

CONTENTS

PRECAUTIONS	. 2
Precautions for Supplemental Restraint System	
(SRS) "AIR BAG" and "SEAT BELT PRE-TEN-	
SIONER"	. 2
BCM (BODY CONTROL MODULE)	. 3
System Description	. 3
BCM FUNCTION	
COMBINATION SWITCH READING FUNCTION	. 3
CAN COMMUNICATION CONTROL	. 6
BCM STATUS CONTROL	. 6
SYSTEMS CONTROLLED BY BCM DIRECTLY	. 7
SYSTEMS CONTROLLED BY BCM AND IPDM	
E/R	. 7
MAJOR COMPONENTS AND CONTROL SYS-	
TEM	. 7

CAN Communication System Description8
Schematic9
CONSULT-II Function (BCM)11
CONSULT-II INSPECTION PROCEDURE 11
ITEMS OF EACH PART12
WORK SUPPORT13
CAN Communication Inspection Using CONSULT-
II (Self-Diagnosis)13
Configuration14
DESCRIPTION14
READ CONFIGURATION PROCEDURE14
WRITE CONFIGURATION PROCEDURE 16
Removal and Installation of BCM19
REMOVAL19
INSTALLATION20

BCS

D

Е

F

Н

_

PRECAUTIONS

PRECAUTIONS PFP:00001

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

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 Man-

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

FKS00BV5

Α

D

Е

Н

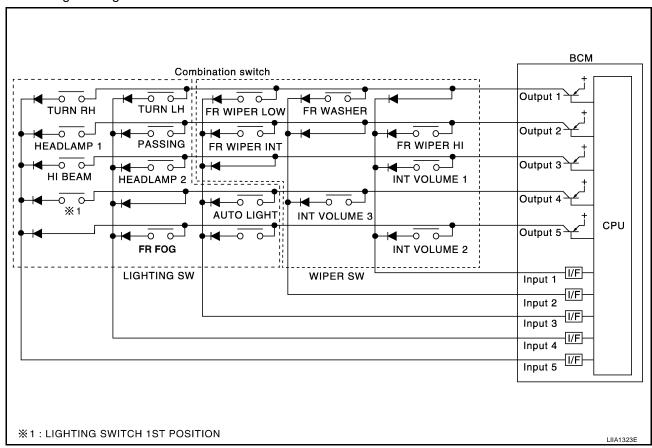
• BCM (Body Control Module) controls the operation of various electrical units installed on the vehicle.

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.

BCS

1./

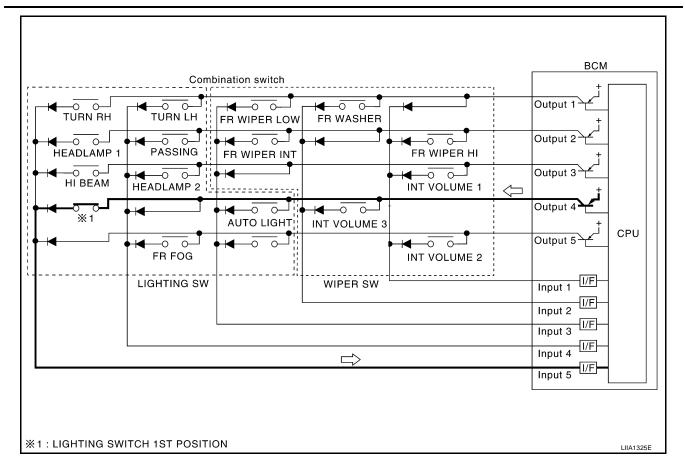
Revision: November 2005 BCS-3 2005 Frontier

COMB SW INPUT 1	ON —	OFF —	ON FR WIPER HI ON	OFF FR WIPER	ON INT	OFF INT	ON	OFF	ON	OFF
INPUT 1	_	ı	WIPER		INT	INIT				
COMB SW			•	HI OFF	VOLUME 1 ON	VOLUME 1 OFF	_	_	INT VOLUME 2 ON	INT VOLUME 2 OFF
INPUT 2	FR WASHER ON	FR WASHER OFF	1	ı	_	_	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	1	_
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		_

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

BCS

Α

В

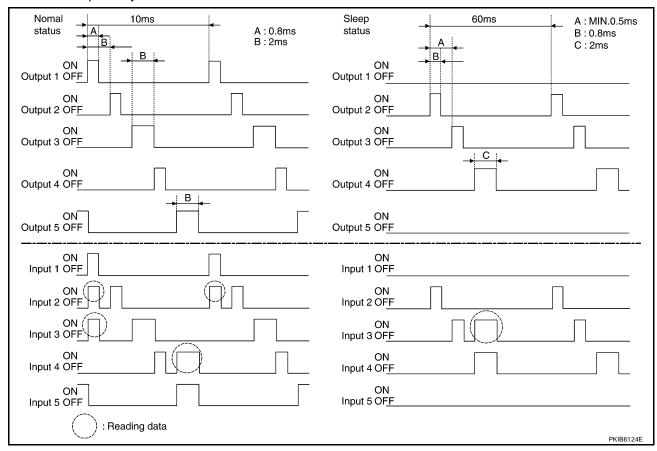
D

Е

Н

L

 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 60ms 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.
- 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.
- 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:
- Ignition switch
- Key switch
- Hazard switch
- Door lock/unlock switch
- Front door switch LH, RH
- Rear door switch LH, RH (Crew cab)
- Rear door switch upper LH, RH (King cab)
- Rear door switch lower LH, RH (King cab)
- Combination switch (passing, lighting switch 1st position, front fog lamp)
- 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

- Power door lock system. Refer to <u>BL-16</u>, "<u>POWER DOOR LOCK SYSTEM</u>".
- Remote keyless entry system. Refer to <u>BL-48</u>, "<u>REMOTE KEYLESS ENTRY SYSTEM</u>".
- Power window system. Refer to <u>GW-17</u>, "<u>POWER WINDOW SYSTEM</u>". NOTE
- Sunroof system. Refer to <u>RF</u>-10, "SUNROOF". NOTE
- Room lamp timer. Refer to <u>LT-128, "INTERIOR ROOM LAMP"</u>.
- Warning chime system. Refer to <u>DI-50, "WARNING CHIME"</u>.
- Turn signal and hazard warning lamps system. Refer to <u>LT-74, "TURN SIGNAL AND HAZARD WARNING LAMPS"</u>.

NOTE:

Power supply only. No system control.

SYSTEMS CONTROLLED BY BCM AND IPDM E/R

- Panic system. Refer to BL-48, "REMOTE KEYLESS ENTRY SYSTEM".
- NVIS (NATS) system. Refer to BL-125, "NVIS(NISSAN Vehicle Immobilizer System-NATS)".
- Headlamp, tail lamp, auto light (Crew cab) and battery saver control systems. Refer to <u>LT-5</u>, "<u>HEADLAMP</u> (<u>FOR USA</u>)" or <u>LT-31</u>, "<u>HEADLAMP</u> (<u>FOR CANADA</u>) <u>DAYTIME LIGHT SYSTEM -</u>".
- Front wiper and washer system. Refer to WW-4, "FRONT WIPER AND WASHER SYSTEM".
- Rear window defogger system (Crew cab). Refer to <u>GW-72</u>, "<u>REAR WINDOW DEFOGGER</u>".

MAJOR COMPONENTS AND CONTROL SYSTEM

System	Input	Output
Remote keyless entry system	Keyfob	All door locking actuator Turn signal lamp (LH, RH)
Power door lock system	Front power door lock/unlock switch (LH, RH)	All door locking actuator
Power supply (IGN) to power window and sunroof	Ignition 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
Panic alarm	Key switch Keyfob	IPDM E/R

BCS

Α

Е

Н

M

IV

System	Input	Output
Auto light system (Crew cab)	Optical sensor Combination switch	IPDM E/R
Battery saver control	Ignition switchCombination switch	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 Keyfob Main power window and door lock/unlock switch Front door switch LH All door switch 	Interior room lamp
Key warning chime • Key switch • Front door switch LH		Combination meter (warning buzzer)
Light warning chime	Combination switchKey switchFront door switch LH	Combination meter (warning buzzer)
Variable speed intermittent wiper	Combination switch Combination meter	IPDM E/R
Rear window defogger (crew cab)	Rear window defogger switch	IPDM E/R
Air conditioner switch signal	Front air control	ECM
Blower fan switch signal	Front air control	ECM

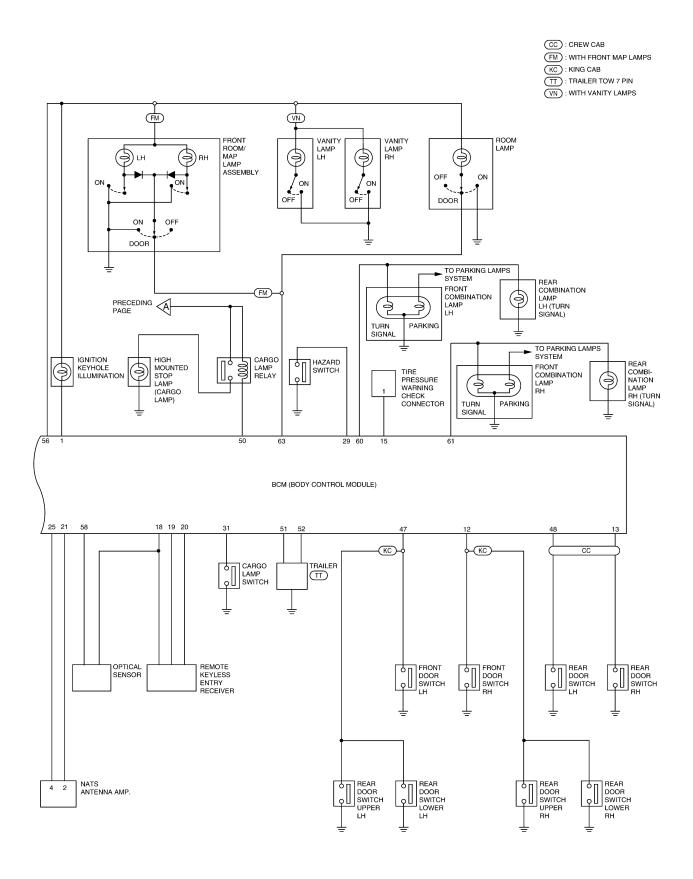
CAN Communication System Description

EKS00BV6

Refer to LAN-22, "CAN COMMUNICATION" .

Schematic EKS00BV7 Α CC : CREW CAB В IGNITION SWITCH ACC OR ON BATTERY IGNITION SWITCH ON OR START C FUSE IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM) (CPU) FUSIBLE LINK FUSE FUSE FUSE FUSE FUSE FUSE D COMBINATION METER Е KEY SWITCH UNIFIED METER CONTROL UNIT FRONT AIR CONTROL SECURITY INDICATOR LAMP 37 57 38 23 40 9 28 27 BCM (BODY CONTROL MODULE) Н 13 12 16 11 14 10 15 5 6 COMBINATION SWITCH FRONT DOOR LOCK ASS-EMBLY LH (M)ACTUATOR KEY CYLINDER SWITCH LOCK UNLUCK

BETWEEN FULL N BETWEEN FULL FULL
STROKE AND N STROKE AND N STROKE FULL **BCS** POWER WINDOW AND DOOR LOCK/ UNLOCK SWITCH RH MAIN POWER WINDOW AND DOOR LOCK/ UNLOCK SWITCH UNLOCK LOCK UNLOCK LOCK (CC) M REAR POWER WINDOW SWITCH RH REAR DOOR LOCK ACTUATOR LH REAR DOOR LOCK ACTUATOR RH <u></u> **(** REAR POWER WINDOW MOTOR LH REAR POWER WINDOW MOTOR RH -(M)--(M)-MAIN POWER WINDOW AND DOOR LOCK/UNLOCK SWITCH LH POWER WINDOW AND DOOR LOCK/UNLOCK SWITCH RH FRONT POWER WINDOW MOTOR LH FRONT POWER WINDOW MOTOR RH L(M)F -(M)-



WIWA0912E

CONSULT-II Function (BCM)

EKS00BV8

Α

Е

Н

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

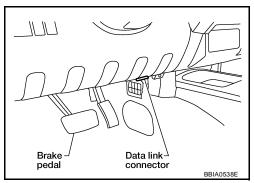
BCM diagnostic test item	Diagnostic mode	Content
	WORK SUPPORT	Changes setting of each function.
	DATA MONITOR	Displays BCM input/output data in real time.
	ACTIVE TEST	Operation of electrical loads can be checked by sending drive signal to them.
Inspection by part	SELF-DIAG RESULTS	Displays BCM self-diagnosis results.
moposition 2) pair	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

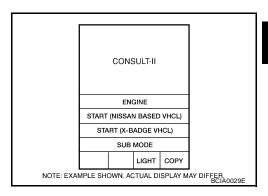
CAUTION:

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

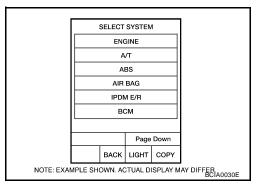
1. With ignition switch OFF, connect CONSULT-II and CONSULT-II CONVERTER to data link connector and turn ignition switch ON.



2. Touch "START (NISSAN BASED VHCL)".



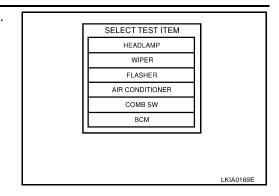
3. Touch "BCM" on "SELECT SYSTEM" screen.



BCS

Revision: November 2005 BCS-11 2005 Frontier

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



ITEMS OF EACH PART

NOTE:

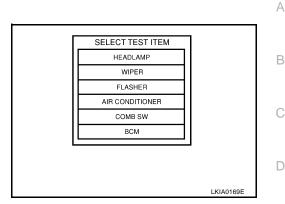
CONSULT-II will only display systems the vehicle possesses.

		Diagnostic test mode (Inspection by part)							
System and item	CONSULT-II dis- play	WORK SUPPORT	SELF- DIAG RESULTS	CAN DIAG SUPPORT MNTR	DATA MONITOR	ECU PART NUMBER	ACTIVE TEST	CON- FIGU- RATION	
BCM	ВСМ	×	×	×		×		×	
Power door lock system	DOOR LOCK	×			×		×		
Rear defogger	REAR DEFOG- GER				×		×		
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 sig- nal Air conditioner switch signal	AIR CONDI- TIONER				×				
Combination switch	COMB SW				×				
NVIS (NATS)	IMMU				×		×		
Interior lamp battery saver	BATTERY SAVER	×			×		×		
Back door	TRUNK				×		×		
Theft alarm	THEFT ALARM	×			×		×		
Retained power control	RETAINED PWR	×			×		×		
Oil pressure switch	SIGNAL BUFFER				×		×		
Air pressure monitor	AIR PRESSURE MONITOR				×		×		
Panic alarm	PANIC ALARM	×			×		×		

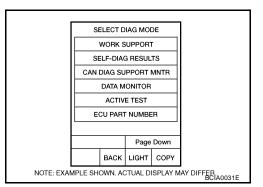
WORK SUPPORT

Operation Procedure

1. Touch "BCM" on "SELECT TEST ITEM" screen.



- Touch "WORK SUPPORT" on "SELECT DIAG MODE" screen.
- 3. Touch item on "SELECT WORK ITEM" screen.
- 4. Touch "START".
- Touch "CHANGE SET".
- 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)

EKS00BV9

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.

- Connect CONSULT-II and CONSULT-II CONVERTER, and select "BCM" on "SELECT SYSTEM" screen.
- 2. Select "BCM" on "SELECT TEST ITEM" screen, and select "SELF-DIAG RESULTS".
- Check display content in self-diagnostic results.

CONSULT-II display code	Diagnosis item
	INITIAL DIAG
U1000	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-22, "CAN COMMUNICATION".

BCS

Н

Configuration DESCRIPTION

EKS00BVA

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:

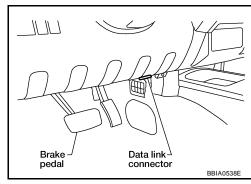
- When replacing BCM, you must perform WRITE CONFIGURATION with CONSULT-II.
- Complete the procedure of WRITE CONFIGURATION in order.
- If you set incorrect WRITE CONFIGURATION, incidents will occur.
- Configuration is different for each vehicle model. Confirm configuration of each vehicle model.

READ CONFIGURATION PROCEDURE

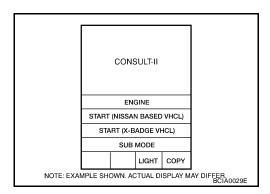
CAUTION:

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.

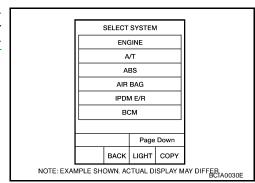
 With ignition switch OFF, connect CONSULT-II and CONSULT-II CONVERTER to data link connector and turn ignition switch ON.



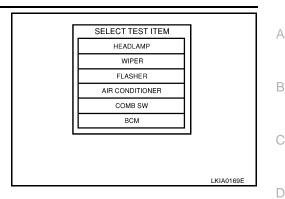
Touch "START (NISSAN BASED VHCL)".



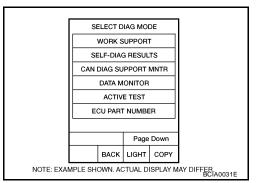
3. Touch "BCM" on "SELECT ITEM" screen. If "BCM" is not indicated, go to GI section to check CONSULT II data link connector (DLC) circuit. Refer to GI-40, "CONSULT-II Data Link Connector (DLC) Circuit".



4. Touch "BCM" on "SELECT TEST ITEM" screen.



5. Touch "CONFIGURATION" on "SELECT DIAG MODE" screen.



Е

Н

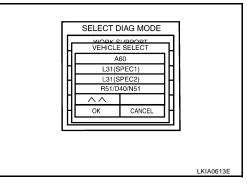
BCS

M

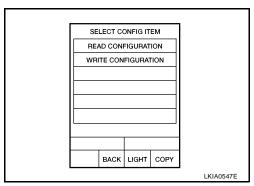
6. Touch "R51/D40/N51" and "OK" on "VEHICLE SELECT" screen. For canceling, touch "CANCEL" on "VEHICLE SELECT" screen.

NOTE:

Confirm vehicle model on IDENTIFICATION PLATE. Refer to GI-48, "Model Variation" in GI section.

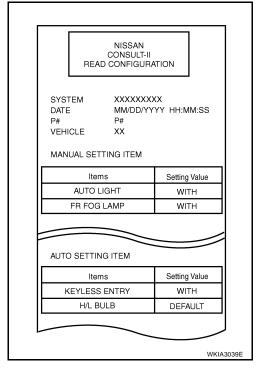


Touch "READ CONFIGURATION" on "SELECT CONFIG ITEM" screen.

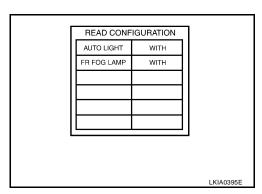


Revision: November 2005 BCS-15 2005 Frontier

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.

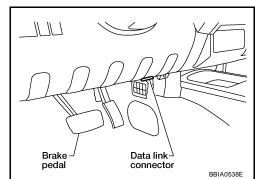


WRITE CONFIGURATION PROCEDURE

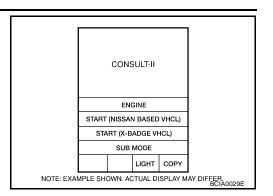
CAUTION:

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)".



Α

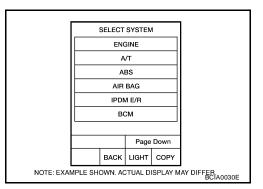
Е

Н

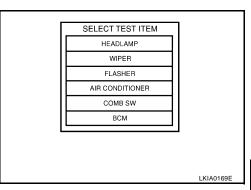
BCS

M

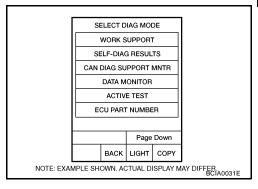
3. Touch "BCM" on "SELECT SYSTEM" screen. If "BCM" is not indicated, go to GI section to check CONSULT II data link connector (DLC) circuit. Refer to GI-40, "CONSULT-II Data Link Connector (DLC) Circuit".



4. Touch "BCM" on "SELECT TEST ITEM" screen.

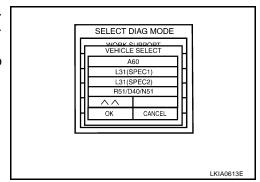


5. Touch "CONFIGURATION" on "SELECT DIAG MODE" screen.

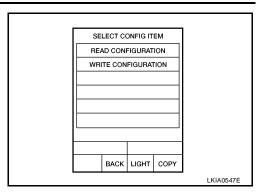


6. Touch "R51/D40/N51" and "OK" on "VEHICLE SELECT" screen. For canceling, touch "CANCEL" on "VEHICLE SELECT" screen. **NOTE:**

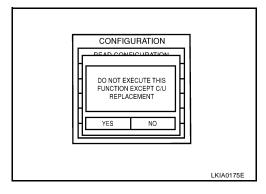
Confirm vehicle model on IDENTIFICATION PLATE. Refer to GI-48, "Model Variation" .



7. Touch "WRITE CONFIGURATION" on "SELECT CONFIGURE ITEM" screen.



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



9. Using the following flow chart, identify the correct model and configuration list. Confirm and/or change setting value for each item according to the configuration list.

Depending on CONSULT-II software version being used, some or all of the write configuration items shown in the following configuration lists may be displayed. If an item does not appear on the CONSULT-II "WRITE CONFIGURATION" screen(s), then it is an auto setting item and it cannot be manually set or changed.

NOTE:

Confirm vehicle model on IDENTIFICATION PLATE. Refer to GI-48, "Model Variation".

ITEM	SET VAL
AUTO LIGHT	WITH ⇔ WITHOUT
DTRL	WITH ⇔ WITHOUT

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

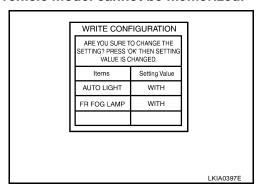
CAUTION:

Make sure to touch "CHNG SETTING" even if the indicated configuration of brand-new BCM is same as the desirable configuration.

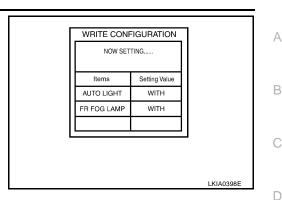
If not, configuration which is set automatically by selecting vehicle model cannot be memorized.

11. Touch "OK" on "WRITE CONFIGURATION" screen.

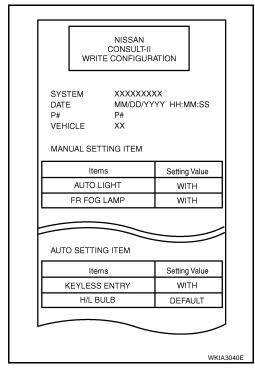
If "CANCEL" is touched, it will return to previous screen.



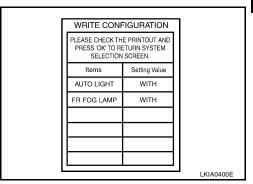
12. Wait until the next screen during setting.



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 REMOVAL

NOTE:

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

- 1. Disconnect negative battery cable.
- 2. Remove lower knee protector. Refer to IP-12, "LOWER INSTRUMENT PANEL LH".

BCS

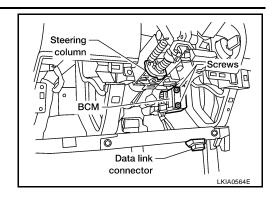
Е

Н

M

EKS00BVB

- 3. Remove screws and release BCM.
- 4. Disconnect connectors and then remove BCM.



INSTALLATION

Installation is 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 <u>BL-125</u>, "NVIS(NISSAN Vehicle Immobilizer System-NATS)"
- When replacing BCM, perform ID registration procedure of low tire pressure warning system. Refer to WT-12, "ID Registration Procedure" .