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SECTION

WIPER, WASHER & HORN

CONTENTS

<p>PRECAUTION 2</p> <p> Precautions for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER" 2</p> <p> Wiring Diagrams and Trouble Diagnosis 2</p> <p>FRONT WIPER AND WASHER SYSTEM 3</p> <p> Components Parts and Harness Connector Location 3</p> <p> System Description 3</p> <p> LOW SPEED WIPER OPERATION 4</p> <p> HI SPEED WIPER OPERATION 4</p> <p> INTERMITTENT OPERATION 4</p> <p> AUTO STOP OPERATION 4</p> <p> WASHER OPERATION 5</p> <p> MIST OPERATION 5</p> <p> FAIL-SAFE FUNCTION 5</p> <p> COMBINATION SWITCH READING FUNCTION... 5</p> <p> CAN Communication System Description 8</p> <p> Wiring Diagram — WIPER — 9</p> <p> Terminals and Reference Value for BCM 11</p> <p> Terminals and Reference Values for IPDM E/R 12</p> <p> Work Flow 12</p> <p> Preliminary Inspection 13</p> <p> INSPECTION FOR POWER SUPPLY AND GROUND CIRCUIT 13</p> <p> CONSULT-II Function (BCM) 14</p> <p> CONSULT-II OPERATION 14</p> <p> DATA MONITOR 15</p> <p> ACTIVE TEST 15</p> <p> CONSULT-II Function (IPDM E/R) 16</p> <p> CONSULT-II OPERATION 16</p> <p> DATA MONITOR 17</p> <p> ACTIVE TEST 17</p> <p> Trouble Diagnosis 18</p> <p> FRONT WIPER DOES NOT OPERATE 18</p> <p> FRONT WIPER STOP POSITION IS INCORRECT 20</p>	<p> ONLY FRONT WIPER LOW DOES NOT OPERATE 22</p> <p> ONLY FRONT WIPER HI DOES NOT OPERATE.. 22</p> <p> ONLY FRONT WIPER INT DOES NOT OPERATE 23</p> <p> FRONT WIPER INTERMITTENT OPERATION SWITCH POSITION CANNOT BE ADJUSTED... 24</p> <p> WIPERS DO NOT WIPE WHEN FRONT WASHER OPERATES 24</p> <p> FRONT WIPERS OPERATE FOR 10 SECONDS, STOP FOR 20 SECONDS, AND AFTER REPEATING THIS OPERATION FIVE TIMES, THEY BECOME INOPERATIVE 24</p> <p> Removal and Installation for Front Wiper Arms, Adjustment for Wiper Arms Stop Location 26</p> <p> Removal and Installation for Wiper Motor and Linkage 26</p> <p> REMOVAL 26</p> <p> INSTALLATION 27</p> <p> Washer Nozzle Adjustment 27</p> <p> Washer Tube Layout 27</p> <p> Removal and Installation for Wiper and Washer Switch 28</p> <p> Removal and Installation for Washer Tank 28</p> <p> Removal and Installation for Washer Motor 28</p> <p> POWER SOCKET 29</p> <p> Wiring Diagram — P/SCKT — 29</p> <p> Removal and Installation 30</p> <p> FRONT POWER SOCKET 30</p> <p> REAR POWER SOCKET 30</p> <p> HORN 31</p> <p> Wiring Diagram — HORN — 31</p> <p> Removal and Installation 32</p> <p> REMOVAL (HORN HIGH) 32</p> <p> INSTALLATION (HORN HIGH) 32</p> <p> REMOVAL (HORN LOW) 32</p> <p> INSTALLATION (HORN LOW) 32</p>
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PRECAUTION

PRECAUTION

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

EKS004T3

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.

Wiring Diagrams and Trouble Diagnosis

EKS003UB

When you read wiring diagrams, refer to the following:

- Refer to [GI-12, "How to Read Wiring Diagrams"](#) .
- Refer to [PG-3, "POWER SUPPLY ROUTING CIRCUIT"](#) for power distribution circuit.

When you perform trouble diagnosis, refer to the following:

- Refer to [GI-10, "HOW TO FOLLOW TEST GROUPS IN TROUBLE DIAGNOSES"](#) .
- Refer to [GI-25, "How to Perform Efficient Diagnosis for an Electrical Incident"](#) .

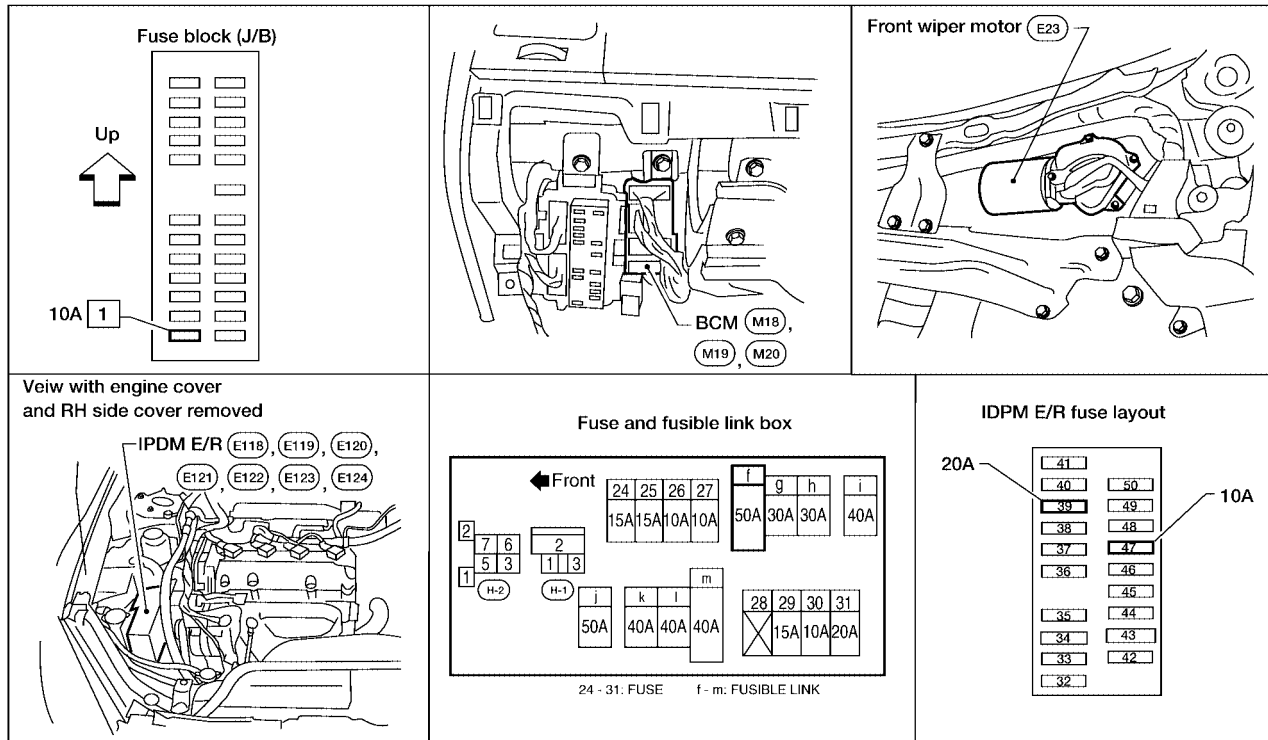
FRONT WIPER AND WASHER SYSTEM

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EKS003UC

FRONT WIPER AND WASHER SYSTEM

Components Parts and Harness Connector Location



WKIA1546E

EKS003UD

System Description

- Both front wiper relays are located in IPDM E/R (intelligent power distribution module engine room).
- Wiper switch (combination switch) is composed of a combination of 5 output terminals and 5 input terminals. Terminal combination status is read by BCM (body control module) when switch is turned ON.
- BCM controls front wiper LO, HI, and INT (intermittent) operation.
- IPDM E/R operates wiper motor according to CAN communication signals from the BCM.

Power is supplied at all times

- through 50A fusible link (letter f, located in the fuse and fusible link box)
- to BCM terminal 55
- through 20A fuse (No. 39, located in the IPDM E/R)
- to front wiper relay (located in the IPDM E/R).

With the ignition switch in ON or START position, power is supplied at all times

- through 10A fuse [No. 1, located in the fuse block (J/B)]
- to BCM terminal 38
- through 10A fuse (No. 47, located in the IPDM E/R)
- through IPDM E/R terminal 44
- to front washer motor terminal +.

Ground is supplied at all times

- to BCM terminals 49 (early production) and 52
- to combination switch terminal 12
- from body grounds M57, M61, and M79
- to IPDM E/R terminals 38 and 60
- to front wiper motor terminal E

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C
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F
G
H
I
J
L
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FRONT WIPER AND WASHER SYSTEM

- from body grounds E15 and E24.

LOW SPEED WIPER OPERATION

When the ignition switch is in the ON or START position and the front wiper switch is turned to low position, the BCM detects a low speed wiper ON signal by BCM wiper switch reading function. BCM then sends front wiper (low) request signal over CAN communication lines

- from BCM terminals 39 and 40
- to IPDM E/R terminals 48 and 49.

When IPDM E/R receives front wiper (low) request signal, it supplies ground to energize the front wiper relay. With the front wiper relay energized, power is supplied

- from front wiper relay
- to front wiper HI relay
- through IPDM E/R terminal 21
- to front wiper motor terminal L.

With power and ground supplied, the front wiper motor operates at low speed.

HI SPEED WIPER OPERATION

When the ignition switch is in the ON or START position and the front wiper switch is turned to high position, the BCM detects a high speed wiper ON signal by BCM wiper switch reading function. BCM then sends front wiper (high) request signal over CAN communication lines

- from BCM terminals 39 and 40
- to IPDM E/R terminals 48 and 49.

When IPDM E/R receives front wiper (high) request signal, it supplies ground to energize the front wiper and the front wiper HI relays.

With the front wiper and the front wiper HI relays energized, power is supplied

- from front wiper relay
- to front wiper HI relay
- through IPDM E/R terminal 31
- to front wiper motor terminal H.

With power and ground supplied, the front wiper motor operates at high speed.

INTERMITTENT OPERATION

Wiper intermittent operation delay interval is determined from the combination of the intermittent wiper dial position inputs and vehicle speed. During each intermittent operation delay interval, the BCM sends a front wiper request signal to the IPDM E/R to operate the wipers.

When the ignition switch is in ON or START position and the front wiper switch is turned to intermittent position, the BCM detects a front wiper (intermittent) ON signal by BCM wiper switch reading function.

BCM then sends front wiper (intermittent) request signal over CAN communication lines

- from BCM terminals 39 and 40
- to IPDM E/R terminals 48 and 49.

When BCM determines that combination switch status is front wiper intermittent ON, it performs the following operations.

- BCM detects ON/OFF status of intermittent wiper dial position
- BCM calculates operation interval from wiper dial position and vehicle speed signal received from unified meter and A/C amp. through CAN communications
- BCM sends front wiper request signal (INT) to IPDM E/R at calculated operation interval.

When IPDM E/R receives front wiper request signal (INT), it supplies ground to energize the front wiper relay. It then sends auto-stop signal to BCM and conducts intermittent front wiper motor operation.

AUTO STOP OPERATION

When the wiper arms are not located at the base of the windshield and the wiper switch is turned OFF, the wiper motor will continue to operate until the wiper arms reach windshield base. When wiper arms reach base of windshield, front wiper motor terminals P and E are connected.

Ground is supplied

- to terminal 32 of the IPDM E/R

FRONT WIPER AND WASHER SYSTEM

- through front wiper motor terminal P
- through terminal E of the front wiper motor
- from body grounds E15 and E24.

The IPDM E/R sends auto stop operation signal to BCM through CAN communication lines.

When BCM receives auto stop operation signal, BCM sends wiper stop signal to IPDM E/R with CAN communication lines. The IPDM E/R then de-energizes the front wiper relay.

Wiper motor will then stop wiper arms at the STOP position.

WASHER OPERATION

When the ignition switch is in ON or START position, power is supplied

- through 10A fuse (No. 47, located in the IPDM E/R)
- through IPDM E/R terminal 44
- to front washer motor terminal +.

When front wiper switch is placed in washer position, ground is supplied

- to front washer motor terminal -
- through combination switch terminal 11
- through combination switch terminal 12
- from body grounds M57, M61, and M79.

With power and ground supplied, the front washer motor is operated. At the same time, power is supplied

- through combination switch terminal 2
- to BCM (output 2) terminal 35.

When BCM detects that front washer motor has operated for 0.4 seconds or longer, BCM uses CAN communication and sends wiper request signal to IPDM E/R for low speed operation of wipers.

When BCM detects that washer switch is OFF, low speed operation cycles approximately 3 times and then stops.

MIST OPERATION

When the wiper switch is temporarily placed in the mist position, wiper low speed operation cycles once and then stops.

For additional information about wiper operation under this condition, refer to [WW-4, "LOW SPEED WIPER OPERATION"](#).

If the switch is held in the mist position, low speed operation continues.

FAIL-SAFE FUNCTION

BCM includes fail-safe function to prevent malfunction of electrical components controlled by CAN communications if a malfunction in CAN communications occurs.

BCM uses CAN communications to stop output of electrical components it controls.

Until ignition switch is turned off, front wiper remains in same status as just before fail-safe control was initiated. (If wiper was in low speed operation just before fail-safe, it continues low speed operation until ignition switch is turned OFF.)

When fail-safe status is initiated, BCM remains in standby until normal signals are received.

When normal signals are received, fail-safe status is canceled.

COMBINATION SWITCH READING FUNCTION

Description

- BCM reads combination switch (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).

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.

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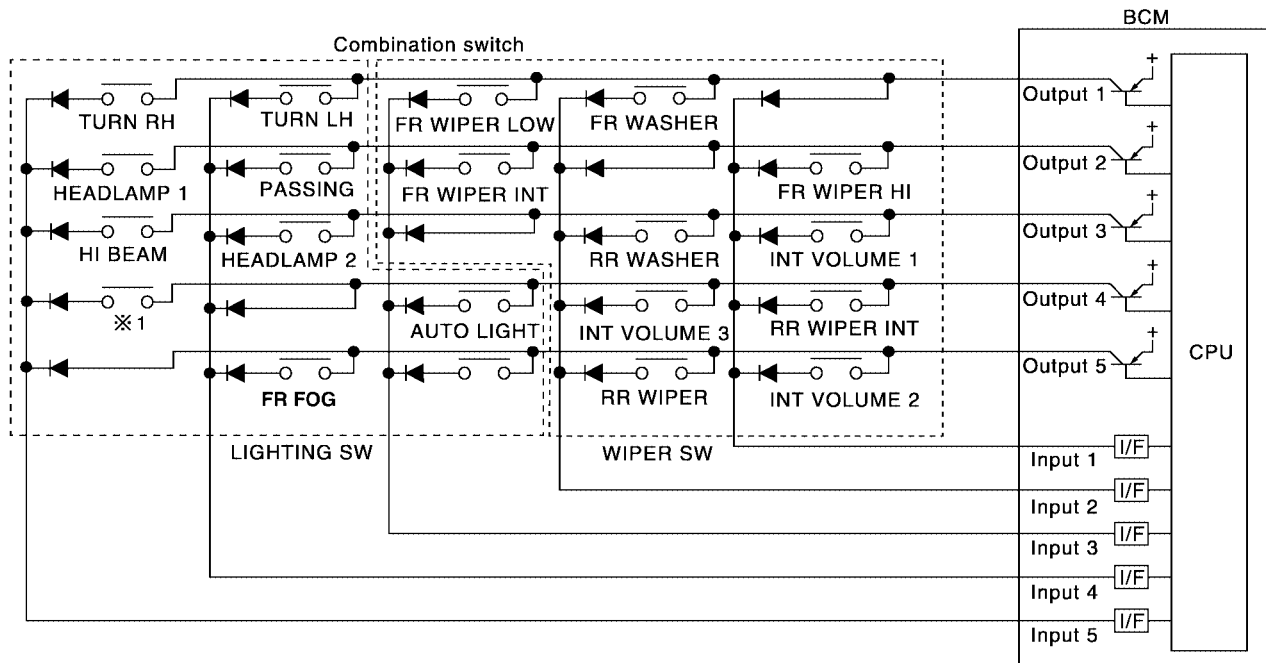
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FRONT WIPER AND WASHER SYSTEM

- 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

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 WASH ON	FR WASH OFF	—	—	RR WASH ON	RR WASH 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	—	—

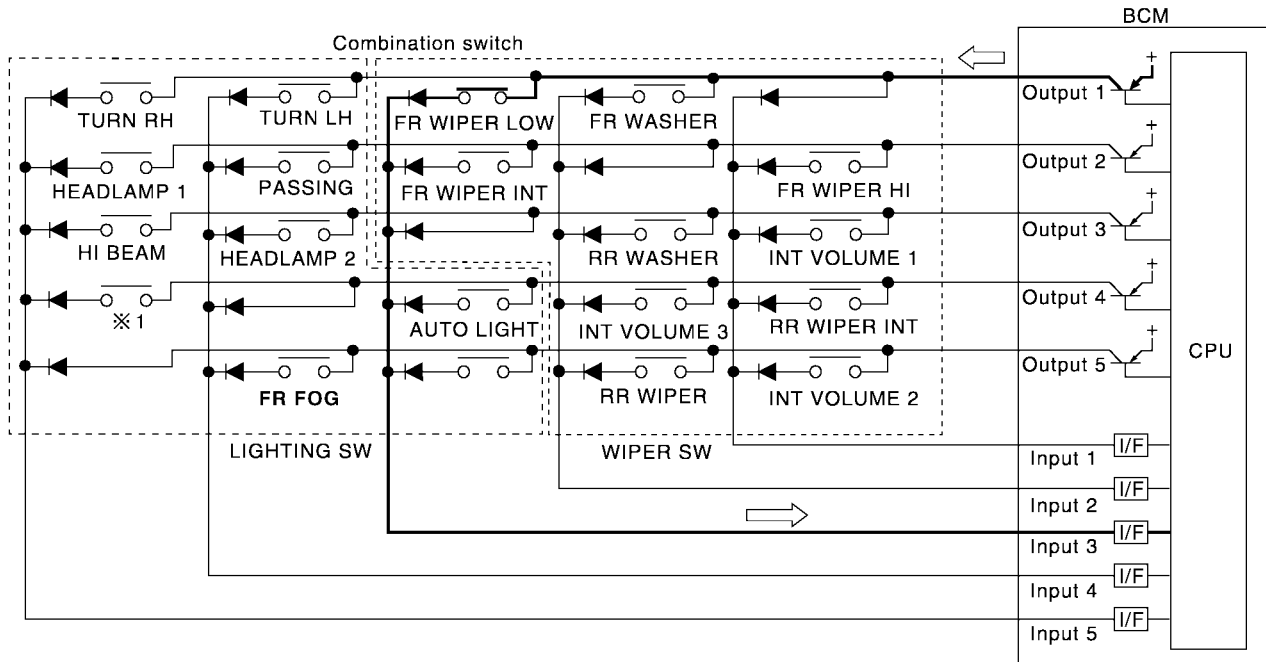
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Sample Operation: (When Wiper Switch is Turned ON)

- When wiper switch is turned ON, contact in combination switch turns ON. At this time, if OUTPUT 1 transistor is activated, BCM detects that voltage changes in INPUT 3.

FRONT WIPER AND WASHER SYSTEM

- When OUTPUT 1 transistor is ON, BCM detects that voltage changes in INPUT 3 and judges that front wiper low is ON. Then BCM sends front wiper request signal (LO) to IPDM E/R using CAN communication.
- When OUTPUT 1 transistor is activated again, BCM detects that voltage changes in INPUT 3 and recognizes that wiper switch is continuously ON.



※ 1 : LIGHTING SWITCH 1ST POSITION

SKIA5290E

NOTE:

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

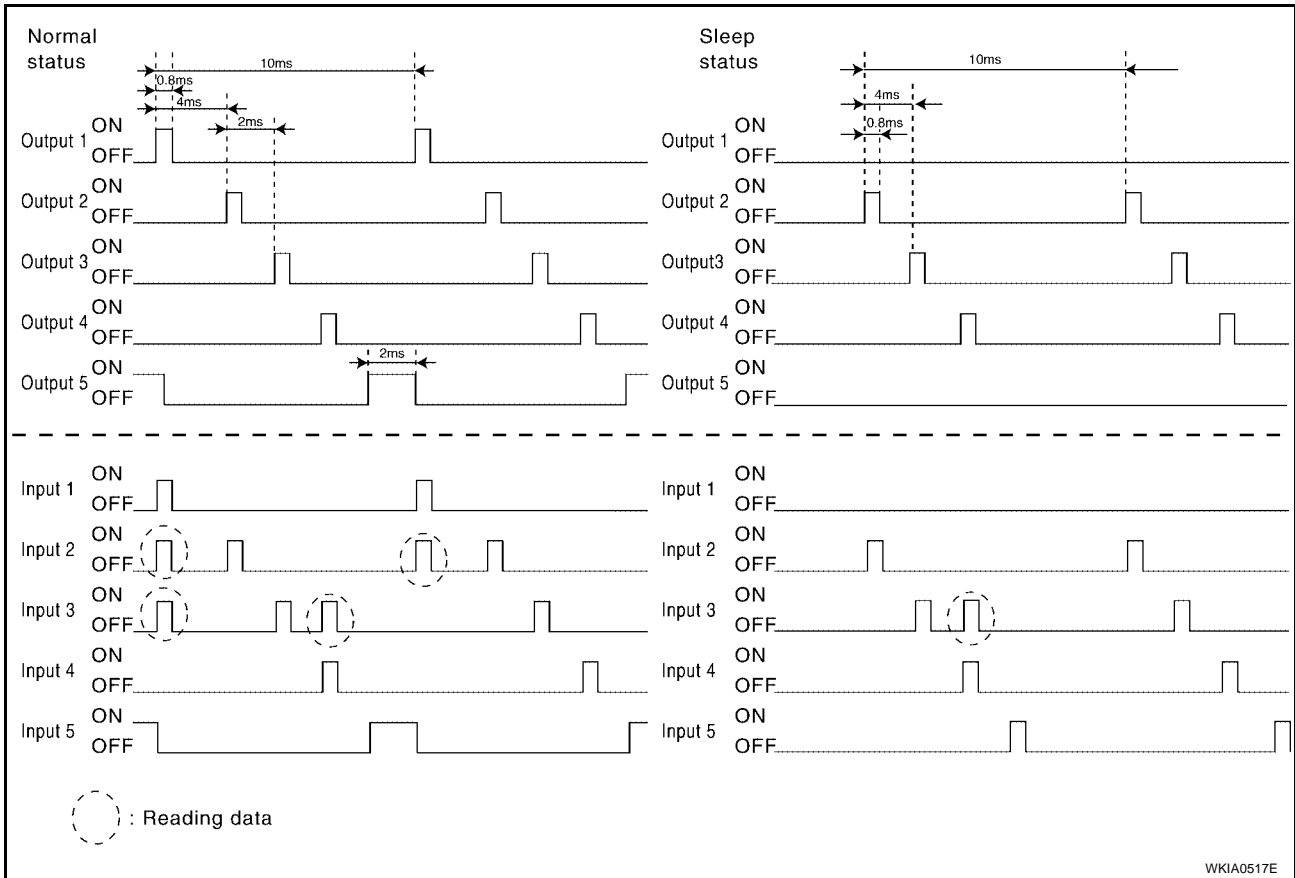
Operation Mode

Combination switch reading function has operation modes shown below.

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

FRONT WIPER AND WASHER SYSTEM

- When BCM is in sleep status, transistors of OUTPUT 1 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 System Description

EKS003UE

Refer to [LAN-8, "CAN COMMUNICATION"](#) .

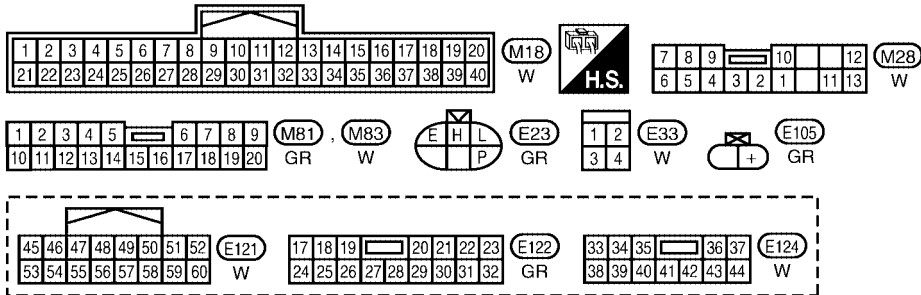
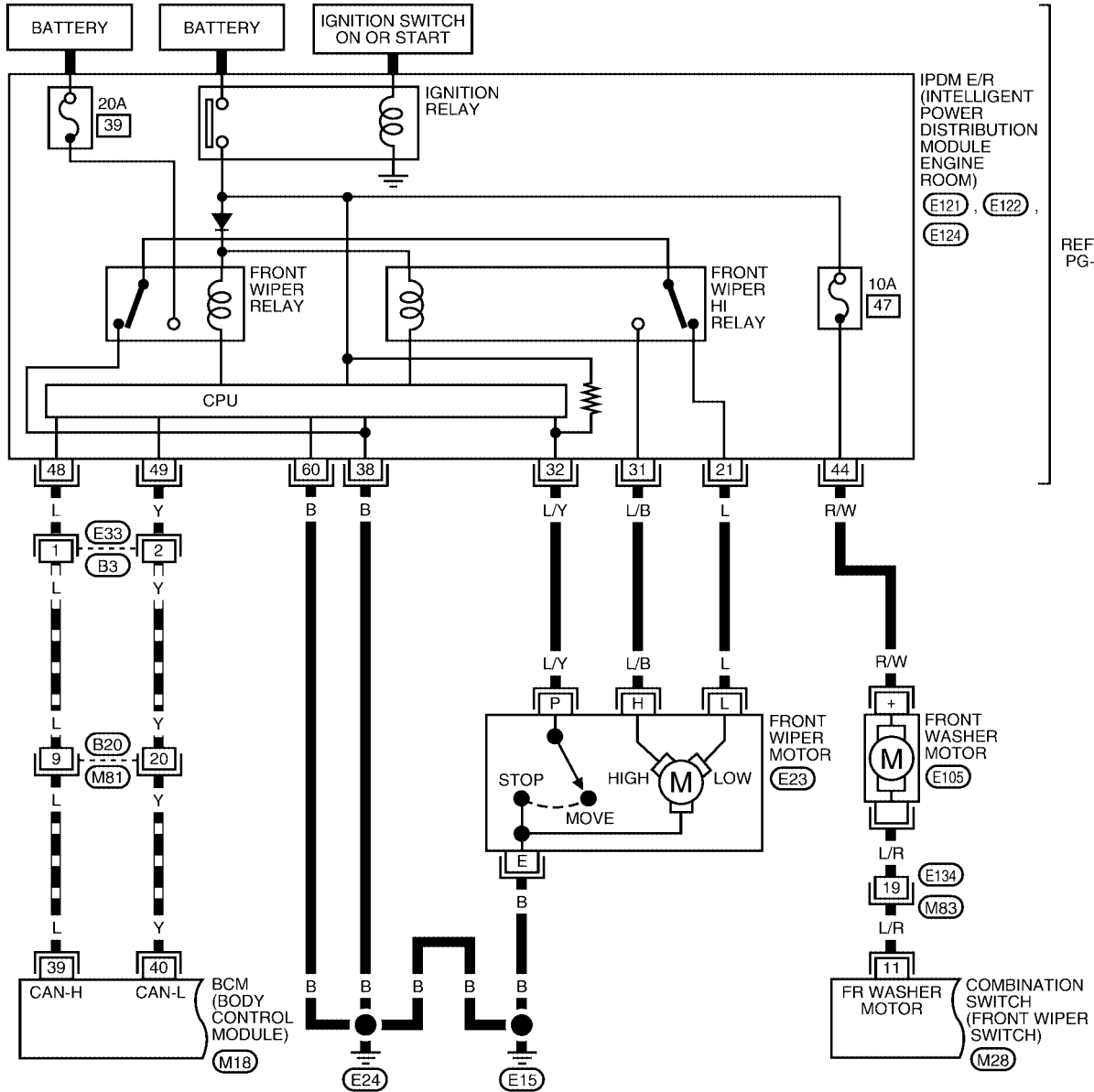
FRONT WIPER AND WASHER SYSTEM

Wiring Diagram — WIPER —

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WW-WIPER-01

— : DATALINE

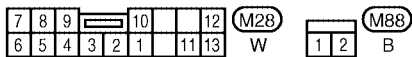
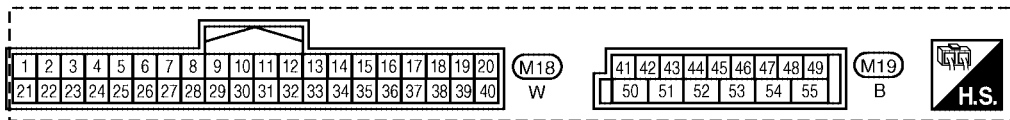
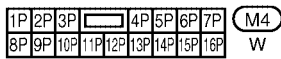
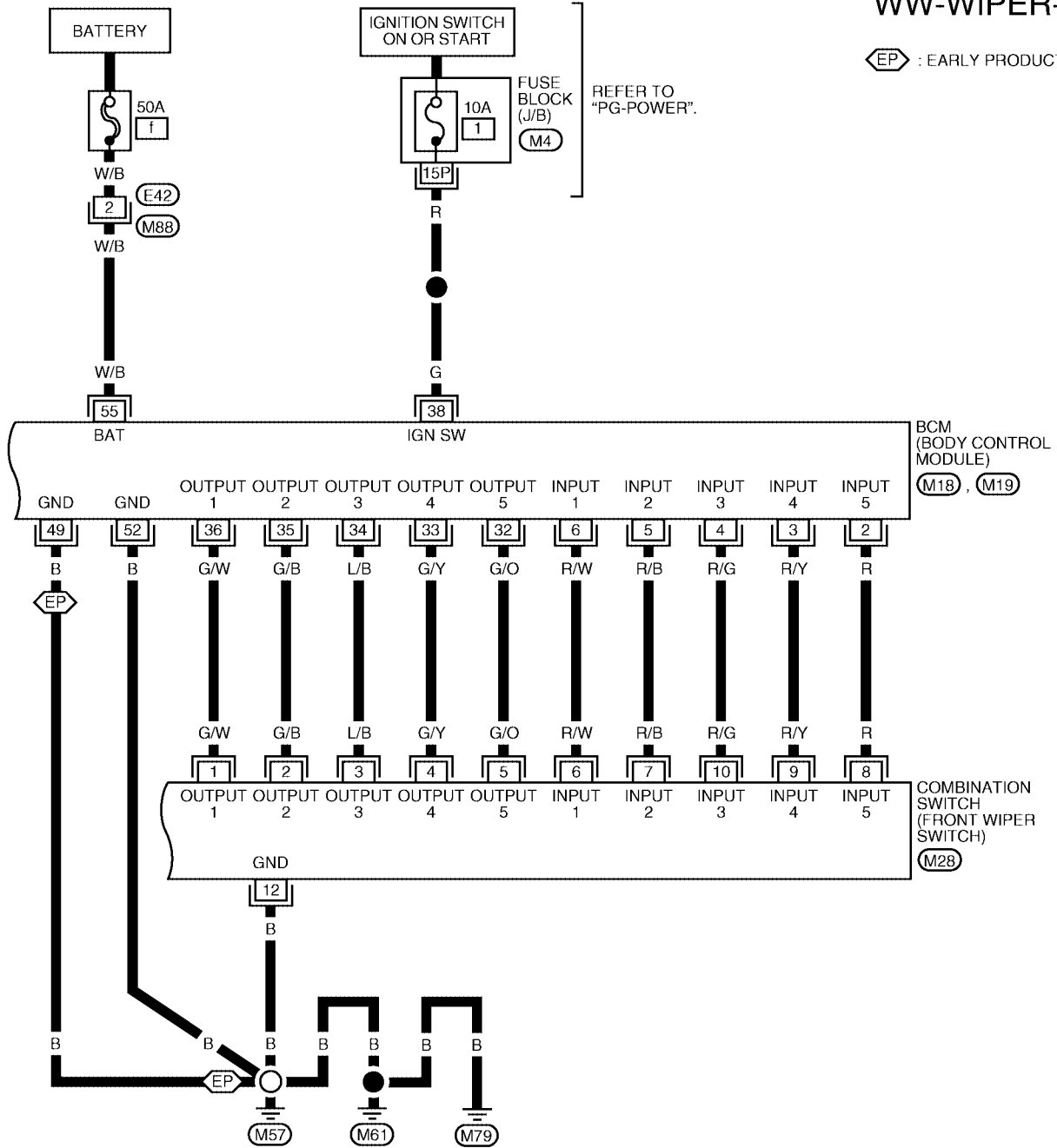


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FRONT WIPER AND WASHER SYSTEM

WW-WIPER-02

EP : EARLY PRODUCTION

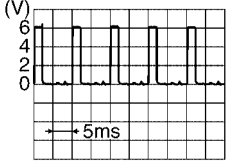


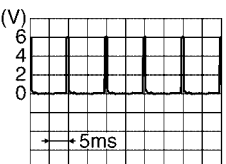
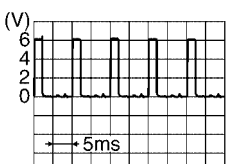




WKWA1805E

FRONT WIPER AND WASHER SYSTEM

Terminals and Reference Value for BCM

EKS003UG

Terminal No. (Wire color)	Signal name	Measuring condition		Reference Value (V) (Approx.)
		Ignition switch	Operation or condition	
2 (R)	Combination switch input 5	ON	<ul style="list-style-type: none"> Light switch and wiper switch OFF Wiper dial position 4 	 <p style="text-align: right;">SKIA5291E</p>
3 (R/Y)	Combination switch input 4	ON	<ul style="list-style-type: none"> Light switch and wiper switch OFF Wiper dial position 4 	 <p style="text-align: right;">SKIA5292E</p>
4 (R/G)	Combination switch input 3	ON	<ul style="list-style-type: none"> Light switch and wiper switch OFF Wiper dial position 4 	 <p style="text-align: right;">SKIA5291E</p>
5 (R/B)	Combination switch input 2	ON	<ul style="list-style-type: none"> Light switch and wiper switch OFF Wiper dial position 4 	 <p style="text-align: right;">SKIA5292E</p>
6 (R/W)	Combination switch input 1	ON		
32 (G/O)	Combination switch output 5	ON	<ul style="list-style-type: none"> Light switch and wiper switch OFF Wiper dial position 4 	 <p style="text-align: right;">SKIA5291E</p>
33 (G/Y)	Combination switch output 4	ON	<ul style="list-style-type: none"> Light switch and wiper switch OFF Wiper dial position 4 	 <p style="text-align: right;">SKIA5292E</p>
34 (L/B)	Combination switch output 3	ON	<ul style="list-style-type: none"> Light switch and wiper switch OFF Wiper dial position 4 	 <p style="text-align: right;">SKIA5291E</p>

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FRONT WIPER AND WASHER SYSTEM

Terminal No. (Wire color)	Signal name	Measuring condition		Reference Value (V) (Approx.)
		Ignition switch	Operation or condition	
35 (G/B)	Combination switch output 2	ON	<ul style="list-style-type: none"> ● Light switch and wiper switch OFF ● Wiper dial position 4 	
36 (G/W)	Combination switch output 1			
38 (G)	Ignition switch (ON)	ON	—	Battery
39 (L)	CAN-H	ON	—	—
40 (Y)	CAN-L	ON	—	—
49 (B) (early production)	Ground	—	—	0
52 (B)	Ground	—	—	0
55 (W/B)	Battery power	OFF	—	Battery

Terminals and Reference Values for IPDM E/R

EKS003UH

Terminal No. (Wire color)	Signal name	Measuring condition		Reference value (V) (Approx.)	
		Ignition switch	Operation or condition		
21 (L)	Low speed signal	ON	Wiper switch	OFF	0
				LO	Battery
31 (L/B)	High speed signal	ON	Wiper switch	OFF	0
				HI	Battery
32 (L/Y)	Wiper auto - stop signal	ON	Wiper operating		Battery
			Wiper stopped		0
38 (B)	Ground	—	—	0	
44 (R/W)	Front washer motor power	ON	—	Battery	
48 (L)	CAN-H	ON	—	—	
49 (Y)	CAN-L	ON	—	—	
60 (B)	Ground	—	—	0	

EKS003UJ

Work Flow

1. Confirm the trouble symptom or customer complaint.
2. Understand the system description, refer to [WW-3, "System Description"](#) .
3. Perform preliminary inspection, refer to [WW-13, "Preliminary Inspection"](#) .
4. According to the trouble diagnosis chart, repair or replace the cause of the malfunction.
5. Does wiper function operate normally? If it operates normally, GO TO 6. If not, GO TO 4.
6. Inspection End.

FRONT WIPER AND WASHER SYSTEM

EKS004T4

Preliminary Inspection INSPECTION FOR POWER SUPPLY AND GROUND CIRCUIT

Inspection procedure

1. CHECK FUSE

Check if wiper and washer fuse is blown.

Unit	Power source	Fuse No.
Front washer motor	Ignition ON or START	47
Front wiper relay	Battery	39
BCM	Ignition ON or START	1
BCM	Battery	f

OK or NG

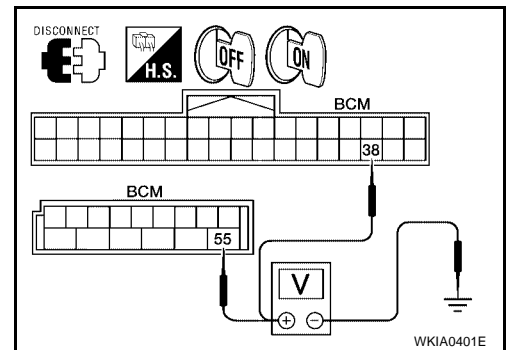
OK >> GO TO 2.

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

2. CHECK POWER SUPPLY CIRCUIT

1. Disconnect BCM connector.
2. Check voltage between BCM harness connector terminals and ground.

Terminals (+)		(-)	Ignition switch position	
Connector	Terminal (Wire color)		OFF	ON
M18	38 (G)	Ground	0V	Battery voltage
M19	55 (W/B)		Battery voltage	Battery voltage



OK or NG

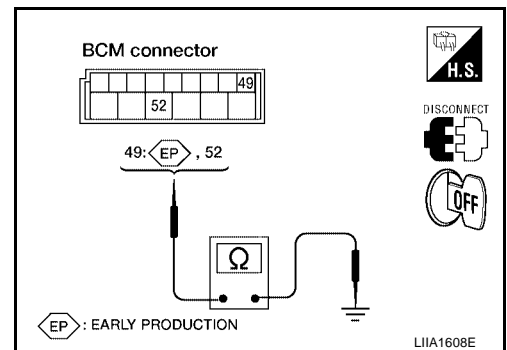
OK >> GO TO 3.

NG >> Check harness for open or short between BCM and fuse.

3. GROUND CIRCUIT INSPECTION (BCM)

Check for continuity between the following terminals on BCM connector and body ground.

Terminals (+)		(-)	Ignition switch condition	Continuity
Connector	Terminal (wire color)			
M19	49 (B) (early production)	Body ground	OFF	Continuity should exist
M19	52 (B)			



OK or NG

OK >> Inspection End.

NG >> Repair/replace BCM ground circuit.

FRONT WIPER AND WASHER SYSTEM

EKS004T5

CONSULT-II Function (BCM)

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

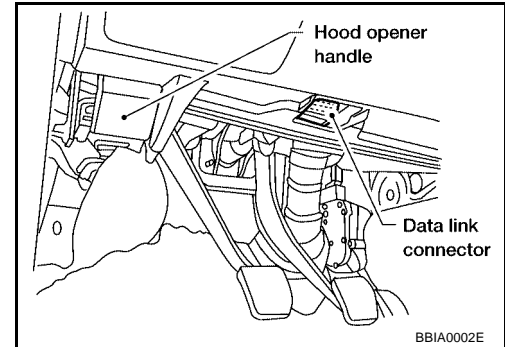
BCM diagnostic test item	Diagnostic mode	Description
Inspection by part	WORK SUPPORT	Supports inspections and adjustments. Commands are transmitted to the BCM for setting the status suitable for required operation, input/output signals are received from the BCM and received data is displayed.
	DATA MONITOR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

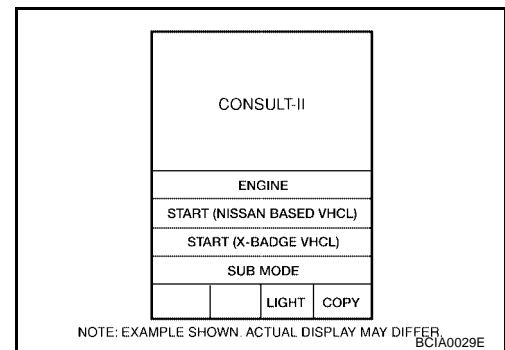
CAUTION:

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.

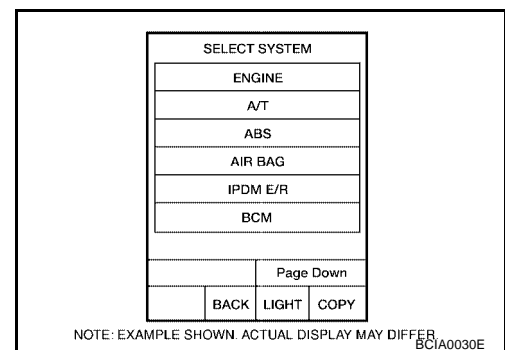
1. With the ignition switch OFF, connect CONSULT-II and CONSULT-II CONVERTER to the data link connector, then turn the ignition switch ON.



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



3. Touch "BCM" on the "SELECT SYSTEM" screen. If "BCM" is not indicated, go to [GI-36, "CONSULT-II Data Link Connector \(DLC\) Circuit"](#).



FRONT WIPER AND WASHER SYSTEM

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

SELECT TEST ITEM			
HEAD LAMP			
WIPER			
FLASHER			
AIR CONDITIONER			
COMB SW			
BCM			
Scroll Up		Page Down	
BACK	LIGHT	COPY	

LKIA0183E

A
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DATA MONITOR

Operation Procedure

1. Touch "WIPER" on the "SELECT TEST ITEM" screen.
2. Touch "DATA MONITOR" on the "SELECT DIAG MODE" screen.
3. Touch either "ALL SIGNALS" or "SELECTION FROM MENU" on the "DATA MONITOR" screen.

ALL SIGNALS	Monitors all the items.
SELECTION FROM MENU	Selects and monitors the individual item selected.

4. Touch "START".
5. When "SELECTION FROM MENU" is selected, touch items to be monitored. When "ALL SIGNALS" is selected, all the items will be monitored.
6. Touch "RECORD" while monitoring to record the status of the item being monitored. To stop recording, touch "STOP".

Display Item List

Monitor item name "OPERATION OR UNIT"	Contents
IGN ON SW "ON/OFF"	Displays "IGN Position (ON)/OFF, ACC Position (OFF)" status as judged from ignition switch signal.
FR WIPER HI "ON/OFF"	Displays "Front Wiper HI (ON)/Other (OFF)" status as judged from wiper switch signal.
FR WIPER LOW "ON/OFF"	Displays "Front Wiper LOW (ON)/Other (OFF)" status as judged from wiper switch signal.
FR WIPER INT "ON/OFF"	Displays "Front Wiper INT (ON)/Other (OFF)" status as judged from wiper switch signal.
FR WASHER SW "ON/OFF"	Displays "Front Washer Switch (ON)/Other (OFF)" status as judged from wiper switch signal.
INT VOLUME (1 - 7)	Displays intermittent operation dial position setting (1 - 7) as judged from wiper switch signal.
FR WIPER STOP "ON/OFF"	Displays "Stopped (ON)/Operating (OFF)" status as judged from the auto-stop signal.
VEHICLE SPEED "ON/OFF"	Displays "Driving (ON)/Stopped (OFF)" status as judged from vehicle speed signal.

WW

L
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ACTIVE TEST

Operation Procedure

1. Touch "WIPER" on the "SELECT TEST ITEM" screen.
2. Touch "ACTIVE TEST" on the "SELECT DIAG MODE" screen.
3. Touch item(s) to be tested and check operation of the selected item(s).
4. During the operation check, touching "BACK" deactivates the operation.

FRONT WIPER AND WASHER SYSTEM

Display Item List

Test item	Display on CONSULT-II screen	Description
Front wiper HI output	FR WIPER (HI)	Front wiper HI can be operated by any ON-OFF operation.
Front wiper LO output	FR WIPER (LO)	Front wiper LO can be operated by any ON-OFF operation.
Front wiper INT output	FR WIPER (INT)	Front wiper INT can be operated by any ON-OFF operation.

CONSULT-II Function (IPDM E/R)

EKS005K7

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

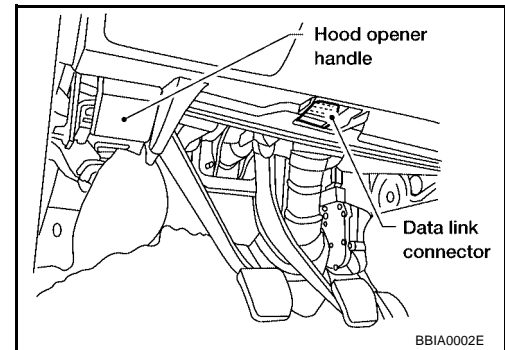
IPDM E/R diagnostic Mode	Description
SELF-DIAG RESULTS	Displays IPDM E/R self-diagnosis results.
DATA MONITOR	Displays IPDM E/R input/output data in real time.
CAN DIAG SUPPORT MNTR	The result of transmit/receive diagnosis of CAN communication can be read.
ACTIVE TEST	Operation of electrical loads can be checked by sending drive signal to them.

CONSULT-II OPERATION

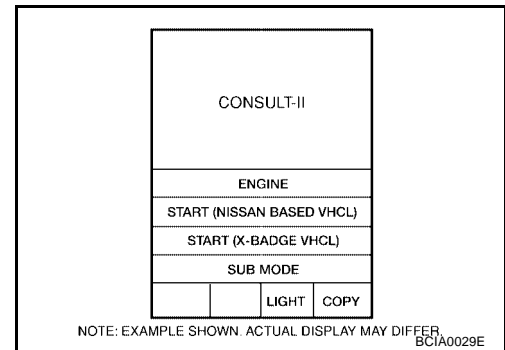
CAUTION:

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.

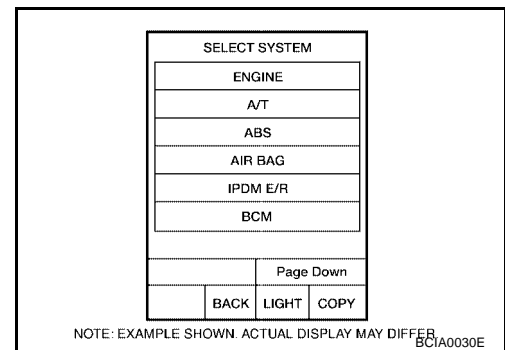
1. With the ignition switch OFF, connect CONSULT-II and CONSULT-II CONVERTER to the data link connector, then turn the ignition switch ON.



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

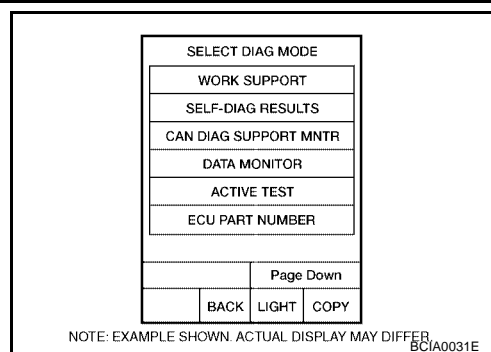


3. Touch "IPDM E/R" on "SELECT SYSTEM" screen. If "IPDM E/R" is not displayed, go to [GI-36, "CONSULT-II Data Link Connector \(DLC\) Circuit"](#).



FRONT WIPER AND WASHER SYSTEM

- Select the desired part to be diagnosed on the "SELECT DIAG MODE" screen.



DATA MONITOR

Operation Procedure

- Touch "WIPER" on the "SELECT TEST ITEM" screen.
- Touch "DATA MONITOR" on the "SELECT DIAG MODE" screen.
- Touch "ALL SIGNALS", "MAIN SIGNALS" or "SELECTION FROM MENU" on the "DATA MONITOR" screen.

ALL SIGNALS	Monitors all the items.
MAIN SIGNALS	Monitors predetermined items.
SELECTION FROM MENU	Selects and monitors the individual item selected.

- Touch "START".
- When "SELECTION FROM MENU" is selected, touch items to be monitored. When "ALL SIGNALS" is selected, all the items will be monitored.
- Touch "RECORD" while monitoring to record the status of the item being monitored. To stop recording, touch "STOP".

All Items, Main Items, Select Item Menu

Item name	CONSULT-II screen display	Display or unit	Monitor item selection			Description
			ALL SIGNALS	MAIN SIGNALS	SELECT FROM MENU	
FR wiper request	FR WIP REQ	STOP/1LO/LO/HI	x	x	x	Signal status input form BCM.
Wiper auto stop	WIP AUTO STOP	ACT P/STOP P	x	x	x	Output status of IPDM E/R.
Wiper protection	WIP PROT	OFF/LS/HS/BLOCK	x	x	x	Control status of IPDM E/R.

NOTE:

Perform monitoring of IPDM E/R data with the ignition switch ON. When the ignition switch is at ACC, the display may not be correct.

ACTIVE TEST

Operation Procedure

- Touch "WIPER" on the "SELECT TEST ITEM" screen.
- Touch "ACTIVE TEST" on the "SELECT DIAG MODE" screen.
- Touch item(s) to be tested and check operation of the selected item(s).
- During the operation check, touching "BACK" deactivates the operation.

Display Item List

Test item	CONSULT-II screen display	Description
Front wiper (HI, LO) output	FRONT WIPER	With a certain operation (OFF, HI ON, LO ON) front wiper relays can be operated.

FRONT WIPER AND WASHER SYSTEM

EKS003UM

Trouble Diagnosis FRONT WIPER DOES NOT OPERATE

Inspection Procedure

1. CHECK IPDM E/R TO FRONT WIPERS (1)

Ⓟ With CONSULT-II

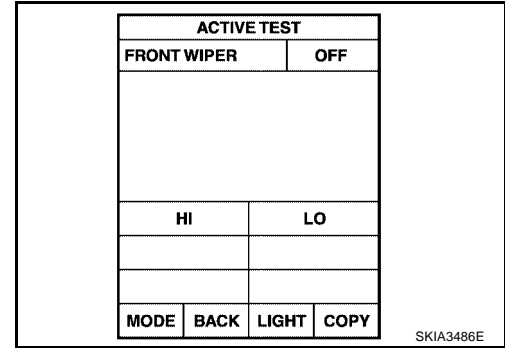
- Select "IPDM E/R" with CONSULT-II and select "ACTIVE TEST" on "SELECT DIAG MODE" screen.
- Select "FRONT WIPER" on "SELECT TEST ITEM" screen.

ⓧ Without CONSULT-II

- Turn on front wipers using active test. Refer to [PG-20, "Auto Active Test"](#).
- Confirm front wiper operation.

OK or NG

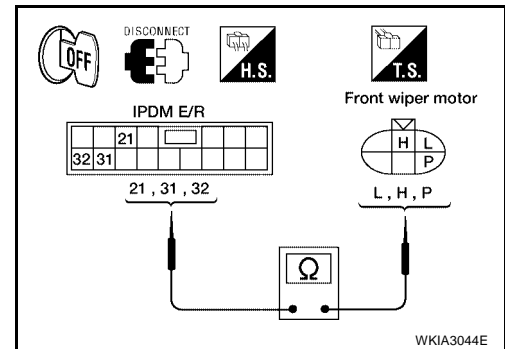
- OK >> GO TO 4.
NG >> GO TO 2.



2. IPDM E/R TO FRONT WIPERS (2) INSPECTION

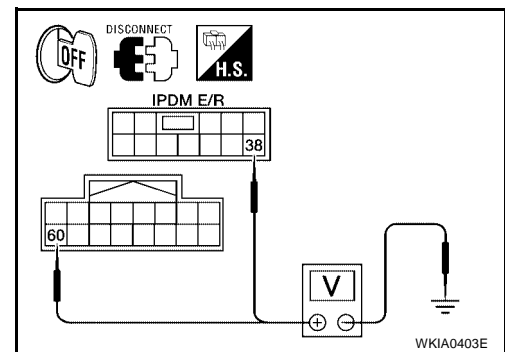
- Disconnect IPDM E/R connector and front wiper motor connector.
- Check continuity between IPDM E/R harness connector terminals and front wiper motor harness connector terminals.

Terminals				Continuity
(+)		(-)		
Connector	Terminal (wire color)	Connector	Terminal (wire color)	
E122	31 (L/B)	E23	H (L/B)	YES
	21 (L)		L (L)	
	32 (L/Y)		P (L/Y)	



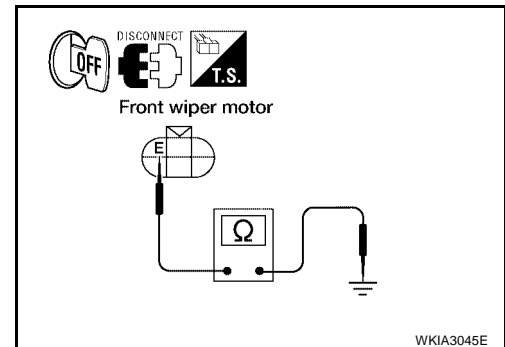
- Check continuity between IPDM E/R harness connector terminal and body ground.

Terminals			Continuity
(+)		(-)	
Connector	Terminal (wire color)		
E121	60 (B)	Body ground	YES
E124	38 (B)		



- Check continuity between front wiper motor harness connector terminal E and body ground.

Terminals			Continuity
(+)		(-)	
Connector	Terminal (wire color)		
E23	E (B)	Body ground	YES



OK or NG

- OK >> Connect connector. GO TO 3.
NG >> Check for open circuit in harness between front wiper motor and body ground.

FRONT WIPER AND WASHER SYSTEM

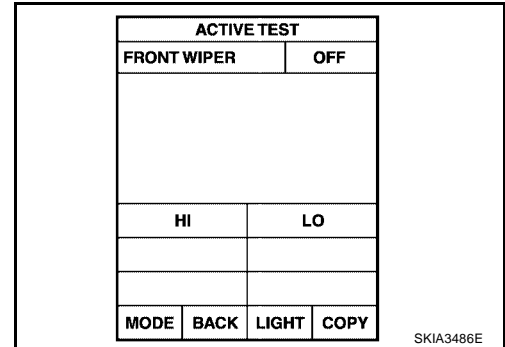
3. IPDM E/R INSPECTION

Ⓜ With CONSULT-II

1. Select "IPDM E/R" with CONSULT-II and select "ACTIVE TEST" on "SELECT DIAG MODE" screen.
2. Select "FRONT WIPER HI" on "SELECT TEST ITEM" screen.

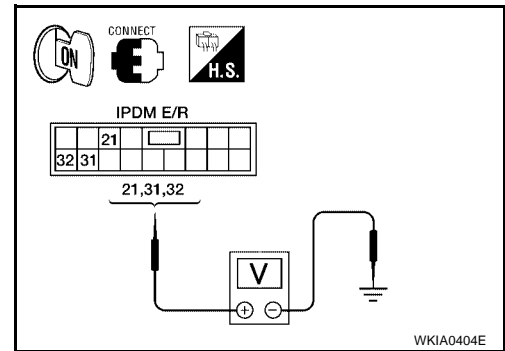
ⓧ Without CONSULT-II

1. Turn on front wipers using active test. Refer to [PG-20, "Auto Active Test"](#).



When front wiper relay, and front wiper HI relay are operating, check voltage between IPDM E/R terminals and body ground.

Terminals		(-)	Condition	Voltage (Approx.)
(+)	Terminal (wire color)			
E122	21 (L)	Ground	Stopped	0
			LO operation	Battery voltage
	31 (L/B)		Stopped	0
			HI operation	Battery voltage
	32 (L/Y)		LO operation	0
			Stopped	Battery voltage



OK or NG

- OK >> Replace wiper motor. Refer to [WW-26, "Removal and Installation for Wiper Motor and Linkage"](#).
- NG >> Replace IPDM E/R. Refer to [PG-26, "Removal and Installation of IPDM E/R"](#).

4. COMBINATION SWITCH TO BCM (1) INSPECTION

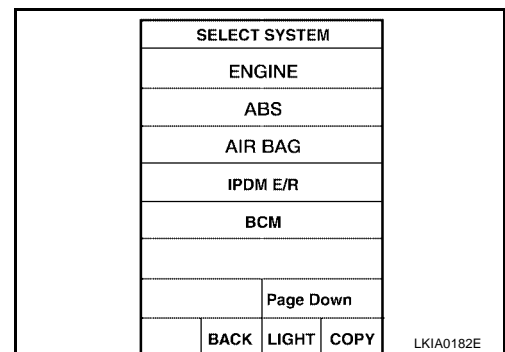
Select "BCM" on CONSULT-II. Carry out self-diagnosis of BCM.

Displayed self-diagnosis results

No malfunction detected>> GO TO 5.

CAN communications or CAN system>> Inspect the BCM CAN communication system. Go to [BCS-13, "CAN Communication Inspection Using CONSULT-II \(Self-Diagnosis\)"](#).

OPEN DETECT 1 - 5>>Combination switch system malfunction. Go to [WW-5, "COMBINATION SWITCH READING FUNCTION"](#).



FRONT WIPER AND WASHER SYSTEM

5. COMBINATION SWITCH TO BCM (2) INSPECTION

Select "BCM" on CONSULT-II. With "WIPER" data monitor, check that "FR WIPER INT", "FR WIPER LOW" and "FR WIPER HI" turn ON-OFF according to operation of wiper switch.

OK or NG

- OK >> Replace BCM. Refer to [BCS-19, "Removal and Installation of BCM"](#).
- NG >> Replace wiper switch. Refer to [WW-28, "Removal and Installation for Wiper and Washer Switch"](#).

DATA MONITOR	
MONITOR	NODTC
IGN ON SW	OFF
FR WIPER HI	OFF
FR WIPER LOW	OFF
FR WIPER INT	OFF
FR WASHER SW	OFF
INT VOLUME	5 rpm
FR WIPER STOP	OFF
RR WIPER ON	OFF
RR WIPER INT	ON
PAGE DOWN	
RECORD	
MODE	BACK LIGHT COPY

WKIA0405E

FRONT WIPER STOP POSITION IS INCORRECT

Inspection Procedure

1. IPDM E/R TO FRONT WIPER MOTOR (1) INSPECTION

With CONSULT-II

Select "IPDM E/R" with CONSULT-II. With data monitor, confirm that "WIP AUTO STOP" changes from "ACT P" to "STOP P" according to wiper operation.

Without CONSULT-II

GO TO 2.

OK or NG

- OK >> Replace IPDM E/R. Refer to [PG-26, "Removal and Installation of IPDM E/R"](#).
- NG >> GO TO 2.

DATA MONITOR	
MONITOR	
MOTOR FAN REQ	1
AC COMP REQ	OFF
TAIL&CLR REQ	OFF
HL LO REQ	OFF
HL HI REQ	OFF
FR FOG REQ	OFF
FR WIP REQ	STOP
WIP AUTO STOP	STOP P
WIP PROT	OFF
Page DOWN	
RECORD	
MODE	BACK LIGHT COPY

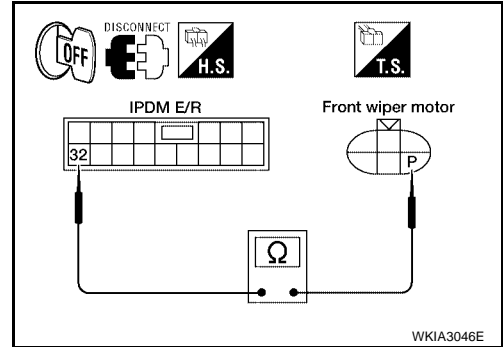
SKIA5301E

FRONT WIPER AND WASHER SYSTEM

2. IPDM E/R TO FRONT WIPER MOTOR (2) INSPECTION

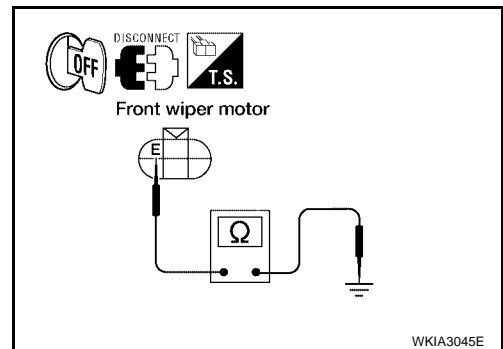
1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector and front wiper motor connector.
3. Check continuity between IPDM E/R harness connector terminal and front wiper motor harness connector terminal.

Terminals				Continuity
(+)		(-)		
Connector	Terminal (wire color)	Connector	Terminal (wire color)	
E122	32 (L/Y)	E23	P (L/Y)	YES



4. Check continuity between front wiper motor harness connector terminal E and body ground.

Terminals			Continuity
(+)		(-)	
Connector	Terminal (wire color)	Ground	
E23	E (B)	Ground	YES



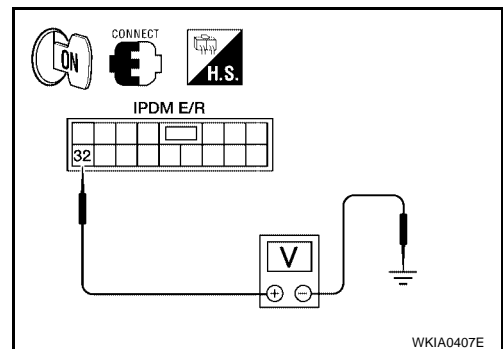
OK or NG

- OK >> Connect connector. GO TO 3.
- NG >>
 - Check for short circuit or open circuit in harness between IPDM E/R and front wiper motor.
 - Check for open circuit in harness between front wiper motor and body ground.

3. IPDM E/R TO FRONT WIPER MOTOR (3) INSPECTION

While front wiper motor is stopped and while operating, measure voltage between IPDM E/R terminal 32 and body ground.

Terminals				Voltage (Approx.)
(+)		(-)	Condition	
Connector	Terminal (wire color)	Ground		
E122	32 (L/Y)	Ground	Wiper operating	Fluctuating
			Wiper stopped	12V



OK or NG

- OK >> Replace IPDM E/R. Refer to [PG-26, "Removal and Installation of IPDM E/R"](#).
- NG >> Replace front wiper motor. Refer to [WW-26, "Removal and Installation for Wiper Motor and Linkage"](#).

FRONT WIPER AND WASHER SYSTEM

ONLY FRONT WIPER LOW DOES NOT OPERATE

Inspection Procedure

1. COMBINATION SWITCH TO BCM INSPECTION

Select "BCM" on CONSULT-II. With "WIPER" data monitor, check that "FR WIPER LOW" turns ON-OFF according to operation of wiper switch.

OK or NG

- OK >> Replace BCM. Refer to [BCS-19, "Removal and Installation of BCM"](#) .
- NG >> Replace wiper switch. Refer to [WW-28, "Removal and Installation for Wiper and Washer Switch"](#) .

DATA MONITOR	
MONITOR	NODTC
IGN ON SW	OFF
FR WIPER HI	OFF
FR WIPER LOW	OFF
FR WIPER INT	OFF
FR WASHER SW	OFF
INT VOLUME	5 rpm
FR WIPER STOP	OFF
RR WIPER ON	OFF
RR WIPER INT	ON

PAGE DOWN			
RECORD			
MODE	BACK	LIGHT	COPY

WKIA0405E

ONLY FRONT WIPER HI DOES NOT OPERATE

Inspection Procedure

1. IPDM E/R TO FRONT WIPERS (1) INSPECTION

☐ With CONSULT-II

1. Select "IPDM E/R" with CONSULT-II and select "ACTIVE TEST" on "SELECT DIAG MODE" screen.
2. Select "FRONT WIPER" on "SELECT TEST ITEM" screen.

⊗ Without CONSULT-II

1. Turn on front wipers using active test. Refer to [PG-20, "Auto Active Test"](#) .
2. Confirm front wiper operation.

OK or NG

- OK >> GO TO 4.
- NG >> GO TO 2.

ACTIVE TEST			
FRONT WIPER	OFF		
HI	LO		
MODE	BACK	LIGHT	COPY

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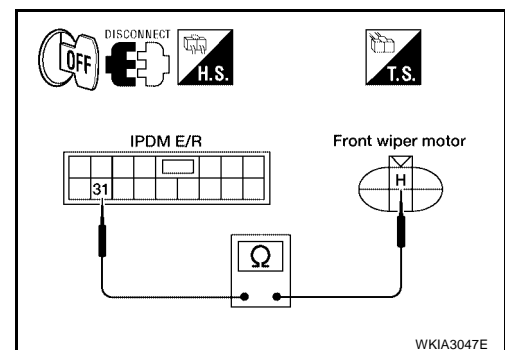
2. IPDM E/R TO FRONT WIPERS (2) INSPECTION

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector and front wiper motor connector.
3. Check continuity between IPDM E/R harness connector E122 terminal 31 (L/B) and front wiper motor harness connector E23 terminal H (L/B).

Terminals				Continuity
(+)		(-)		
Connector	Terminal (wire color)	Connector	Terminal (wire color)	
E122	31 (L/B)	E23	H (L/B)	YES

OK or NG

- OK >> Connect connector. GO TO 3.
- NG >> Check for short circuit or open circuit in harness between IPDM E/R and front wiper motor.



FRONT WIPER AND WASHER SYSTEM

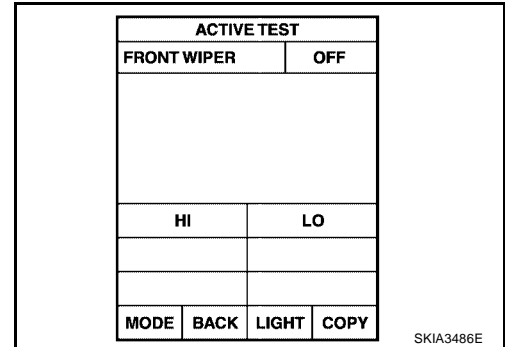
3. IPDM E/R INSPECTION

Ⓟ With CONSULT-II

1. Select "IPDM E/R" with CONSULT-II and select "ACTIVE TEST" on "SELECT DIAG MODE" screen.
2. Select "FRONT WIPER HI" on "SELECT TEST ITEM" screen.

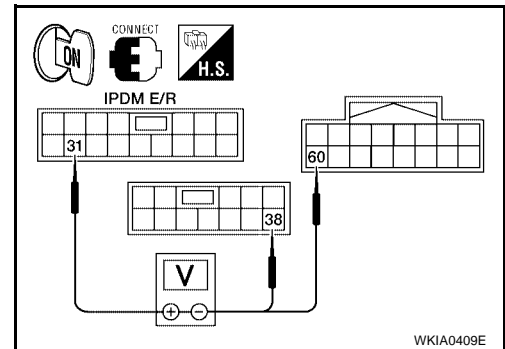
ⓧ Without CONSULT-II

1. Turn on front wipers using active test. Refer to [PG-20, "Auto Active Test"](#) .



When front wiper relay (HI) is operating, check voltage between IPDM E/R terminal 31 (L/B) and terminals 38 (B), 60 (B).

Terminals			Voltage (Approx.)
IPDM E/R			
Connector	Terminal (wire color)	Terminal (wire color)	
E122	31 (L/B)	38 (B)	12
E122	31 (L/B)	60 (B)	12



OK or NG

- OK >> Replace wiper motor. Refer to [WW-26, "Removal and Installation for Wiper Motor and Linkage"](#) .
- NG >> Replace IPDM E/R. Refer to [PG-26, "Removal and Installation of IPDM E/R"](#) .

4. COMBINATION SWITCH TO BCM INSPECTION

Select "BCM" on CONSULT-II. With "WIPER" data monitor, check that "FR WIPER HI" turns ON-OFF according to operation of wiper switch.

OK or NG

- OK >> Replace BCM. Refer to [BCS-19, "Removal and Installation of BCM"](#) .
- NG >> Replace wiper switch. Refer to [WW-28, "Removal and Installation for Wiper and Washer Switch"](#) .

DATA MONITOR	
MONITOR	NODTC
IGN ON SW	OFF
FR WIPER HI	OFF
FR WIPER LOW	OFF
FR WIPER INT	OFF
FR WASHER SW	OFF
INT VOLUME	5 rpm
FR WIPER STOP	OFF
RR WIPER ON	OFF
RR WIPER INT	ON
PAGE DOWN	
RECORD	
MODE	BACK
LIGHT	COPY

WKIA0405E

ONLY FRONT WIPER INT DOES NOT OPERATE

Inspection Procedure

1. COMBINATION SWITCH TO BCM INSPECTION

Select "BCM" on CONSULT-II. With "WIPER" data monitor, check that "FR WIPER INT" turns ON-OFF according to operation of wiper switch.

OK or NG

- OK >> Replace BCM. Refer to [BCS-19, "Removal and Installation of BCM"](#) .
- NG >> Replace wiper switch. Refer to [WW-28, "Removal and Installation for Wiper and Washer Switch"](#) .

DATA MONITOR	
MONITOR	NODTC
IGN ON SW	OFF
FR WIPER HI	OFF
FR WIPER LOW	OFF
FR WIPER INT	OFF
FR WASHER SW	OFF
INT VOLUME	5 rpm
FR WIPER STOP	OFF
RR WIPER ON	OFF
RR WIPER INT	ON
PAGE DOWN	
RECORD	
MODE	BACK
LIGHT	COPY

WKIA0405E

FRONT WIPER AND WASHER SYSTEM

FRONT WIPER INTERMITTENT OPERATION SWITCH POSITION CANNOT BE ADJUSTED

Inspection Procedure

1. COMBINATION SWITCH TO BCM INSPECTION

Select "BCM" on CONSULT-II. With "WIPER" data monitor, check that "INT VOLUME" changes in order from 1 to 7 according to operation of the intermittent switch dial position.

OK or NG

- OK >> Replace BCM. Refer to [BCS-19, "Removal and Installation of BCM"](#).
- NG >> Replace wiper switch. Refer to [WW-28, "Removal and Installation for Wiper and Washer Switch"](#).

DATA MONITOR	
MONITOR	NODTC
IGN ON SW	OFF
FR WIPER HI	OFF
FR WIPER LOW	OFF
FR WIPER INT	OFF
FR WASHER SW	OFF
INT VOLUME	5 rpm
FR WIPER STOP	OFF
RR WIPER ON	OFF
RR WIPER INT	ON

PAGE DOWN			
RECORD			
MODE	BACK	LIGHT	COPY

WKIA0405E

WIPERS DO NOT WIPE WHEN FRONT WASHER OPERATES

Inspection Procedure

1. COMBINATION SWITCH TO BCM INSPECTION

Select "BCM" on CONSULT-II. With "WIPER" data monitor, check that "FR WASHER SW" turns ON-OFF according to operation of front washer switch.

OK or NG

- OK >> Replace BCM. Refer to [BCS-19, "Removal and Installation of BCM"](#).
- NG >> Replace wiper switch. Refer to [WW-28, "Removal and Installation for Wiper and Washer Switch"](#).

DATA MONITOR	
MONITOR	
IGN ON SW	ON
FR WIPER INT	OFF
FR WIPER LOW	OFF
FR WIPER HI	OFF
FR WASHER SW	OFF
INT VOLUME	5
VHCL SPEED SEN	OFF
FR WIPER STOP	ON

LKIA0102E

FRONT WIPERS OPERATE FOR 10 SECONDS, STOP FOR 20 SECONDS, AND AFTER REPEATING THIS OPERATION FIVE TIMES, THEY BECOME INOPERATIVE

CAUTION:

- When auto stop signal has not varied for 10 seconds or longer while IPDM E/R is operating front wipers, IPDM E/R considers front wipers locked and stops wiper output, which causes this symptom.
- This status can be checked by using IPDM E/R "DATA MONITOR". Under this condition, "WIPER PROT" reads "BLOCK".

Inspection Procedure

1. IPDM E/R TO FRONT WIPER MOTOR (1) INSPECTION

④ With CONSULT-II

Select "IPDM E/R" with CONSULT-II. With data monitor, confirm that "WIP AUTO STOP" changes from "ACT P" to "STOP P" according to wiper operation.

⊗ Without CONSULT-II

GO TO 2.

OK or NG

- OK >> Replace IPDM E/R. Refer to [PG-26, "Removal and Installation of IPDM E/R"](#).
- NG >> GO TO 2.

DATA MONITOR	
MONITOR	
MOTOR FAN REQ	1
AC COMP REQ	OFF
TAIL&CLR REQ	OFF
HL LO REQ	OFF
HL HI REQ	OFF
FR FOG REQ	OFF
FR WIP REQ	STOP
WIP AUTO STOP	STOP P
WIP PROT	OFF

Page DOWN			
RECORD			
MODE	BACK	LIGHT	COPY

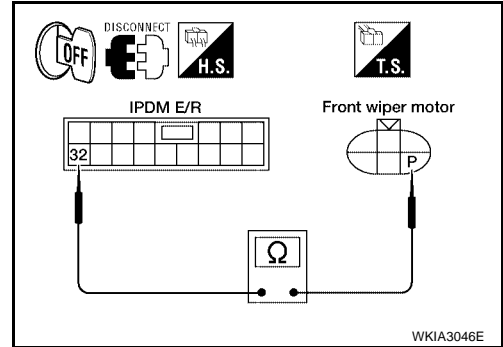
SKIA5301E

FRONT WIPER AND WASHER SYSTEM

2. IPDM E/R TO FRONT WIPER MOTOR (2) INSPECTION

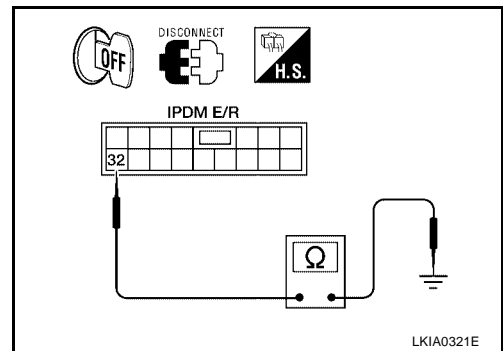
1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector and front wiper motor connector.
3. Check continuity between IPDM E/R harness connector terminal and front wiper motor harness connector terminal.

Terminals				Continuity
(+)		(-)		
Connector	Terminal (wire color)	Connector	Terminal (wire color)	
E122	32 (L/Y)	E23	P (L/Y)	YES



4. Check continuity between IPDM E/R harness connector terminal and body ground.

Terminals			Continuity
(+)		(-)	
Connector	Terminal (wire color)	Ground	
E122	32 (L/Y)	Ground	NO



OK or NG

- OK >> Connect connectors. GO TO 3.
- NG >> Repair harness or connector.

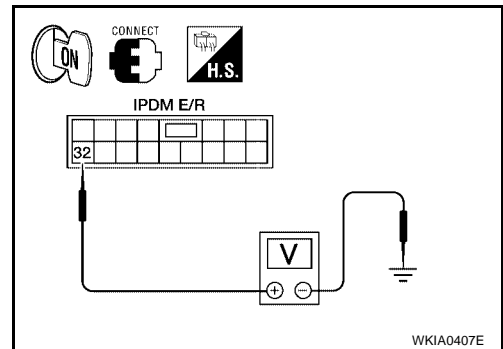
3. IPDM E/R TO FRONT WIPER MOTOR (3) INSPECTION

While front wiper motor is stopped and while operating, measure voltage between IPDM E/R terminal 32 and body ground.

Terminals				Voltage (Approx.)
(+)		(-)	Condition	
Connector	Terminal (wire color)	Ground	Condition	
E122	32 (L/Y)	Ground	Wiper operating	12V
			Wiper stopped	Fluctuating

OK or NG

- OK >> Replace IPDM E/R. Refer to [PG-26, "Removal and Installation of IPDM E/R"](#) .
- NG >> Replace front wiper motor. Refer to [WW-26, "Removal and Installation for Wiper Motor and Linkage"](#) .



FRONT WIPER AND WASHER SYSTEM

Removal and Installation for Front Wiper Arms, Adjustment for Wiper Arms Stop Location

EKS003UN

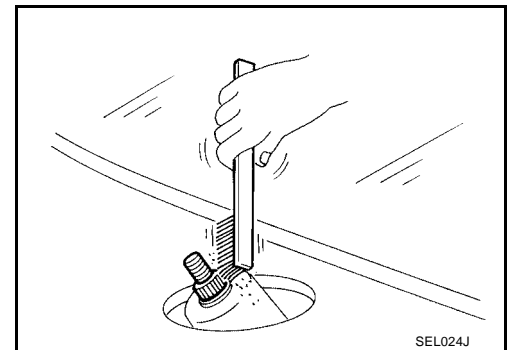
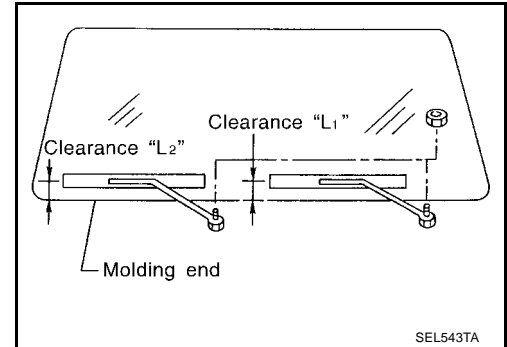
1. Prior to wiper arm installation, turn on wiper switch to operate wiper motor and then turn it "OFF" (Auto Stop).
2. Lift the blade up and then set it down onto glass surface to set the blade center to clearance "L1" and "L2" immediately before tightening nut.
3. Eject washer fluid. Turn on wiper switch to operate wiper motor and then turn it "OFF".
4. Ensure that wiper blades stop within clearance "L1" and "L2".

Clearance "L1" : 30.5 - 45.5 mm (1.201 - 1.791 in)

Clearance "L2" : 32.5 - 47.5 mm (1.280 - 1.870 in)

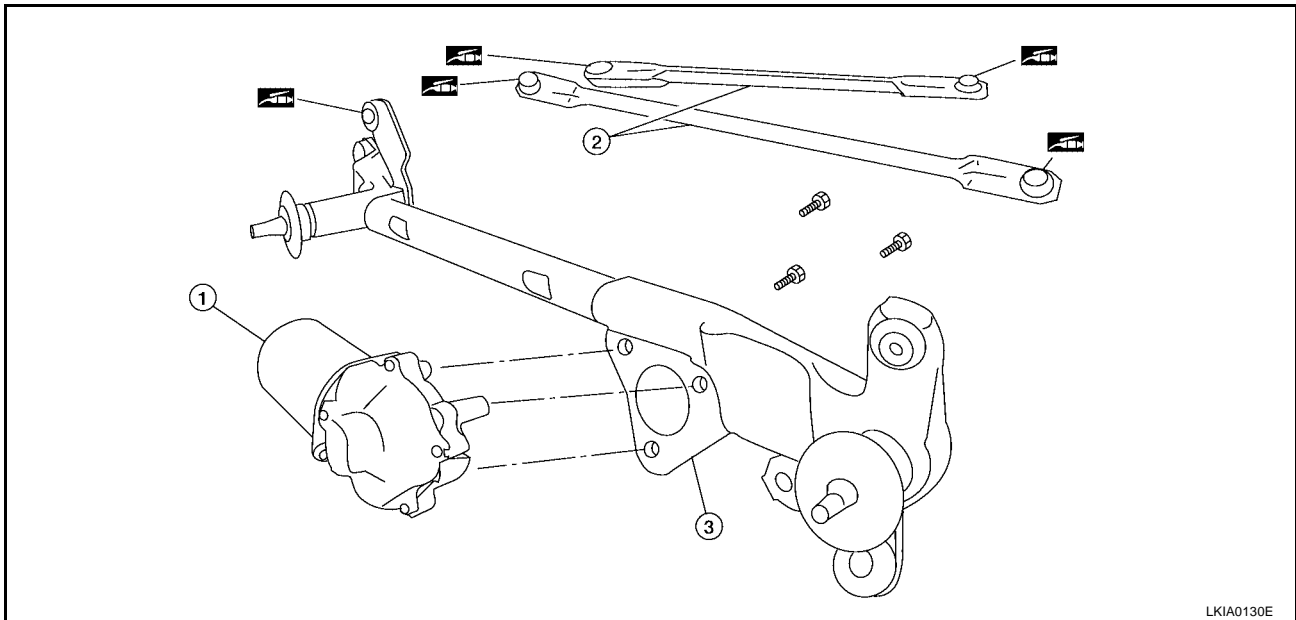
- Before reinstalling wiper arm, clean up the pivot area as illustrated. This will reduce possibility of wiper arm looseness.
- Tighten wiper arm nuts to specified torque.

**Front wiper arm nuts : 20.6 - 26.5 N·m
(2.1 - 2.7 kg·m, 16 - 19 ft·lb)**



Removal and Installation for Wiper Motor and Linkage

EKS003UO



1. Front wiper motor

2. Wiper link

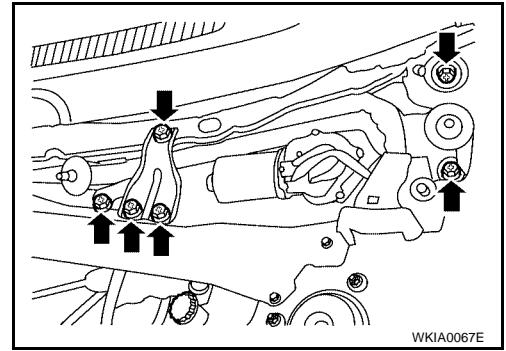
3. Wiper frame

REMOVAL

1. Operate the wiper motor and stop it at the auto stop position.
2. Remove the cowl top cover. Refer to [EI-19, "Removal and Installation"](#).
3. Disconnect wiper motor connector.

FRONT WIPER AND WASHER SYSTEM

4. Remove bracket and wiper motor assembly.
5. Remove wiper link from wiper frame.
6. Remove wiper motor from wiper frame.



INSTALLATION

CAUTION:

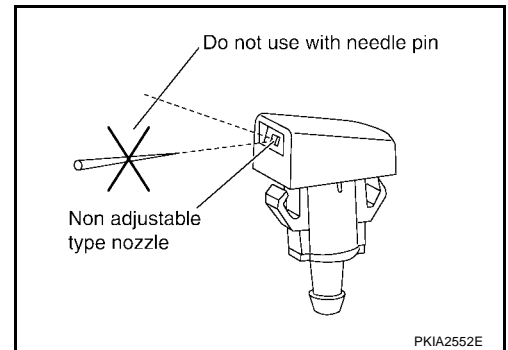
- Do not drop the wiper motor or cause it to contact other parts.
 - Check the grease conditions of the motor arm and wiper link joint(s). Apply grease if necessary.
1. Connect wiper motor to connector. Turn the wiper switch ON to operate wiper motor, then turn the wiper switch OFF (auto stop).
 2. Disconnect wiper motor connector.
 3. Install wiper motor to bracket and wiper link and install assembly to the vehicle.

Wiper motor assembly bolts : 3.8 - 5.1 N·m (0.39 - 0.52 kg-m, 33.9 - 45.1 in-lb)

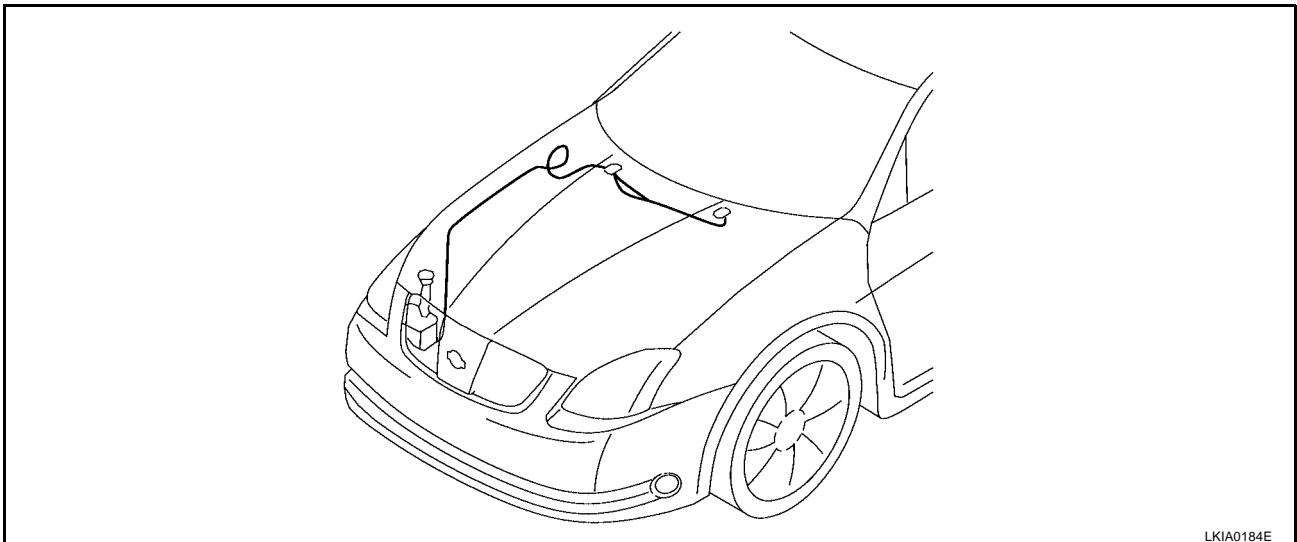
4. Connect wiper motor connector. Turn the wiper switch ON to operate the wiper motor, then turn wiper switch OFF (auto stop).
5. Install cowl top cover. Refer to [EI-19, "Removal and Installation"](#).

Washer Nozzle Adjustment

- This vehicle is equipped with non-adjustable washer nozzles.
- If not satisfied with washer fluid spray coverage, confirm that the washer nozzle is installed correctly.
- If the washer nozzle is installed correctly and the washer fluid spray coverage is not satisfactory, replace washer nozzle.



Washer Tube Layout



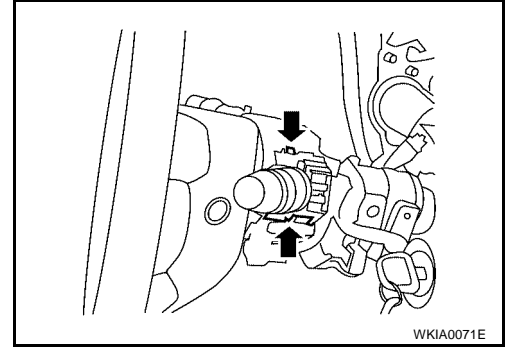
FRONT WIPER AND WASHER SYSTEM

Removal and Installation for Wiper and Washer Switch

EKS003UR

1. Remove steering column cover.
2. Remove wiper washer switch connector.
3. Pinch tabs at wiper and washer switch base and slide switch away from steering column to remove.

Installation is in the reverse order of removal.



Removal and Installation for Washer Tank

EKS003US

1. Pull out washer tank inlet.
2. Remove fender protector. Refer to [EI-21, "Removal and Installation"](#).
3. Remove front washer motor connector and washer fluid level switch connector.
4. Remove washer tank screws.
5. Remove washer hose and remove the washer tank from the vehicle.

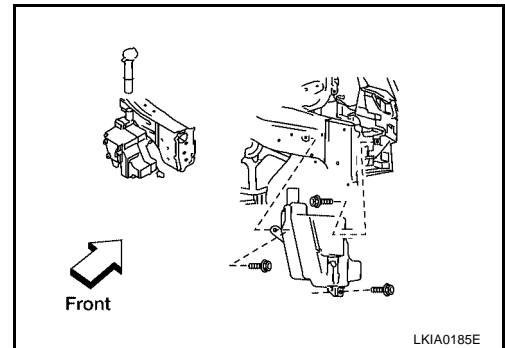
CAUTION:

After installation, add water up to the upper level of the washer tank inlet and check for water leaks.

Installation is in the reverse order of removal.

Washer tank installation screw

Tightening torque: 3.9 - 5.0 N·m
(0.40 - 0.50 kg·m, 34 - 45 in·lb)



Removal and Installation for Washer Motor

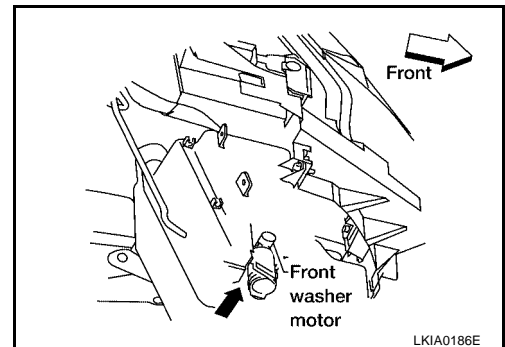
EKS003UT

1. Remove fender protector. Refer to [EI-21, "Removal and Installation"](#).
2. Remove front washer motor connector and hose.
3. Pull out front washer motor in the direction of the arrow as shown and remove the washer pump from the washer tank.

CAUTION:

When installing front washer motor, there should be no packing twists, etc.

Installation is in the reverse order of removal.



POWER SOCKET

PF2:253A2

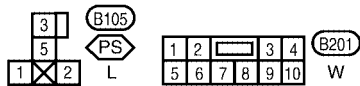
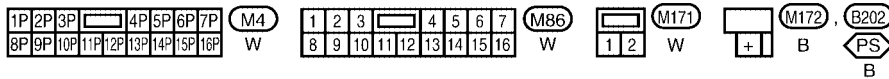
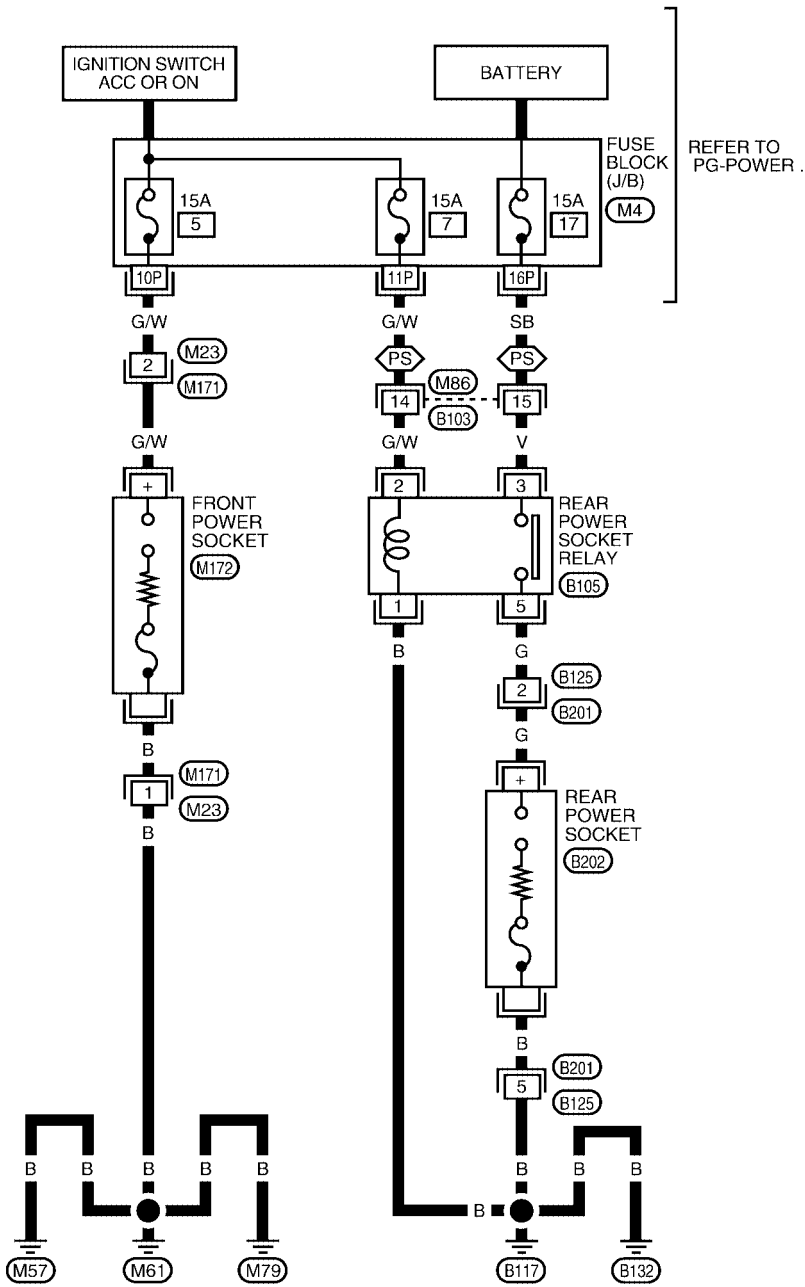
POWER SOCKET

Wiring Diagram — P/SCKT —

EKS003UW

WW-P/SCKT-01

⬡(PS) : WITH REAR POWER SOCKET



A
B
C
D
E
F
G
H
I
J
L
M

WW

POWER SOCKET

EKS003UX

Removal and Installation **FRONT POWER SOCKET**

Refer to [IP-17, "Center Console"](#) .

REAR POWER SOCKET

Refer to [IP-18, "Rear Console"](#) .

HORN


PF25610

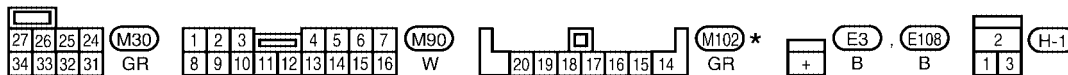
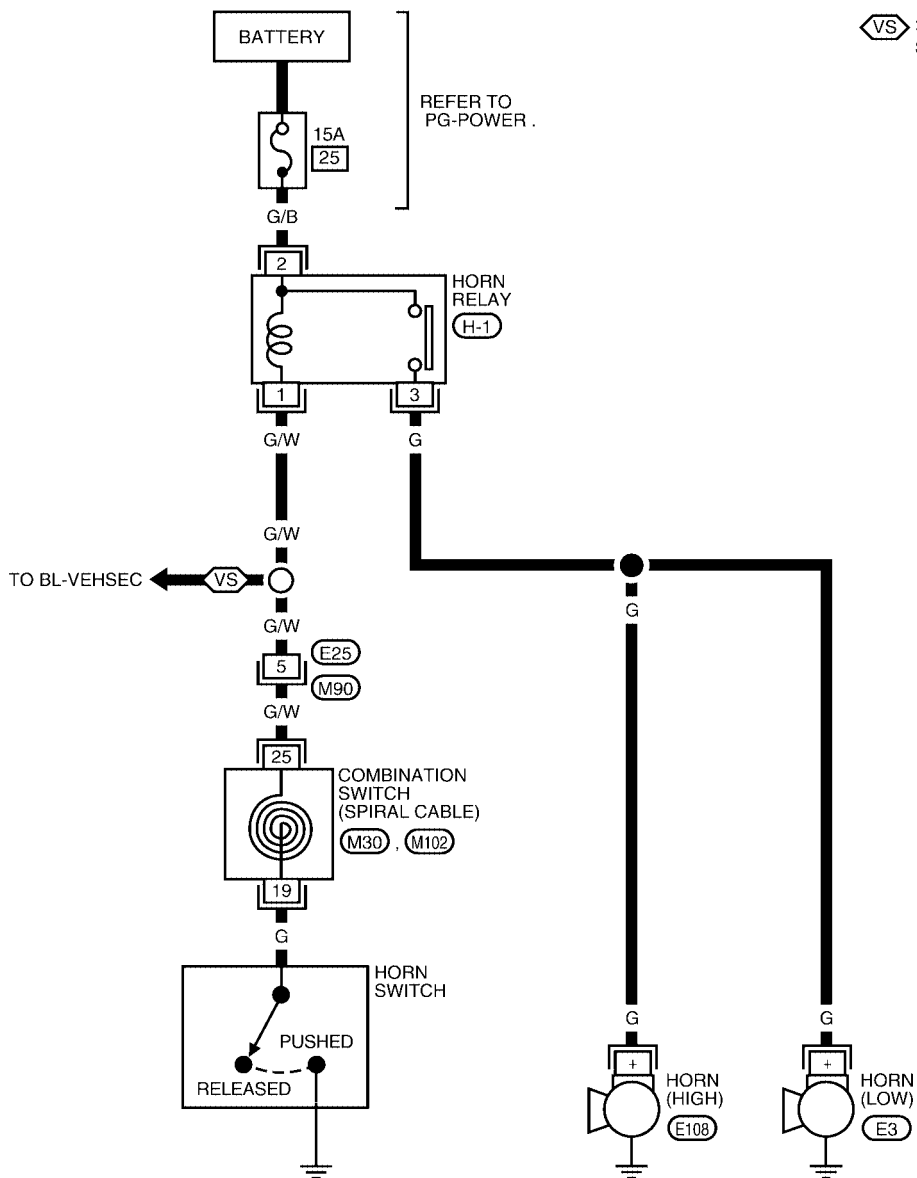
HORN

Wiring Diagram — HORN —

EKS003UY

WW-HORN-01

 : WITH VEHICLE SECURITY SYSTEM



*: THIS CONNECTOR IS NOT SHOWN IN HARNESS LAYOUT OF PG SECTION.

WKWA0416E

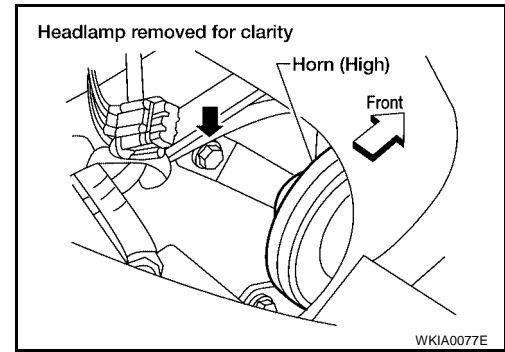
HORN

EKS003UZ

Removal and Installation

REMOVAL (HORN HIGH)

1. Remove right headlamp. Refer to [LT-41, "Combination Lamp Removal and Installation"](#) .
2. Disconnect horn connector.
3. Remove horn.



INSTALLATION (HORN HIGH)

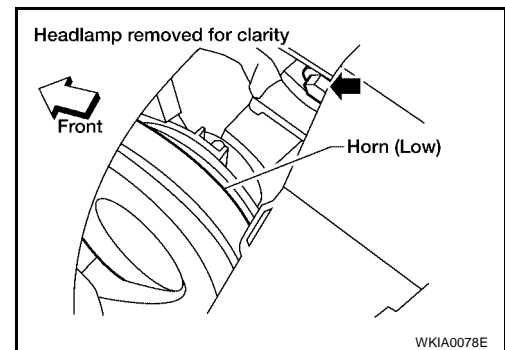
Tighten horn bolt to specified torque.

Horn bolt : 15.6-18.6 N·m (1.6-1.8 kg·m, 12-13 ft·lb)

1. Reconnect horn connector.
2. Install right headlamp. Refer to [LT-41, "Combination Lamp Removal and Installation"](#) .

REMOVAL (HORN LOW)

1. Remove left headlamp. Refer to [LT-41, "Combination Lamp Removal and Installation"](#) .
2. Disconnect horn connector.
3. Remove horn.



INSTALLATION (HORN LOW)

Tighten horn bolt to specified torque.

Horn bolt : 15.6-18.6 N·m (1.6-1.8 kg·m, 12-13 ft·lb)

1. Reconnect horn connector.
2. Install left headlamp. Refer to [LT-41, "Combination Lamp Removal and Installation"](#) .