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# WW

## SECTION

### WIPER, WASHER & HORN

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# PRECAUTION

## PRECAUTION

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

EKS0094G

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

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When you read wiring diagrams, refer to the following:

- Refer to [GI-13, "How to Read Wiring Diagrams"](#) .
- Refer to [PG-4, "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"](#) .

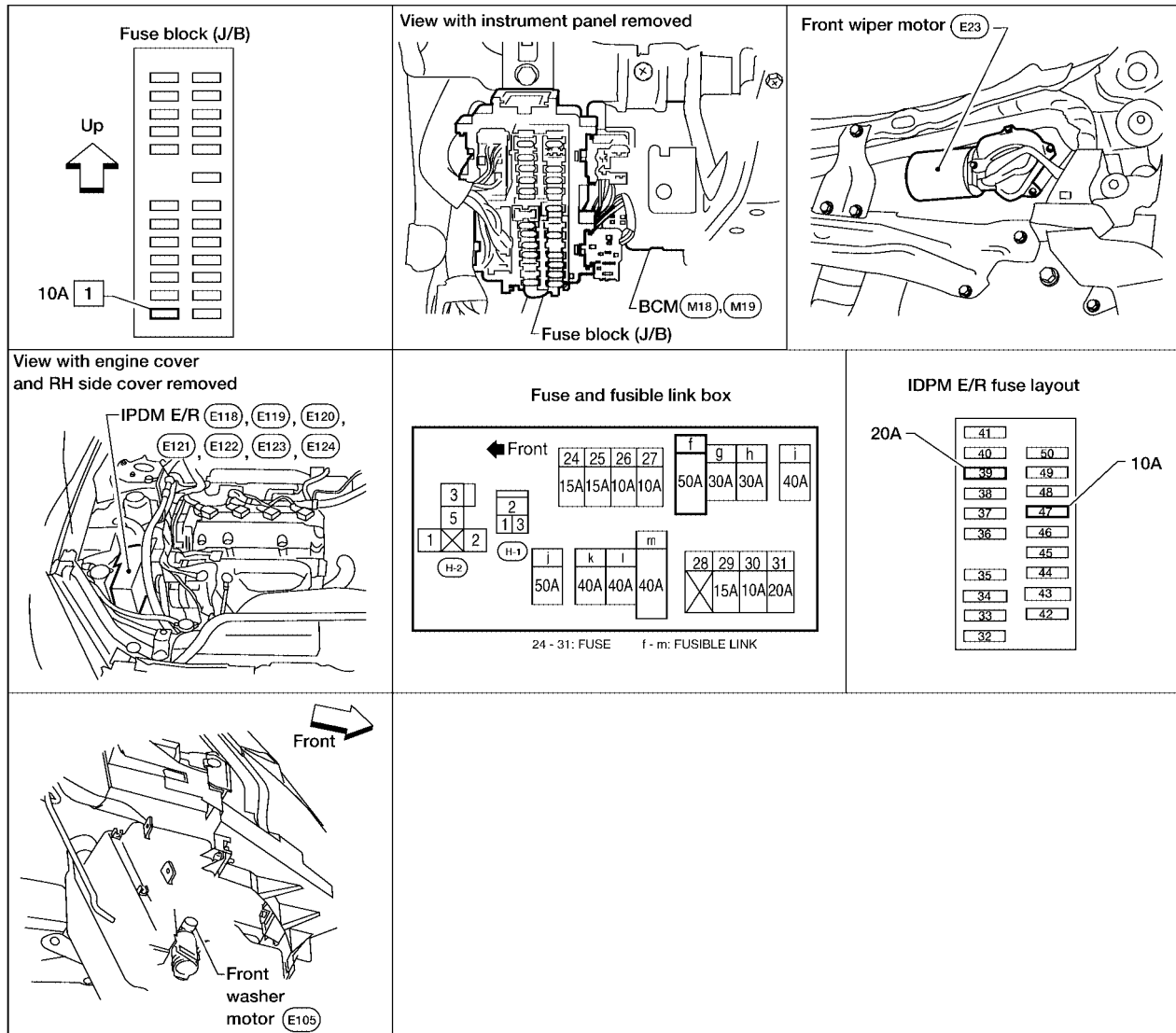
# FRONT WIPER AND WASHER SYSTEM

## FRONT WIPER AND WASHER SYSTEM

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### Components Parts and Harness Connector Location

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### System Description

- Both front wiper relays are located in the 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, and
- 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

- through 10A fuse [No. 1, located in the fuse block (J/B)]
- to BCM terminal 38, and

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# FRONT WIPER AND WASHER SYSTEM

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- 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

- to BCM terminal 52
- to combination switch terminal 12
- through grounds M57, M61 and M79, and
- to IPDM E/R terminals 38 and 60
- to front wiper motor terminal E
- through 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

- through front wiper relay
- to front wiper high 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 high relays.

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

- through front wiper relay
- to front wiper high 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.

# FRONT WIPER AND WASHER SYSTEM

- 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
- through front wiper motor terminal P
- through terminal E of the front wiper motor
- through 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 wiper switch is in front wiper washer position, BCM detects front wiper washer signal by BCM wiper switch reading function. Refer to [BCS-3, "COMBINATION SWITCH READING FUNCTION"](#).

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
- through grounds M57, M61 and M79.

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

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

Refer to [BCS-3, "COMBINATION SWITCH READING FUNCTION"](#).

## CAN Communication System Description

Refer to [LAN-7, "CAN COMMUNICATION"](#).

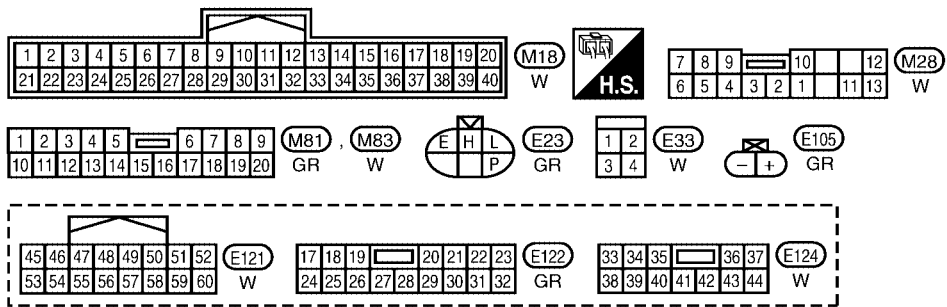
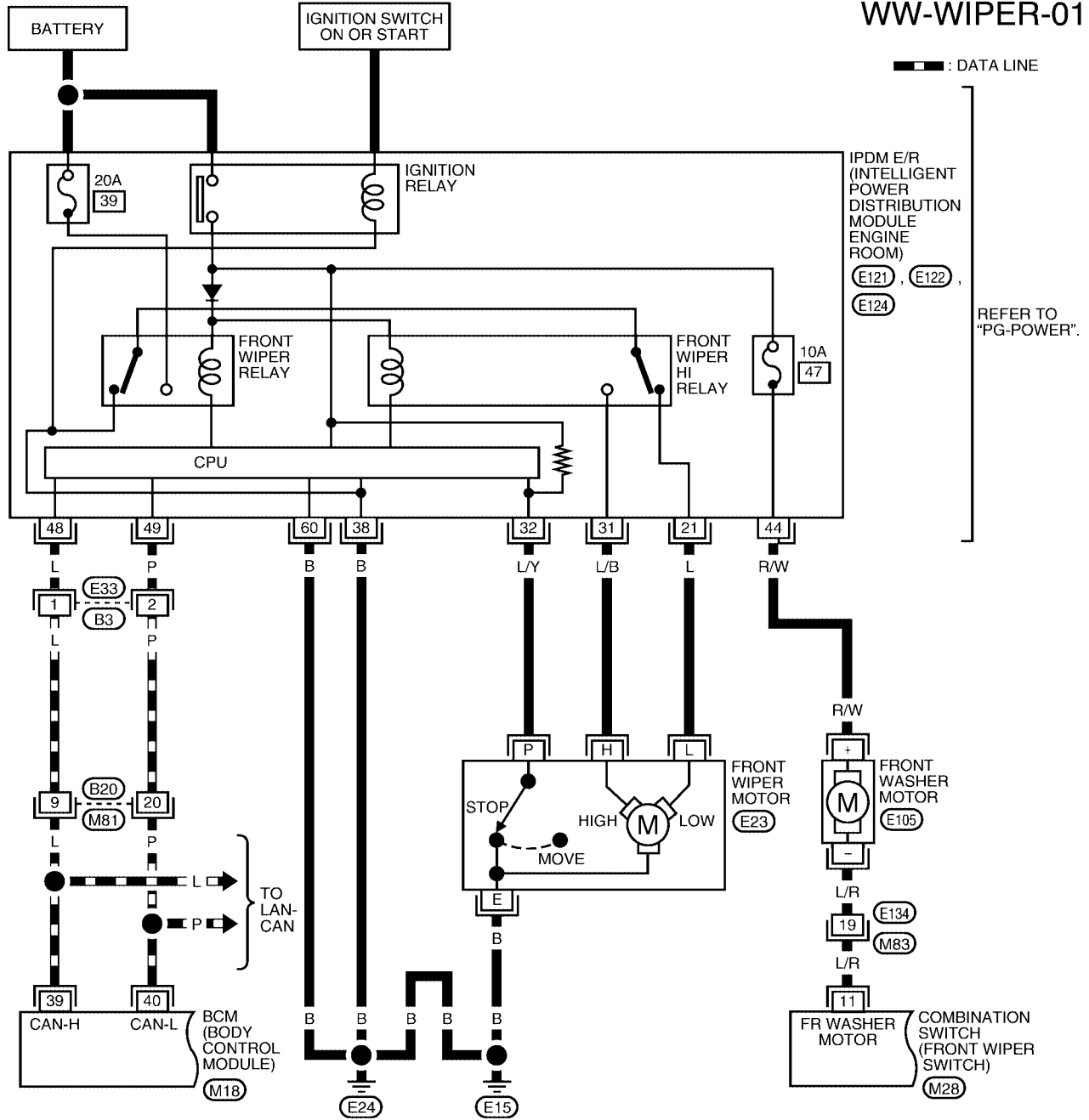
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# FRONT WIPER AND WASHER SYSTEM

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## Wiring Diagram — WIPER —

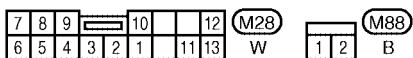
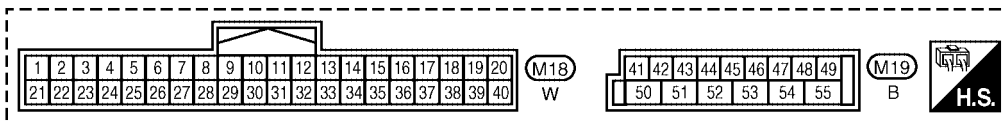
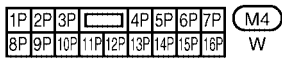
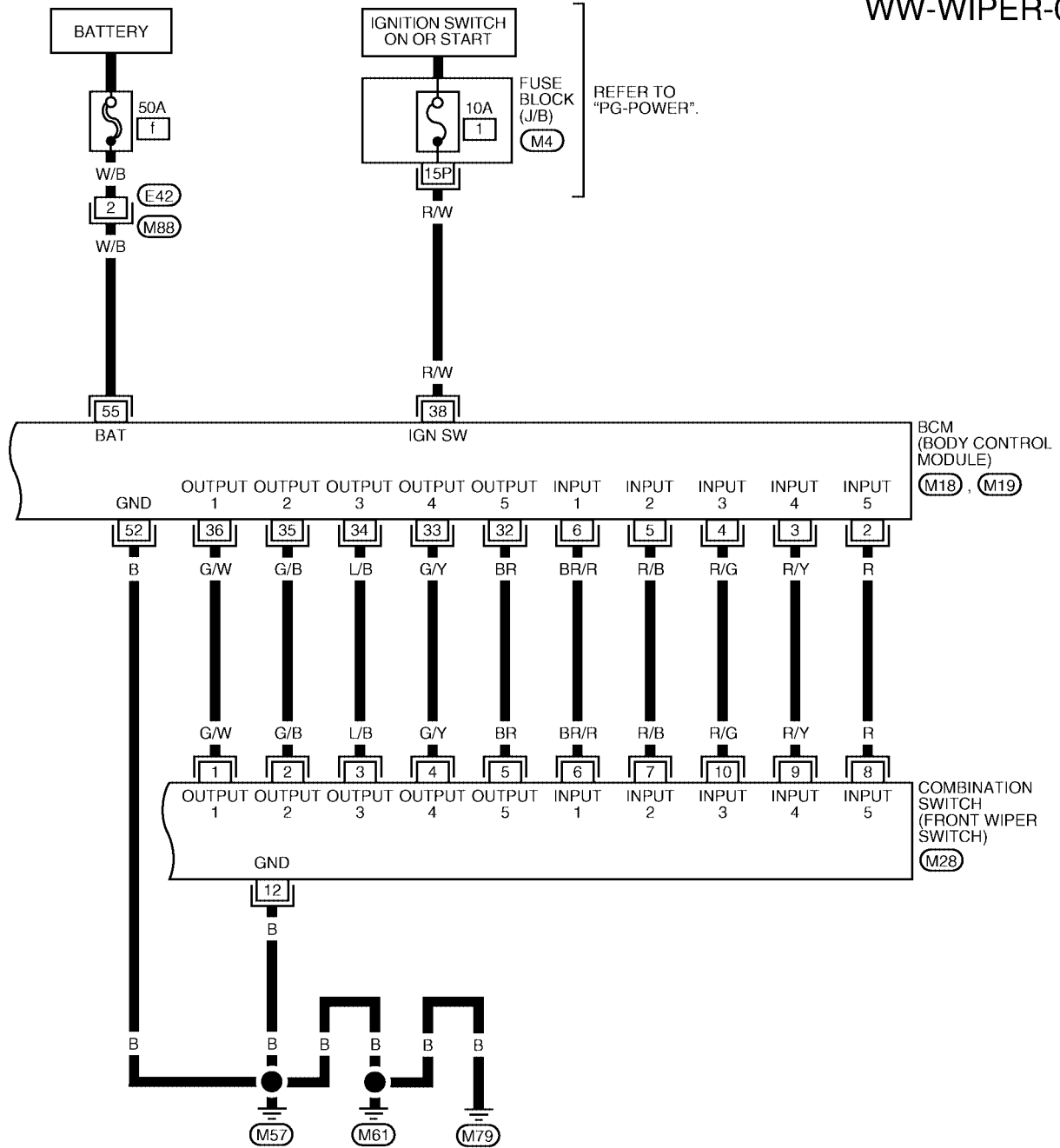
### WW-WIPER-01



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# FRONT WIPER AND WASHER SYSTEM

WW-WIPER-02

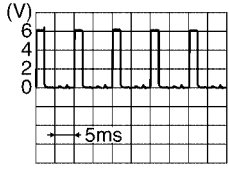
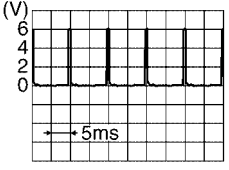
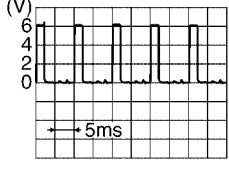
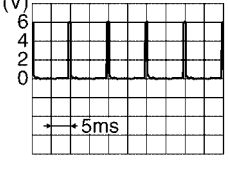
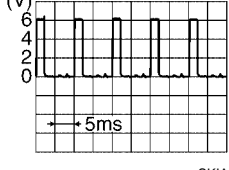
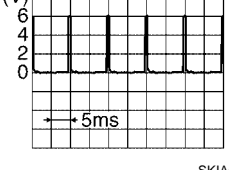



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# FRONT WIPER AND WASHER SYSTEM

## Terminals and Reference Values for BCM

EKS0094M

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"> <li>Light switch and wiper switch OFF</li> <li>Wiper dial position 4</li> </ul>	 <p style="text-align: right;">SKIA5291E</p>
3	R/Y	Combination switch input 4	ON	<ul style="list-style-type: none"> <li>Light switch and wiper switch OFF</li> <li>Wiper dial position 4</li> </ul>	 <p style="text-align: right;">SKIA5292E</p>
4	R/G	Combination switch input 3	ON	<ul style="list-style-type: none"> <li>Light switch and wiper switch OFF</li> <li>Wiper dial position 4</li> </ul>	 <p style="text-align: right;">SKIA5291E</p>
5	R/B	Combination switch input 2	ON	<ul style="list-style-type: none"> <li>Light switch and wiper switch OFF</li> <li>Wiper dial position 4</li> </ul>	 <p style="text-align: right;">SKIA5292E</p>
6	BR/R	Combination switch input 1			
32	BR	Combination switch output 5	ON	<ul style="list-style-type: none"> <li>Light switch and wiper switch OFF</li> <li>Wiper dial position 4</li> </ul>	 <p style="text-align: right;">SKIA5291E</p>
33	G/Y	Combination switch output 4	ON	<ul style="list-style-type: none"> <li>Light switch and wiper switch OFF</li> <li>Wiper dial position 4</li> </ul>	 <p style="text-align: right;">SKIA5292E</p>
34	L/B	Combination switch output 3	ON	<ul style="list-style-type: none"> <li>Light switch and wiper switch OFF</li> <li>Wiper dial position 4</li> </ul>	 <p style="text-align: right;">SKIA5291E</p>



# 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"> <li>● Light switch and wiper switch OFF</li> <li>● Wiper dial position 4</li> </ul>	
36	G/W	Combination switch output 1			
38	R/W	Ignition switch (ON)	ON	—	Battery voltage
39	L	CAN-H	—	—	—
40	P	CAN-L	—	—	—
52	B	Ground	ON	—	0V
55	W/B	Battery power	OFF	—	Battery voltage

## Terminals and Reference Values for IPDM E/R

EKS0094N

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	0V
					LO	Battery voltage
31	L/B	High speed signal	ON	Wiper switch	OFF	0V
					HI	Battery voltage
32	L/Y	Wiper auto stop signal	ON	Wiper operating		Battery voltage
				Wiper stopped		0V
38	B	Ground	ON	—	0V	
44	R/W	Front washer motor power	ON	—	Battery voltage	
48	L	CAN-H	—	—	—	
49	P	CAN-L	—	—	—	
60	B	Ground	ON	—	0V	

## Work Flow

EKS0094O

1. Confirm the symptom or customer complaint.
2. Understand the system description, refer to [WW-3, "System Description"](#).
3. Perform preliminary inspection, refer to [WW-10, "Preliminary Inspection"](#).
4. Check symptom and repair or replace the cause of 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

EKS0094P

## 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
	Battery	f

OK or NG

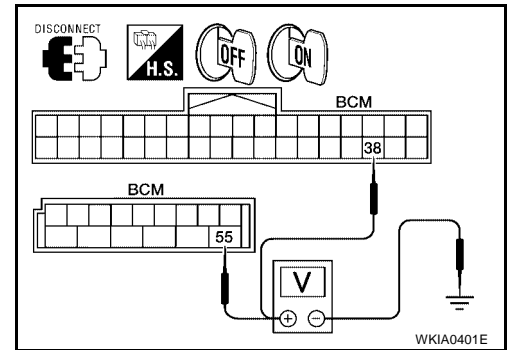
OK >> GO TO 2.

NG >> If fuse is blown, be sure to eliminate cause of blown fuse before installing new fuse. Refer to [PG-4, "POWER SUPPLY ROUTING CIRCUIT"](#).

### 2. CHECK POWER SUPPLY CIRCUIT

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

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



OK or NG

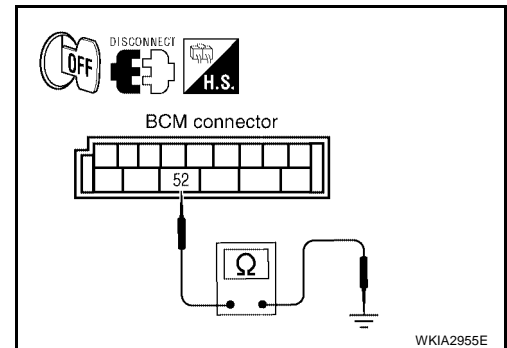
OK >> GO TO 3.

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

### 3. GROUND CIRCUIT INSPECTION (BCM)

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

BCM (+)		(-)	Ignition switch condition	Continuity
Connector	Terminal (wire color)			
M19	52 (B)	Ground	OFF	Yes



OK or NG

OK >> Inspection End.

NG >> Repair/replace BCM ground circuit.

# FRONT WIPER AND WASHER SYSTEM

## CONSULT-II Function (BCM)

EKS0094Q

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

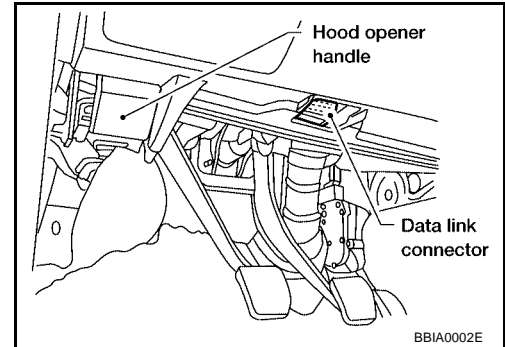
BCM diagnostic test item	Diagnostic mode	Description
Inspection by part	WORK SUPPORT	Supports inspections and adjustments. Commands are transmitted to the BCM for setting the status suitable for required operation, input/output signals are received from the BCM and received data is displayed.
	DATA MONITOR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

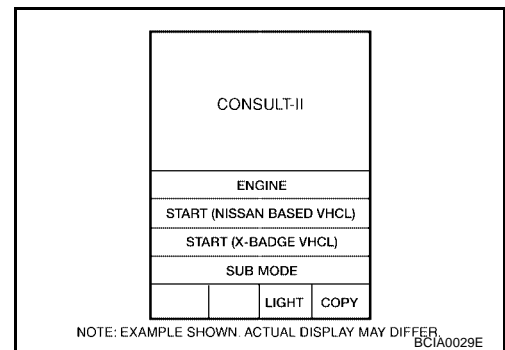
### CAUTION:

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.

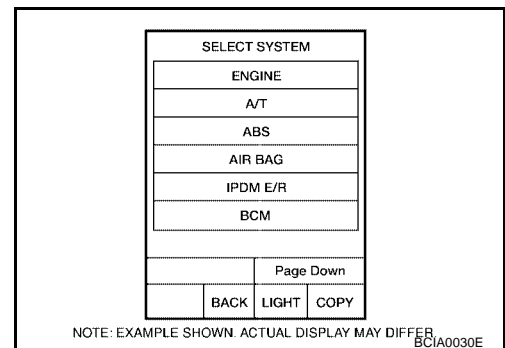
1. With the ignition switch OFF, connect CONSULT-II and CONSULT-II CONVERTER to the data link connector, then turn the ignition switch ON.



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



3. Touch "BCM" on the "SELECT SYSTEM" screen. If "BCM" is not indicated, go to [GI-37, "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.

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

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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 "SELECT MONITOR ITEM" 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.
IGN SW CAN      "ON/OFF"	Displays "IGN switch ON (ON)/Other OFF or ACC (OFF)" status as judged from CAN communications.
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.

## 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.

### 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.

# FRONT WIPER AND WASHER SYSTEM

## CONSULT-II Function (IPDM E/R)

EKS0094R

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

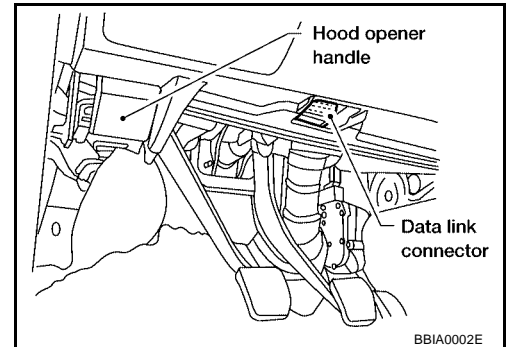
IPDM E/R diagnostic Mode	Description
SELF-DIAG RESULTS	Displays IPDM E/R self-diagnosis results.
DATA MONITOR	Displays IPDM E/R input/output data in real time.
CAN DIAG SUPPORT MNTR	The result of transmit/receive diagnosis of CAN communication can be read.
ACTIVE TEST	Operation of electrical loads can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

## CONSULT-II OPERATION

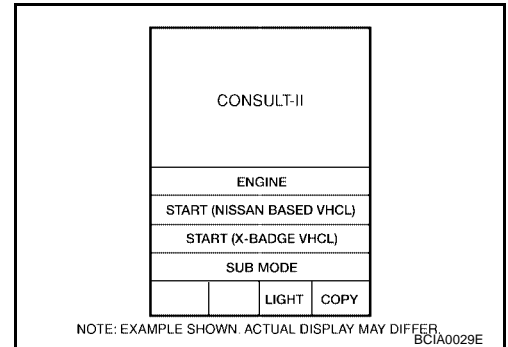
### CAUTION:

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.

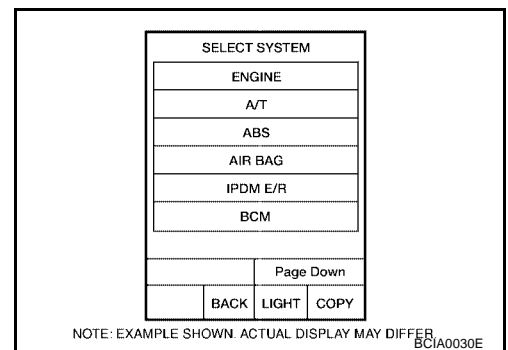
1. With the ignition switch OFF, connect CONSULT-II and CONSULT-II CONVERTER to the data link connector, then turn the ignition switch ON.



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

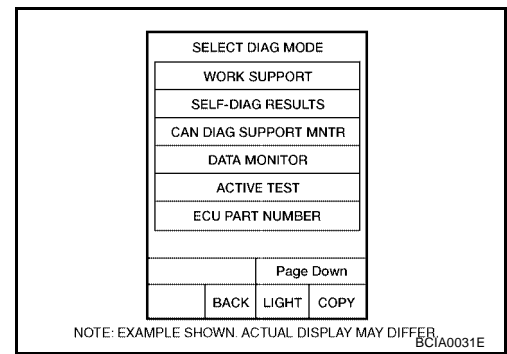


3. Touch "IPDM E/R" on "SELECT SYSTEM" screen. If "IPDM E/R" is not displayed, go to [GI-37, "CONSULT-II Data Link Connector \(DLC\) Circuit"](#).



# FRONT WIPER AND WASHER SYSTEM

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



## DATA MONITOR

### Operation Procedure

- Touch "DATA MONITOR" on the "SELECT DIAG MODE" screen.
- Touch "ALL SIGNALS", "MAIN SIGNALS" or "SELECTION FROM MENU" on the "SELECT MONITOR ITEM" 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. When "MAIN SIGNALS" is selected, predetermined items are 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	SELECTION FROM MENU	
Front wiper request	FR WIP REQ	STOP/1LO/LO/HI	x	x	x	Signal status input from 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 "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, LO) front wiper relays can be operated.

# FRONT WIPER AND WASHER SYSTEM

EKS0094S

## Front Wiper Does Not Operate

### 1. CHECK IPDM E/R TO FRONT WIPER MOTOR

Ⓜ With CONSULT-II

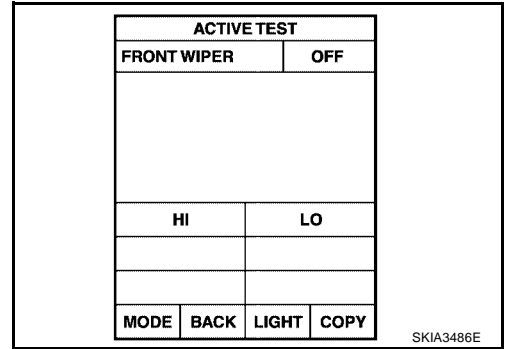
1. Select "IPDM E/R" with CONSULT-II, and select "ACTIVE TEST" on "SELECT DIAG MODE" screen.
2. Select "FRONT WIPER" on "SELECT TEST ITEM" screen.

ⓧ Without CONSULT-II

1. Turn on front wipers using auto active test. Refer to [PG-21, "Auto Active Test"](#).
2. Confirm front wiper operation.

OK or NG

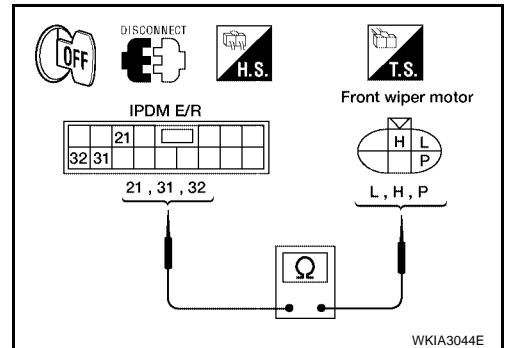
- OK >> GO TO 4.
- NG >> GO TO 2.



### 2. IPDM E/R TO FRONT WIPERS CIRCUIT INSPECTION

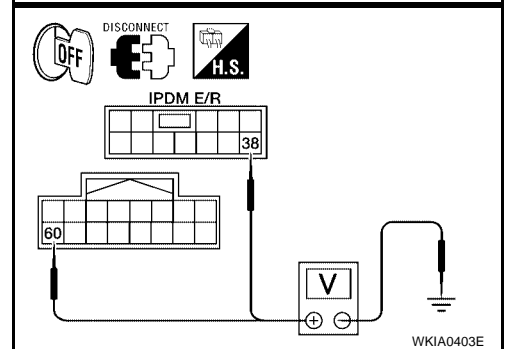
1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector and front wiper motor connector.
3. Check continuity between IPDM E/R harness connector terminals and front wiper motor harness connector terminals.

IPDM E/R		Front wiper motor		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)	



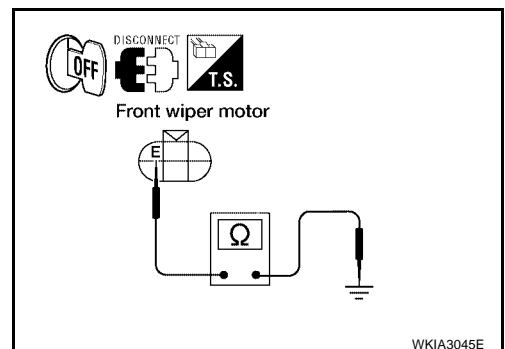
4. Check continuity between IPDM E/R harness connector terminal and ground.

IPDM E/R (+)		(-)	Continuity
Connector	Terminal (wire color)		
E121	60 (B)	Ground	Yes
E124	38 (B)		



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

Front wiper motor		Continuity
Connector	Terminal (wire color)	
E23	E (B)	Ground Yes



OK or NG

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

# FRONT WIPER AND WASHER SYSTEM

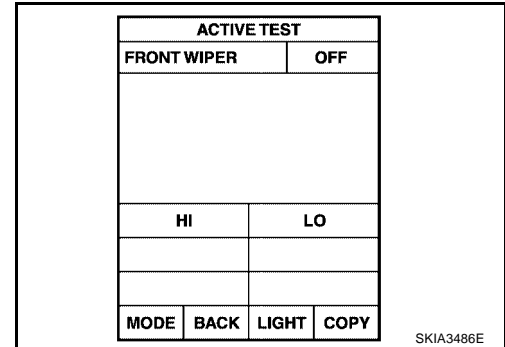
## 3. IPDM E/R INSPECTION

① 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.

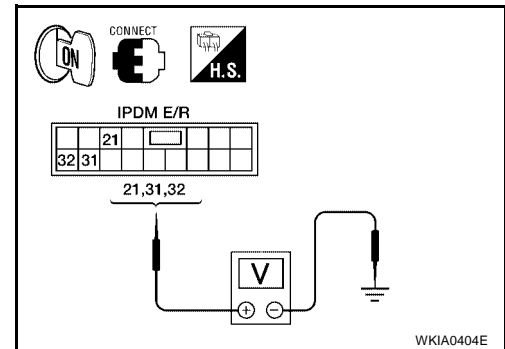
⊗ Without CONSULT-II

1. Turn on front wipers using auto active test. Refer to [PG-21, "Auto Active Test"](#).



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

IPDM E/R		(-)	Condition	Voltage (Approx.)
Connector	Terminal (wire color)			
E122	21 (L)	Ground	Stopped	0V
			LO operation	Battery voltage
	31 (L/B)		Stopped	0V
			HI operation	Battery voltage
	32 (L/Y)		LO operation	Battery voltage
			Stopped	0V



OK or NG

- OK >> Replace wiper motor. Refer to [WW-23, "Removal and Installation of Wiper Motor and Linkage"](#).
- NG >> Replace IPDM E/R. Refer to [PG-27, "Removal and Installation of IPDM E/R"](#).

## 4. COMBINATION SWITCH TO BCM INSPECTION

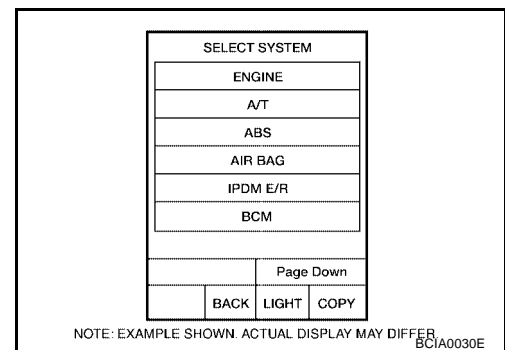
Select "BCM" on CONSULT-II. Carry out self-diagnosis of BCM.

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 [BCS-3, "COMBINATION SWITCH READING FUNCTION"](#).





# FRONT WIPER AND WASHER SYSTEM

## 5. BCM 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-20, "Removal and Installation of BCM"](#).
- NG >> Replace wiper switch. Refer to [WW-24, "Removal and Installation of Wiper and Washer Switch"](#).

DATA MONITOR	
MONITOR	
IGN ON SW	OFF
IGN SW CAN	ON
FR WIPER HI	OFF
FR WIPER LOW	OFF
FR WIPER INT	OFF
FR WASHER SW	OFF
INT VOLUME	7
FR WIPER STOP	ON
VEHICLE SPEED	0.0 km/h
PAGE DOWN	
RECORD	
MODE	BACK
LIGHT	COPY

WKIA1018E

## Front Wiper Stop Position Is Incorrect

### 1. CHECK IPDM E/R TO FRONT WIPER MOTOR

Ⓜ 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-27, "Removal and Installation of IPDM E/R"](#).
- NG >> GO TO 2.

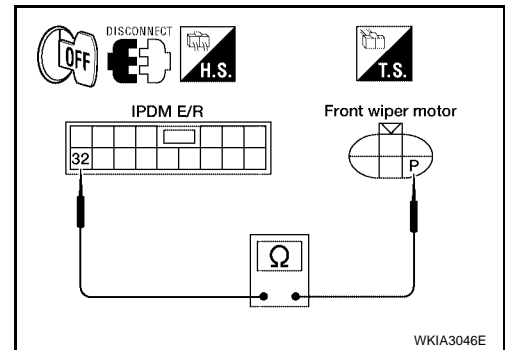
DATA MONITOR	
MONITOR	
MOTOR FAN REQ	1
AC COMP REQ	OFF
TAIL&CLR REQ	OFF
HL LO REQ	OFF
HL HI REQ	OFF
FR FOG REQ	OFF
FR WIP REQ	STOP
WIP AUTO STOP	STOP P
WIP PROT	OFF
Page DOWN	
RECORD	
MODE	BACK
LIGHT	COPY

SKIA5301E

### 2. CHECK IPDM E/R AND FRONT WIPER MOTOR AUTO STOP CIRCUITS

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.

IPDM E/R		Front wiper motor		Continuity
Connector	Terminal (wire color)	Connector	Terminal (wire color)	
E122	32 (L/Y)	E23	P (L/Y)	Yes

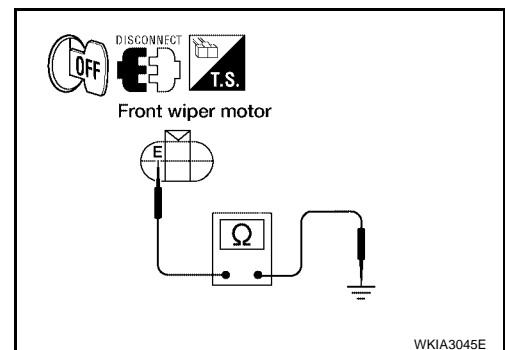


4. Check continuity between front wiper motor harness connector terminal E and ground.

Front wiper motor		Continuity
Connector	Terminal (wire color)	
E23	E (B)	Ground
		Yes

OK or NG

- OK >> Connect connectors. 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 ground.





# FRONT WIPER AND WASHER SYSTEM

## 2. IPDM E/R TO FRONT WIPER CIRCUIT INSPECTION

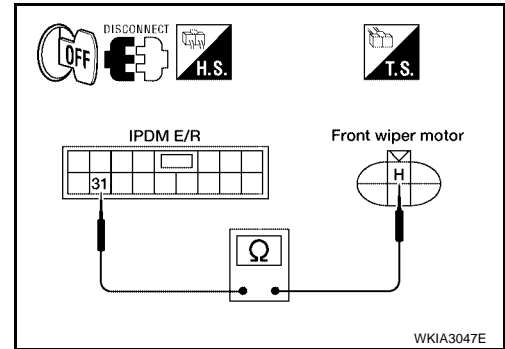
1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector and front wiper motor connector.
3. Check continuity between IPDM E/R harness connector E122 terminal 31 (L/B) and front wiper motor harness connector E23 terminal H (L/B).

IPDM E/R		Front wiper motor		Continuity
Connector	Terminal (wire color)	Connector	Terminal (wire color)	
E122	31 (L/B)	E23	H (L/B)	Yes

OK or NG

OK >> Connect connectors. GO TO 3.

NG >> Check for short circuit or open circuit in harness between IPDM E/R and front wiper motor.



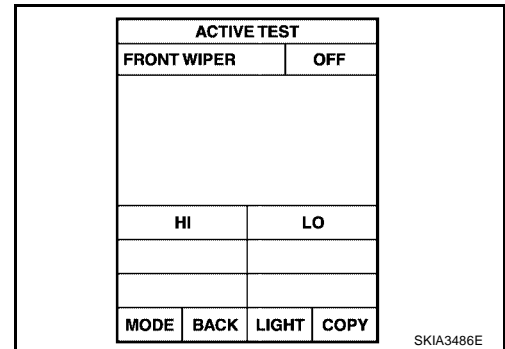
## 3. IPDM E/R INSPECTION

Ⓜ With CONSULT-II

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

ⓧ Without CONSULT-II

1. Turn on front wipers using auto active test. Refer to [PG-21, "Auto Active Test"](#).



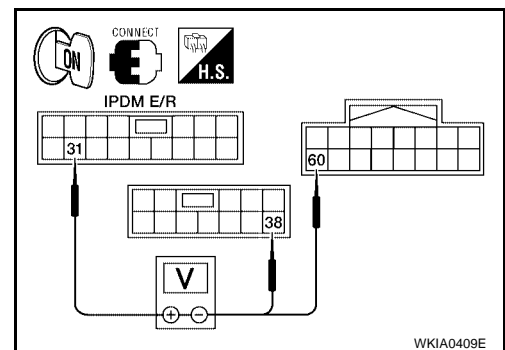
When front wiper high relay is operating, check voltage between IPDM E/R terminal 31 (L/B) and terminals 38 (B), 60 (B).

IPDM E/R				Voltage (Approx.)
(+)		(-)		
Connector	Terminal (wire color)	Connector	Terminal (wire color)	
E122	31 (L/B)	E124	38 (B)	Battery voltage
		E121	60 (B)	

OK or NG

OK >> Replace wiper motor. Refer to [WW-23, "Removal and Installation of Wiper Motor and Linkage"](#).

NG >> Replace IPDM E/R. Refer to [PG-27, "Removal and Installation of IPDM E/R"](#).



# FRONT WIPER AND WASHER SYSTEM

## 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-20, "Removal and Installation of BCM"](#).
- NG >> Replace wiper switch. Refer to [WW-24, "Removal and Installation of Wiper and Washer Switch"](#).

DATA MONITOR			
MONITOR			
IGN ON SW		OFF	
IGN SW CAN		ON	
FR WIPER HI		OFF	
FR WIPER LOW		OFF	
FR WIPER INT		OFF	
FR WASHER SW		OFF	
INT VOLUME		7	
FR WIPER STOP		ON	
VEHICLE SPEED		0.0 km/h	
		PAGE DOWN	
		RECORD	
MODE	BACK	LIGHT	COPY

WKIA1018E

EKS00FQ9

## Only Front Wiper INT Does Not Operate

### 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-20, "Removal and Installation of BCM"](#).
- NG >> Replace wiper switch. Refer to [WW-24, "Removal and Installation of Wiper and Washer Switch"](#).

DATA MONITOR			
MONITOR			
IGN ON SW		OFF	
IGN SW CAN		ON	
FR WIPER HI		OFF	
FR WIPER LOW		OFF	
FR WIPER INT		OFF	
FR WASHER SW		OFF	
INT VOLUME		7	
FR WIPER STOP		ON	
VEHICLE SPEED		0.0 km/h	
		PAGE DOWN	
		RECORD	
MODE	BACK	LIGHT	COPY

WKIA1018E

EKS00FQA

## Front Wiper INT Operation Switch Position Cannot Be Adjusted

### 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-20, "Removal and Installation of BCM"](#).
- NG >> Replace wiper switch. Refer to [WW-24, "Removal and Installation of Wiper and Washer Switch"](#).

DATA MONITOR			
MONITOR			
IGN ON SW		OFF	
IGN SW CAN		ON	
FR WIPER HI		OFF	
FR WIPER LOW		OFF	
FR WIPER INT		OFF	
FR WASHER SW		OFF	
INT VOLUME		7	
FR WIPER STOP		ON	
VEHICLE SPEED		0.0 km/h	
		PAGE DOWN	
		RECORD	
MODE	BACK	LIGHT	COPY

WKIA1018E

EKS00FQB

## Wipers Do Not Wipe When Front Washer Operates

### 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-20, "Removal and Installation of BCM"](#).
- NG >> Replace wiper switch. Refer to [WW-24, "Removal and Installation of Wiper and Washer Switch"](#).

DATA MONITOR			
MONITOR			
IGN ON SW		OFF	
IGN SW CAN		ON	
FR WIPER HI		OFF	
FR WIPER LOW		OFF	
FR WIPER INT		OFF	
FR WASHER SW		OFF	
INT VOLUME		7	
FR WIPER STOP		ON	
VEHICLE SPEED		0.0 km/h	
		PAGE DOWN	
		RECORD	
MODE	BACK	LIGHT	COPY

WKIA1018E

# FRONT WIPER AND WASHER SYSTEM

## Front Wipers Operate For 10 Seconds, Stop For 20 Seconds, And After Repeating This Operation Five Times, They Become Inoperative

EKS00FQC

### 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, "WIP PROT" reads "BLOCK".

### 1. CHECK IPDM E/R TO FRONT WIPER MOTOR

☐ 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-27, "Removal and Installation of IPDM E/R"](#).

NG >> GO TO 2.

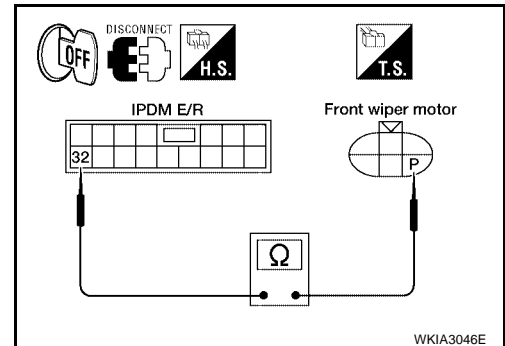
DATA MONITOR	
MONITOR	
MOTOR FAN REQ	1
AC COMP REQ	OFF
TAIL&CLR REQ	OFF
HL LO REQ	OFF
HL HI REQ	OFF
FR FOG REQ	OFF
FR WIP REQ	STOP
WIP AUTO STOP	STOP P
WIP PROT	OFF
Page DOWN	
RECORD	
MODE	BACK LIGHT COPY

SKIA5301E

### 2. IPDM E/R TO FRONT WIPER MOTOR AUTO STOP CIRCUIT INSPECTION

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

IPDM E/R		Front wiper motor		Continuity
Connector	Terminal (wire color)	Connector	Terminal (wire color)	
E122	32 (L/Y)	E23	P (L/Y)	Yes



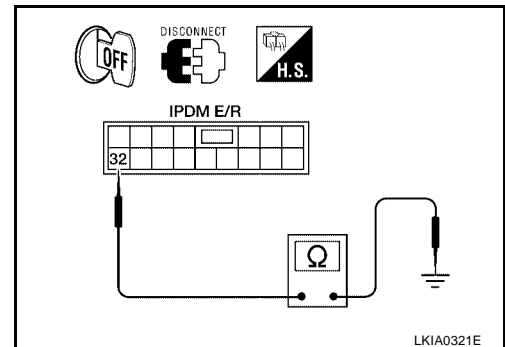
- Check continuity between IPDM E/R harness connector terminal and ground.

IPDM E/R		Continuity
Connector	Terminal (wire color)	
E122	32 (L/Y)	No

OK or NG

OK >> Connect connectors. GO TO 3.

NG >> Repair harness or connector.

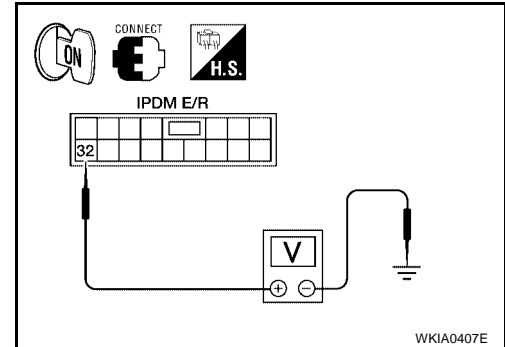


# FRONT WIPER AND WASHER SYSTEM

## 3. IPDM E/R TO FRONT WIPER MOTOR AUTO STOP CIRCUIT VOLTAGE

1. Turn ignition switch ON.
2. While front wiper motor is stopped and while operating, measure voltage between IPDM E/R terminal 32 and ground.

IPDM E/R		(-)	Condition	Voltage (Approx.)
(+) Connector				
Terminal (wire color)				
E122	32 (L/Y)	Ground	Wiper operating	Battery voltage
			Wiper stopped	0V



### OK or NG

- OK >> Replace IPDM E/R. Refer to [PG-27, "Removal and Installation of IPDM E/R"](#).
- NG >> Replace front wiper motor. Refer to [WW-23, "Removal and Installation of Wiper Motor and Linkage"](#).

## Removal and Installation of Front Wiper Arms, Adjustment of Wiper Arms Stop Location

EKS0094T

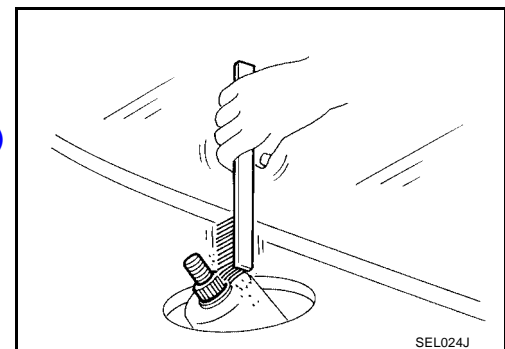
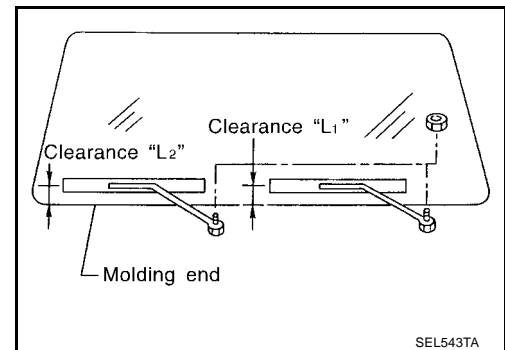
1. Prior to wiper arm installation, turn on wiper switch to operate wiper motor and then turn it "OFF" (Auto Stop).
2. Lift the blade up and then set it down onto glass surface to set the blade center to clearance "L1" and "L2" immediately before tightening nut.
3. Eject washer fluid. Turn on wiper switch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

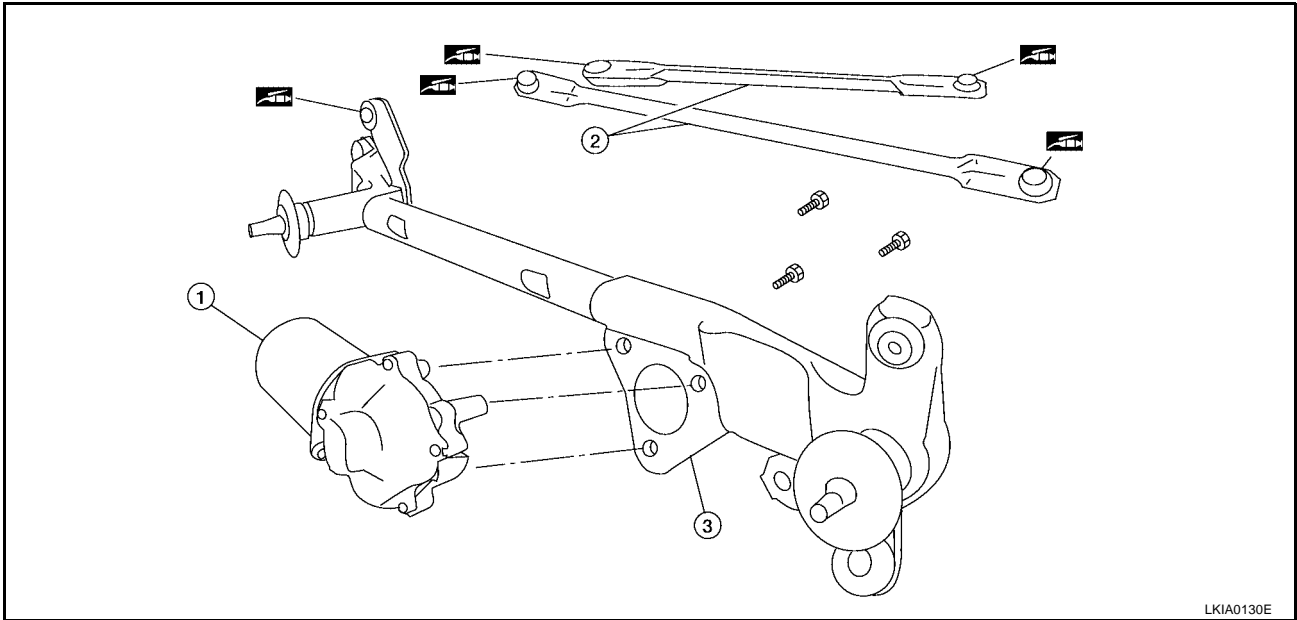
**Front wiper arm nuts : 20.6 - 26.5 N·m (2.1 - 2.7 kg·m, 16 - 19 ft·lb)**



# FRONT WIPER AND WASHER SYSTEM

## Removal and Installation of Wiper Motor and Linkage

EKS0094U



1. Front wiper motor

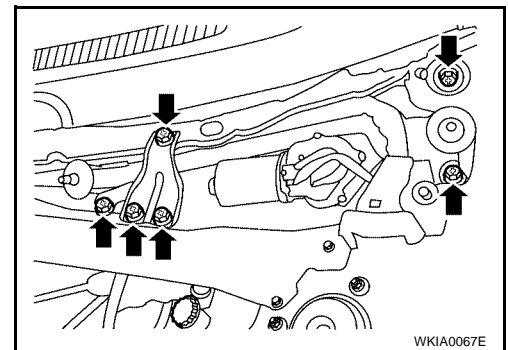
2. Wiper link

3. Wiper frame

LKIA0130E

### REMOVAL

1. Operate the wiper motor and stop it at the auto stop position.
2. Remove wiper arms from the vehicle. Refer to [WW-22, "Removal and Installation of Front Wiper Arms, Adjustment of Wiper Arms Stop Location"](#).
3. Remove the cowl top cover. Refer to [EI-19, "Removal and Installation"](#).
4. Disconnect wiper motor connector.
5. Remove bracket and wiper motor assembly.
6. Remove wiper link from wiper frame.
7. Remove wiper motor from wiper frame.



WKIA0067E

### INSTALLATION

#### CAUTION:

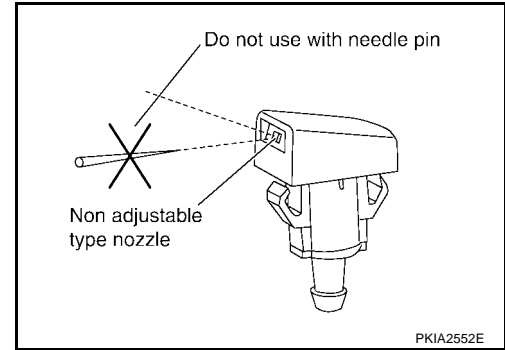
- Do not drop the wiper motor or cause it to contact other parts.
  - Check the grease conditions of the motor arm and wiper link joint(s). Apply grease if necessary.
1. Connect wiper motor to connector. Turn the wiper switch ON to operate wiper motor, then turn the wiper switch OFF (auto stop).
  2. 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"](#).
  6. Install wiper arms. Refer to [WW-22, "Removal and Installation of Front Wiper Arms, Adjustment of Wiper Arms Stop Location"](#).

# FRONT WIPER AND WASHER SYSTEM

## Washer Nozzle Adjustment

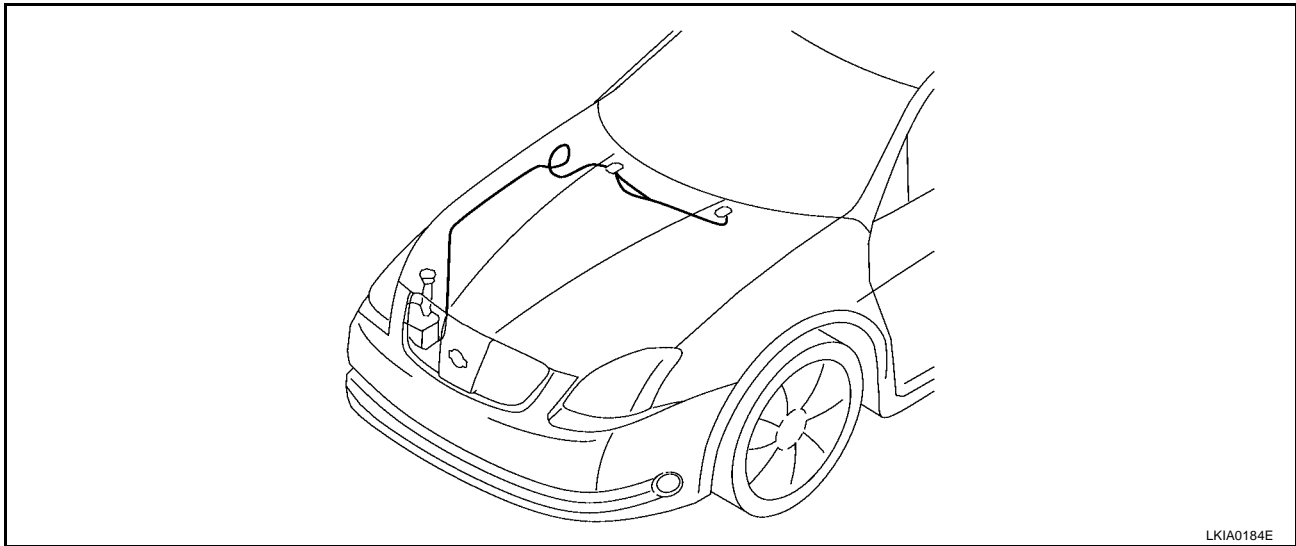
EKS0094V

- 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

EKS0094W

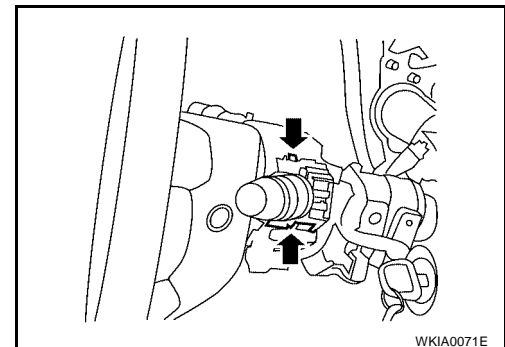


## Removal and Installation of Wiper and Washer Switch

EKS0094X

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.



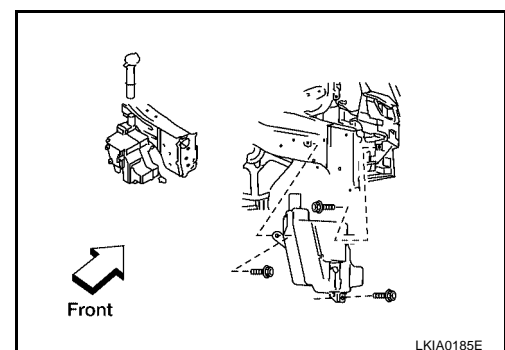
## Removal and Installation of Washer Tank

EKS0094Y

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.





# FRONT WIPER AND WASHER SYSTEM

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 of Washer Motor

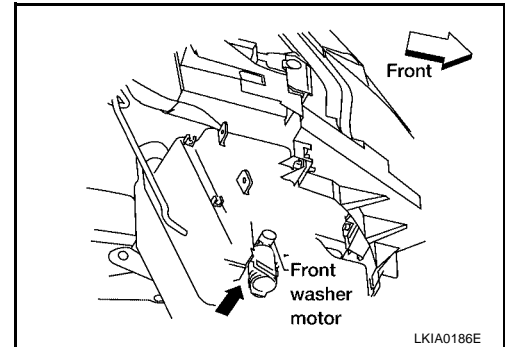
EKS0094Z

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.



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# POWER SOCKET

PPF:253A2

EKS00952

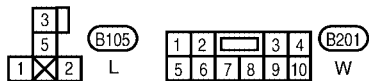
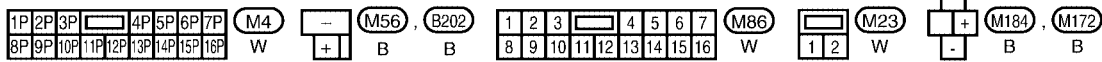
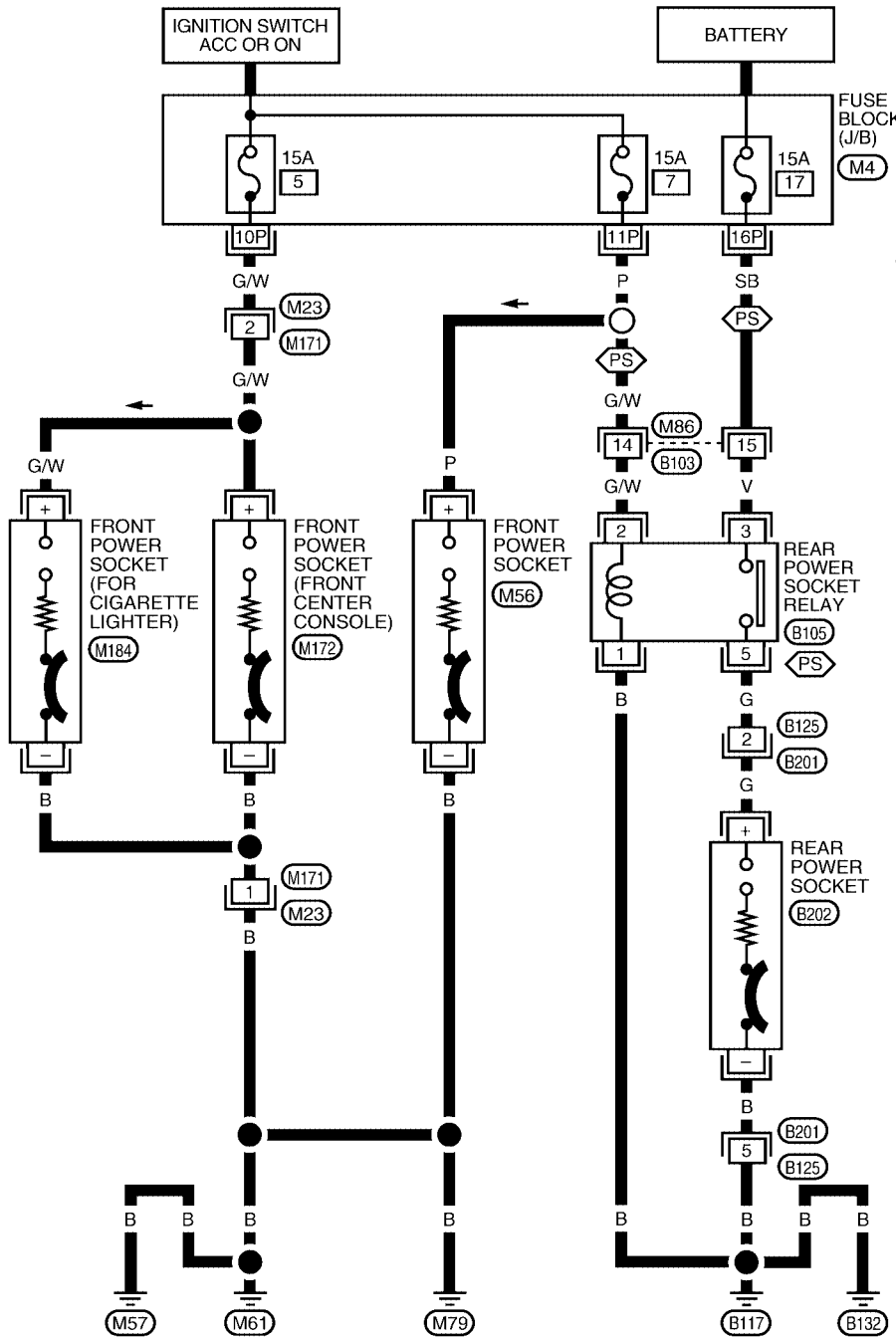
## POWER SOCKET

### Wiring Diagram — P/SCKT —

## WW-P/SCKT-01

⬠PS⬠ : WITH REAR POWER SOCKET

REFER TO "PG-POWER".



WKWA1637E

# POWER SOCKET

## Removal and Installation of Power Sockets

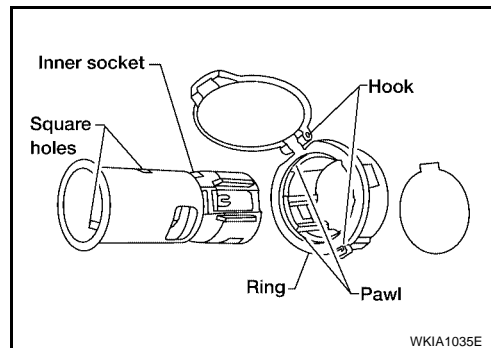
EKS00951

### REMOVAL

#### NOTE:

Removal and Installation is common for all power sockets.

1. Remove inner socket from the ring, while pressing the hook on the ring out from square hole.
2. Disconnect power socket connector.
3. Remove ring from power socket finisher while pressing pawls.



### INSTALLATION

Installation is in the reverse order of removal.

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# HORN

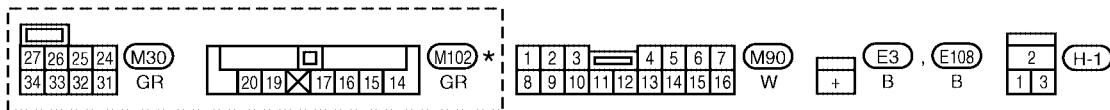
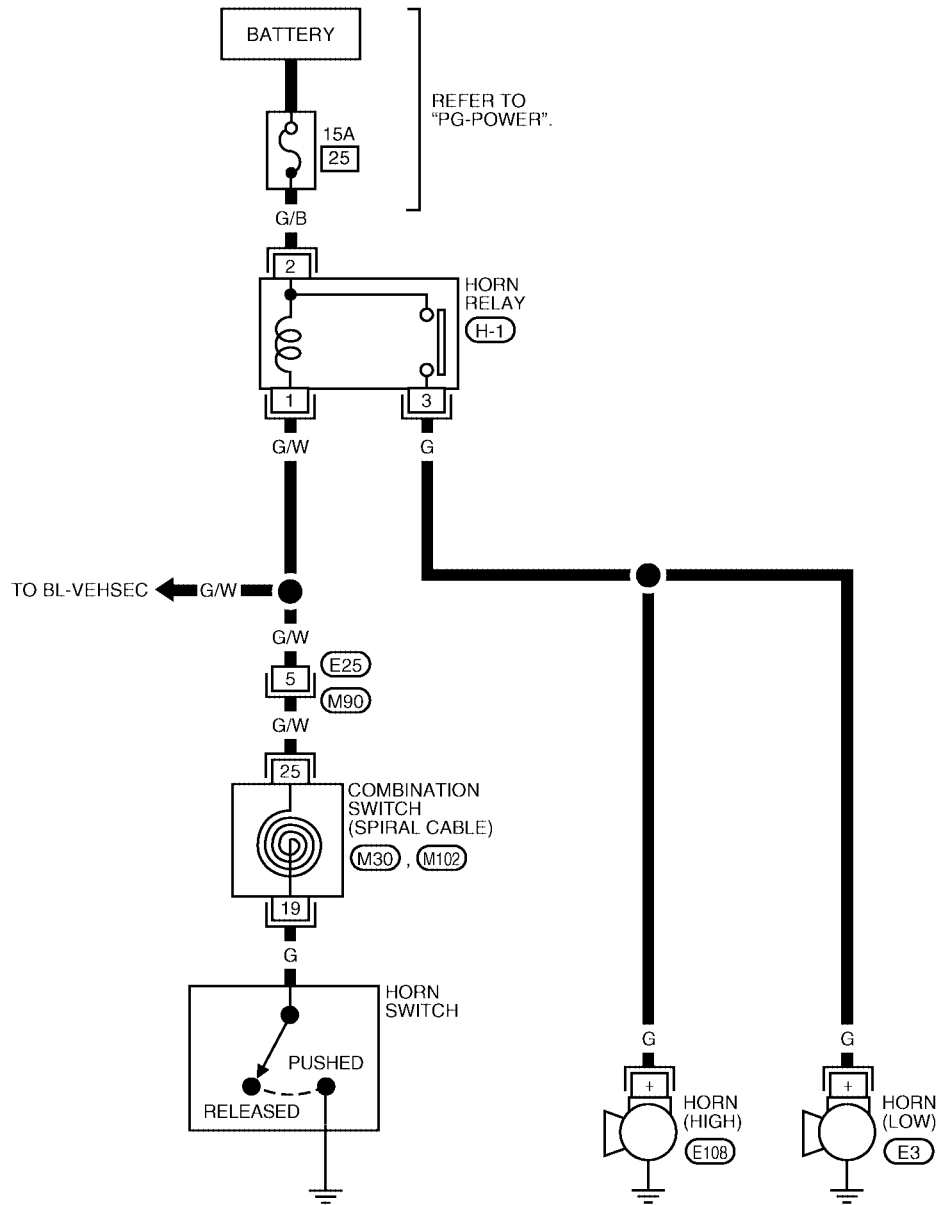
PF2:25610

## HORN

### Wiring Diagram — HORN —

EKS00954

## WW-HORN-01



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

WKWA1640E

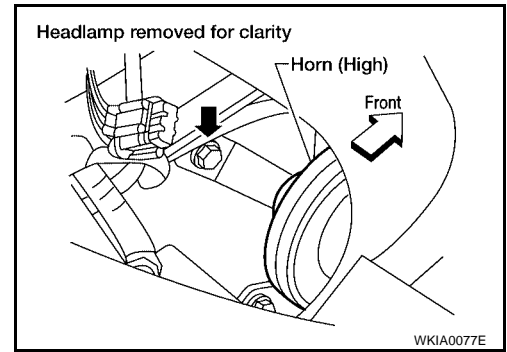
# HORN

EKS00955

## 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)

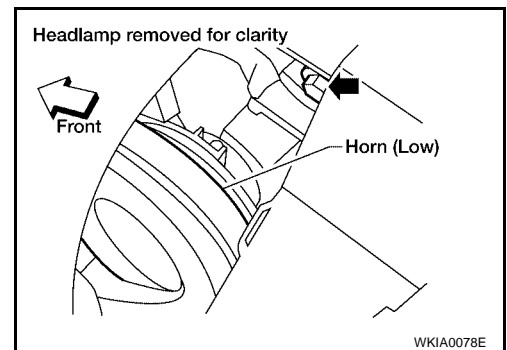
Tighten horn bolt to specified torque.

**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"](#).

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# HORN

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