SECTION WW
WIPER, WASHER & HORN

CONTENTS

PRECAUTION

PFP:00011

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

AKS009EF

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.**

Precautions for Battery Service

AKS003RE

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

Wiring Diagrams and Trouble Diagnosis

AKS000Y5

When You Read Wiring Diagrams, Refer to the Following:

- Refer to GI-15, "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:

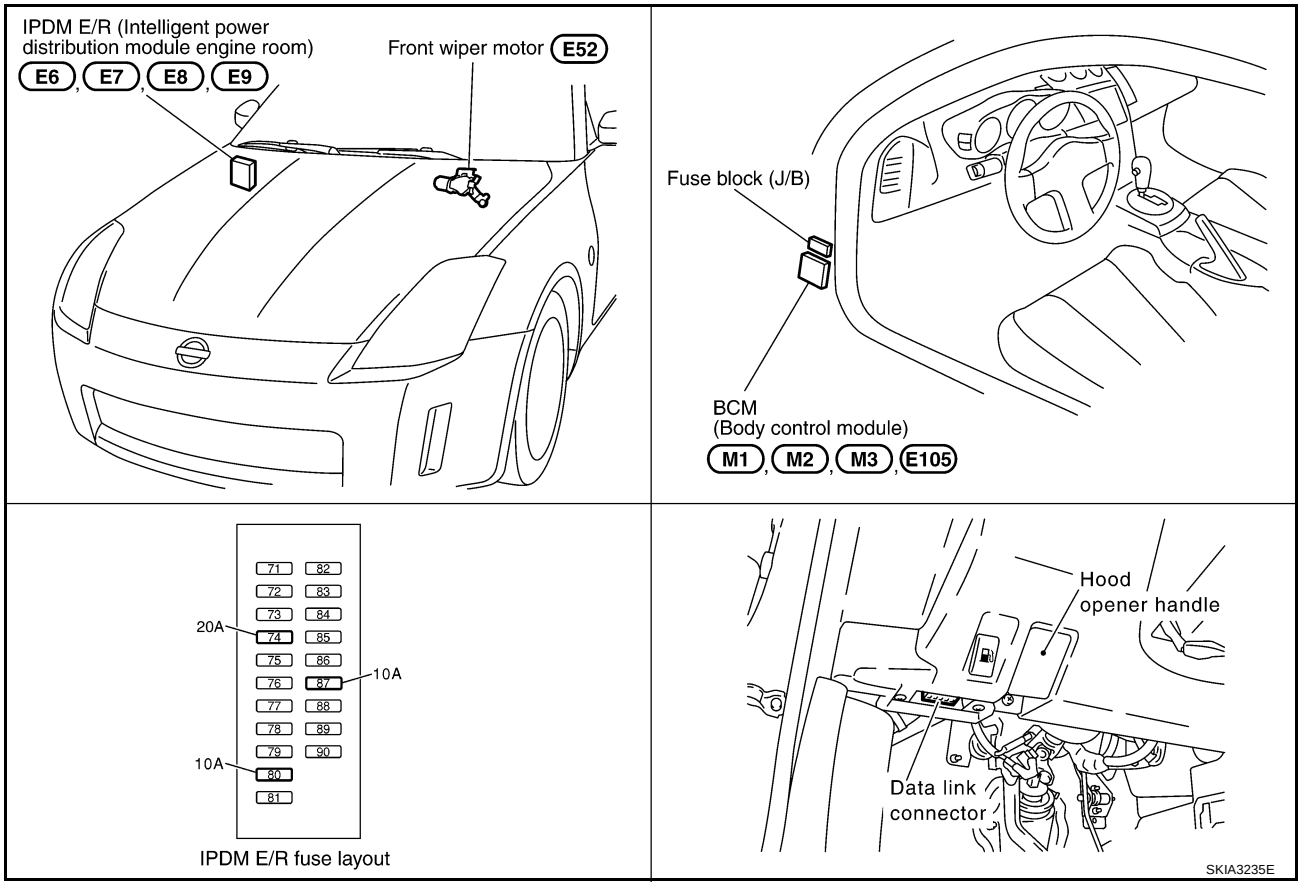
- Refer to GI-11, "HOW TO FOLLOW TEST GROUPS IN TROUBLE DIAGNOSES" .
- Refer to GI-27, "How to Perform Efficient Diagnosis for an Electrical Incident" .

FRONT WIPER AND WASHER SYSTEM

PFP:28810

Components Parts and Harness Connector Location

AKS000Y6



System Description

AKS000Y7

- All front wiper relays (HI, LO) are included in IPDM E/R.
- 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 (body control module) controls front wiper LO, HI, and INT (intermittent) operation.
- IPDM E/R operates wiper motor according to CAN communication signals from BCM (body control module).

Power is supplied at all times

- through 40 A fusible link (letter F, located in fuse and fusible link block)
- to BCM (body control module) terminal 7
- through 20 A fuse [No.74, located in IPDM E/R (intelligent power distribution module engine room)]
- to front wiper relay [located in IPDM E/R (intelligent power distribution module engine room)]
- through 15 A fuse [No.73, located in IPDM E/R (intelligent power distribution module engine room)]
- to CPU (control processing unit) [located in IPDM E/R (intelligent power distribution module engine room)].

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

- through 10 A fuse [No.1, located in fuse block (J/B)]
- to BCM (body control module) terminal 35 and
- through 10 A fuse [No.80, located in IPDM E/R (intelligent power distribution module engine room)]
- to front wiper relay [located in IPDM E/R (intelligent power distribution module engine room)] and
- to front wiper high relay [located in IPDM E/R (intelligent power distribution module engine room)] and
- through 10 A fuse [No.87, located in IPDM E/R (intelligent power distribution module engine room)]
- through IPDM E/R (intelligent power distribution module engine room) terminal 18

- to front washer motor terminal 2.

Ground is supplied

- to BCM (body control module) terminal 8
- through grounds E17, E43 and F152
- to IPDM E/R (intelligent power distribution module engine room) terminals 14 and 45
- through grounds E17, E43 and F152
- to combination switch (wiper switch) terminal 12
- through grounds M30 and M66.

LOW SPEED WIPER OPERATION

When front wiper switch is in LO position, BCM detect low speed wiper ON signal by BCM wiper switch reading function.
BCM sent front wiper request signal (LO) with CAN communication line

- from BCM terminals 70 and 71
- to IPDM E/R terminals 48 and 49.

When IPDM E/R receives front wiper request signal (LO), it turns ON front wiper relay (located in IPDM E/R), power is supplied

- to front wiper motor terminal 3
- through IPDM E/R terminal 31 and front wiper HIGH relay and front wiper relay.

Ground is supplied

- to front wiper motor terminal 4
- through grounds E17, E43 and F152.

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

HI SPEED WIPER OPERATION

When front wiper switch is in HI position, BCM detect high speed wiper ON signal by BCM wiper switch reading function.
BCM sent front wiper request signal (HI) with CAN communication line

- from BCM terminals 70 and 71
- to IPDM E/R terminals 48 and 49.

When IPDM E/R receives front wiper request signal (HI), it turns ON front wiper relay (located in IPDM E/R), power is supplied

- to front wiper motor terminal 2
- through IPDM E/R terminal 30 and front wiper HIGH relay and front wiper relay.

Ground is supplied

- to front wiper motor terminal 4
- through grounds E17, E43 and F152.

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

INTERMITTENT OPERATION

The front wiper motor operates the wiper arms one time at low speed at a set interval of wiper volume switch and vehicle speeds, this feature is controlled by the BCM and IPDM E/R.
When front wiper switch is in HI position BCM detect high speed wiper ON signal by BCM wiper switch reading function. BCM performs the following operations

- When BCM detects ON/OFF status of intermittent operation dial positions 1, 2, and 3 it determines wiper dial position status, Refer to WW-9, "Wiper Dial Position Setting" .
- BCM calculates operation interval from wiper dial position and vehicle speed signal received from combination meter with 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 turns ON internal front wiper relay. It then sends

auto-stop signal to BCM, and conducts intermittent front wiper operation.
With power and ground is supplied, rear wiper operates at intermittent.

AUTO STOP OPERATION

With wiper switch turned OFF, wiper motor will continue to operate until wiper arms reach windshield base.
When wiper arms are not located at base of windshield with wiper switch OFF, ground is provided

- from IPDM E/R terminal 31
- to front wiper motor terminal 3, in order to continue wiper motor operation at low speed.

When wiper arms reach base of windshield, front wiper motor terminals 1 and 4 are connected,
and Ground is supplied

- to IPDM E/R terminal 38
- through front wiper motor terminals 1 and 4
- through grounds E17, E43 and F152.

Then the IPDM E/R sends auto stop operation signal to BCM with CAN communication line.
When BCM receives auto-stop operation signal, BCM sends wiper stop signal to IPDM E/R with CAN communication line.
IPDM E/R stops wiper motor. Wiper motor will then stop wiper arms at the STOP position.

WASHER OPERATION

When wiper switch is in front wiper washer position, BCM detect front wiper washer signal by BCM wiper switch reading function (Refer to WW-7, "BCM WIPER SWITCH READING FUNCTION"), combination switch (wiper switch) ground is supplied

- to front washer motor terminal 1
- through combination switch (wiper switch) terminal 11
- to combination switch (wiper switch) terminal 12
- through grounds M30 and M66

With ground is supplied, front washer motor is operated.
When BCM detects that front washer motor has operated for 0.4 seconds or linger, BCM operates front wiper motor for low speed.
When BCM detects washer switch is OFF, low speed operation cycles approximately 3 times and stops.

MIST OPERATION

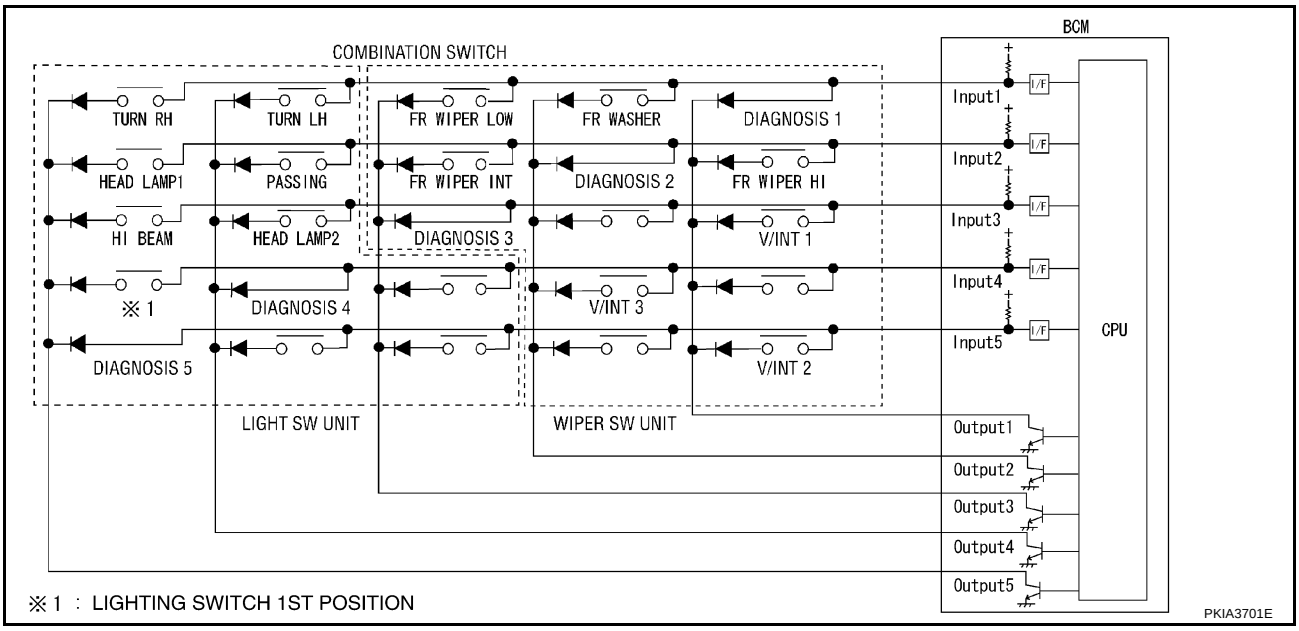
When the wiper switch is turned to the mist position, wiper low speed operation cycles once and then stops.
For additional information about wiper operation under this condition, Refer to WW-5, "LOW SPEED WIPER OPERATION" .
If the switch is held in the mist position, low speed operation continues.

FAIL-SAFE FUNCTION

IPDM E/R includes a fail-safe function to prevent malfunction of electrical components controlled by CAN communications in CAN communications occurs.
When fail-safe status is initiated, IPDM E/R remains in steady unit signals are received.

BCM WIPER SWITCH READING FUNCTION

BCM reads combination switch (wiper switch) status, and controls front wipers based on the results.
BCM is a combination of 5 output terminals (OUTPUT 1 - 5) and 5 input terminals (INPUT 1 - 5). It reads 20 types of switch data and 5 types of diagnosis data.



Operation Description

BCM continuously outputs power voltage from input terminals (INPUT 1 - 5). At this time, output terminals (OUTPUT 1 - 5) operate transistors in sequence and carry current. If any switch (or switches) becomes ON at this time, the input terminal corresponding to that switch detects current flowing, and BCM determines that the switch is ON.

Table of BCM - Combination Switch Operations

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

	COMB SW INPUT 1		COMB SW INPUT 2		COMB SW INPUT 3		COMB SW INPUT 4		COMB SW INPUT 5	
	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF
COMB SW OUTPUT 1	DIAGNOSIS 1 OK	DIAGNOSIS 1 NG	FR WIPER HI ON	FR WIPER HI OFF	V/INT 1 ON	V/INT 1 OFF	—	—	V/INT 2 ON	V/INT 2 OFF
COMB SW OUTPUT 2	FR WASHER ON	FR WASHER OFF	DIAGNOSIS 2 OK	DIAGNOSIS 2 NG	—	—	V/INT 3 ON	V/INT 3 OFF	—	—
COMB SW OUTPUT 3	FR WIPER LOW ON	FR WIPER LOW OFF	FR WIPER INT ON	FR WIPER INT OFF	DIAGNOSIS 3 OK	DIAGNOSIS 3 NG	—	—	—	—
COMB SW OUTPUT 4	TURN LH ON	TURN LH OFF	PASSING ON	PASSING OFF	HEAD LAMP 2 ON	HEAD LAMP 2 OFF	DIAGNOSIS 4 OK	DIAGNOSIS 4 NG	—	—
COMB SW OUTPUT 5	TURN RH ON	TURN RH OFF	HEAD LAMP ON	HEAD LAMP OFF	HI BEAM ON	HI BEAM OFF	LIGHTING SWITCH 1ST POSITION ON	LIGHTING SWITCH 1ST POSITION OFF	DIAGNOSIS 5 OK	DIAGNOSIS 5 NG

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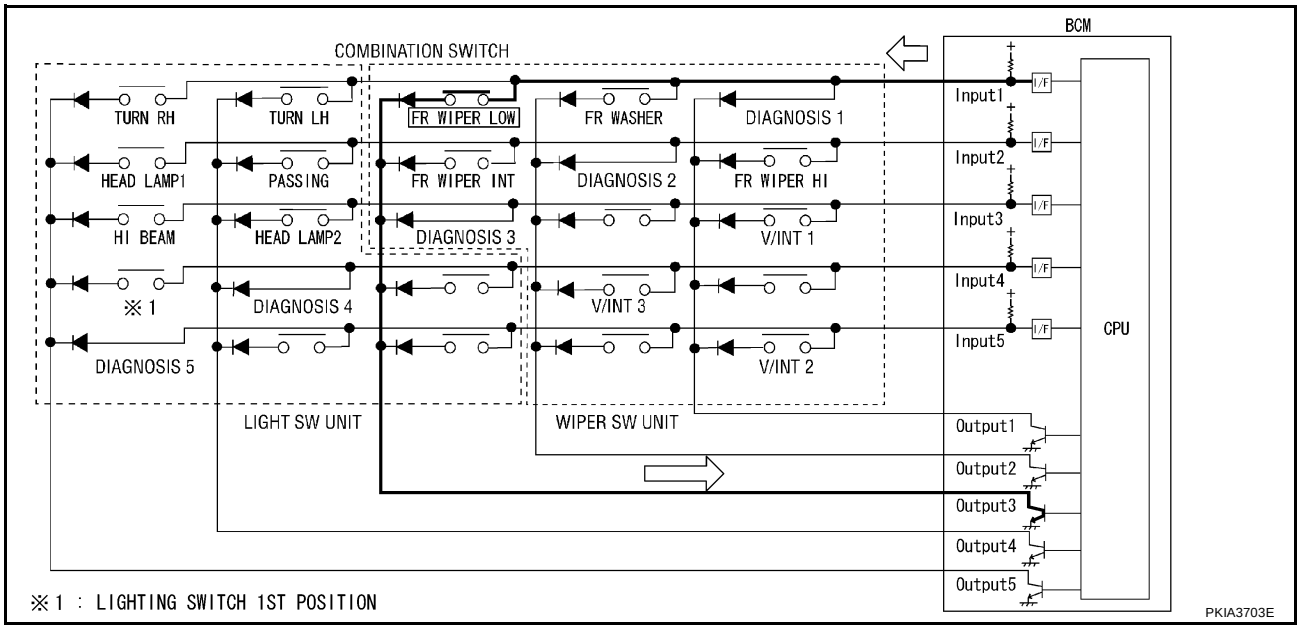
Sample Operation: (Wiper Switch Turned to Lo Position)

- When wiper switch is turned to LO position, front wiper LO contact inside combination switch becomes ON. At this time, OUTPUT 3 transistor operates and BCM detects flow of current at INPUT 1.
- When OUTPUT 3 transistor is ON and BCM detects current flowing at INPUT 1, BCM determines that wiper switch is at LO. BCM uses CAN communication and sends front wiper signals to IPDM E/R.
- When OUTPUT 3 transistor operates again and BCM again detects current flowing at INPUT 1, it confirms that front wiper LO operation is continuing.



NOTE:
Each OUTPUT terminal transistor operates at 10 ms intervals. Therefore, a delay occurs between the switch becoming ON and operation of the electric load. However, this delay is so small it is undetectable.

Operating Modes

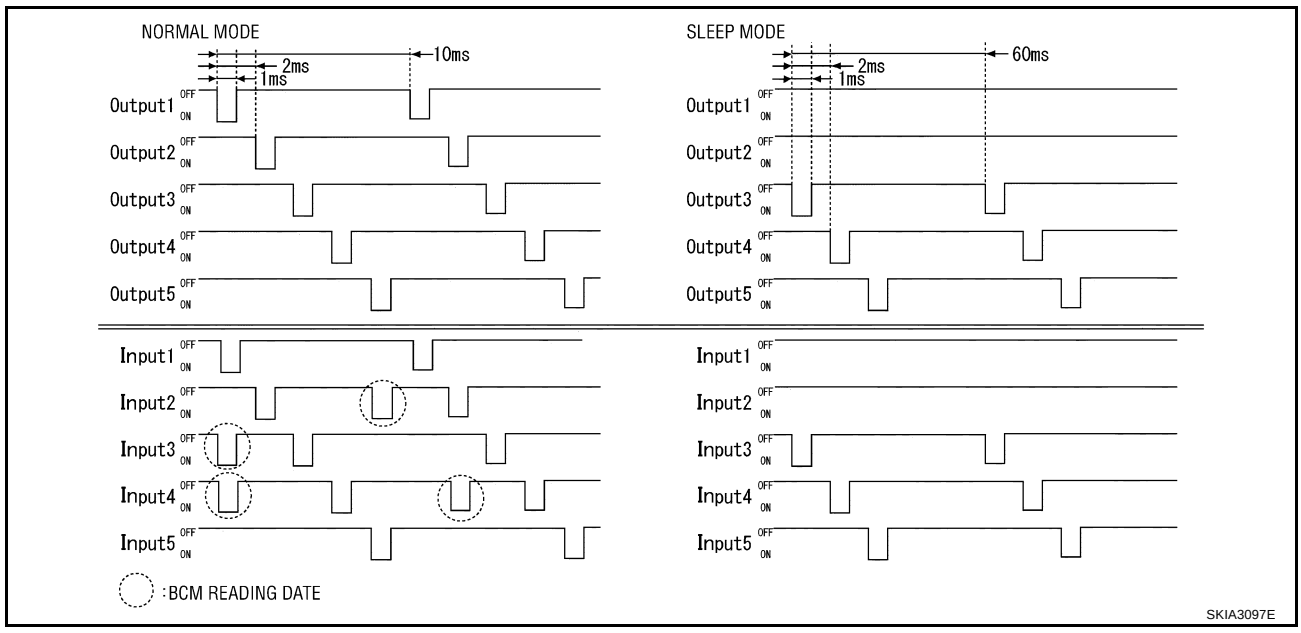
The following operation modes exist for combination switch reading function.

Normal Status

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

Sleep Status

When BCM is in sleep status, output from OUTPUT 1 and 2 transistors stops, with BCM entering a power-saving mode. OUTPUT (3 - 5) turns ON-OFF every 60 ms, and only input from lighting switch system is accepted.



Intermittent Operation

Wiper intermittent operation delay interval is determined from a combination of 3 switches (intermittent operation dial position 1, intermittent operation dial position 2, and intermittent operation dial position 3) and vehicle speed signal.
During each intermittent operation delay interval, BCM sends front wiper request signal to IPDM E/R.

Wiper Dial Position Setting

Wiper dial position	Intermittent operation interval	Combination switch		
		Intermittent operation dial position 1	Intermittent operation dial position 2	Intermittent operation dial position 3
Wiper dial position 1	Small	ON	ON	ON
Wiper dial position 2		ON	ON	OFF
Wiper dial position 3		ON	OFF	OFF
Wiper dial position 4	↓	OFF	OFF	OFF
Wiper dial position 5		OFF	OFF	ON
Wiper dial position 6		OFF	ON	ON
Wiper dial position 7	Large	OFF	ON	OFF

Example: For wiper dial position 1...
Using combination switch reading function, BCM detects ON/OFF status of intermittent operation dial positions 1, 2, and 3.
When combination switch status is as listed below, BCM determines that it is wiper dial position 1.

- Intermittent operation dial position 1: ON (input 3 and output 1 are conducting.)
- Intermittent operation dial position 2: ON (input 5 and output 1 are conducting.)
- Intermittent operation dial position 3: ON (input 4 and output 2 are conducting.)

BCM determines front wiper intermittent operation delay interval from wiper dial position 1 and vehicle speed, and sends wiper request signal (INT) to IPDM E/R.

CAN Communication System Description

AKS000Y8

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

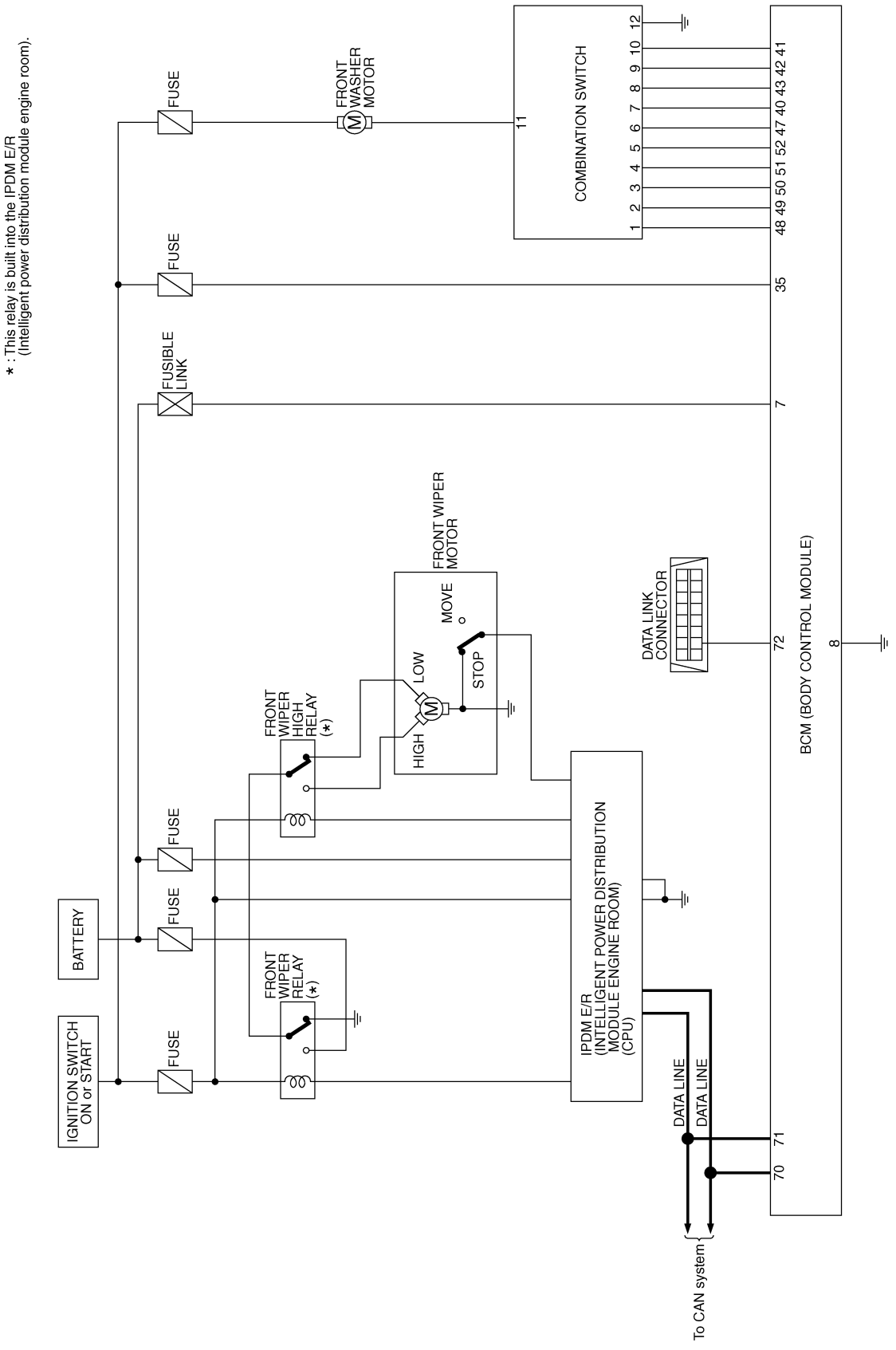
CAN Communication Unit

AKS003M9

Refer to LAN-4, "CAN Communication Unit" .

Schematic

AKS000Y9



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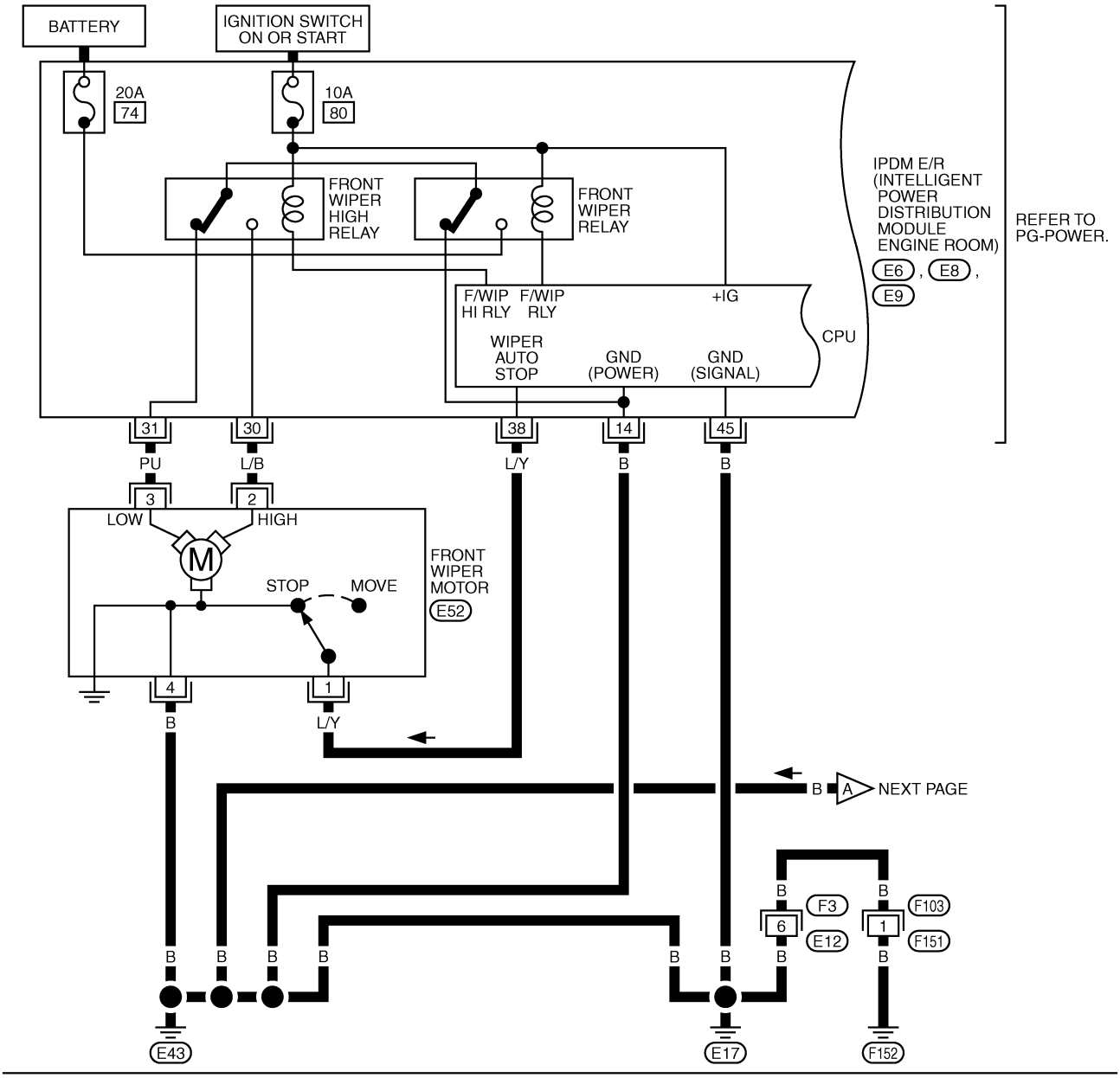
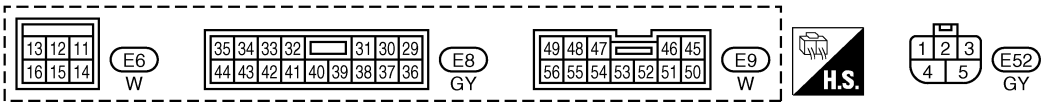
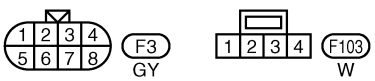
Wiring Diagram — WIPER —

AKS000YA

WW-WIPER-01







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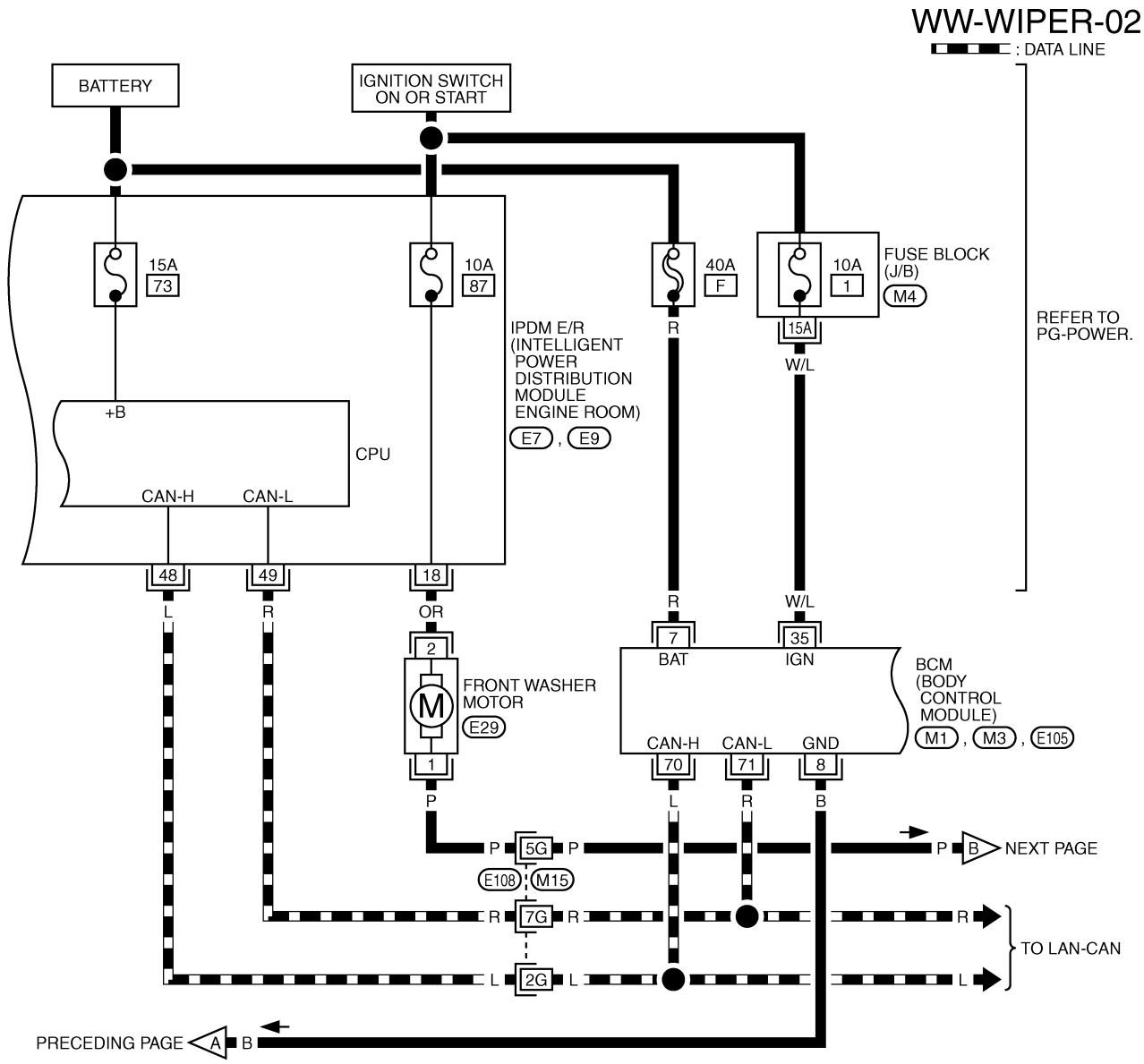
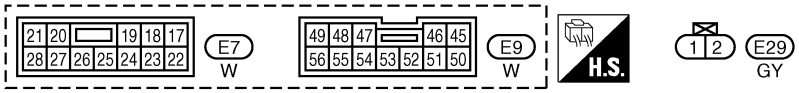
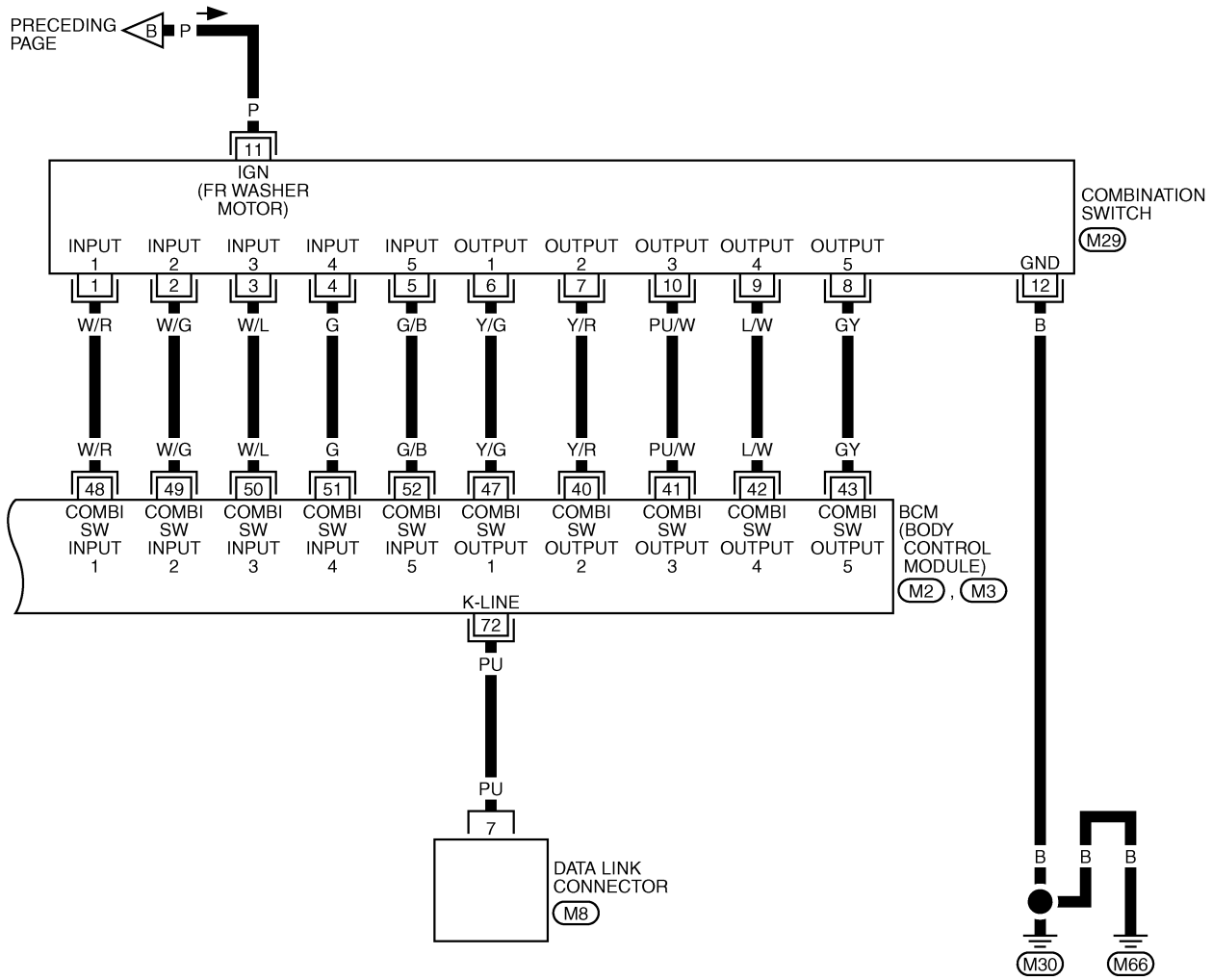


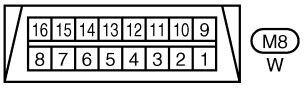


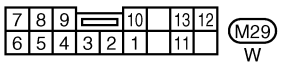
REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)
M4 -FUSE BLOCK-JUNCTION BOX (J/B)
M1, M3, E105 -ELECTRICAL UNITS

TKWT0398E

WW-WIPER-03





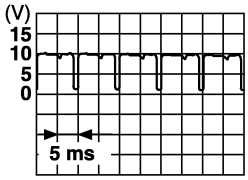


REFER TO THE FOLLOWING.
M2 , M3 -ELECTRICAL UNITS

TKWT0399E

Terminals and Reference Values for BCM

AKS000YB

Terminal No. (Wire color)	Signal name	Measuring condition		Reference value
		Ignition switch	Operation or condition	
7 (R)	Battery power supply	OFF	—	Battery voltage
8 (B)	Ground	ON	—	Approx. 0 V
35 (W/L)	Ignition switch (ON)	ON	—	Battery voltage
40 (Y/R)	Combination switch output 2	ON	Lighting switch and wiper switch OFF	 SKIA1119J
41 (PU/W)	Combination switch output 3			
42 (L/W)	Combination switch output 4			
43 (GY)	Combination switch output 5			
47 (Y/G)	Combination switch output 1			
48 (W/R)	Combination switch input 1	ON	Lighting switch and wiper switch OFF	4.5 or more
49 (W/G)	Combination switch input 2	ON		
50 (W/L)	Combination switch input 3	ON		
51 (G)	Combination switch input 4	ON		
52 (G/B)	Combination switch input 5	ON		
70 (L)	CAN– H	—	—	—
71 (R)	CAN– L	—	—	—
72 (PU)	K– LINE	—	—	—

Terminals and Reference Values for IPDM E/R

AKS000YC

Terminal No. (Wire color)	Signal name	Measuring condition			Reference value
		Ignition switch	Operation or condition		
14 (B)	Ground	ON	—		Approx. 0 V
18(OR)	Front washer motor power supply	ON	—		Battery voltage
30 (L/B)	High speed signal	ON	Wiper switch	OFF	Approx. 0 V
				HI	Battery voltage
31 (PU)	Low speed signal	ON	Wiper switch	OFF	Approx. 0 V
				LO	Battery voltage
38 (L/Y)	Wiper auto- stop signal	ON	Wiper operating		Battery voltage
			Wiper stopped		Approx. 0 V
45 (B)	Ground	ON	—		Approx. 0 V
48 (L)	CAN– H	—	—		—
49 (R)	CAN– L	—	—		—

How to Proceed With Trouble Diagnosis

AKS000YD

1. Confirm the symptoms and customer complaint.
2. Understand operation description and function description. Refer to WW-4, "System Description" .
3. Carry out the Preliminary Check. Refer to WW-15, "Preliminary Inspection" .
4. Check symptom and repair or replace the cause of malfunction.
5. Does the warning chime operate normally? If YES, GO TO 6. If NO, GO TO 4.
6. INSPECTION END.

Preliminary Inspection

AKS000YE

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 switch ON or START	87
Front wiper motor, front wiper relay, front wiper HI relay	Battery	74
Front wiper relay, front wiper HI relay	Ignition switch ON or START	80

Refer to WW-11, "Wiring Diagram — WIPER —" .

OK or NG

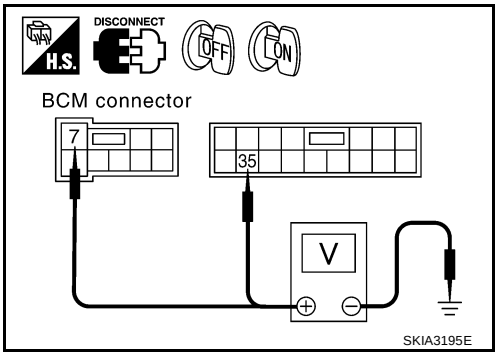
OK >> GO TO 2

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

2. POWER SUPPLY CIRCUIT CHECK

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

Terminals			Ignition switch position	
(+)		(-)	OFF	ON
Connector	Terminal (Wire color)			
E105	7 (R)	Ground	Battery voltage	Battery voltage
M1	35 (W/L)		0V	Battery voltage



OK or NG

OK >> GO TO 3.

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

3. GROUND CIRCUIT CHECK

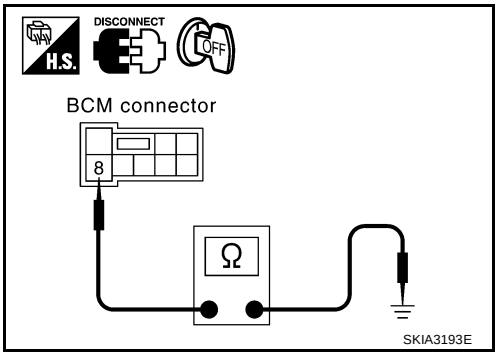
Check continuity between BCM harness connector and ground.

Terminals			Continuity
Connector	Terminal (wire color)		
E105	8 (B)	Ground	Yes

OK or NG

OK >> INSPECTION END.

NG >> Check harness ground circuit.



CONSULT-II Functions

AKS000YF

CONSULT-II performs the following functions communicating with BCM.

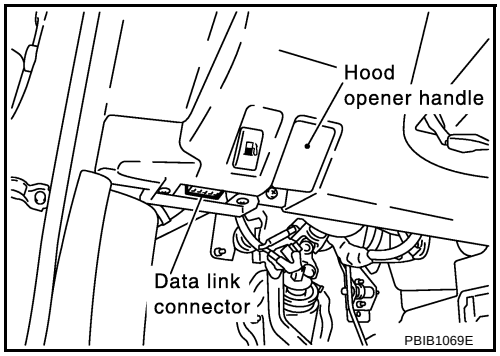
BCM diagnosis position	Check item, Diagnosis mode	Description
Wiper	DATA MONITOR	Displays BCM input data in real time.
	ACTIVE TEST	Device operation can be checked by applying a drive signal to device.
BCM C/U	CAN DIAG SUPPORT MNTR	The result of transmit/receive diagnosis of CAN communication can be read.

CONSULT-II OPERATION

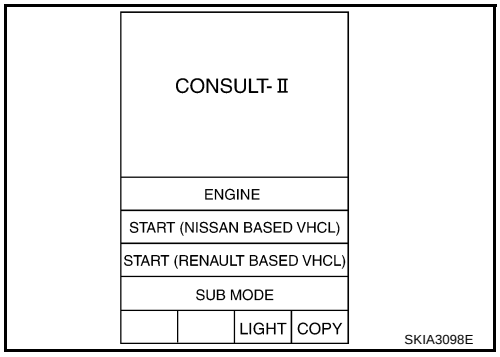
CAUTION:

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

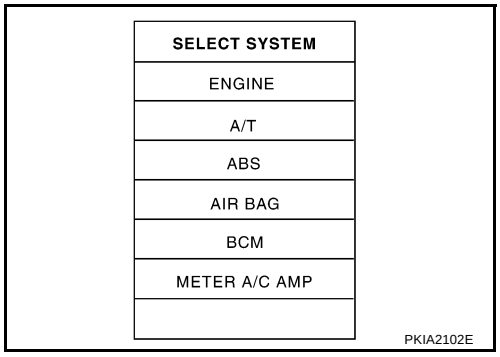
1. With the ignition switch OFF, connect CONSULT-II and CONSULT-II CONVERTER to the data link connector, then turn the ignition switch ON.



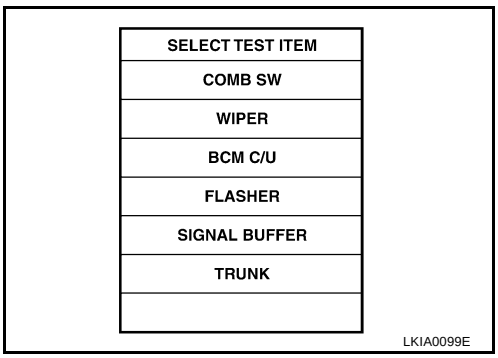
2. Touch “START (NISSAN BASED VHCL)”.



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



4. Touch “WIPER”.



DATA MONITOR

Operation Procedure

1. Touch “WIPER” on “SELECT TEST ITEM” screen.
2. Touch “DATA MONITOR” on “SELECT DIAG MODE” screen.
3. Touch either “ALL SIGNALS” or “SELECTION FROM MENU” on “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, then the status of the monitored item can be recorded. 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 INT	“ON/OFF”	Displays “Front Wiper INT (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 HI	“ON/OFF”	Displays “Front Wiper HI (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.
VHCL SPEED SEN	“ON/OFF”	Displays “Driving (ON)/Stopped (OFF)” status as judged from vehicle speed signal.
FR WIPER STOP	“ON/OFF”	Displays “Stopped (ON)/Operating (OFF)” status as judged from the auto-stop signal.
RR WIPER INT[Note]	“ON/OFF”	—
RR WIPER ON[Note]	“ON/OFF”	—
RR WASHER SW[Note]	“ON/OFF”	—
RR WIPER STOP[Note]	“ON/OFF”	—

NOTE:
This item is displayed, but cannot monitor it.

ACTIVE TEST

Operation Procedure

1. Touch “WIPERS” on the “SELECT TEST ITEM” screen.
2. Touch “ACTIVE TEST” on the “SELECT DIAG MODE” screen.
3. Touch item to be tested and check operation of the selected item.
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.
Rear wiper output[Note]	RR WIPER	—

NOTE:
This item is displayed, but cannot monitor it.

Front Wiper Does Not Operate

AKS000YG

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

1. Turn on front wipers using auto active test. Refer to PG-19, "Auto Active Test" .
2. Confirm front wiper operation.

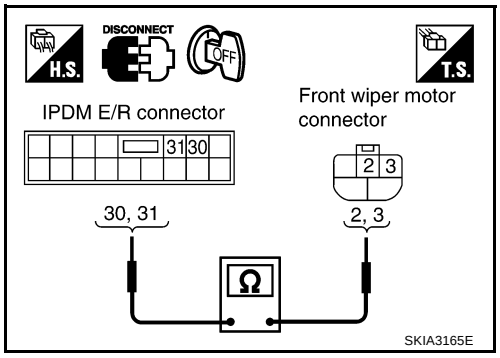
Wiper operation should operate

OK or NG

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

2. IPDM E/R TO FRONT WIPERS CIRCUIT

1. Disconnect IPDM E/R connector and front wiper motor connector.
2. Check continuity between IPDM E/R harness connector E8 terminal 30(L/B) and front wiper motor harness connector E52 terminal 2(L/B).
3. Check continuity between IPDM E/R harness connector E8 terminal 31(PU) and front wiper motor harness connector E52 terminal 3(PU).

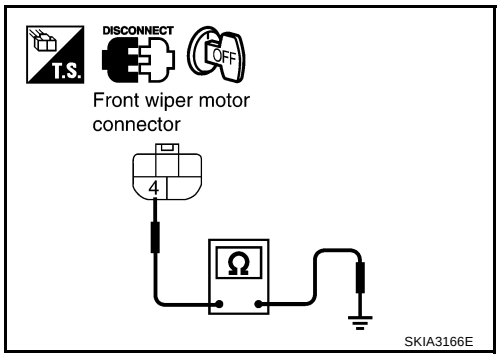


4. Check continuity between front wiper motor harness connector E52 terminal 4(B) and ground.

Continuity should exist

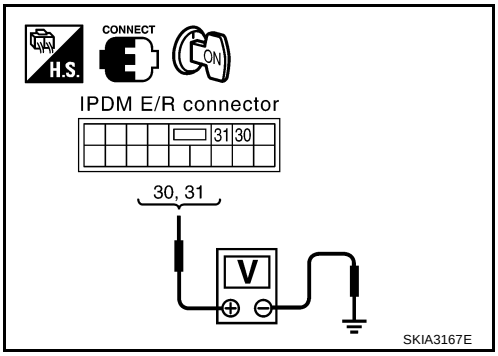
OK or NG

OK >> GO TO 3.
NG >> Repair harness or connector.



3. IPDM E/R INSPECTION

1. Connect IPDM E/R connector and front wiper motor connector.
2. Select “FR WIPER HI” during auto active test. Refer to PG-19, "Auto Active Test" . When front wiper relay, and front wiper HI relay are operating, check voltage between IPDM E/R harness connector terminals and ground.



Terminals				Voltage
(+)		(-)	Wiper relay Condition	
Connector	Terminal (wire color)			
E8	31 (PU)	Ground	Stopped	Approx. 0V
			LOW operation	Battery voltage
	30 (L/B)		Stopped	Approx. 0V
			HI operation	Battery voltage

OK or NG

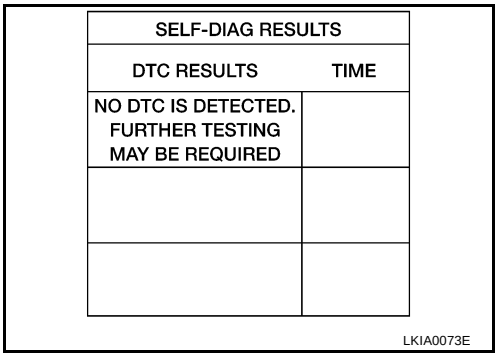
OK >> Replace front wiper motor.
NG >> Replace IPDM E/R.

4. COMBINATION SWITCH TO BCM (1) INSPECTION

Select BCM on CONSULT-II. Carry out self-diagnosis of “BCM C/U”.

Displayed self-diagnosis results

No malfunction detected>>GO TO 5.
CAN communications or CAN system>>Inspect the BCM CAN communications system. Go to BCS-13, "CAN Communication Inspection Using CONSULT-II (Self-Diagnosis)" .
OPEN DETECT 1 - 5>>Combination switch system malfunction. Go to LT-81, "Combination Switch Inspection According to Self-Diagnostic Results" .



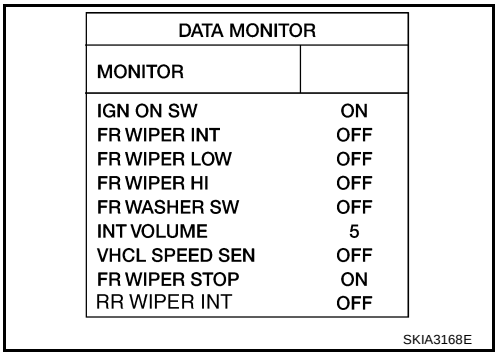
5. COMBINATION SWITCH TO BCM (2) INSPECTION

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.

When front wiper is low position :FR WIPER LOW ON
When front wiper is HI position :FR WIPER HI ON
When front wiper is INT position :FR WIPER INT ON

OK or NG

OK >> Replace BCM.
NG >> Replace front wiper switch.



Front Wiper Stop Position Is Incorrect

AKS000YH

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

Select BCM on CONSULT-II. With “WIPER” data monitor, check that “FR WIPER STOP” turns ON-OFF according to wiper operation.

When wiper switch OFF :FR WIPER STOP ON

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
RR WIPER INT	OFF

SKIA3168E

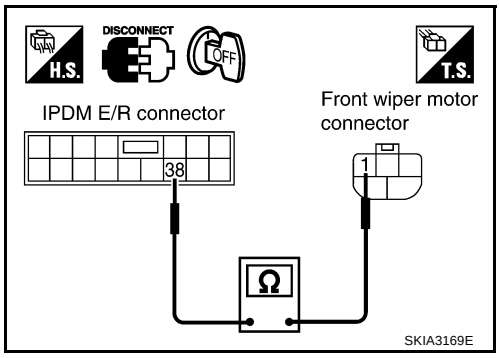
OK or NG

OK >> Replace IPDM E/R.
NG >> GO TO 2.

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

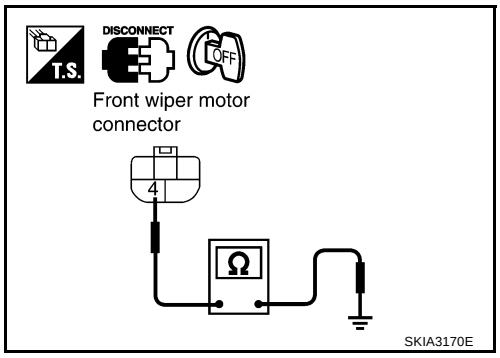
1. Disconnect IPDM E/R connector and front wiper motor connector.
2. Check continuity between IPDM E/R harness connector E8 terminal 38(L/Y) and front wiper motor harness connector E52 terminal 1(L/Y).

Continuity should exist



3. Check continuity between front wiper motor harness connector E52 terminal 4(B) and ground.

Continuity should exist

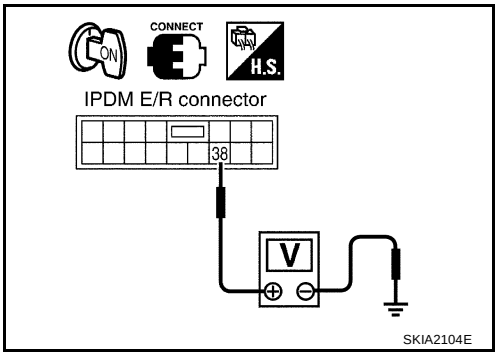


OK or NG

OK >> GO TO 3.
NG >> Repair harness or connector.

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

1. Connect IPDM E/R connector and front wiper motor connector.
2. While front wiper motor is stopped and while operating, measure voltage between IPDM E/R harness connector terminal and ground.



Terminals				Voltage
(+)		(-)	Condition	
Connector	Terminal (wire color)			
E8	38 (L/Y)	Ground	Wiper operating	Battery voltage
			Wiper stopped	Approx. 0V

OK or NG

OK >> Replace IPDM E/R.
NG >> Replace front wiper motor.

Only Front Wiper Low Does Not Operate

AKS000YI

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

1. Select “FR WIPER LOW” during auto active test. Refer to PG-19, "Auto Active Test" .
2. Verify that front wipers operate in LOW operation mode.

Wiper LOW operation should operate

OK or NG

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

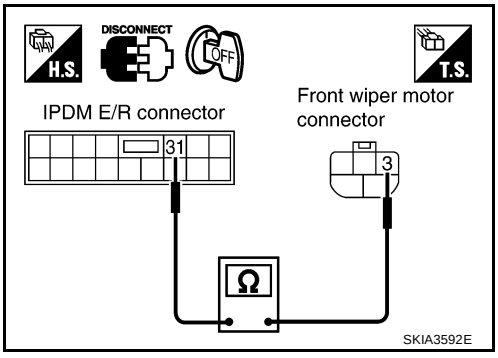
2. IPDM E/R TO FRONT WIPERS (2) INSPECTION

1. Disconnect IPDM E/R connector and front wiper motor connector.
2. Check continuity between IPDM E/R harness connector E8 terminal 31(PU) and front wiper motor harness connector E52 terminal 3(PU).

Continuity should exist

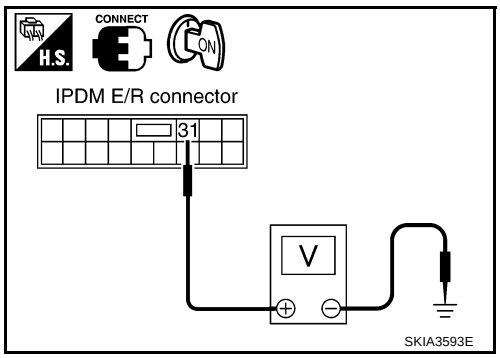
OK or NG

OK >> GO TO 3.
NG >> Check harness for open or short IPDM E/R and front wiper motor.



3. IPDM E/R INSPECTION

1. Connect IPDM E/R connector and front wiper motor connector.
2. Select “FR WIPER LOW” during auto active test. Refer to PG-19, "Auto Active Test" . When front wiper relay are operating, check voltage between IPDM E/R harness connector terminals and ground.



Terminals				Voltage
(+)		(-)	Condition	
Connector	Terminal (wire color)			
E8	31 (PU)	Ground	Stopped	Approx. 0V
			LOW operation	Battery voltage

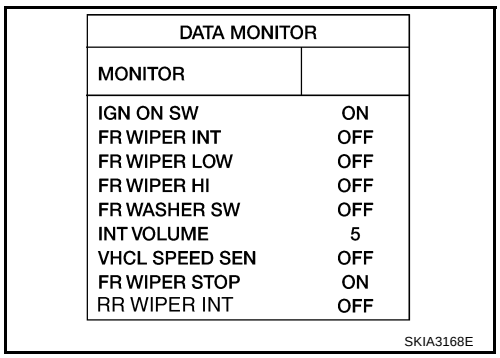
OK or NG

OK >> Replace front wiper motor.
NG >> Replace IPDM E/R.

4. 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.

When wiper switch LOW position :FR WIPER LOW ON



OK or NG

OK >> Replace BCM.
NG >> Replace wiper switch.

Only Front Wiper Hi Does Not Operate

AKS000YJ

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

1. Select “FR WIPER HI” during auto active test. Refer to PG-19, "Auto Active Test" .
2. Verify that front wipers operate in HI operation mode.

Wiper HI operation should operate

OK or NG

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

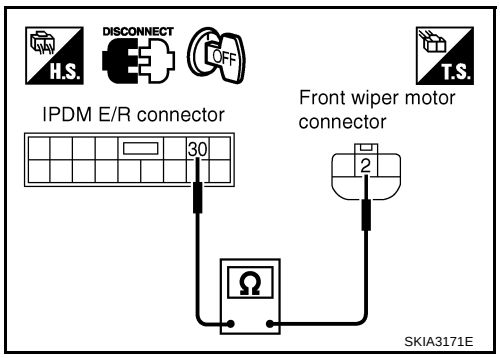
2. IPDM E/R TO FRONT WIPERS (2) INSPECTION

1. Disconnect IPDM E/R connector and front wiper motor connector.
2. Check continuity between IPDM E/R harness connector E8 terminal 30(L/B) and front wiper motor harness connector E52 terminal 2(L/B).

Continuity should exist

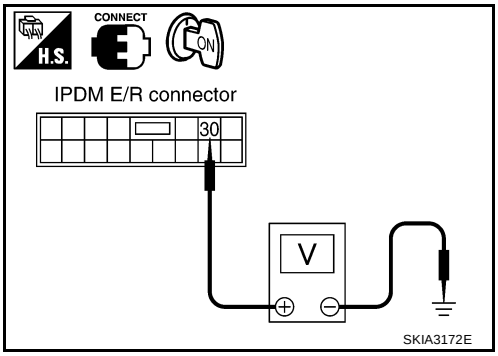
OK or NG

OK >> GO TO 3.
NG >> Check harness for open or short IPDM E/R and front wiper motor.



3. IPDM E/R INSPECTION

1. Connect IPDM E/R connector and front wiper motor connector.
2. Select “FR WIPER HI” during auto active test. Refer to PG-19, "Auto Active Test" . When front wiper relay, and front wiper HI relay are operating, check voltage between IPDM E/R harness connector terminals and ground.



Terminals				Voltage
(+)		(-)	Condition	
Connector	Terminal (wire color)			
E8	30 (L/B)	Ground	Stopped	Approx. 0V
			HI operation	Battery voltage

OK or NG

OK >> Replace front wiper motor.
NG >> Replace IPDM E/R.

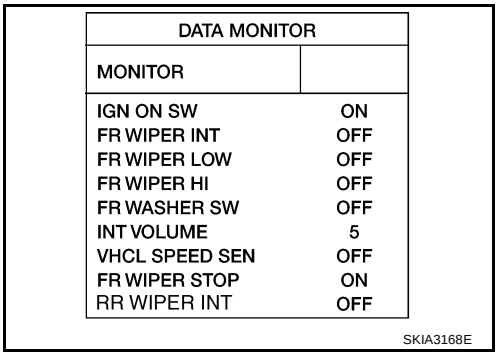
4. COMBINATION SWITCH TO BCM INSPECTION

Select BCM on CONSULT-II. With “WIPER” data monitor.

When wiper switch is HI operation :FR WIPER HI ON

OK or NG

OK >> Replace BCM.
NG >> Replace wiper switch.



Only Front Wiper Intermittent Does Not Operate

AKS000YK

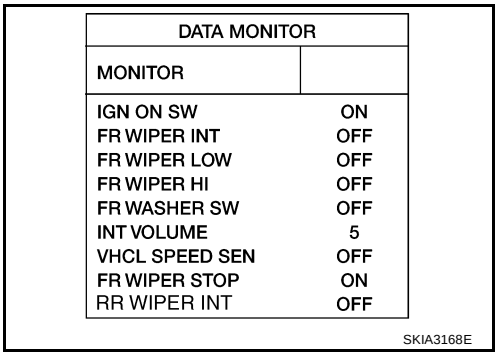
1. COMBINATION SWITCH TO BCM INSPECTION

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

When wiper switch INT position :FR WIPER INT ON

OK or NG

OK >> Replace BCM.
NG >> Replace wiper switch.



Front Wiper Intermittent Operation Switch Position Cannot Be Adjusted

AKS000YL

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.
NG >> Replace wiper 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
RR WIPER INT	OFF

SKIA3168E

Wipers Do Not Wipe When Front Washer Operates

AKS000YM

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.

When wiper switch washer position :FR WASHER SW ON

OK or NG

OK >> Replace BCM.
NG >> Replace wiper 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
RR WIPER INT	OFF

SKIA3168E

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

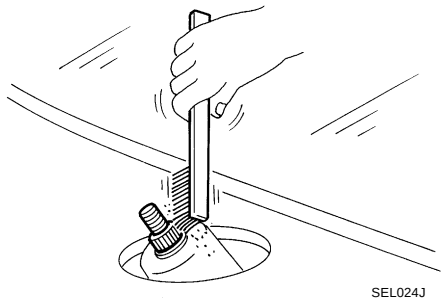
AKS000YN

REMOVAL

1. Operate front wiper motor, and stop it at the auto stop position.
2. Remove washer tube from washer tube joint.
3. Remove front wiper arm mounting nuts and front wiper arm from vehicle.

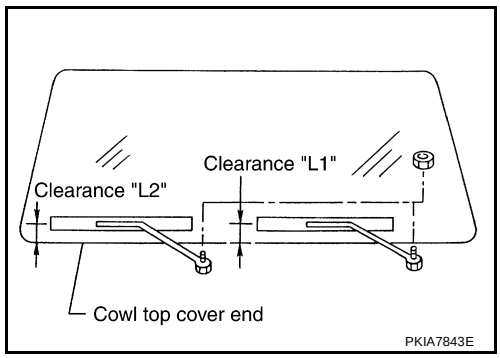
INSTALLATION

1. Clean up the pivot area as illustrated. This will reduce possibility of front wiper arm looseness.



SEL024J

2. Prior to front wiper arm installation, turn on wiper switch to operate front wiper motor and then turn it “OFF” (Auto Stop).
3. Push front wiper arm onto pivot shaft, paying attention to blind spline.
4. Attach washer tube to washer tube joint.
5. Lift the blade up and then set it down onto glass surface to set the blade center to clearance “L1” & “L2” immediately before tightening nut.
6. Eject washer fluid. Turn on wiper switch to operate front wiper motor and then turn it “OFF”.
7. Ensure that wiper blades stop within clearance “L1” & “L2”.



Clearance “L1” : 56.4 - 71.4 mm (2.22 - 2.81 in)

Clearance “L2” : 29.5 - 44.5 mm (1.16 - 1.75 in)

- Tighten front wiper arm nuts to specified torque.

Front wiper arm nuts : 23.6 N-m (2.4 Kg-m, 17 ft-lb)

ADJUSTMENT

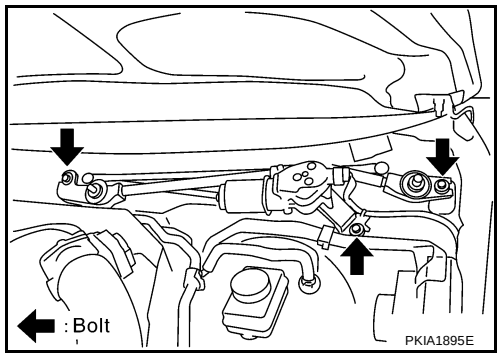
Refer to WW-24, "INSTALLATION"

Removal and Installation of Front Wiper Motor and Linkage

AKS000YO

REMOVAL

1. Remove front wiper arm. Refer to WW-24, "REMOVAL"
2. Remove cowl top cover. Refer to EI-20, "COWL TOP" in “EI” section.
3. Remove washer tube.
4. Disconnect front wiper motor connector.
5. Remove front wiper motor and linkage mounting bolts, and remove front wiper motor and linkage.



INSTALLATION

1. Install front wiper motor and linkage to the vehicle.
2. Connect front wiper motor assembly to the connector. Turn wiper switch ON to operate front wiper motor, then turn wiper switch OFF (auto stop).
3. Attach washer tube to washer tube joint.
4. Install cowl top cover. Refer to EI-20, "COWL TOP" in “EI” section.
5. Install front wiper arms. Refer to WW-24, "Removal and Installation for Front Wiper Arms, Adjustment for Wiper Arms Stop Location"
6. Attach front wiper arm washer tube.

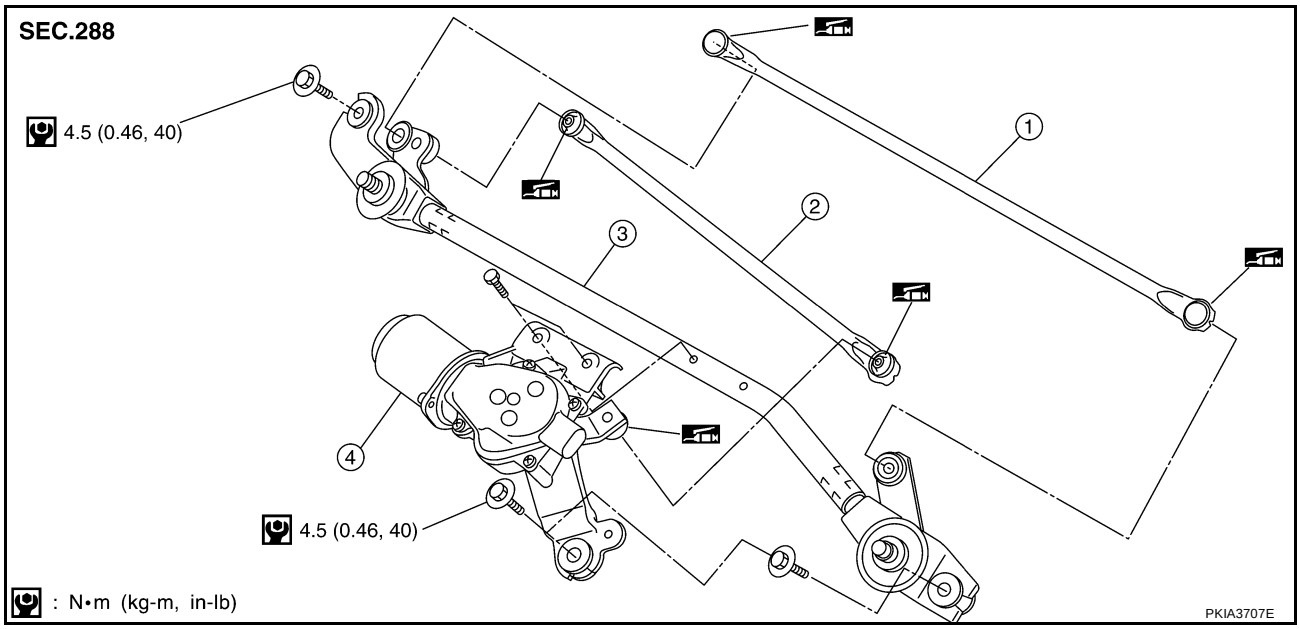
Front wiper motor and linkage mounting bolts : 4.5 N·m (0.46 kg-m, 40 in-lb)

CAUTION:

- **Do not drop the front wiper motor or cause it to contact other parts.**
- **Check grease conditions of the motor arm and wiper link joint (at retainer). Apply grease if necessary.**

Disassembly and Assembly Front Wiper Motor and Linkage

AKS000YP



1. Wiper link 1
2. Wiper link 2
3. Wiper frame
4. Front wiper motor

DISASSEMBLY

1. Remove wiper link from wiper frame and the motor arm.
2. Remove front wiper motor mounting bolts, and remove front wiper motor from wiper frame.

ASSEMBLY

Paying attention to the work listed below, assemble in reverse order of disassembly.

Wiper motor mounting bolts: : 4.5 N·m (0.46 kg-m, 40 in-lb)

Washer Nozzle Adjustment

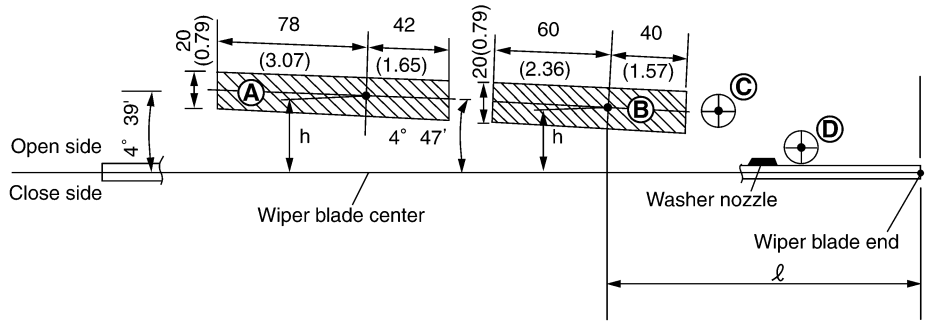
AKS000YQ

1. When wiper blade position is in auto stop condition, remove front wiper motor connector to ensure front wiper arms do not move.
2. Adjust each nozzle position (A, B, E, F, and G) so that spray positions are in the range of shaded parts.

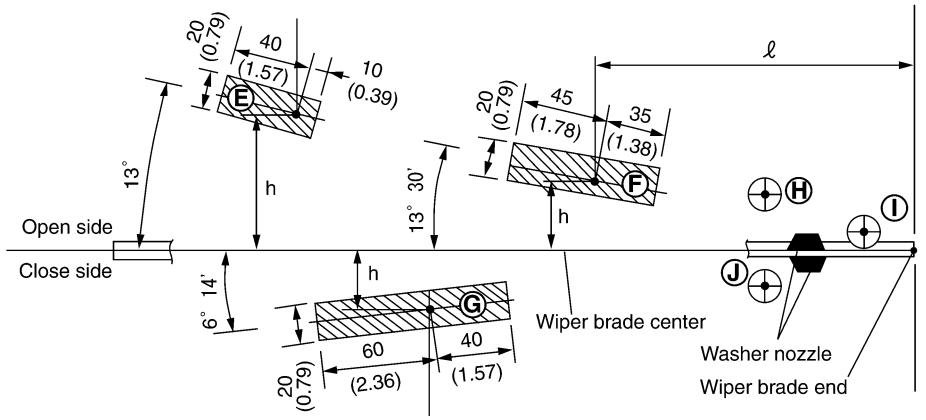
CAUTION:

Only washer nozzles (A, B, E, F, and G) can be adjusted. Washer nozzles (C, D, H, I, and J) cannot be adjusted because of fixed nozzles.

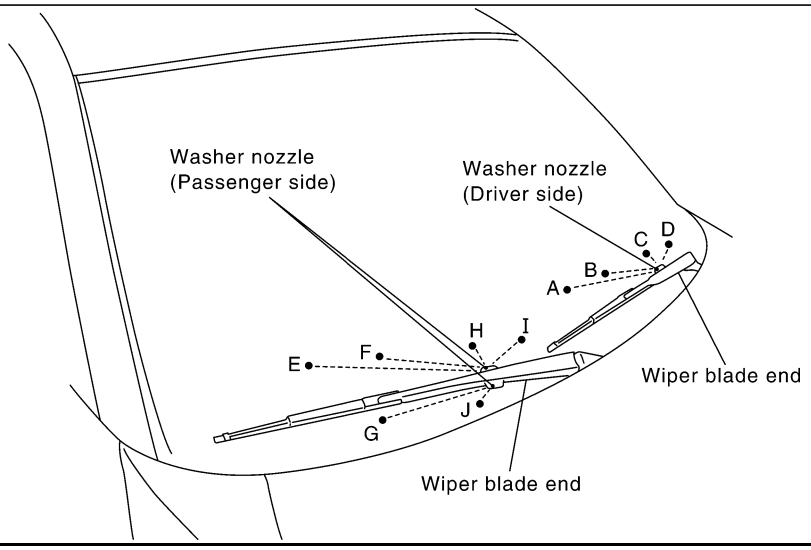
Driver side



Passenger side

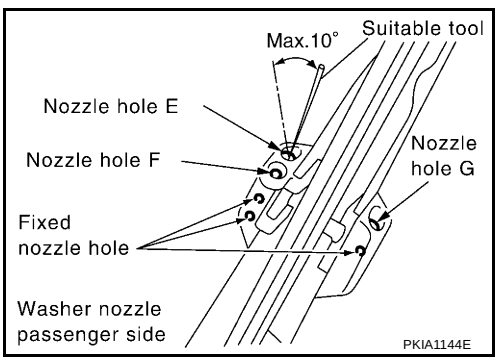


Unit : mm(in)



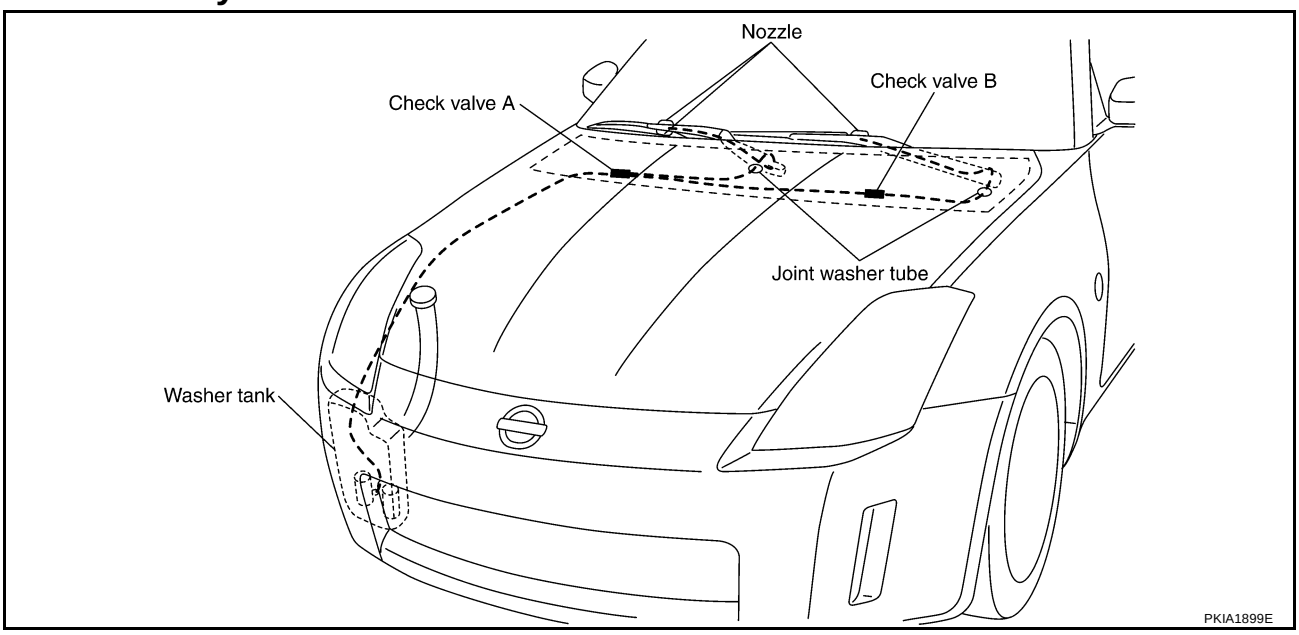
Unit: mm (in)

Spray position	h (height)	ℓ (width)
A	30 (1.18)	282.5 (11.12)
B	20 (0.79)	157.5 (6.20)
(C)	—	—
(D)	—	—
E	70 (2.76)	320 (12.60)
F	35 (1.38)	165 (6.50)
G	–30 (–1.18)	250 (9.84)
(H,I,J)	—	—



Washer Tube Layout

AKS000YR



Removal and Installation of Front Washer Nozzle

AKS000YS

Replace front wiper arm assembly. Refer to WW-24, "Removal and Installation for Front Wiper Arms, Adjustment for Wiper Arms Stop Location" .

CAUTION:

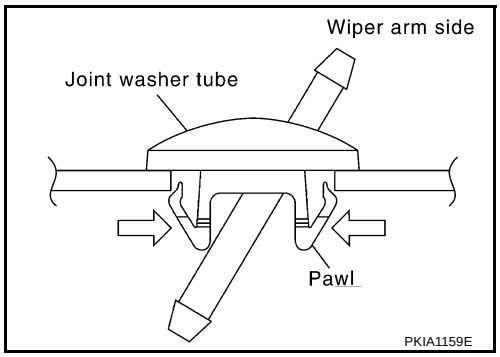
Removal/installation of the washer nozzle as a unit must not be done.

Removal and Installation of Front Washer tube Joint

AKS000YT

REMOVAL

1. Remove upwards while pressing the pawls on reverse side.
2. Remove washer tube.



INSTALLATION

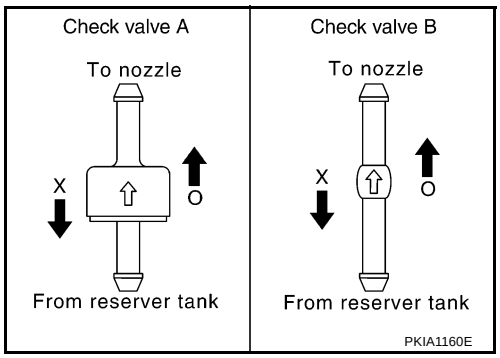
Install in reverse order removal.

Inspection of Check Valve

AKS000YU

CHECK VALVE

Blow air in the injection direction, and check that air flows only one way. Make sure that the reverse direction (inhale) is not possible.

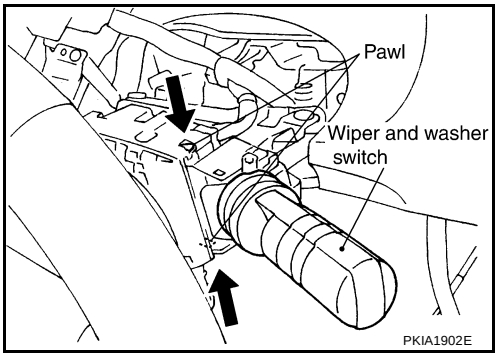


Removal and Installation of Front Wiper and Washer Switch

AKS000YV

REMOVAL

1. Remove steering column lower cover and combination meter. Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" in “IP” section.
2. Disconnect wiper and washer switch connector.
3. Pull wiper and washer switch toward the passenger door while pressing pawls in direction shown by the arrow in the figure, and remove it from the base.



INSTALLATION

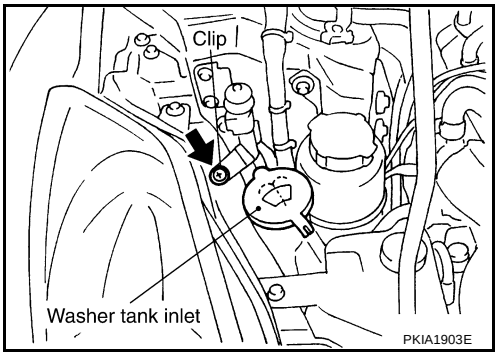
Install in reverse order removal.

Removal and Installation of Washer Tank

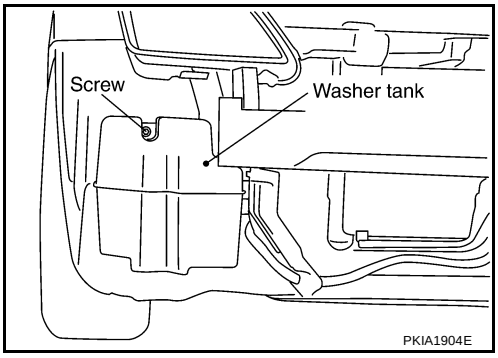
AKS000YW

REMOVAL

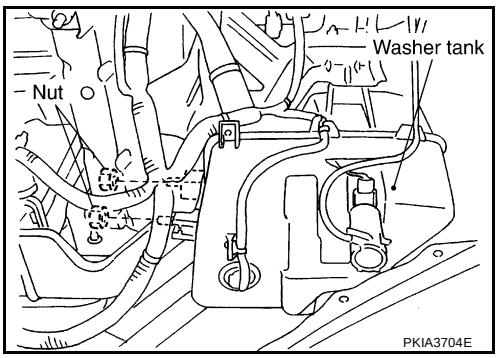
1. Remove the clip and pull out washer tank inlet.



2. Remove fender protector. Refer to EI-21, "FENDER PROTECTOR" in “EI” section.
3. Remove front bumper fascia. Refer to EI-14, "FRONT BUMPER" in “EI” section.
4. Disconnect washer pump connector.
5. Remove washer tank mounting screw and nuts.



6. Remove washer tube, and remove washer tank from the vehicle.



INSTALLATION

Note the following, and install in reverse order of removal.

CAUTION:

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

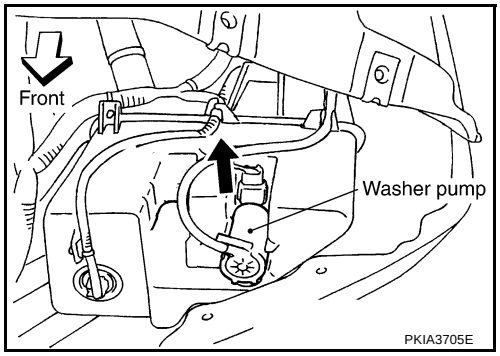
Washer tank mounting screw and nuts : 5.7 N·m (0.58 kg-m, 50 in-lb)

Removal and Installation of Washer Pump

AKS000YX

REMOVAL

1. Remove fender protector. Refer to EI-21, "FENDER PROTECTOR" in “EI” section.
2. Disconnect washer pump connector and tube.
3. Pull out washer pump in direction shown by the arrow in the figure. Remove washer pump from washer tank.



INSTALLATION

Paying attention to the following, install in reverse order of removal.

CAUTION:

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

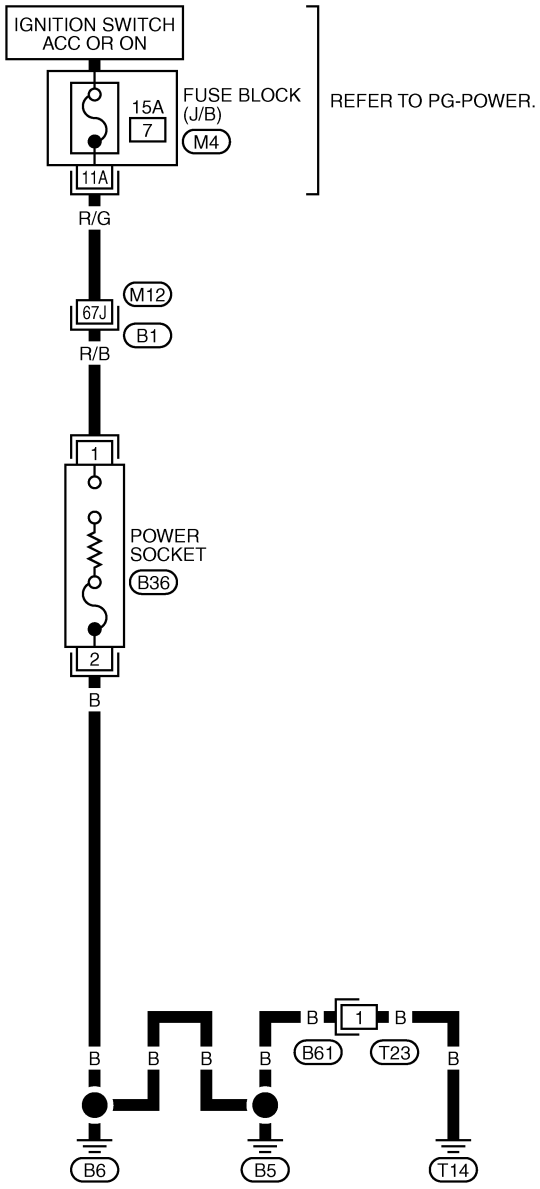
POWER SOCKET

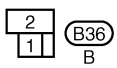
PFP:253A2

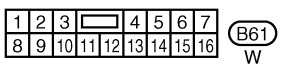
Wiring Diagram — P/SCKT —

AKS0033M

WW-P/SCKT-01







REFER TO THE FOLLOWING.

B1 -SUPER MULTIPLE JUNCTION (SMJ)

M4 -FUSE BLOCK-JUNCTION BOX (J/B)

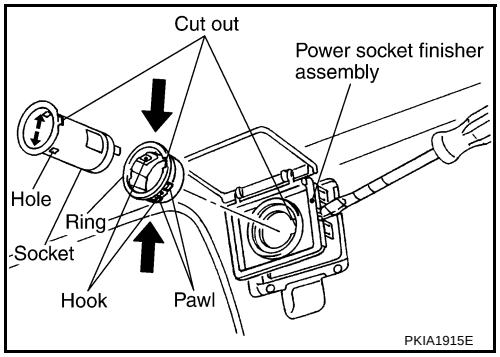
TKWT1077E

Removal and Installation

AKS0033N

REMOVAL

1. Remove the power socket finisher assembly using a clip driver or a suitable tool.
2. Disconnect power socket connector.
3. Remove inner socket from the ring. While pressing the hook on the ring out from square hole.
4. Remove ring from power socket finisher while pressing pawls.



INSTALLATION

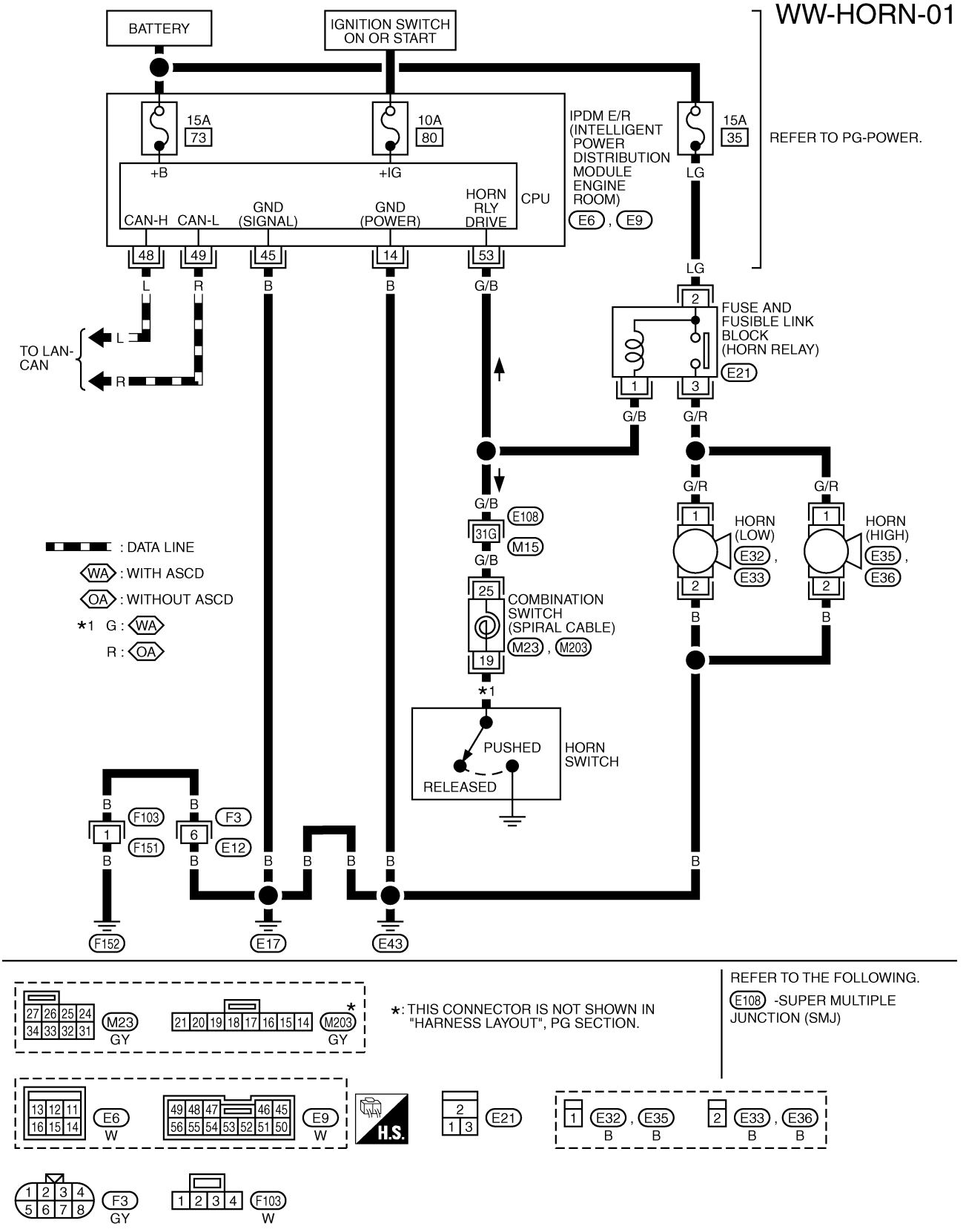
Instal in reverse order of removal.

HORN

PFP:25610

Wiring Diagram — HORN —

AKS000Z0



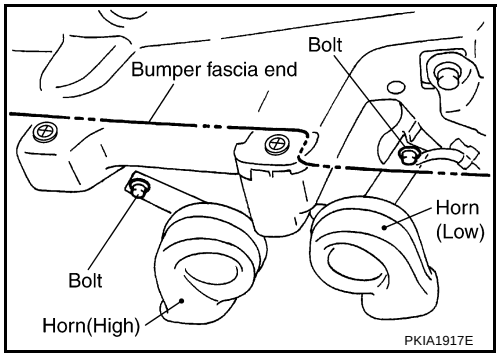
TKWT1078E

Removal and Installation

AKS000Z1

REMOVAL

1. Disconnect all horn connectors.
2. Remove horn mounting bolt and remove horn from vehicle.



INSTALLATION

Tighten horn bolt to specified torque.

Horn mounting bolt : 5.7 N·m (0.58 kg·m, 50 in-lb)