicle Immobilizer System-NATS)" .