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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”

NKS003WA

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.

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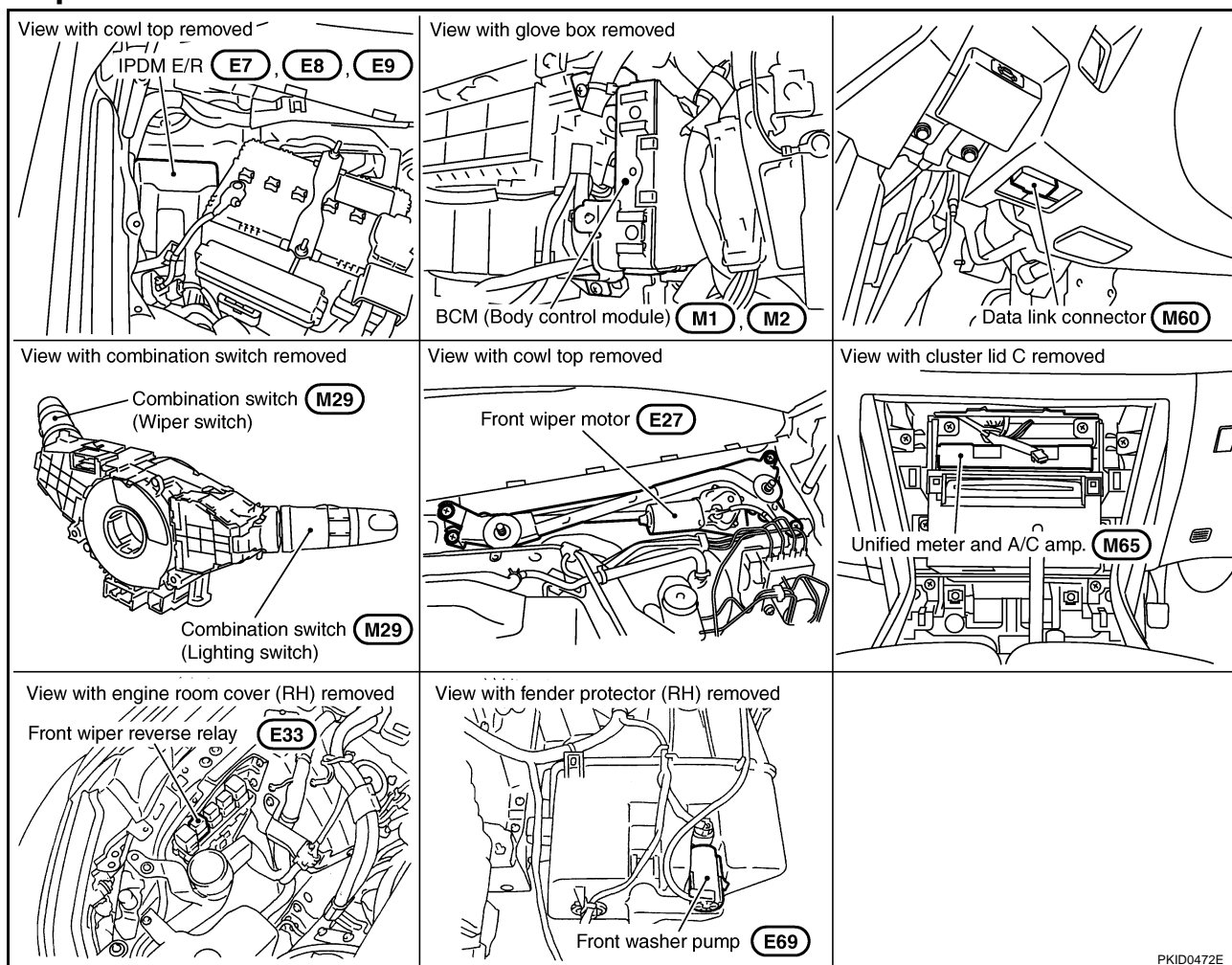
FRONT WIPER AND WASHER SYSTEM

FRONT WIPER AND WASHER SYSTEM

PFP:28810

Components Parts and Harness Connector Location

NKS003WB



PKID0472E

System Description

NKS003WC

- Front wiper relays (HIGH, LOW) are included in IPDM E/R (intelligent power distribution module engine room).
- Front wiper reverse relay is included in relay box-1. Refer to [PG-98, "ELECTRICAL UNITS LOCATION"](#).
- 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 BCM.
- Front wiper motor switches LOW speed to/from HIGH speed by BCM function to change polarity.

OUTLINE

Power is supplied at all times

- to ignition relay, located in IPDM E/R, from battery directly,
- through 50 A fusible link (letter F, located in fuse and fusible link block)
- to BCM terminal 55,
- through 10 A fuse [No. 21, located in fuse block (J/B)]
- to BCM terminal 42,
- through 30 A fuse (No. 73, located in IPDM E/R)
- to front wiper low relay, located in IPDM E/R
- to front wiper reverse relay terminal 5,
- through 15 A fuse (No. 78, located in IPDM E/R)

FRONT WIPER AND WASHER SYSTEM

- to CPU (central processing unit) located in IPDM E/R,
- through 15 A fuse (No. 71, located in IPDM E/R)
- to CPU located in IPDM E/R.

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

- to ignition relay, located in IPDM E/R,
- through 15 A fuse [No. 1, located in fuse block (J/B)]
- to BCM terminal 38,
- through 10 A fuse [No. 12, located in fuse block (J/B)]
- to front wiper reverse relay terminal 1,
- through 10 A fuse (No. 84, located in IPDM E/R)
- to front washer pump terminal 1
- to front wiper motor terminal 4.

Ground is supplied

- to BCM terminal 52
- through grounds M16 and M70,
- to IPDM E/R terminals 38 and 51
- through grounds E22 and E43,
- to combination switch terminal 12
- through grounds M16 and M70.

LOW SPEED WIPER OPERATION

When wiper switch is in the LO position, BCM detects low speed wiper ON signal by BCM wiper switch reading function.

BCM sends front wiper request signal (LO) with CAN communication line

- from BCM terminals 39 and 40
- to IPDM E/R terminals 49 and 50.

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

- through IPDM E/R terminal 23 and front wiper high relay and front wiper low relay
- to front wiper motor terminal 3.

Ground is supplied

- to front wiper motor terminal 1
- through front wiper reverse relay terminals 3 and 4
- through grounds E22 and E43.

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

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FRONT WIPER AND WASHER SYSTEM

HIGH SPEED WIPER OPERATION

When wiper switch is in the HI position, BCM detects high speed wiper ON signal by BCM wiper switch reading function.

BCM sends front wiper request signal (HI) with CAN communication line

- from BCM terminals 39 and 40
- to IPDM E/R terminals 49 and 50.

When IPDM E/R receives front wiper request signal (HI), it turns ON front wiper high relay (located in IPDM E/R) and front wiper reverse relay (located in relay box-1), power is supplied

- through IPDM E/R terminal 19
- through front wiper reverse relay terminals 5 and 3
- to front wiper motor terminal 1.

Ground is supplied

- to front wiper motor terminal 2
- to IPDM E/R terminal 31 and front wiper high relay and front wiper low relay
- to IPDM E/R terminal 38
- through grounds E22 and E43.

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

INTERMITTENT OPERATION

1. BCM detects ON/OFF status of intermittent operation dial position 1, 2 and 3 switched by wiper dial position to judge wiper dial position status.
2. BCM calculates intermittent operation interval time (second) from the vehicle speed signal received by combination meter through CAN communication line and the wiper dial position.

Unit: second

Wiper dial position	Intermittent operation interval time	Stopped	Vehicle speed; approx. 5 km/h (3.1 MPH) or more to approx. 65 km/h (40.4 MPH)	Vehicle speed approx. 65 km/h (40.4 MPH) or more
1	Short	1	0.4	0.2
2		2.5	1	0.6
3	↑	5	2	1.2
4	↓	7.5	3	1.8
5	Long	12.5	5	3
6		25	10	6
7		40	16	9.6

NOTE:

The value in the table can differ from the actual vehicle speed.

3. BCM switches front wiper request signal transmitted to IPDM E/R through CAN communication line from STOP to LO once at intervals of intermittent operation time.
4. IPDM E/R receives front wiper request signal (LO) once to turn ON front wiper main relay located in IPDM E/R. Then operates front wiper. IPDM E/R receives front wiper auto stop signal (stop) input from front wiper motor to turn OFF front wiper motor relay. IPDM E/R switches front wiper auto stop signal transmitted through CAN communication line from MOVE to STOP.
5. BCM receives front wiper auto stop signal (stop) to operate timer that determines intermittent operation interval time till next front wiper motor operation.

FRONT WIPER AND WASHER SYSTEM

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 23
- 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 4 and 5 are connected

- to IPDM E/R terminal 32
- through front wiper motor terminals 4 and 5.

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 with ignition switch ON, BCM detects front wiper washer signal by BCM wiper switch reading function (refer to [BCS-3, "COMBINATION SWITCH READING FUNCTION"](#)). Combination switch ground is supplied

- to front washer pump terminal 2
- through combination switch terminal 14
- to combination switch terminal 12
- through grounds M16 and M70.

With power and ground supplied, front washer pump is operated.

When BCM detects that front washer pump has operated for 0.4 seconds or longer, BCM operates front wiper motor for low speed.

When BCM detects washer switch is OFF, low speed operation cycles approximately 2 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

If an abnormality occurs in CAN communications, IPDM E/R holds the condition just before fail-safe status is initiated until ignition switch is turned OFF. (If wipers were operating in LO just before the initiation of fail-safe status, they continue to operate in LOW until ignition switch is turned OFF.)

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FRONT WIPER AND WASHER SYSTEM

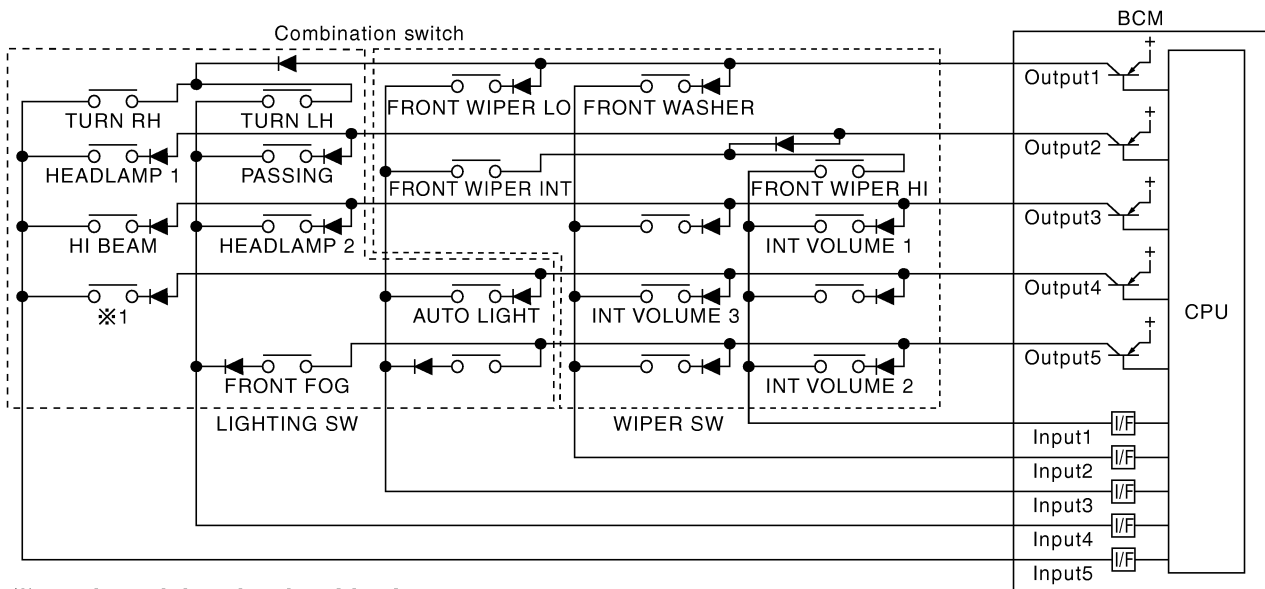
COMBINATION SWITCH READING FUNCTION

Description

- BCM reads combination switch (wiper) status, and controls front wipers according to the results.
- BCM reads information of a maximum of 20 switches by combining five output terminals (OUTPUT 1-5) and five input terminals (INPUT 1-5).

Operation Description

- BCM activates transistors of output terminals (OUTPUT 1-5) periodically and allows current to flow in turn.
- If any (one or more) switches are turned ON, circuit of output terminals (OUTPUT 1-5) and input terminals (INPUT 1-5) becomes active.
- At this time, transistors of output terminals (OUTPUT 1-5) are activated to allow current to flow. When voltage of input terminals (INPUT 1-5) corresponding to that switch changes, interface in BCM detects voltage change, and BCM determines that the switch is ON.



※ 1 : LIGHTING SWITCH 1ST POSITION

PKID0470E

BCM - Operation Table of Combination Switches

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

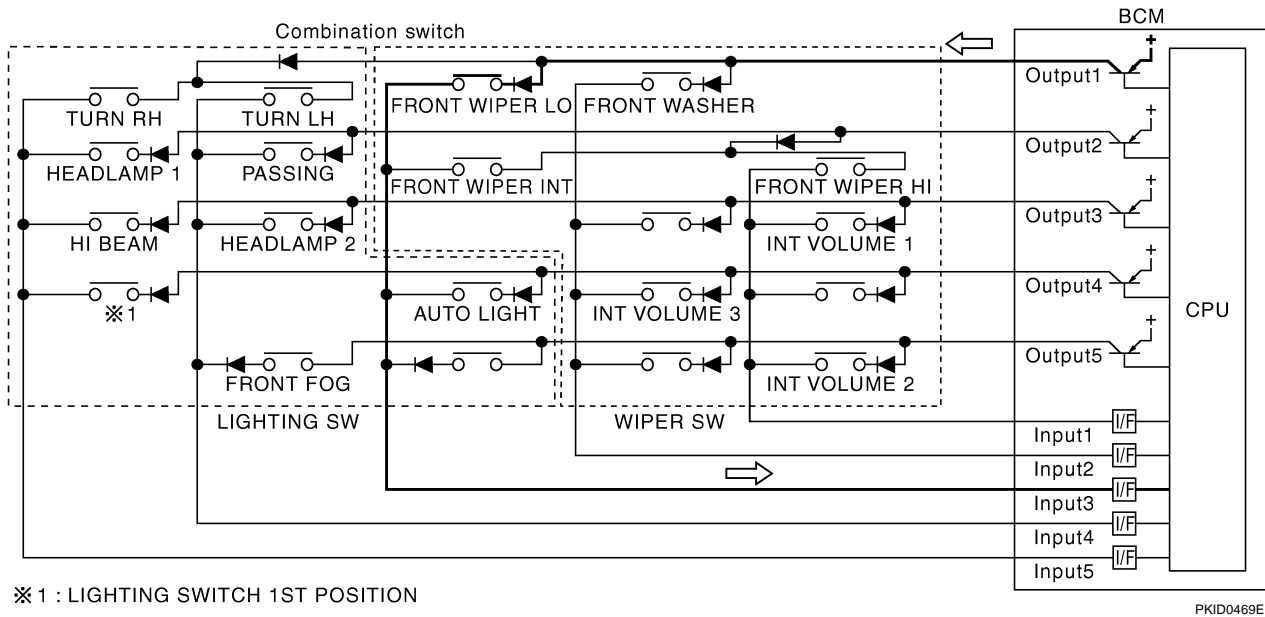
	COMB SW OUTPUT 1		COMB SW OUTPUT 2		COMB SW OUTPUT 3		COMB SW OUTPUT 4		COMB SW OUTPUT 5	
	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF
COMB SW INPUT 1	—	—	FRONT WIPER HI ON	FRONT WIPER HI OFF	INT VOLUME 1 ON	INT VOLUME 1 OFF	—	—	INT VOLUME 2 ON	INT VOLUME 2 OFF
COMB SW INPUT 2	FRONT WASHER ON	FRONT WASHER OFF	—	—	—	—	INT VOLUME 3 ON	INT VOLUME 3 OFF	—	—
COMB SW INPUT 3	FRONT WIPER LO ON	FRONT WIPER LO OFF	FRONT WIPER INT ON	FRONT WIPER INT OFF	—	—	AUTO LIGHT ON	AUTO LIGHT OFF	—	—
COMB SW INPUT 4	TURN LH ON	TURN LH OFF	PASSING ON	PASSING OFF	HEAD-LAMP 2 ON	HEAD-LAMP 2 OFF	—	—	FRONT FOG ON	FRONT FOG OFF
COMB SW INPUT 5	TURN RH ON	TURN RH OFF	HEAD-LAMP 1 ON	HEAD-LAMP 1 OFF	HI BEAM ON	HI BEAM OFF	LIGHTING SW (1ST) ON	LIGHTING SW (1ST) OFF	—	—

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FRONT WIPER AND WASHER SYSTEM

Sample Operation: (When Wiper Switch Turned to LO Position)

- When wiper switch is turned to LO position, front wiper LO contact in combination switch turns ON. At this time if OUTPUT 1 transistor is activated, BCM detects that voltage changes in INPUT 3.
- When BCM detects that voltage changes in INPUT 3 while OUTPUT 1 transistor is ON, it judges that front wiper switch is in LO position. Then BCM sends front wiper request signal (LO) to IPDM E/R using CAN communication.
- If BCM detects that voltage changes in INPUT 3 when OUTPUT 1 transistor is activated again, it recognizes that wiper switch is still in LO position.



NOTE:

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

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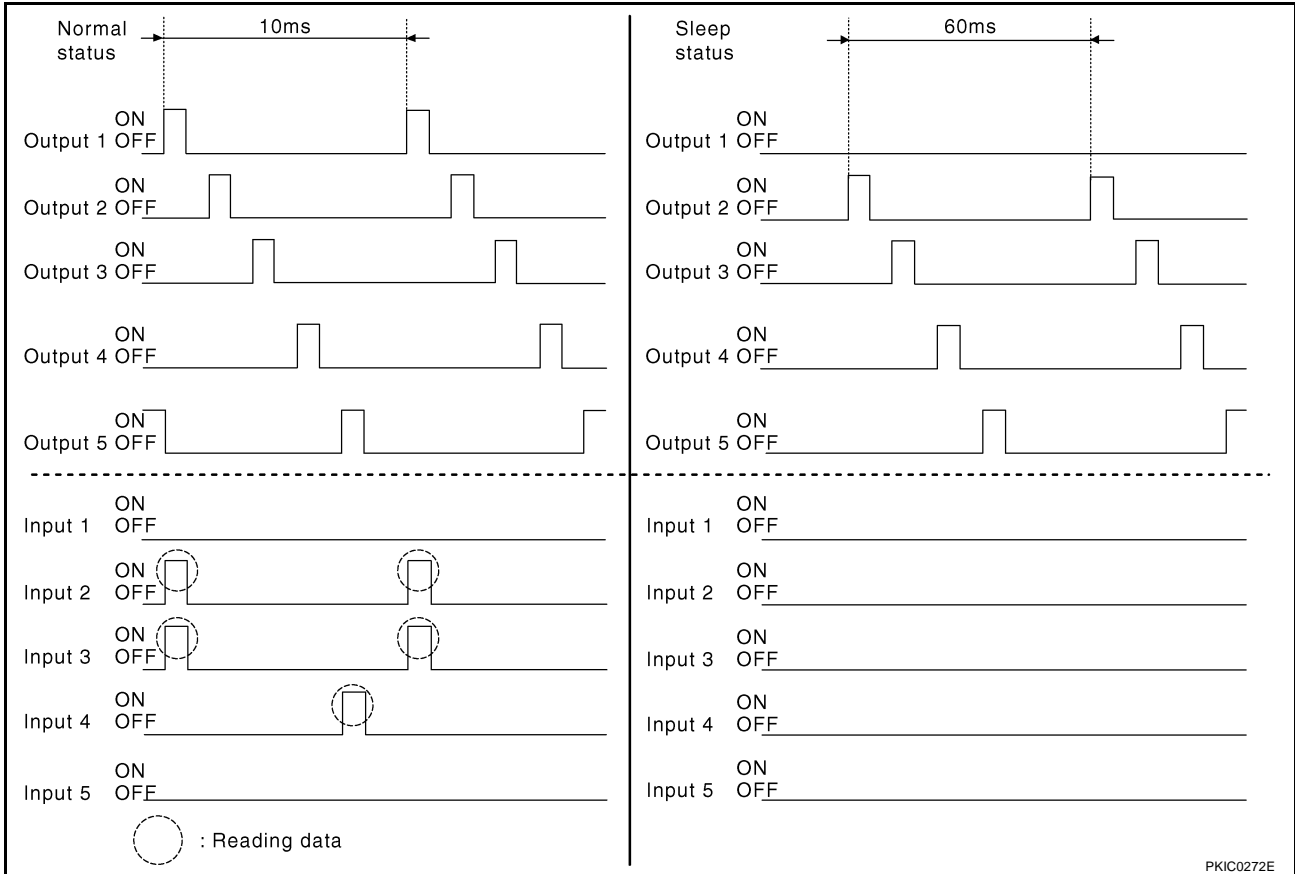
WW

FRONT WIPER AND WASHER SYSTEM

Operation Mode

Combination switch reading function has operation modes shown below.

1. Normal status
 - When BCM is not in sleep status, OUTPUT terminals (1-5) each turn ON-OFF every 10 ms.
2. Sleep status
 - When BCM is in sleep status, transistors of OUTPUT 1 and 5 stop the output, and BCM enters low current consumption mode. OUTPUT 2, 3, and 4 turn ON-OFF every 60 ms, and only input from lighting switch system is accepted.



FRONT WIPER AND WASHER SYSTEM

Wiper Dial Position Setting

Front wiper intermittent operation delay interval is determined from a combination of 3 switches (intermittent operation dial position 1, 2, and 3) and vehicle speed signal.

After each intermittent operation delay interval, BCM sends front wiper request signal to IPDM E/R.

Wiper dial position	Intermittent operation interval	Combination switch		
		Intermittent operation dial position 1	Intermittent operation dial position 2	Intermittent operation dial position 3
1	Short	ON	ON	ON
2		ON	ON	OFF
3		ON	OFF	OFF
4	↑	OFF	OFF	OFF
5	↓	OFF	OFF	ON
6	Long	OFF	ON	ON
7		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 (Continuity exists between combination switch output 3 and input 1.)
- Intermittent operation dial position 2: ON (Continuity exists between combination switch output 5 and input 1.)
- Intermittent operation dial position 3: ON (Continuity exists between combination switch output 4 and input 2.)

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

CAN Communication System Description

NKS003WD

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-board 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.

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CAN Communication Unit

NKS003WE

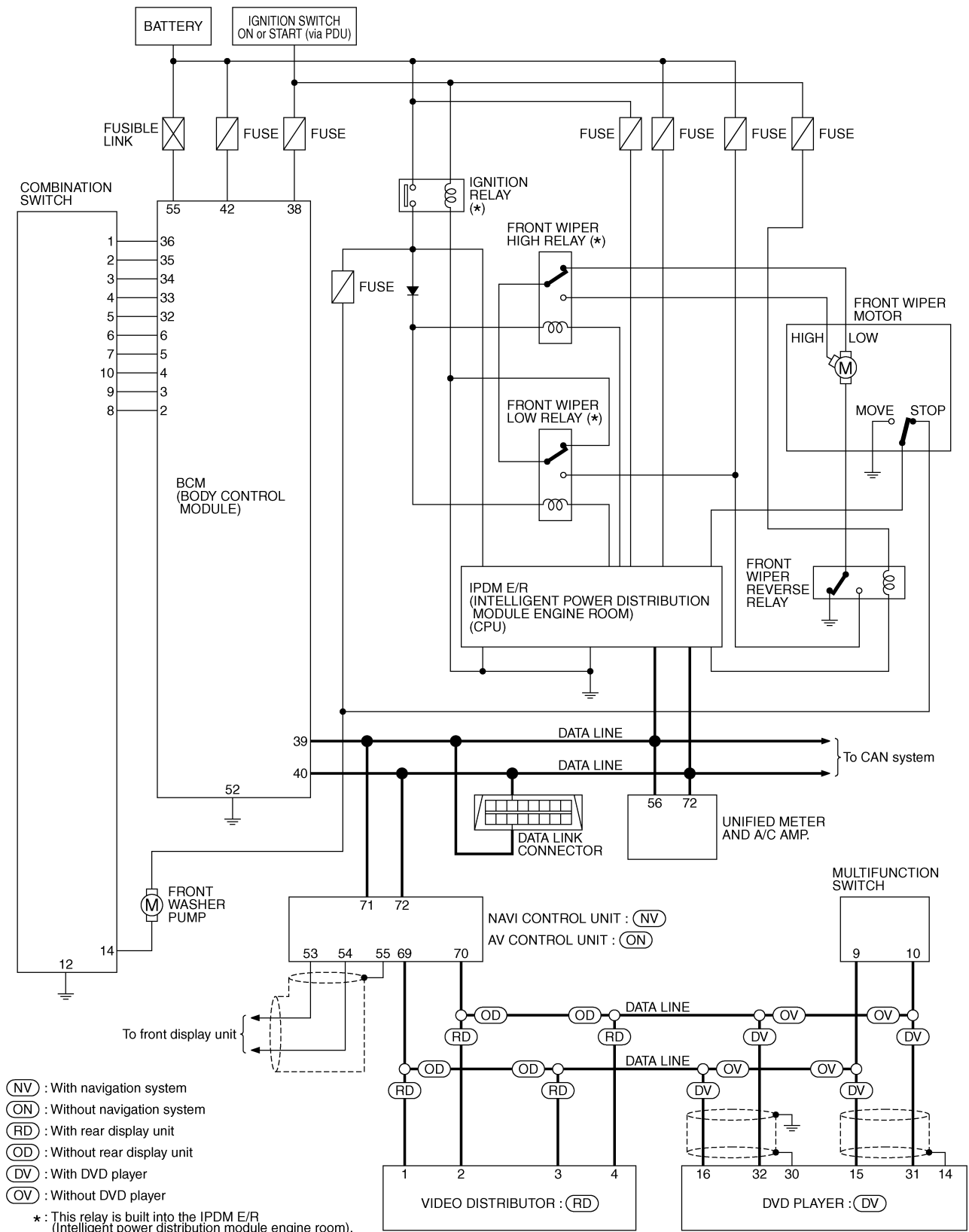
Refer to [LAN-50, "CAN System Specification Chart"](#) .

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FRONT WIPER AND WASHER SYSTEM

Schematic

NKS003WF



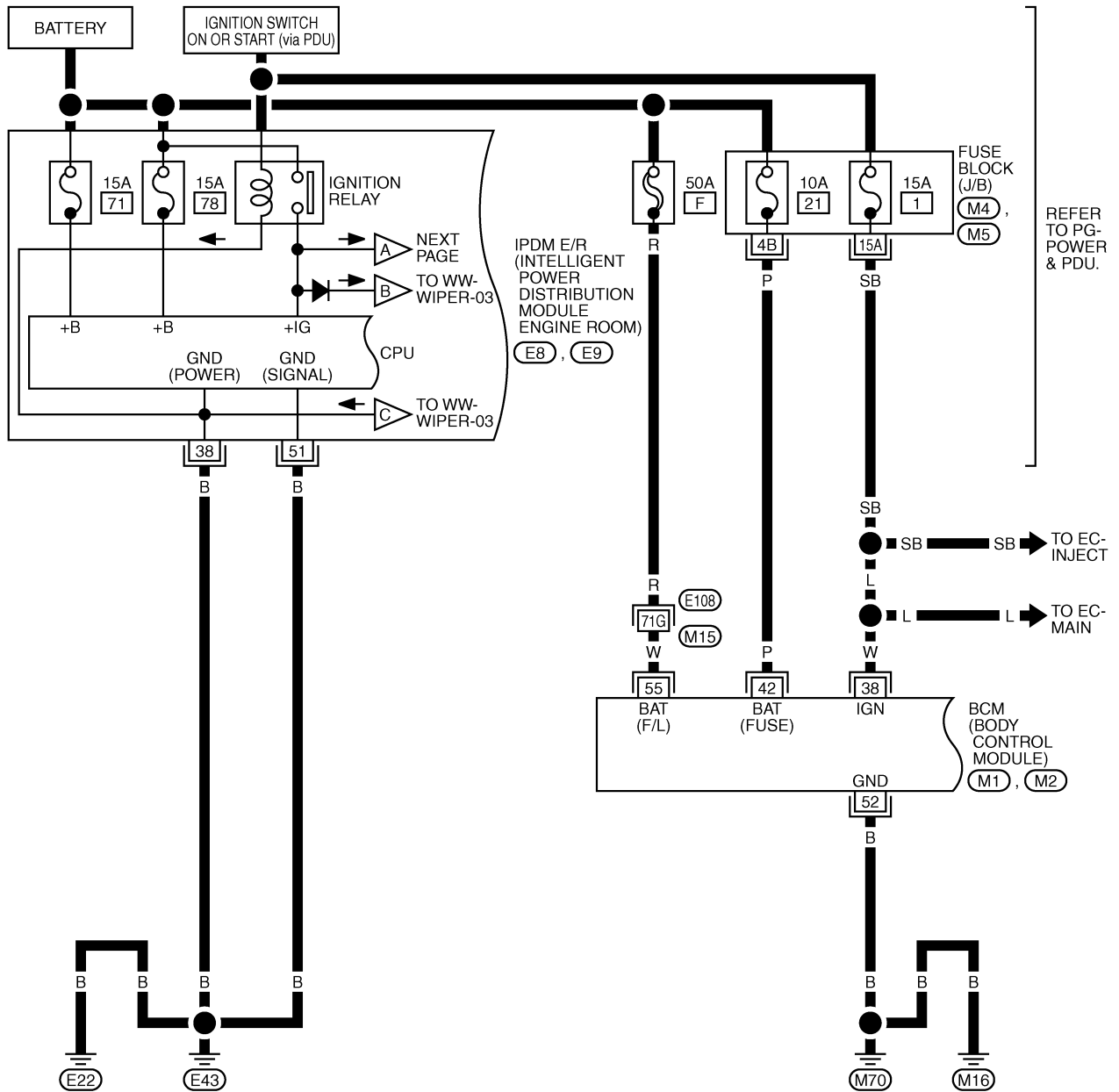
TKWT5089E

FRONT WIPER AND WASHER SYSTEM

Wiring Diagram — WIPER —

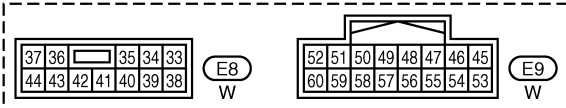
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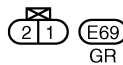
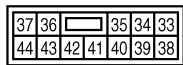
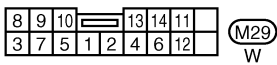
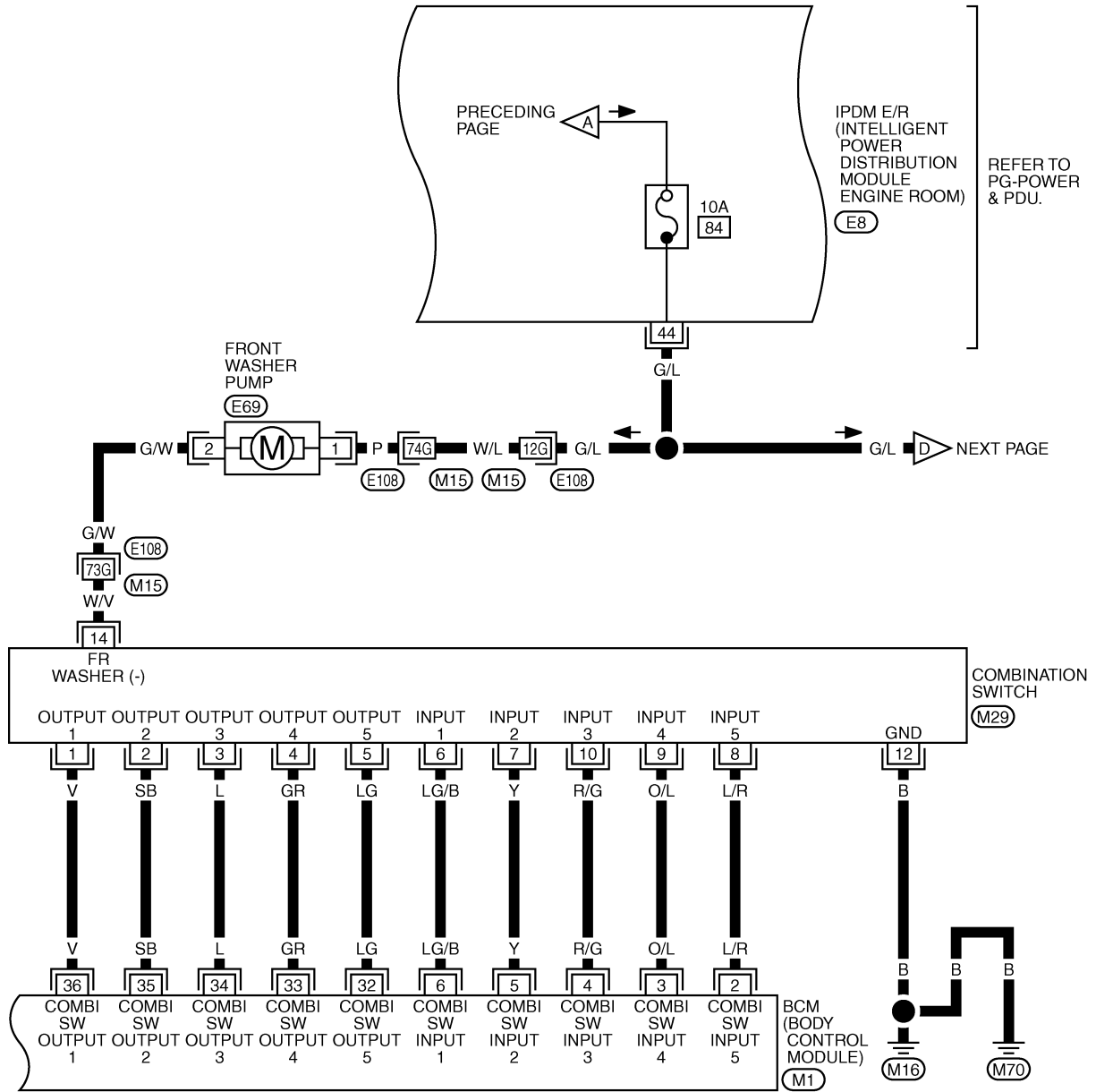


REFER TO THE FOLLOWING.
 (E108) -SUPER MULTIPLE JUNCTION (SMJ)
 (M4), (M5) -FUSE BLOCK-JUNCTION BOX (J/B)
 (M1), (M2) -ELECTRICAL UNITS

TKWT5090E

FRONT WIPER AND WASHER SYSTEM

WW-WIPER-02



REFER TO THE FOLLOWING.

(E108) -SUPER MULTIPLE JUNCTION (SMJ)

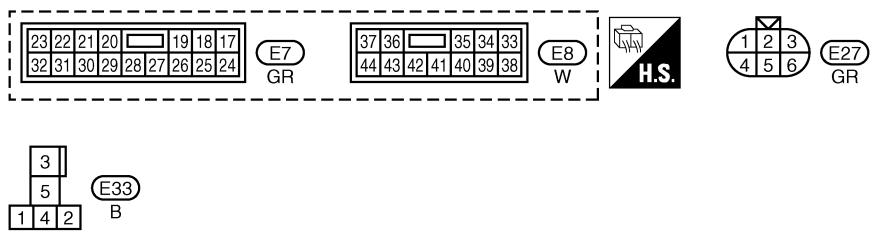
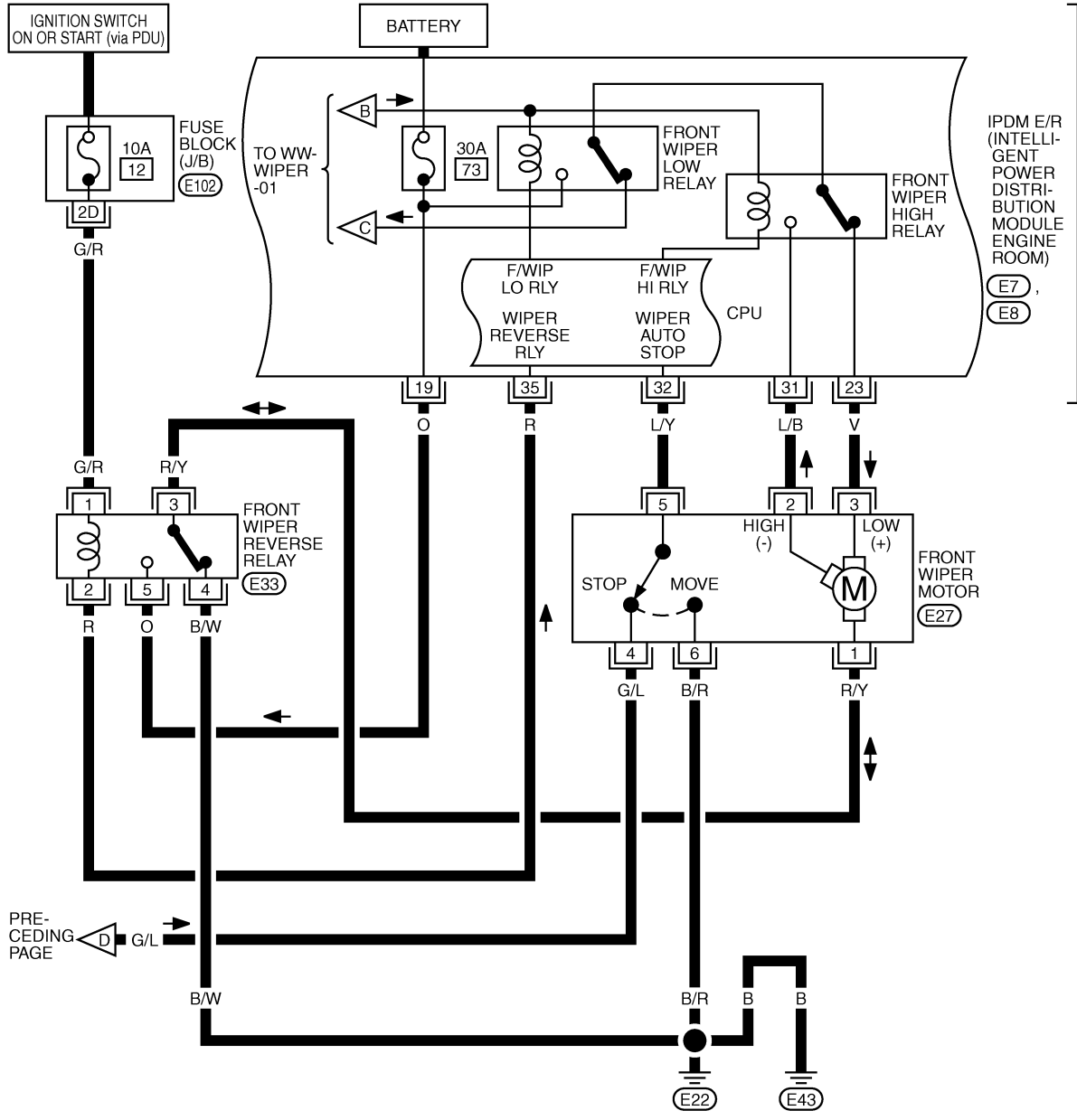
(M1) -ELECTRICAL UNITS

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FRONT WIPER AND WASHER SYSTEM

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REFER TO THE FOLLOWING.
 (E102) - FUSE BLOCK-JUNCTION BOX (J/B)

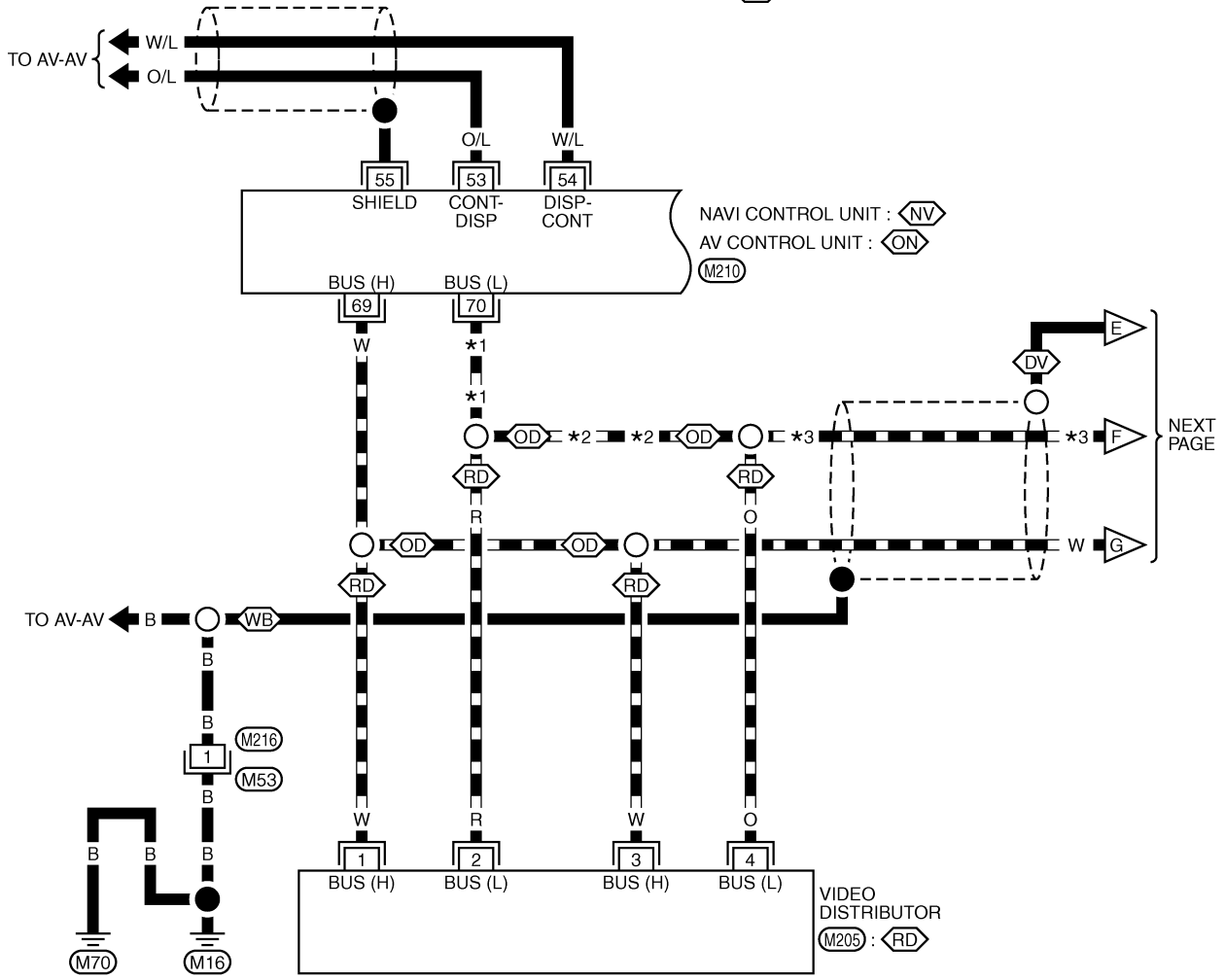
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FRONT WIPER AND WASHER SYSTEM

WW-WIPER-04

▬ : DATA LINE

- ◊NV : WITH NAVIGATION SYSTEM
- ◊ON : WITHOUT NAVIGATION SYSTEM
- ◊RD : WITH REAR DISPLAY UNIT
- ◊OD : WITHOUT REAR DISPLAY UNIT
- ◊DV : WITH DVD PLAYER
- ◊WB : WITH BOSE SYSTEM
- ◊OB : WITHOUT BOSE SYSTEM
- ◊BR : WITH BOSE SYSTEM WITHOUT REAR DISPLAY UNIT
- ◊XR : WITH REAR DISPLAY UNIT OR WITHOUT BOSE SYSTEM
- *1 R: ◊XR *3 R: ◊OB
- O: ◊BR O: ◊WB
- *2 R: ◊OB
- O: ◊BR



1	2	3	4	5	6	7	8	9	10	11	12
13	14	15	16	17	18	19	20	21	22	23	24

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24	22	20	18	16	14	12	10	8	6	4	2
23	21	19	17	15	13	11	9	7	5	3	1

M205
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72	70	68	66	64	62	60	58	56	54	52	50	48	46	44	42
71	69	67	65	63	61	59	57	55	53	51	49	47	45	43	41

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FRONT WIPER AND WASHER SYSTEM

WW-WIPER-05

▬ : DATA LINE

◊DV◊ : WITH DVD PLAYER

◊OV◊ : WITHOUT DVD PLAYER

◊WB◊ : WITH BOSE SYSTEM

◊OB◊ : WITHOUT BOSE SYSTEM

◊A1◊ : 2WD MODELS WITHOUT BOSE SYSTEM, NAVIGATION SYSTEM AND RAS

◊VR◊ : WITHOUT DVD PLAYER EXCEPT ◊A1◊

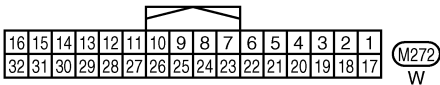
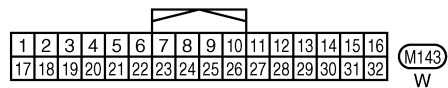
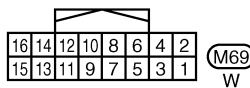
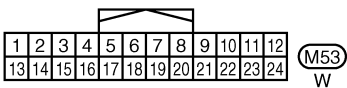
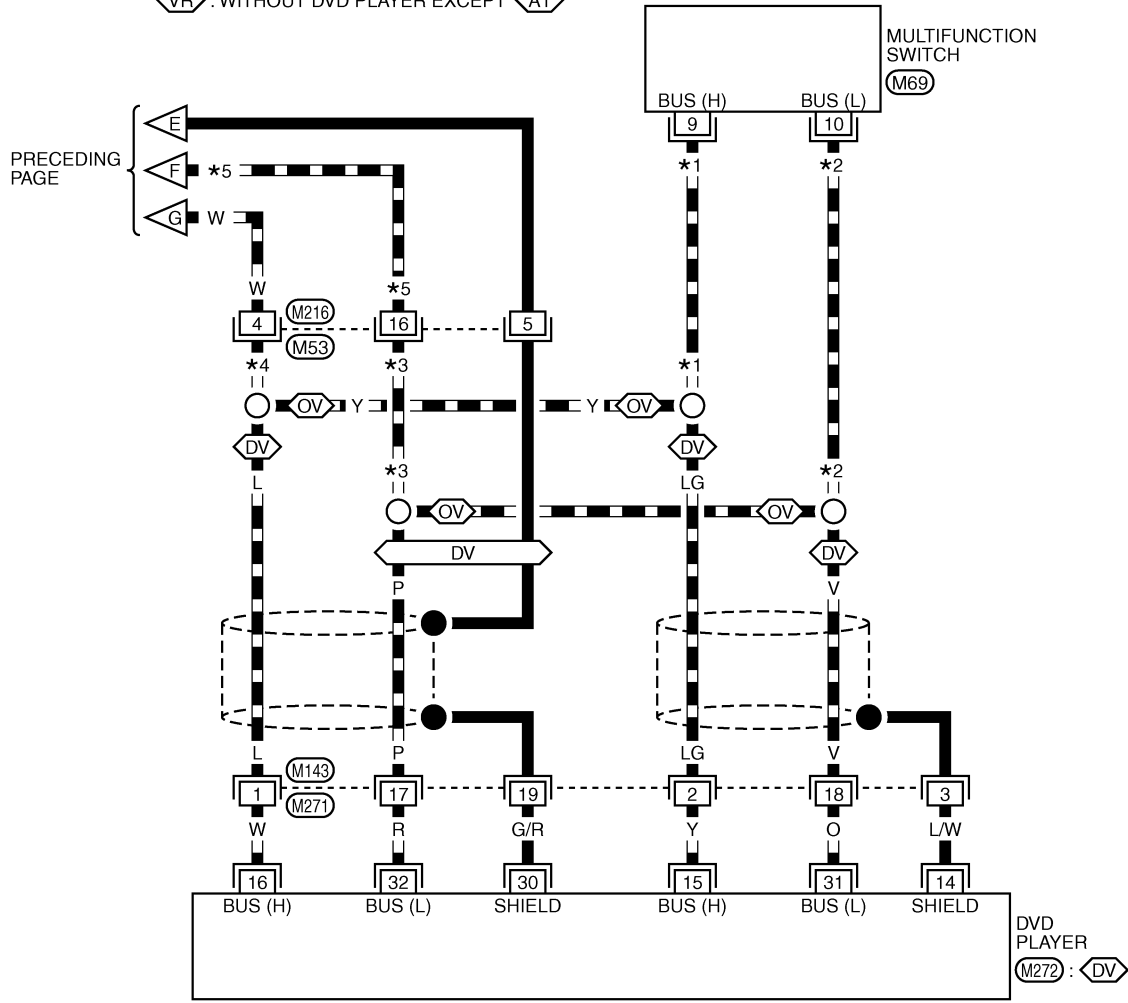
*1 LG: ◊DV◊ *3 P: ◊DV◊ *5 R: ◊OB◊

Y: ◊OV◊ R: ◊VR◊ O: ◊WB◊

*2 V: ◊DV◊ O: ◊A1◊

R: ◊VR◊ *4 L: ◊DV◊

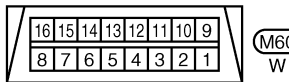
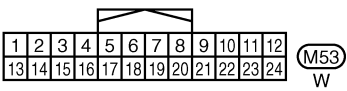
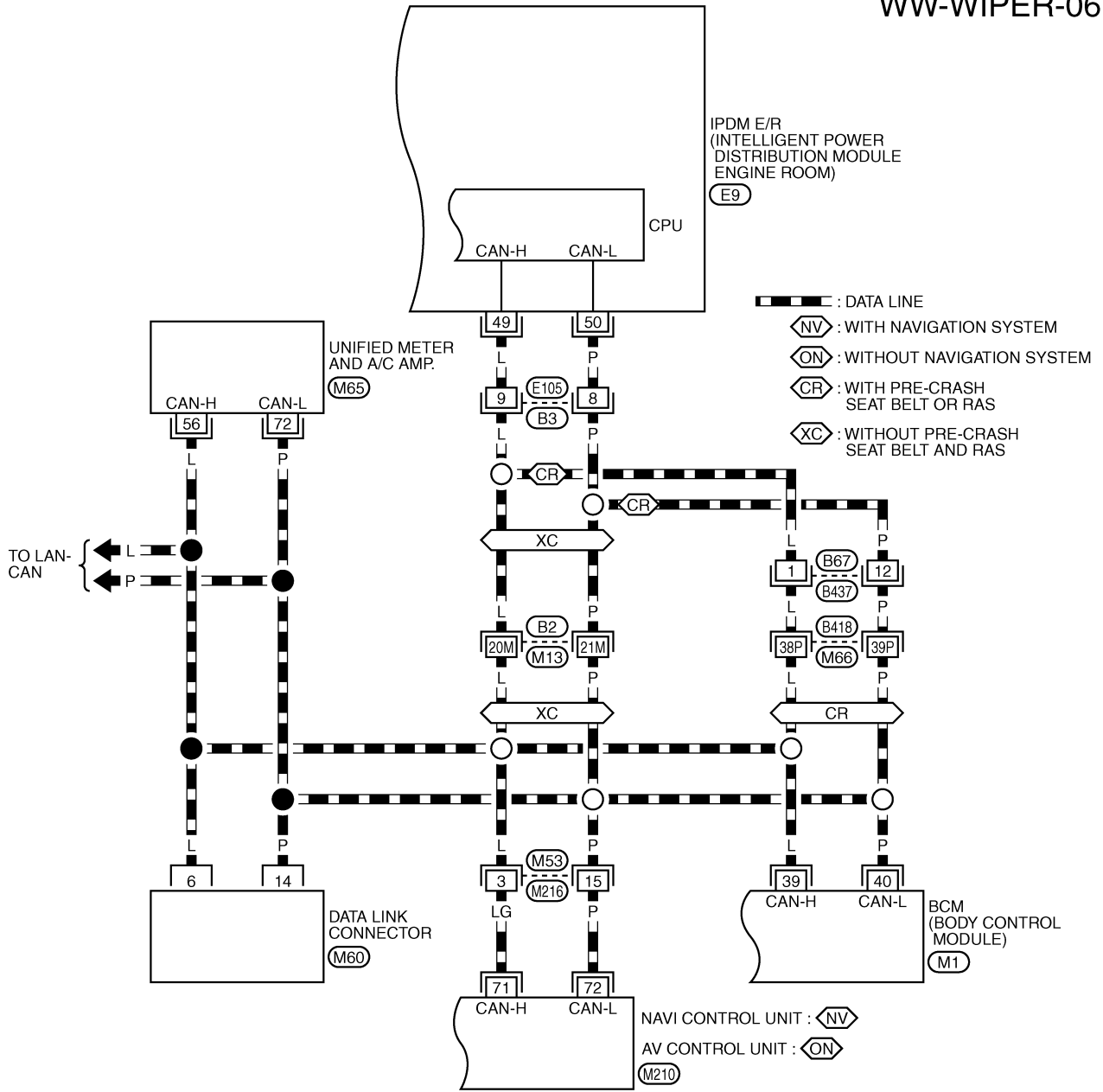
O: ◊A1◊ Y: ◊OV◊



TKWT5093E

FRONT WIPER AND WASHER SYSTEM

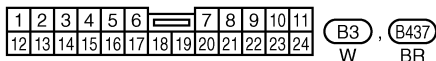
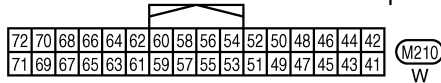
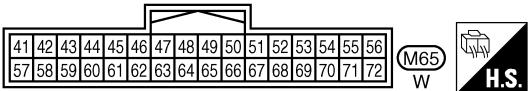
WW-WIPER-06



REFER TO THE FOLLOWING.

(B2), (B418) -SUPER MULTIPLE JUNCTION (SMJ)

(M1) -ELECTRICAL UNITS



TKWT5291E

FRONT WIPER AND WASHER SYSTEM

Terminals and Reference Values for BCM

NKS003WH

CAUTION:

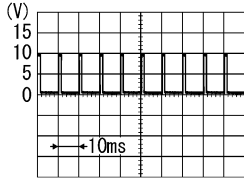
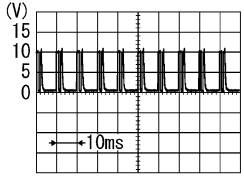
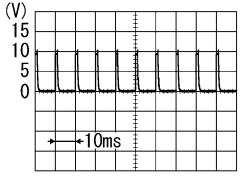
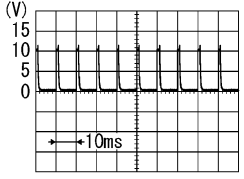
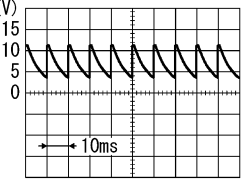
- Check combination switch system terminal waveform under the loaded condition with lighting switch, turn signal switch and wiper switch OFF not to be fluctuated by overloaded.
- Turn wiper dial position to 4 except when checking waveform or voltage of wiper dial position. Wiper dial position can be confirmed on CONSULT-II. Refer to [WW-25, "DATA MONITOR"](#) .

Terminal No.	Wire color	Signal name	Measuring condition		Reference value	
			Ignition switch	Operation or condition		
4	R/G	Combination switch input 3	ON	Lighting, turn, wiper OFF (Wiper dial position 4)	Any of several conditions below <ul style="list-style-type: none"> ● Front wiper SW MIST ● Front wiper SW INT ● Front wiper SW LO 	<p style="text-align: right; font-size: small;">PKIB4957J</p>
				OFF	Approx. 0 V	
5	Y	Combination switch input 2	ON	Lighting, turn, wiper OFF	Any of several conditions below <ul style="list-style-type: none"> ● Front washer switch (Wiper dial position 4) ● Wiper dial position 1 ● Wiper dial position 5 ● Wiper dial position 6 	<p style="text-align: right; font-size: small;">PKIB4957J</p>
				OFF (Wiper dial position 4)	Approx. 0 V	

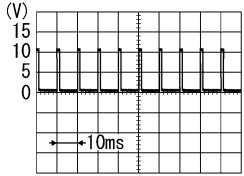
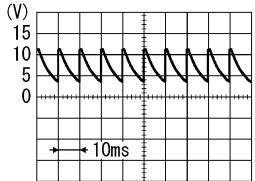
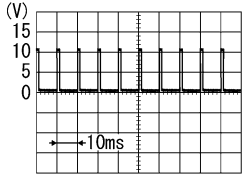
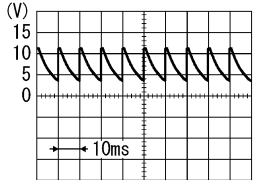
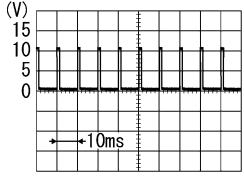
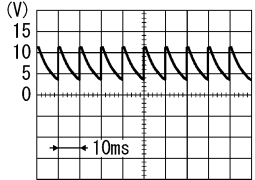
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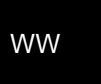
FRONT WIPER AND WASHER SYSTEM

Terminal No.	Wire color	Signal name	Measuring condition		Reference value
			Ignition switch	Operation or condition	
6	LG/B	Combination switch input 1	ON	Lighting, turn, wiper OFF	<p>Any of several conditions below</p> <ul style="list-style-type: none"> ● Front wiper switch HI (Wiper dial position 4) ● Wiper dial position 3  <p style="text-align: right;">PKIB4959J</p> <p style="text-align: center;">Approx. 1.0 V</p>
					<p>Any of several conditions below</p> <ul style="list-style-type: none"> ● Wiper dial position 1 ● Wiper dial position 2  <p style="text-align: right;">PKIB4952J</p> <p style="text-align: center;">Approx. 1.7 V</p>
					<p>Any of several conditions below</p> <ul style="list-style-type: none"> ● Wiper dial position 6 ● Wiper dial position 7  <p style="text-align: right;">PKIB4955J</p> <p style="text-align: center;">Approx. 0.8 V</p>
					<p>OFF (Wiper dial position 4)</p> <p style="text-align: center;">Approx. 0 V</p>
32	LG	Combination switch output 5	ON	Lighting, turn, wiper OFF	<p>Any of several conditions below</p> <ul style="list-style-type: none"> ● Wiper dial position 1 ● Wiper dial position 2 ● Wiper dial position 6 ● Wiper dial position 7  <p style="text-align: right;">PKIB4956J</p> <p style="text-align: center;">Approx. 1.0 V</p>
					<p>OFF (Wiper dial position 4)</p>  <p style="text-align: right;">PKIB4960J</p> <p style="text-align: center;">Approx. 7.0 - 7.5 V</p>

FRONT WIPER AND WASHER SYSTEM

Terminal No.	Wire color	Signal name	Measuring condition		Reference value
			Ignition switch	Operation or condition	
33	GR	Combination switch output 4	ON	Lighting, turn, wiper OFF (Wiper dial position 4)	<p>Any of several conditions below</p> <ul style="list-style-type: none"> ● Wiper dial position 1 ● Wiper dial position 5 ● Wiper dial position 6  <p style="text-align: right;">PKIB4958J</p> <p style="text-align: center;">Approx. 1.2 V</p>
				OFF (Wiper dial position 4)	 <p style="text-align: right;">PKIB4960J</p> <p style="text-align: center;">Approx. 7.0 - 7.5 V</p>
34	L	Combination switch output 3	ON	Lighting, turn, wiper OFF	<p>Any of several conditions below</p> <ul style="list-style-type: none"> ● Wiper dial position 1 ● Wiper dial position 2 ● Wiper dial position 3  <p style="text-align: right;">PKIB4958J</p> <p style="text-align: center;">Approx. 1.2 V</p>
				OFF (Wiper dial position 4)	 <p style="text-align: right;">PKIB4960J</p> <p style="text-align: center;">Approx. 7.0 - 7.5 V</p>
35	SB	Combination switch output 2	ON	Lighting, turn, wiper OFF (Wiper dial position 4)	<p>Any of several conditions below</p> <ul style="list-style-type: none"> ● Front wiper switch INT ● Front wiper switch HI  <p style="text-align: right;">PKIB4958J</p> <p style="text-align: center;">Approx. 1.2 V</p>
				OFF	 <p style="text-align: right;">PKIB4960J</p> <p style="text-align: center;">Approx. 7.0 - 7.5 V</p>

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FRONT WIPER AND WASHER SYSTEM

Terminal No.	Wire color	Signal name	Measuring condition		Reference value
			Ignition switch	Operation or condition	
36	V	Combination switch output 1	ON	Lighting, turn, wiper OFF (Wiper dial position 4)	<p>Any of several conditions below</p> <ul style="list-style-type: none"> ● Front wiper switch MIST ● Front wiper switch LO ● Front washer switch <p style="text-align: right;"><small>PKIB4958J</small></p>
				OFF (Wiper dial position 4)	<p style="text-align: right;"><small>PKIB4960J</small></p>
38	W	Ignition switch (ON)	ON	—	Battery voltage
39	L	CAN-H	—	—	—
40	P	CAN-L	—	—	—
42	P	Battery power supply	OFF	—	Battery voltage
52	B	Ground	ON	—	Approx. 0 V
55	W	Battery power supply	OFF	—	Battery voltage

FRONT WIPER AND WASHER SYSTEM

Terminals and Reference Values for IPDM E/R

NKS003WI

Terminal No.	Wire color	Signal name	Measuring condition		Reference value	
			Ignition switch	Operation or condition		
19	O	High speed signal	ON	—	Battery voltage	
23	V	Low speed signal	ON	Wiper switch	OFF	Approx. 0 V
					LO	Battery voltage
31	L/B	High speed ground	ON	—	Approx. 0 V	
32	L/Y	Wiper auto stop signal ^{NOTE}	ON	Wiper operating	Approx. 0 V	
				Wiper stopped	Battery voltage	
35	R	Front wiper reverse relay signal	ON	Wiper switch	OFF	Battery voltage
					HI	Approx. 0 V
38	B	Ground	ON	—	Approx. 0 V	
44	G/L	Front washer motor and front wiper auto stop signal (HI) power supply	ON	—	Battery voltage	
49	L	CAN-H	—	—	—	
50	P	CAN-L	—	—	—	
51	B	Ground	ON	—	Approx. 0 V	

NOTE:

- During LO operation, terminal No. 32 detects front wiper motor stopping or moving by front wiper auto stop signal.
- During HI operation, terminal No. 32 detects front wiper motor stopping or moving by front wiper auto stop signal that is output from terminal No. 44 (not from terminal No. 32).

How to Perform Trouble Diagnoses

NKS003WJ

1. Confirm the symptoms and customer complaint.
2. Understand operation description and function description. Refer to [WW-4, "System Description"](#).
3. Perform the Preliminary Check. Refer to [WW-24, "Preliminary Check"](#).
4. Check symptom and repair or replace the cause of malfunction.
5. Does the front wiper and washer operate normally? If YES, GO TO 6. If NO, GO TO 4.
6. INSPECTION END

WW

FRONT WIPER AND WASHER SYSTEM

NKS003WK

Preliminary Check CHECK POWER SUPPLY AND GROUND CIRCUIT

1. CHECK FUSES AND FUSIBLE LINK

Check for blown fuses and fusible link.

Unit	Power source	Fuse and fusible link No.
BCM	Battery	F
		21
	Ignition switch ON or START	1
Front washer motor, front washer pump and front wiper HI auto stop signal	Ignition switch ON or START	84
Front wiper motor, front wiper low relay, front wiper high relay	Battery	73
Front wiper reverse relay	Ignition switch ON or START	12

Refer to [WW-13, "Wiring Diagram — WIPER —"](#) .

OK or NG

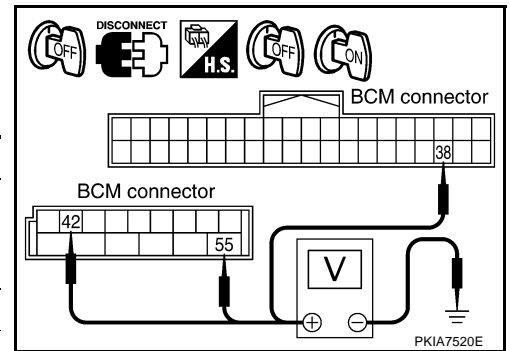
OK >> GO TO 2.

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

2. CHECK POWER SUPPLY CIRCUIT

- Turn ignition switch OFF.
- Disconnect BCM connectors.
- Check voltage between BCM harness connector and ground.

Terminal (+)		Terminal (-)	Ignition switch position	
BCM connector	Terminal		OFF	ON
M1	38	Ground	Approx. 0 V	Battery voltage
			Battery voltage	Battery voltage
M2	42		Battery voltage	Battery voltage
	55		Battery voltage	Battery voltage



OK or NG

OK >> GO TO 3.

NG >> Repair harness or connector.

3. CHECK GROUND CIRCUIT

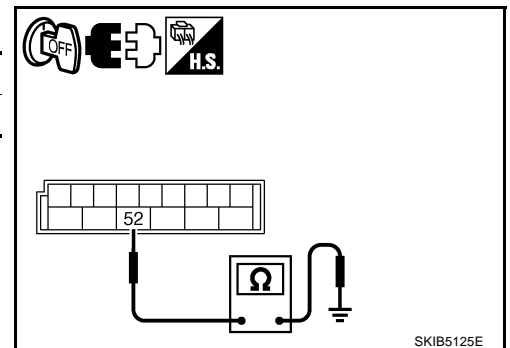
Check continuity between BCM harness connector and ground.

BCM connector	Terminal	Ground	Continuity
M2	52		Yes

OK or NG

OK >> INSPECTION END

NG >> Repair harness or connector.



FRONT WIPER AND WASHER SYSTEM

CONSULT-II Functions (BCM)

NKS003WL

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

BCM diagnosis position	Diagnosis mode	Description
WIPER	WORK SUPPORT	Changes the setting for each function.
	DATA MONITOR	Displays BCM input data in real time.
	ACTIVE TEST	Device operation can be checked by applying a drive signal to device.
BCM	SELF-DIAG RESULTS	BCM performs self-diagnosis of CAN communication.
	CAN DIAG SUPPORT MNTR	The result of transmit/receive diagnosis of CAN communication can be read.

CONSULT-II BASIC OPERATION

Refer to [GI-38, "CONSULT-II Start Procedure"](#) .

WORK SUPPORT

Operation Procedure

1. Touch "WIPER" on "SELECT TEST ITEM" screen.
2. Touch "WORK SUPPORT" on "SELECT DIAG MODE" screen.
3. Touch "WIPER SPEED SETTING" on "SELECT WORK ITEM" screen.
4. Touch "START".
5. Touch "CHANGE SETT".
6. The setting will be changed and "CURRENT SETTING" will be displayed.
7. Touch "END".

Work Support Setting Item

Item	Description	CONSULT-II
WIPER SPEED SETTING	When wiper switch is at INTERMITTENT, front wiper intermittent time can be selected according to vehicle speed. ● ON (Operated)/OFF ^{NOTE} (Not operated)	ON/OFF

NOTE:

Factory setting

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 "SELECT MONITOR ITEM" screen.

ALL SIGNALS	Monitors all the signals.
SELECTION FROM MENU	Selects items and monitors them.

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

FRONT WIPER AND WASHER SYSTEM

Display Item List

Monitor item		Contents
IGN ON SW	"ON/OFF"	Displays status (ignition switch IGN position: ON/other: OFF) of ignition switch judged from the ignition switch signal.
IGN SW CAN	"ON/OFF"	Displays status (ignition switch IGN position: ON/other: OFF) of ignition switch judged from the ignition switch signal (CAN communication lines).
FR WIPER HI	"ON/OFF"	Displays status (front wiper switch high position: ON/other: OFF) of front wiper high switch judged from the wiper switch signal.
FR WIPER LOW	"ON/OFF"	Displays status (front wiper switch low position: ON/other: OFF) of front wiper low switch judged from the wiper switch signal.
FR WIPER INT	"ON/OFF"	Displays status (front wiper switch intermittent position: ON/other: OFF) of front wiper intermittent switch judged from the wiper switch signal.
FR WASHER SW	"ON/OFF"	Displays status (front washer switch ON position: ON/other: OFF) of front washer switch judged from the wiper switch signal.
INT VOLUME	"1 - 7"	Displays status (wiper intermittent dial position setting 1- 7) of intermittent volume switch judged from the wiper switch signal.
FR WIPER STOP	"ON/OFF"	Displays status (front wiper stop position: ON/move: OFF) of front wiper motor stop judged from the front wiper auto stop signal.
VEHICLE SPEED	"km/h"	Displays status vehicle speed as judged from vehicle speed signal.

ACTIVE TEST

Operation Procedure

1. Touch "WIPER" on "SELECT TEST ITEM" screen.
2. Touch "ACTIVE TEST" on "SELECT DIAG MODE" screen.
3. Touch "FR WIPER" on "SELECT TEST ITEM" screen.
4. Touch items to be tested, and check operation.
5. During operation check, touching "OFF" deactivates operation.

Display Item List

Test item	Indication on CONSULT-II display	Description
Front wiper output	FR WIPER	With a certain operation (HI, LO, INT), the front wiper can be operated. ^{NOTE}

NOTE:

With INTERMITTENT operation, the front wiper moves only once.

FRONT WIPER AND WASHER SYSTEM

CONSULT-II Functions (IPDM E/R)

NKS003WM

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

Diagnosis Mode	Description
SELF-DIAG RESULTS	Refer to PG-20. "SELF-DIAG RESULTS" .
DATA MONITOR	The input/output data of IPDM E/R is displayed in real time.
CAN DIAG SUPPORT MNTR	The result of transmit/receive diagnosis of CAN communication can be read.
ACTIVE TEST	IPDM E/R sends a drive signal to electronic components to check their operation.

CONSULT-II BASIC OPERATION

Refer to [GI-38. "CONSULT-II Start Procedure"](#) .

DATA MONITOR

Operation Procedure

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

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

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

All Signals, Main Signals, Selection From Menu

Item name	CONSULT-II screen display	Display or unit	Monitor item selection			Description
			ALL SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	
FR wiper request	FR WIP REQ	STOP/1 LOW/LOW/HI	×	×	×	Signal status input from BCM
Wiper auto stop	WIP AUTO STOP	ACT P/STOP P	×	×	×	Output status of IPDM E/R
Wiper protection	WIP PROT	OFF/BLOCK	×	×	×	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

1. Touch "ACTIVE TEST" on "SELECT DIAG MODE" screen.
2. Touch "FRONT WIPER" on "SELECT TEST ITEM" screen.
3. Touch item to be tested, and check operation.
4. Touch "OFF" while testing to stop the operation.

Test item	CONSULT-II screen display	Description
Front wiper (HI, LO) output	FRONT WIPER	With a certain operation (HI, LO), the front wiper relay (HIGH and LOW) can be operated.

FRONT WIPER AND WASHER SYSTEM

NKS003WN

Front Wiper Does Not Operate

CAUTION:

- During IPDM E/R fail-safe control, front wipers may not operate. Refer to [PG-18, "CAN COMMUNICATION LINE CONTROL"](#) in "PG IPDM E/R" to make sure that it is not in fail-safe status.

1. ACTIVE TEST

With CONSULT-II

- Select "IPDM E/R" by CONSULT-II, and select "ACTIVE TEST" on "SELECT DIAG MODE" screen.
- Select "FRONT WIPER" on "SELECT TEST ITEM" screen.
- Touch "LO" or "HI" screen.

ACTIVE TEST			
FRONT WIPER		OFF	
HI		LO	
MODE	BACK	LIGHT	COPY

SKIA3486E

Without CONSULT-II

Start up auto active test. Refer to [PG-23, "Auto Active Test"](#).

Does front wiper operate normally?

- YES >> GO TO 2.
NO >> GO TO 4.

2. CHECK CIRCUIT BETWEEN COMBINATION SWITCH AND BCM

With CONSULT-II

- Select "BCM" on CONSULT-II, and select "WIPER" on "SELECT TEST ITEM" screen.
- Select "DATA MONITOR" on "SELECT DIAG MODE" screen. Make sure that "FR WIPER INT", "FR WIPER LOW", and "FR WIPER HI" turn ON-OFF according to wiper switch operation.

DATA MONITOR	
MONITOR	
IGN ON SW	ON
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	COPE

PKIB0110E

Without CONSULT-II

Refer to [LT-239, "Combination Switch Inspection"](#).

OK or NG

- OK >> GO TO 3.
NG >> Check combination switch (wiper switch). Refer to [LT-239, "Combination Switch Inspection"](#).

3. CHECK CIRCUIT BETWEEN IPDM E/R AND BCM

Select "BCM" on CONSULT-II, and perform self-diagnosis for "BCM".

Displayed self-diagnosis results

- NO DTC>>Replace BCM. Refer to [BCS-15, "Removal and Installation of BCM"](#).
CAN COMM CIRCUIT>>Check CAN communication line of BCM. Refer to [BCS-13, "CAN Communication Inspection Using CONSULT-II \(Self-Diagnosis\)"](#).

SELF-DIAG RESULTS			
DTC RESULTS		TIME	
CAN COMM CIRCUIT [U1000]			
ERASE		PRINT	
MODE	BACK	LIGHT	COPY

PKIA7627E

FRONT WIPER AND WASHER SYSTEM

4. CHECK CIRCUIT BETWEEN FRONT WIPER MOTOR AND FRONT WIPER REVERSE RELAY

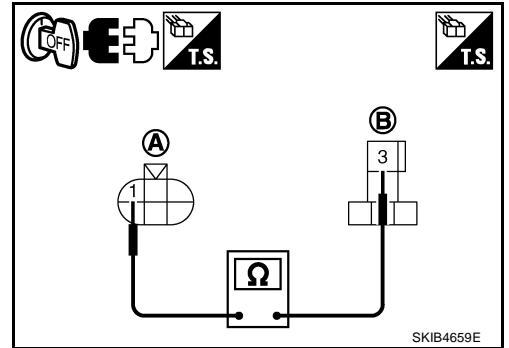
1. Turn ignition switch OFF.
2. Disconnect front wiper motor connector.
3. Remove front wiper reverse relay.
4. Check continuity between front wiper motor harness connector (A) and front wiper reverse relay harness connector (B).

A		B		Continuity
Connector	Terminal	Connector	Terminal	
E27	1	E33	3	Yes

OK or NG

OK >> GO TO 5.

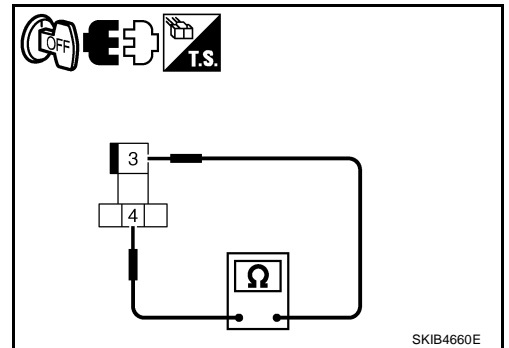
NG >> Repair harness or connector.



5. CHECK FRONT WIPER REVERSE RELAY

1. Check continuity between front wiper reverse relay terminals.

Front wiper reverse relay terminals		Continuity
3	4	Yes



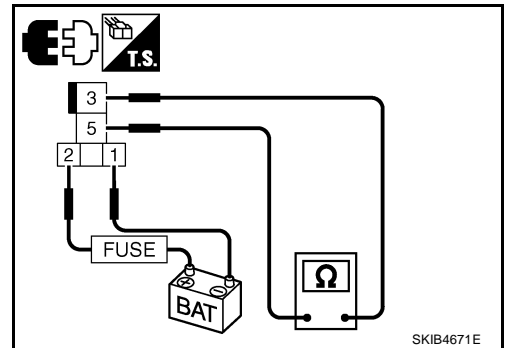
2. Check continuity between front wiper reverse relay terminals.

Front wiper reverse relay terminals		Condition	Continuity
3	5	Applying battery voltage to between terminals 1 and 2	Yes
		No battery voltage	No

OK or NG

OK >> GO TO 6.

NG >> Replace front wiper reverse relay.



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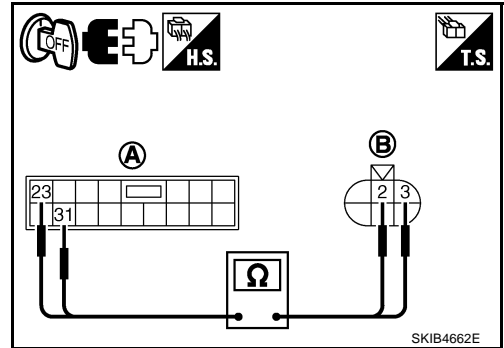
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FRONT WIPER AND WASHER SYSTEM

6. CHECK FRONT WIPER CIRCUIT

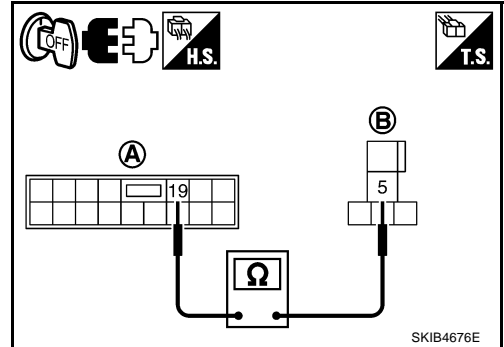
1. Disconnect IPDM E/R connector.
2. Check continuity between IPDM E/R harness connector (A) and front wiper motor harness connector (B).

A		B		Continuity
Connector	Terminal	Connector	Terminal	
E7	23	E27	3	Yes
	31		2	



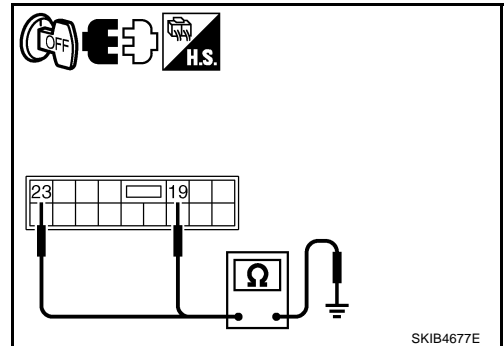
3. Check continuity between IPDM E/R harness connector (A) and front wiper reverse relay harness connector (B).

A		B		Continuity
Connector	Terminal	Connector	Terminal	
E7	19	E33	5	Yes



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

IPDM E/R connector	Terminal	Ground	Continuity
E7	19		Ground
	23		



OK or NG

- OK >> GO TO 7.
- NG >> Repair harness or connector.

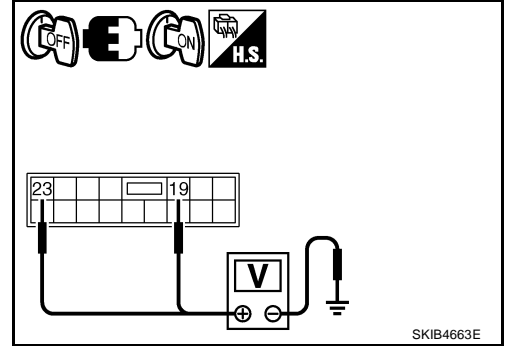
FRONT WIPER AND WASHER SYSTEM

7. CHECK IPDM E/R

☑ With CONSULT-II

1. Connect IPDM E/R connector and front wiper motor connector.
2. Install front wiper reverse relay.
3. Select "IPDM E/R" on CONSULT-II. Select "ACTIVE TEST" on "SELECT DIAG MODE" screen.
4. Select "FRONT WIPER" on "SELECT TEST ITEM" screen.
5. Touch "LO" or "HI" screen.
6. Check voltage between IPDM E/R harness connector and ground while front wiper (HI, LO) is operating.

Terminal (+)		Terminal (-)	Condition	Voltage (Approx.)
IPDM E/R connector	Terminal			
E7	19	Ground	Stopped	Battery voltage
			HI operation	
	23		Stopped	0 V
			LO operation	Battery voltage



☒ Without CONSULT-II

1. Connect IPDM E/R connector and front wiper motor connector.
2. Install front wiper reverse relay.
3. Start up auto active test. Refer to [PG-23, "Auto Active Test"](#).
4. Check voltage between IPDM E/R harness connector and ground while front wiper (HI, LO) is operating.

Terminal (+)		Terminal (-)	Condition	Voltage (Approx.)
IPDM E/R connector	Terminal			
E7	19	Ground	Stopped	Battery voltage
			HI operation	
	23		Stopped	0 V
			LO operation	Battery voltage

OK or NG

- OK >> Replace front wiper motor. Refer to [WW-44, "Disassembly and Assembly of Front Wiper Drive Assembly"](#).
- NG >> Replace IPDM E/R. Refer to [PG-31, "Removal and Installation of IPDM E/R"](#).

Front Wiper Does Not Return to Stop Position (After Front Wiper Operate for 10 Seconds, They Stop for 20 Seconds, and After Repeating the Operations Five Times, They Become Inoperative)

NKS003WO

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 that front wipers are locked, and stops wiper output. That causes this symptom.
- This status can be checked by "DATA MONITOR" of "IPDM E/R" on which "WIPER PROTECTION" item shows "BLOCK".

FRONT WIPER AND WASHER SYSTEM

1. CHECK FRONT WIPER STOP SIGNAL

☑ With CONSULT-II

Select "IPDM E/R" on CONSULT-II. With "DATA MONITOR", make sure that "WIP AUTO STOP" turns "ACT P" - "STOP P" linked with wiper operation.

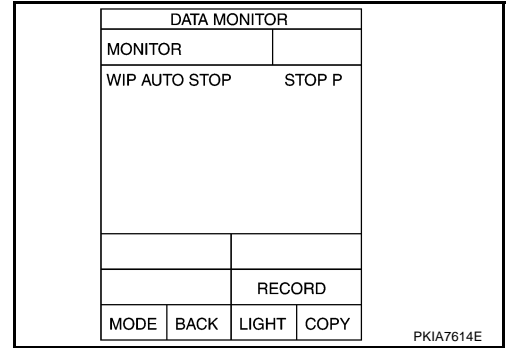
☒ Without CONSULT-II

GO TO 2.

OK or NG

OK >> Replace IPDM E/R. Refer to [PG-31, "Removal and Installation of IPDM E/R"](#).

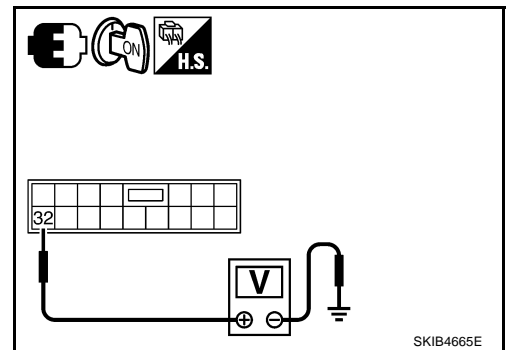
NG >> GO TO 2.



2. CHECK IPDM E/R

Check voltage between IPDM E/R harness connector and ground while front wiper motor is stopped and while front wiper (HI, LO) is operating.

Terminal (+)		Terminal (-)	Condition	Voltage (Approx.)
IPDM E/R connector	Terminal			
E7	32	Ground	Wiper stopped	Battery voltage
			Wiper operating	0 V



OK or NG

OK >> Replace IPDM E/R. Refer to [PG-31, "Removal and Installation of IPDM E/R"](#).

NG >> GO TO 3.

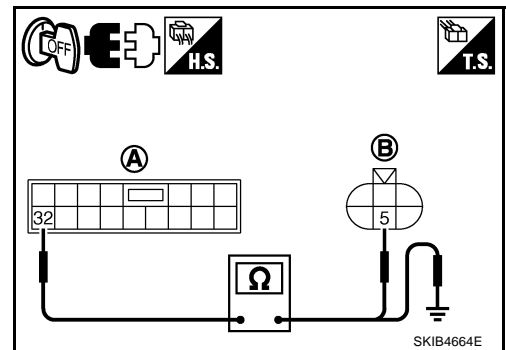
3. CHECK FRONT WIPER AUTO STOP CIRCUIT

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

A		B		Continuity
Connector	Terminal	Connector	Terminal	
E7	32	E27	5	Yes

- Check continuity between IPDM E/R harness connector (A) and ground.

A		Ground	Continuity
Connector	Terminal		
E7	32		No



OK or NG

OK >> Replace front wiper motor. Refer to [WW-44, "Disassembly and Assembly of Front Wiper Drive Assembly"](#).

NG >> Repair harness or connector.

FRONT WIPER AND WASHER SYSTEM

Front Wiper Does Not Return to Stop Position When Front Wiper Motor Operates at Low Speed (After Front Wiper Operate for 10 Seconds, They Stop for 20 Seconds, and After Repeating the Operations Five Times, They Become Inoperative)

NKS003WP

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 that front wipers are locked, and stops wiper output. That causes this symptom.
- This status can be checked by "DATA MONITOR" of "IPDM E/R" on which "WIPER PROTECTION" item shows "BLOCK".

1. CHECK FRONT WIPER STOP SIGNAL

Ⓟ With CONSULT-II

Select "IPDM E/R" on CONSULT-II. With "DATA MONITOR", make sure that "WIP AUTO STOP" turns "ACT P" - "STOP P" linked with wiper LO operation.

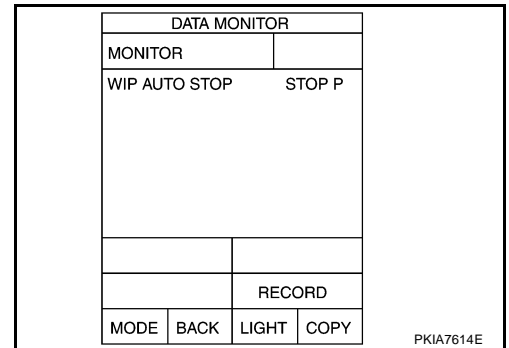
ⓧ Without CONSULT-II

GO TO 2.

OK or NG

OK >> Replace IPDM E/R. Refer to [PG-31, "Removal and Installation of IPDM E/R"](#).

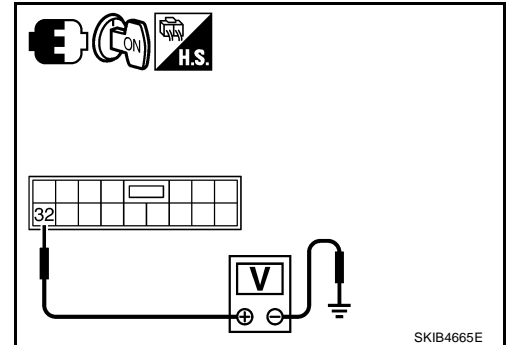
NG >> GO TO 2.



2. CHECK IPDM E/R

Check voltage between IPDM E/R harness connector and ground while front wiper motor is stopped and while front wiper LO is operating.

Terminal (+)		Terminal (-)	Condition	Voltage (Approx.)
IPDM E/R connector	Terminal			
E7	32	Ground	Wiper stopped	Battery voltage
			Wiper operating	0 V



OK or NG

OK >> Replace IPDM E/R. Refer to [PG-31, "Removal and Installation of IPDM E/R"](#).

NG >> GO TO 3.

3. CHECK CIRCUIT BETWEEN FRONT WIPER MOTOR AND GROUND

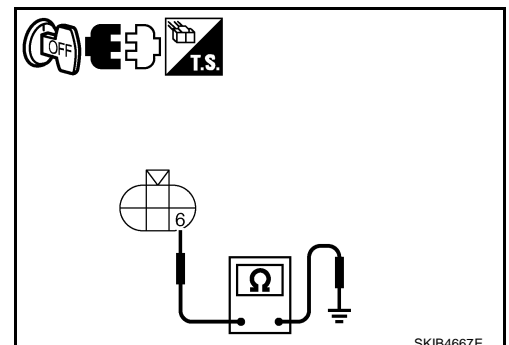
- Turn ignition switch OFF.
- Disconnect front wiper motor connector.
- Check continuity between front wiper motor harness connector and ground.

Front wiper motor connector	Terminal	Ground	Continuity
E27	6		Yes

OK or NG

OK >> Replace front wiper motor. Refer to [WW-44, "Disassembly and Assembly of Front Wiper Drive Assembly"](#).

NG >> Repair harness or connector.



FRONT WIPER AND WASHER SYSTEM

Front Wiper Does Not Return to Stop Position When Front Wiper Motor Operates at HIGH Speed (After Front Wiper Operate for 10 Seconds, They Stop for 20 Seconds, and After Repeating the Operations Five Times, They Become Inoperative)

NKS003WQ

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 that front wipers are locked, and stops wiper output. That causes this symptom.
- This status can be checked by “DATA MONITOR” of “IPDM E/R” on which “WIPER PROTECTION” item shows “BLOCK”.

1. CHECK FRONT WIPER STOP SIGNAL

☑ With CONSULT-II

Select “IPDM E/R” on CONSULT-II. With “DATA MONITOR”, make sure that “WIP AUTO STOP” turns “ACT P” - “STOP P” linked with wiper HI operation.

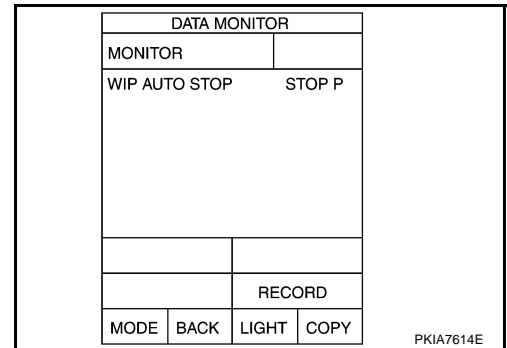
☒ Without CONSULT-II

GO TO 2.

OK or NG

OK >> Replace IPDM E/R. Refer to [PG-31, "Removal and Installation of IPDM E/R"](#).

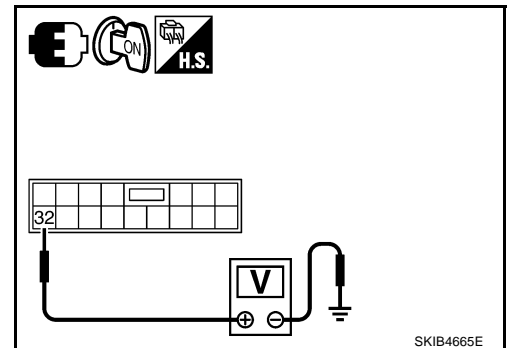
NG >> GO TO 2.



2. CHECK IPDM E/R

1. Turn ignition switch OFF.
2. Connect IPDM E/R connector and front wiper motor connector.
3. Turn ignition switch ON.
4. Check voltage between IPDM E/R harness connector and ground while front wiper motor is stopped and while front wiper HI is operating.

Terminal (+)		Terminal (-)	Condition	Voltage (Approx.)
IPDM E/R connector	Terminal			
E7	32	Ground	Wiper stopped	Battery voltage
			Wiper operating	0 V



OK or NG

OK >> Replace IPDM E/R. Refer to [PG-31, "Removal and Installation of IPDM E/R"](#).

NG >> GO TO 3.

FRONT WIPER AND WASHER SYSTEM

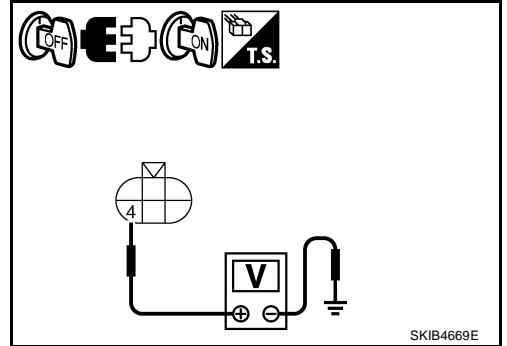
3. CHECK IPDM E/R

1. Disconnect front wiper motor connector.
2. Turn ignition switch ON.
3. Check voltage between front wiper motor harness connector and ground.

Terminal		Voltage (Approx.)
(+)	(-)	
Front wiper motor connector	Terminal	
E27	4	Ground
		Battery voltage

OK or NG

- OK >> Replace front wiper motor. Refer to [WW-44, "Disassembly and Assembly of Front Wiper Drive Assembly"](#) .
- NG >> GO TO 4.



4. CHECK FRONT WIPER AUTO STOP CIRCUIT

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

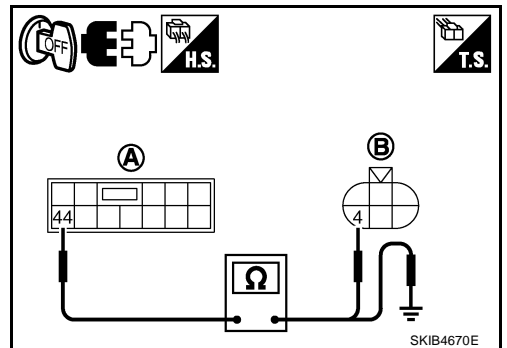
A		B		Continuity
Connector	Terminal	Connector	Terminal	
E8	44	E27	4	Yes

4. Check continuity between IPDM E/R harness connector (A) and Ground.

A		Ground	Continuity
Connector	Terminal		
E8	44		No

OK or NG

- OK >> Replace IPDM E/R. Refer to [PG-31, "Removal and Installation of IPDM E/R"](#) .
- NG >> Repair harness or connector.



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FRONT WIPER AND WASHER SYSTEM

NKS003WR

Only Front Wiper LO Does Not Operate

1. ACTIVE TEST

☑ With CONSULT-II

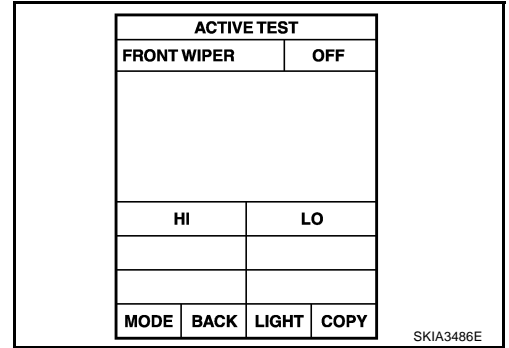
1. Select "IPDM E/R" on CONSULT-II. Select "ACTIVE TEST" on "SELECT DIAG MODE" screen.
2. Select "FRONT WIPER" on "SELECT TEST ITEM" screen.
3. Touch "LO" screen.

☒ Without CONSULT-II

Start up auto active test. Refer to [PG-23, "Auto Active Test"](#) .

Does front wiper operate normally?

- YES >> Refer to [LT-239, "Combination Switch Inspection"](#) .
 NO >> GO TO 2.



2. CHECK IPDM E/R

☑ With CONSULT-II

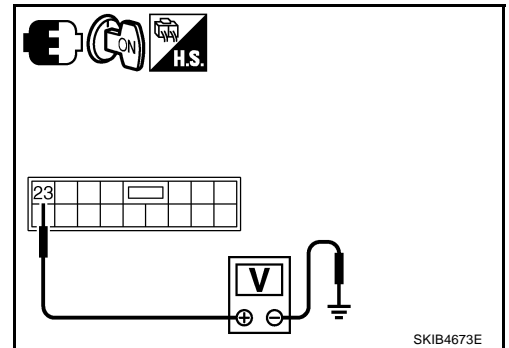
1. Select "IPDM E/R" on CONSULT-II. Select "ACTIVE TEST" on "SELECT DIAG MODE" screen.
2. Select "FRONT WIPER" on "SELECT TEST ITEM" screen.
3. Touch "LO" screen.
4. Check voltage between IPDM E/R harness connector and ground while front wiper LO is operating.

Terminal		(-)	Voltage (Approx.)
(+)			
IPDM E/R connector	Terminal		
E7	23	Ground	Battery voltage

☒ Without CONSULT-II

1. Start up auto active test. Refer to [PG-23, "Auto Active Test"](#) .
2. Check voltage between IPDM E/R harness connector and ground while front wiper LO is operating.

Terminal		(-)	Voltage (Approx.)
(+)			
IPDM E/R connector	Terminal		
E7	23	Ground	Battery voltage



OK or NG

- OK >> GO TO 3.
 NG >> Replace IPDM E/R. Refer to [PG-31, "Removal and Installation of IPDM E/R"](#) .

FRONT WIPER AND WASHER SYSTEM

3. CHECK CIRCUIT BETWEEN IPDM E/R AND FRONT WIPER MOTOR

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 (A) and front wiper motor harness connector (B).

A		B		Continuity
Connector	Terminal	Connector	Terminal	
E7	23	E27	3	Yes

4. Check continuity between IPDM E/R harness connector (A) and ground.

A		Ground	Continuity
Connector	Terminal		
E7	23		No

OK or NG

- OK >> GO TO 4.
 NG >> Repair harness or connector.

4. CHECK FRONT WIPER REVERSE RELAY

1. Remove front wiper reverse relay.
2. Check continuity between front wiper reverse relay terminals.

Front wiper reverse relay terminals		Continuity
3	4	
		Yes

OK or NG

- OK >> GO TO 5.
 NG >> Replace front wiper reverse relay.

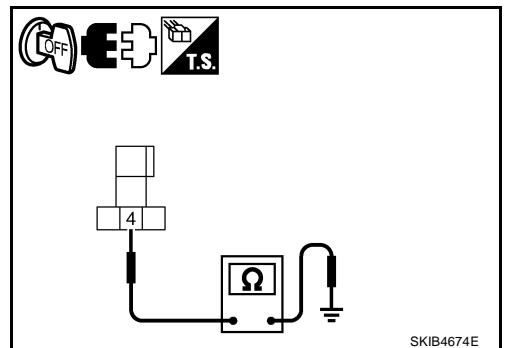
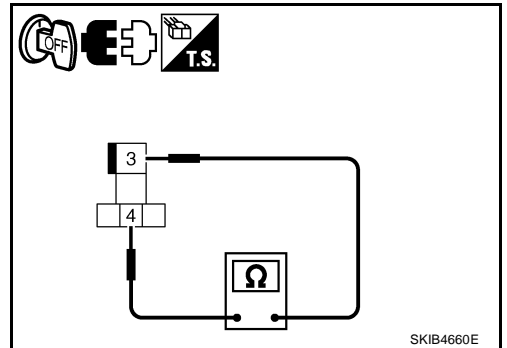
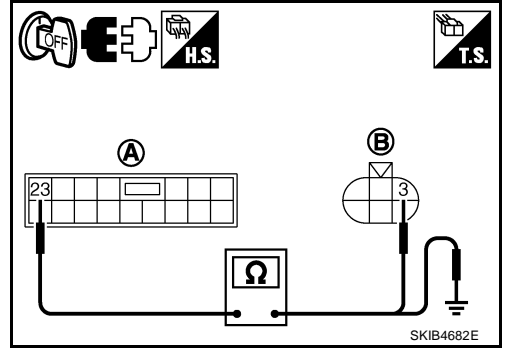
5. CHECK CIRCUIT BETWEEN FRONT WIPER REVERSE RELAY AND GROUND

Check continuity between front wiper reverse relay harness connector and ground.

Front wiper reverse relay connector	Terminal	Ground	Continuity
E33	4		

OK or NG

- OK >> Replace front wiper motor. Refer to [WW-44, "Disassembly and Assembly of Front Wiper Drive Assembly"](#).
 NG >> Repair harness or connector.



FRONT WIPER AND WASHER SYSTEM

NKS003WS

Only Front Wiper HI Does Not Operate

1. ACTIVE TEST

☑ With CONSULT-II

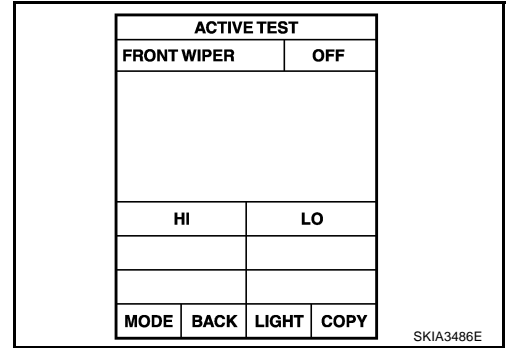
1. Select "IPDM E/R" on CONSULT-II. Select "ACTIVE TEST" on "SELECT DIAG MODE" screen.
2. Select "FRONT WIPER" on "SELECT TEST ITEM" screen.
3. Touch "HI" screen.

☒ Without CONSULT-II

Start up auto active test. Refer to [PG-23, "Auto Active Test"](#) .

Does front wiper operate normally?

- YES >> Refer to [LT-239, "Combination Switch Inspection"](#) .
 NO >> GO TO 2.



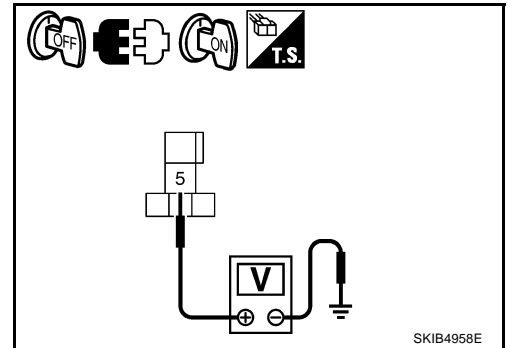
2. CHECK IPDM E/R OUTPUT SIGNAL

1. Remove front wiper reverse relay.
2. Check voltage between front wiper reverse relay harness connector and ground.

Terminal (+)		Terminal (-)	Voltage (Approx.)
Front wiper reverse relay connector	Terminal		
E33	5	Ground	Battery voltage

OK or NG

- OK >> GO TO 4.
 NG >> GO TO 3.



3. CHECK CIRCUIT BETWEEN IPDM E/R AND FRONT WIPER REVERSE RELAY

1. Disconnect IPDM E/R connector.
2. Check continuity between IPDM E/R harness connector (A) and front wiper reverse relay harness connector (B).

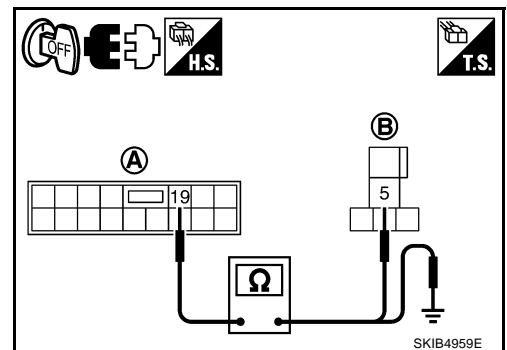
A		B		Continuity
Connector	Terminal	Connector	Terminal	
E7	19	E33	5	Yes

3. Check continuity between IPDM E/R harness connector (A) and ground.

A		Ground	Continuity
Connector	Terminal		
E7	19		No

OK or NG

- OK >> Replace IPDM E/R. Refer to [PG-31, "Removal and Installation of IPDM E/R"](#) .
 NG >> Repair harness or connector.



FRONT WIPER AND WASHER SYSTEM

4. CHECK FRONT WIPER REVERSE RELAY

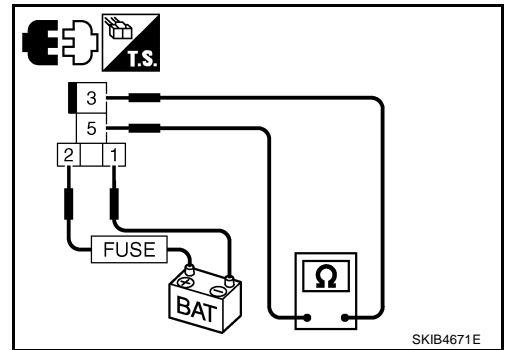
Check continuity between front wiper reverse relay terminals.

Front wiper reverse relay terminals		Condition	Continuity
3	5	Applying battery voltage to between terminals 1 and 2	Yes
		No battery voltage	No

OK or NG

OK >> GO TO 5.

NG >> Replace front wiper reverse relay.



5. CHECK CIRCUIT BETWEEN IPDM E/R AND FRONT WIPER MOTOR

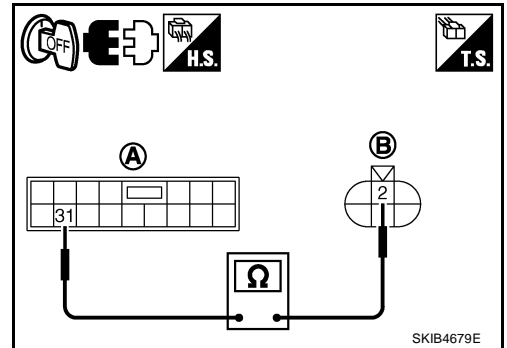
1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector and front wiper motor connector.
3. Check continuity between IPDM E/R harness connector (A) and front wiper motor harness connector (B).

A		B		Continuity
Connector	Terminal	Connector	Terminal	
E7	31	E27	2	Yes

OK or NG

OK >> GO TO 6.

NG >> Repair harness or connector.



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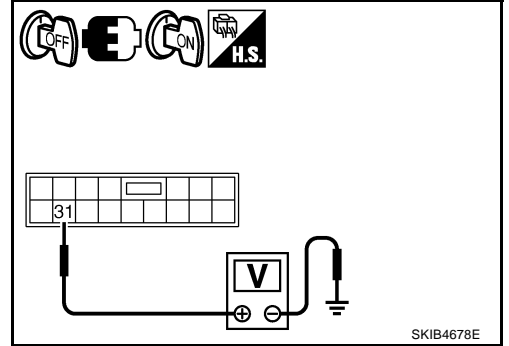
FRONT WIPER AND WASHER SYSTEM

6. CHECK IPDM E/R

Ⓟ With CONSULT-II

1. Connect IPDM E/R connector and front wiper motor connector.
2. Install front wiper reverse relay.
3. Select "IPDM E/R" on CONSULT-II. Select "ACTIVE TEST" on "SELECT DIAG MODE" screen.
4. Select "FRONT WIPER" on "SELECT TEST ITEM" screen.
5. Touch "HI" screen.
6. Check voltage between IPDM E/R harness connector and ground while front wiper HI is operating.

Terminal		(-)	Voltage (Approx.)
(+)			
IPDM E/R connector	Terminal		
E7	31	Ground	0 V



ⓧ Without CONSULT-II

1. Connect IPDM E/R connector and front wiper motor connector.
2. Install front wiper reverse relay.
3. Start up auto active test. Refer to [PG-23, "Auto Active Test"](#).
4. Check voltage between IPDM E/R harness connector and ground while front wiper HI is operating.

Terminal		(-)	Voltage (Approx.)
(+)			
IPDM E/R connector	Terminal		
E7	31	Ground	0 V

OK or NG

- OK >> Replace front wiper motor. Refer to [WW-44, "Disassembly and Assembly of Front Wiper Drive Assembly"](#).
- NG >> Replace IPDM E/R. Refer to [PG-31, "Removal and Installation of IPDM E/R"](#).

Only Front Wiper Intermittent Does Not Operate

NKS003WT

1. CHECK COMBINATION SWITCH

Ⓟ With CONSULT-II

1. Select "BCM" on CONSULT-II, and select "WIPER" on "SELECT TEST ITEM" screen.
2. Select "DATA MONITOR" on "SELECT DIAG MODE" screen. Make sure that "FR WIPER INT", turn ON-OFF according to wiper switch operation.

ⓧ Without CONSULT-II

Refer to [LT-239, "Combination Switch Inspection"](#).

OK or NG

- OK >> Replace BCM. Refer to [BCS-15, "Removal and Installation of BCM"](#).
- NG >> Check combination switch (wiper switch) Refer to [LT-239, "Combination Switch Inspection"](#).

DATA MONITOR	
MONITOR	
IGN ON SW	ON
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	COPE

PKIB0110E

FRONT WIPER AND WASHER SYSTEM

Front Wiper Interval Time Is Not Controlled by Vehicle Speed

NKS003WU

1. CHECK FUNCTION OF COMBINATION METER

Confirm that speedometer operates normally.

Does the speedometer operate normally?

YES >> GO TO 2.

NO >> Combination meter vehicle speed system malfunction. Refer to [DI-20, "Vehicle Speed Signal Inspection"](#).

2. CHECK CAN COMMUNICATION BETWEEN BCM AND COMBINATION METER

Select "BCM" on CONSULT-II, and perform self-diagnosis for "BCM".

Displayed self-diagnosis results

NO DTC>>Replace BCM. Refer to [BCS-15, "Removal and Installation of BCM"](#).

CAN COMM CIRCUIT>>Check CAN communication line of BCM. Refer to [BCS-13, "CAN Communication Inspection Using CONSULT-II \(Self-Diagnosis\)"](#).

SELF-DIAG RESULTS			
DTC RESULTS		TIME	
CAN COMM CIRCUIT [U1000]			
ERASE		PRINT	
MODE	BACK	LIGHT	COPY

PKIA7627E

Front Wiper Intermittent Operation Switch Position Cannot Be Adjusted

NKS003WV

1. CHECK CIRCUIT BETWEEN COMBINATION SWITCH AND BCM

Ⓟ With CONSULT-II

1. Select "BCM" on CONSULT-II, and select "WIPER" on "SELECT TEST ITEM" screen.
2. Select "DATA MONITOR" on "SELECT DIAG MODE" screen. Make sure that "INT VOLUME", changes in order from 1 to 7 according to wiper switch operation.

ⓧ Without CONSULT-II

Refer to [LT-239, "Combination Switch Inspection"](#).

OK or NG

OK >> Replace BCM. Refer to [BCS-15, "Removal and Installation of BCM"](#).

NG >> Check combination switch (wiper switch). Refer to [LT-239, "Combination Switch Inspection"](#).

DATA MONITOR	
MONITOR	
IGN ON SW	ON
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	COPE

PKIB0110E

FRONT WIPER AND WASHER SYSTEM

NKS003WW

Wiper Does Not Wipe When Front Washer Operates

1. CHECK CIRCUIT BETWEEN COMBINATION SWITCH AND BCM

☐ With CONSULT-II

1. Select "BCM" on CONSULT-II, and select "WIPER" on "SELECT TEST ITEM" screen.
2. Select "DATA MONITOR" on "SELECT DIAG MODE" screen. Make sure that "FR WASHER SW" turn ON-OFF according to front wiper switch operation.

DATA MONITOR			
MONITOR			
IGN ON SW	ON		
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	COPE

PKIB0110E

⊗ Without CONSULT-II

Refer to [LT-239, "Combination Switch Inspection"](#) .

OK or NG

- OK >> Replace BCM. Refer to [BCS-15, "Removal and Installation of BCM"](#) .
- NG >> Check combination switch (wiper switch). Refer to [LT-239, "Combination Switch Inspection"](#) .

Front Wiper Does Not Stop

NKS003WX

1. CHECK CIRCUIT BETWEEN COMBINATION SWITCH AND BCM

☐ With CONSULT-II

1. Select "BCM" on CONSULT-II, and select "WIPER" on "SELECT TEST ITEM" screen.
2. Select "DATA MONITOR" on "SELECT DIAG MODE" screen. Make sure that "FR WIPER INT", "FR WIPER LOW", "FR WIPER HI", and "FR WASHER SW" turn ON-OFF according to front wiper switch operation.

DATA MONITOR			
MONITOR			
IGN ON SW	ON		
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	COPE

PKIB0110E

⊗ Without CONSULT-II

Refer to [LT-239, "Combination Switch Inspection"](#) .

OK or NG

- OK >> Replace IPDM E/R. Refer to [PG-31, "Removal and Installation of IPDM E/R"](#) .
- NG >> Check combination switch (wiper switch). Refer to [LT-239, "Combination Switch Inspection"](#) .

FRONT WIPER AND WASHER SYSTEM

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

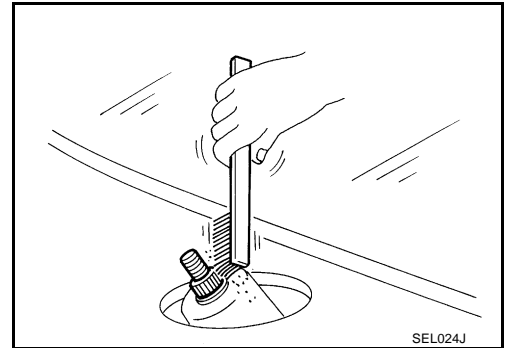
NKS003WY

REMOVAL

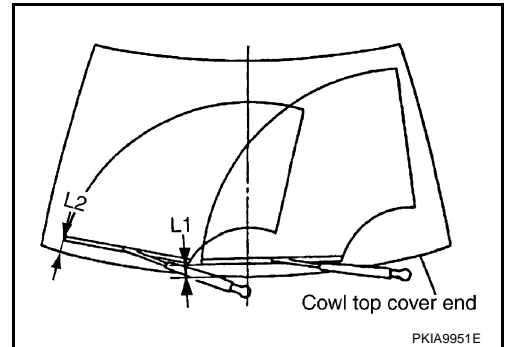
1. Turn wiper switch ON to operate wiper motor, and then turn wiper switch OFF (auto stop).
2. Open hood, remove arm caps, and remove wiper arm nuts.
3. Raise wiper arms, and remove wiper arms from the vehicle.

INSTALLATION

1. Clean up the pivot area as shown in the figure. This will reduce possibility of wiper arm looseness.



2. Prior to wiper arm installation, turn on wiper switch to operate wiper motor and then turn it "OFF" (auto stop).
3. Push wiper arm onto pivot shaft, paying attention to blind spline.
4. Lift the blade up and then set it down onto glass surface to set the blade center to clearance "L1" & "L2" immediately before tightening nuts.
5. Spray washer fluid. Turn on wiper switch to operate wiper motor and then turn it "OFF".
6. Make sure that wiper blades stop within clearance "L1" & "L2".



Clearance "L1" : 17.9 ± 7.5 mm (0.705 \pm 0.295 in)

Clearance "L2" : 33.2 ± 7.5 mm (1.307 \pm 0.295 in)

- Tighten wiper arm nuts to specified torque.

Front wiper arm nuts  : 23.5 N·m (2.4 kg·m, 17 ft·lb)

7. Attach wiper arm caps.

ADJUSTMENT

Refer to [WW-43, "INSTALLATION"](#) .

A

B

C

D

E

F

G

H

I

J

WW

L

M

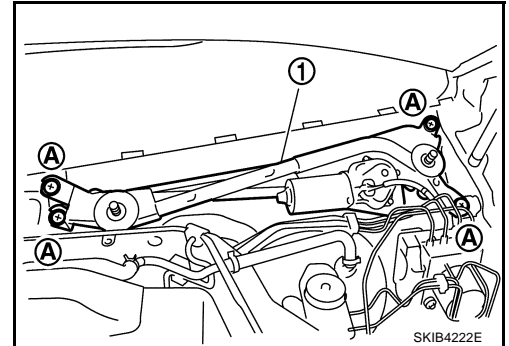
FRONT WIPER AND WASHER SYSTEM

NKS003WZ

Removal and Installation of Front Wiper Drive Assembly

REMOVAL

1. Operate front wiper motor, and stop at the auto stop position.
2. Remove wiper arms. Refer to [WW-43, "REMOVAL"](#).
3. Remove cowl top cover. Refer to [EI-18, "COWL TOP"](#).
4. Disconnect wiper motor connector and remove connector clips.
5. Remove front wiper drive assembly mounting bolts (A), and remove front wiper drive assembly (1) from the vehicle.



INSTALLATION

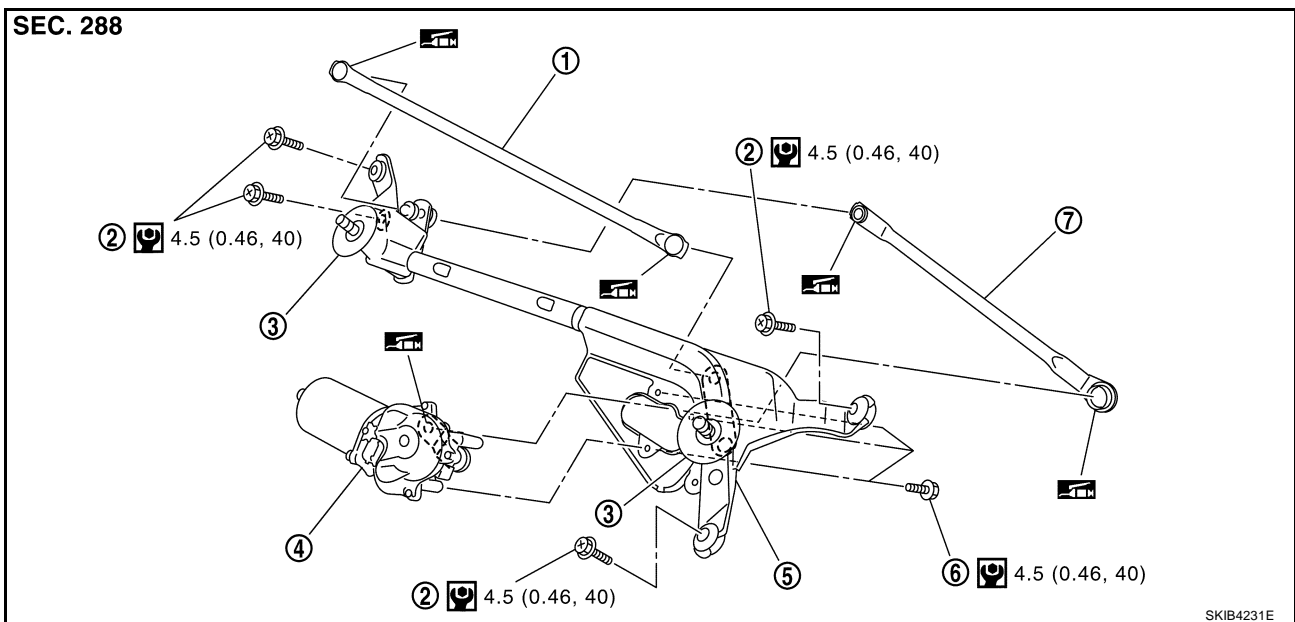
1. Install front wiper drive assembly to the vehicle.

Front wiper drive assembly mounting bolts  : 4.5 N-m (0.46kg-m, 40 in-lb)


2. Connect wiper motor connector. Turn wiper switch ON to operate wiper motor, then turn wiper switch OFF (auto stop).
3. Install connector clips to the wiper frame, and install cowl top cover. Refer to [EI-18, "COWL TOP"](#).
4. Attach wiper arms. Refer to [WW-43, "INSTALLATION"](#).
5. Adjustment of wiper arm stop location.
6. Install arm caps.


Disassembly and Assembly of Front Wiper Drive Assembly

NKS003X0



- | | | |
|--------------------|----------------|---------------|
| 1. Wiper linkage 1 | 2. Bolt | 3. Shaft seal |
| 4. Wiper motor | 5. Wiper frame | 6. Bolt |
| 7. Wiper linkage 2 | | |

 : N-m (kg-m, in-lb)

 : Should be lubricated with grease.

FRONT WIPER AND WASHER SYSTEM

DISASSEMBLY

1. Remove wiper linkage from wiper motor and motor frame.
2. Remove wiper motor mounting bolts, and remove wiper motor from wiper frame.

CAUTION:

Be careful not to bend linkage and not to damage the resin part of ball joint when removing wiper linkage.

ASSEMBLY

1. Connect wiper motor connector. Turn wiper switch ON to operate wiper motor, and then turn wiper switch OFF (auto stop).
2. Disconnect wiper motor connector.
3. Install wiper motor to wiper frame.

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

4. Install wiper linkage to wiper frame and wiper motor.

CAUTION:

- Never drop the wiper motor or cause it to contact other parts.
- Check grease conditions of the motor arm and wiper linkage joint (at retainer). Apply grease if necessary.

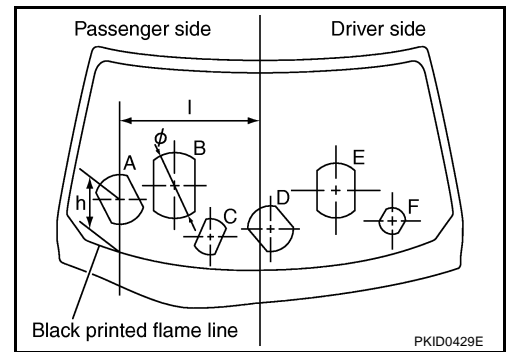
Washer Nozzle Adjustment

NKS004HP

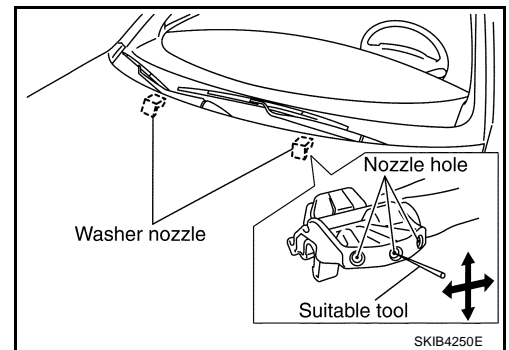
Adjust spray positions to match the positions shown in the figure.

Unit: mm (in)

Spray position	h (height)	l (width)	φ (Diameter) (spray point area)
A	193.9 (7.63)	514.2 (20.24)	180 (7.09)
B	288.7 (11.37)	307.5 (12.11)	240 (9.45)
C	119.7 (4.71)	175.6 (6.91)	130 (5.12)
D	158.0 (6.22)	42.7 (1.68)	165 (6.50)
E	279.0 (10.98)	280.3 (11.04)	200 (7.87)
F	127.6 (5.02)	488.4 (19.23)	95 (3.74)



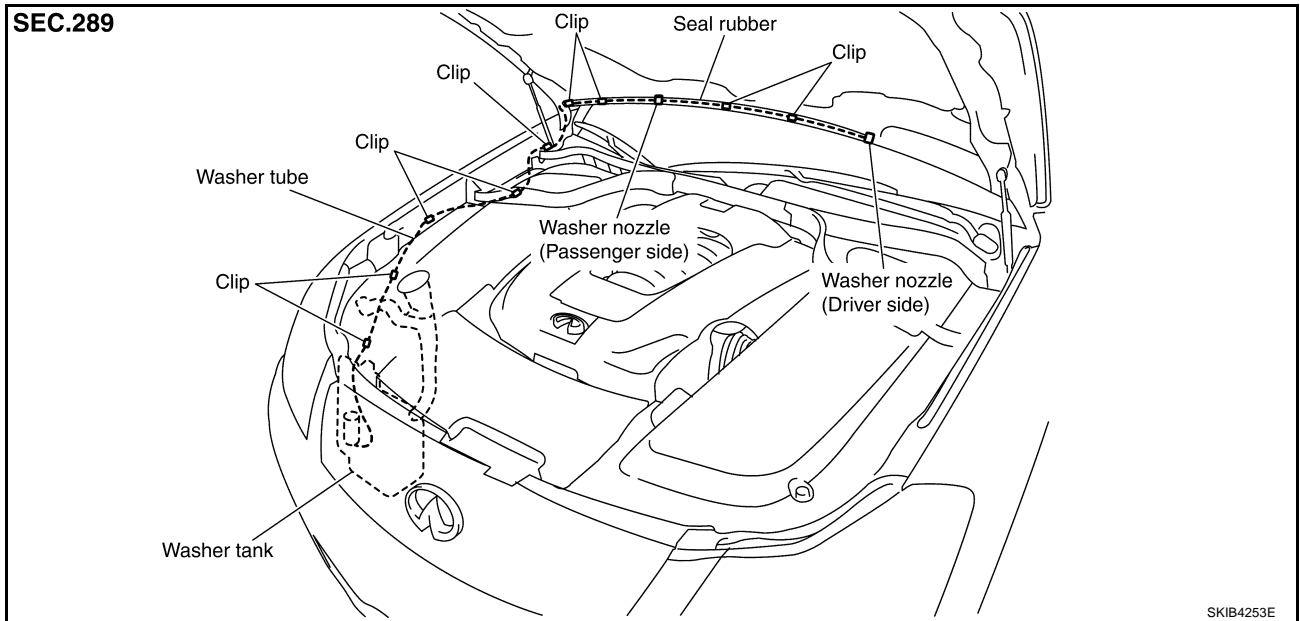
Insert a needle or suitable tool into the nozzle hole and move up/down and left/right to adjust the spray position.



FRONT WIPER AND WASHER SYSTEM

Washer Tube Layout

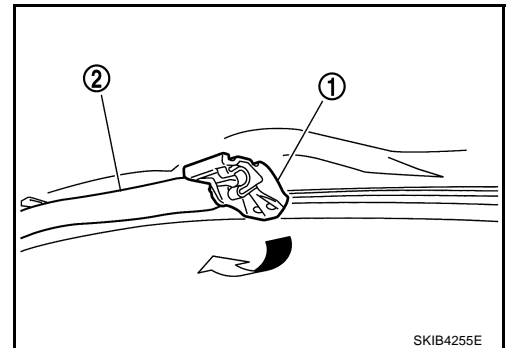
NKS003X2



Removal and Installation of Front Washer Nozzle

NKS003X3

1. Open hood, and turn off the washer hose seal rubber.
2. While pushing nozzle spray point side along body, use the nozzle stop point as the support point and rotate nozzle (1) to remove it from body.
3. Remove washer tube (2).



INSTALLATION

1. Install washer tube in nozzle.
2. Install nozzle to the vehicle.
3. Adjust nozzle spray location. Refer to [WW-45, "Washer Nozzle Adjustment"](#) .

CAUTION:

The spray points differ, so be sure to install left and right nozzles correctly.

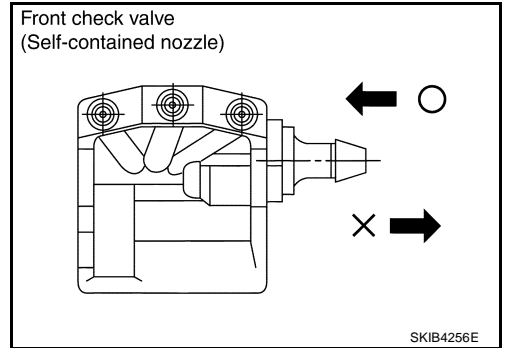
FRONT WIPER AND WASHER SYSTEM

Inspection for Washer Nozzle

CHECK VALVE INSPECTION

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

NKS003X4



Inspection of Front Wiper and Washer Switch Circuit

Refer to [LT-239, "Combination Switch Inspection"](#).

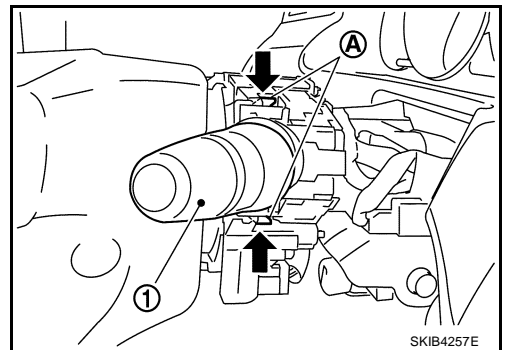
NKS003X5

Removal and Installation of Front Wiper and Washer Switch

REMOVAL

1. Remove steering column cover. Refer to [IP-10, "INSTRUMENT PANEL ASSEMBLY"](#).
2. Disconnect the wiper and washer switch connector.
3. Pull wiper and washer switch (1) toward the passenger door while pressing pawls (A) in direction shown by the arrow in the figure, and remove it from the base.

NKS003X6



INSTALLATION

Installation is the reverse order of removal.

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

WW

FRONT WIPER AND WASHER SYSTEM

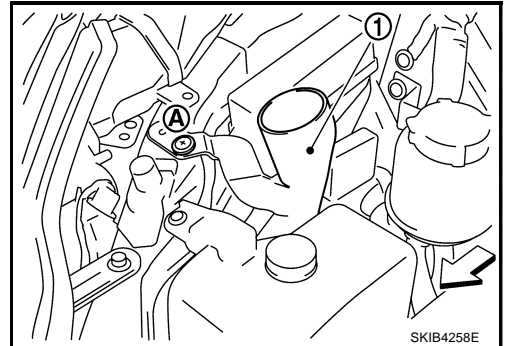
Removal and Installation of Washer Tank

NKS003X7

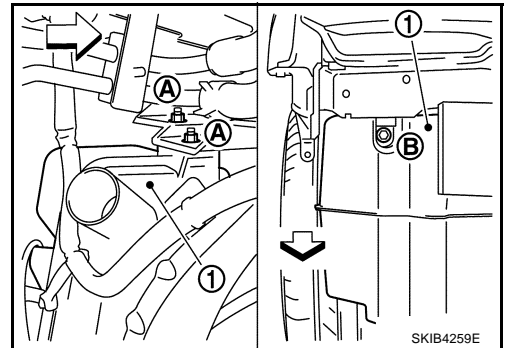
↩: Vehicle front

REMOVAL

1. Remove engine room cover (RH). Refer to [EM-15, "Removal and Installation"](#).
2. Remove clip (A) and pull washer tank inlet (1) out of washer tank.



3. Remove front bumper. Refer to [EI-11, "Removal and Installation"](#).
4. Disconnect washer pump connector and wash fluid level sensor connector.
5. Remove washer tank mounting nuts (A) and remove bolt (B).
6. Remove washer tube, and remove washer tank (1) from vehicle.



INSTALLATION

Note the following, and installation is the reverse order of removal.

CAUTION:

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

Washer tank mounting nuts



: 4.5 N-m (0.46 kg-m, 40 in-lb)

Washer tank mounting bolt



: 4.5 N-m (0.46 kg-m, 40 in-lb)

FRONT WIPER AND WASHER SYSTEM

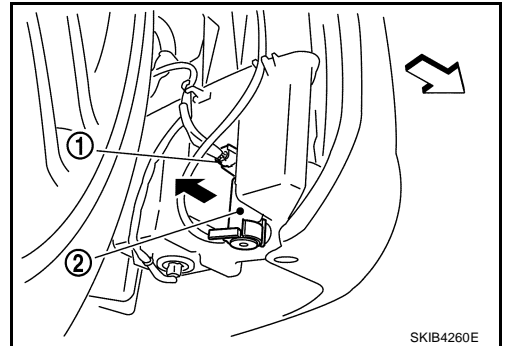
Removal and Installation of Washer Pump

NKS003X8

↔: Vehicle front

REMOVAL

1. Remove fender protector (front) RH. Refer to [EI-20, "FENDER PROTECTOR"](#) .
2. Disconnect washer pump connector (1) and remove washer tube.
3. Pull out washer pump (2) in direction shown by the arrow in the figure. Remove washer pump (2) from washer tank.



INSTALLATION

Note the following, and installation is the reverse order of removal.

CAUTION:

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

A

B

C

D

E

F

G

H

I

J

WW

L

M

CIGARETTE LIGHTER

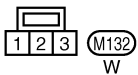
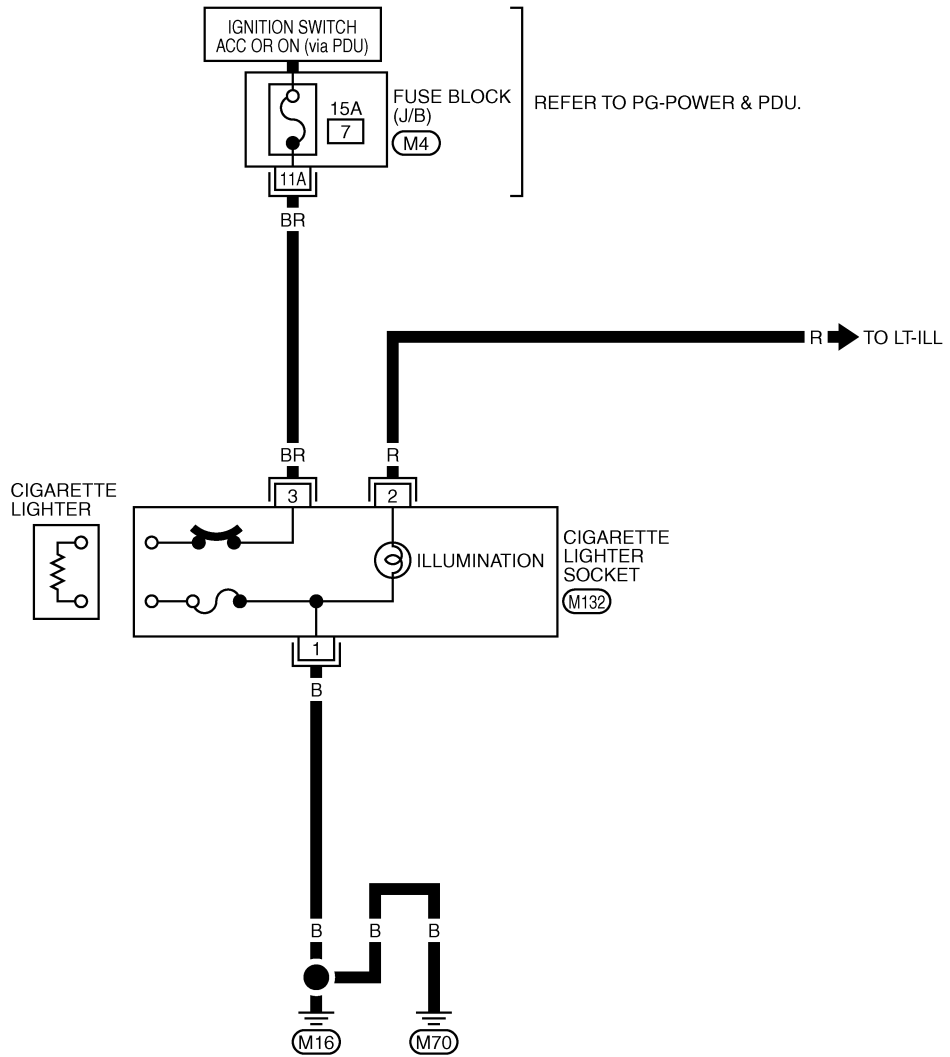
PFP:35330

CIGARETTE LIGHTER

Wiring Diagram — CIGAR —

NKS003X9

WW-CIGAR-01



REFER TO THE FOLLOWING.
M4 - FUSE BLOCK-JUNCTION
BOX (J/B)

TKWT3219E

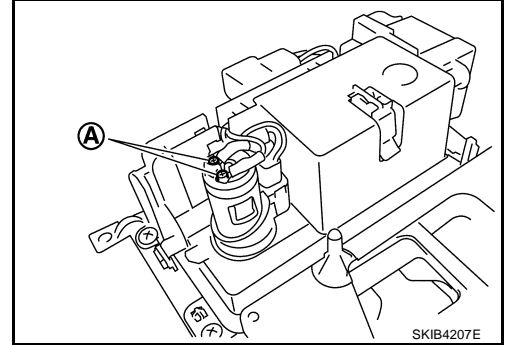
CIGARETTE LIGHTER

NKS003XA

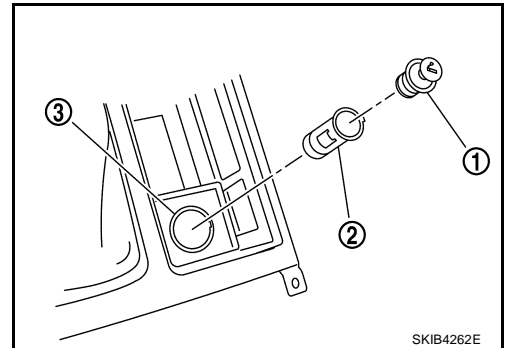
Removal and Installation

REMOVAL

1. Remove A/T console finisher. Refer to [IP-10, "INSTRUMENT PANEL ASSEMBLY"](#).
2. Remove screws (A) from reverse side cigarette lighter socket.



3. Pull out cigarette lighter (1).
4. Insert a small screwdriver or similar tool between the cigarette lighter socket (2) and cigarette lighter ring (3). Pull out cigarette lighter socket (2).



INSTALLATION

Note the following, and installation is the reverse order of removal.

CAUTION:

Align notches of cigarette lighter ring and cigarette lighter socket when installing.

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

WW

POWER SOCKET

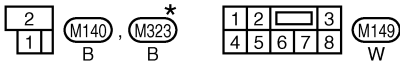
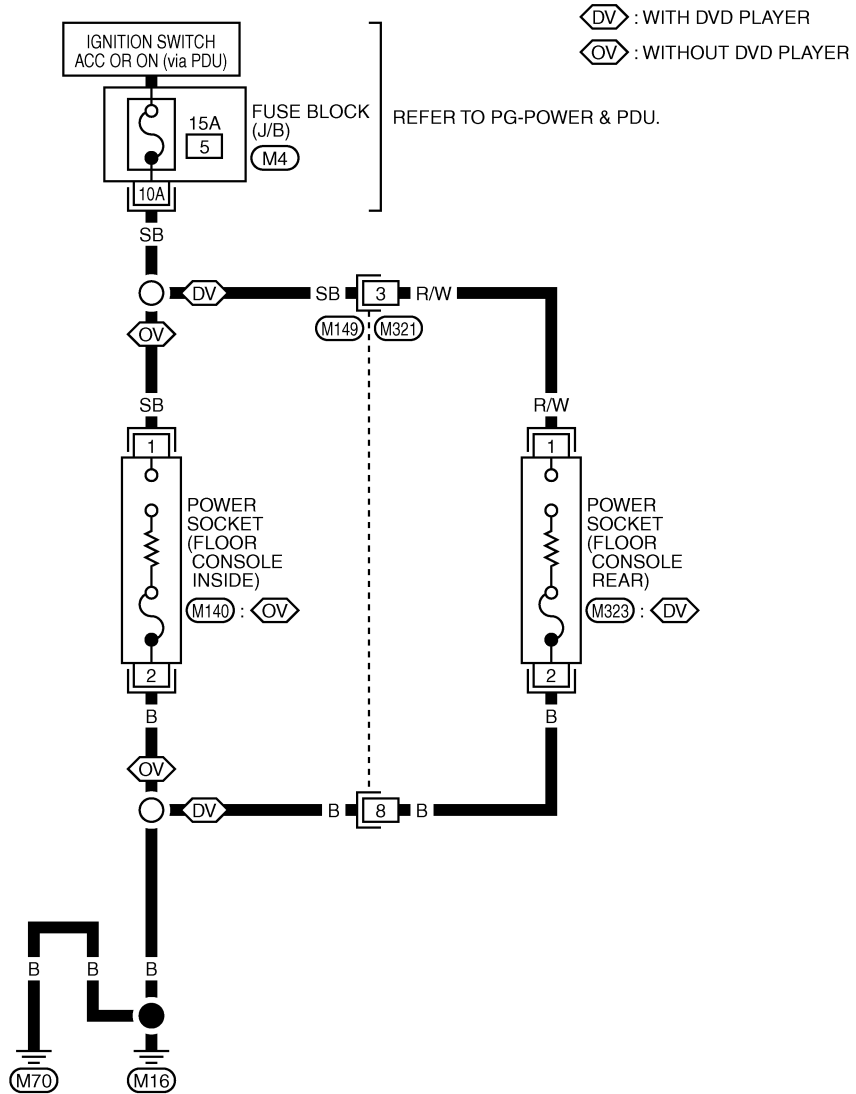
PFP:253A2

NKS003XB

POWER SOCKET

Wiring Diagram — P/SCKT —

WW-P/SCKT-01



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

REFER TO THE FOLLOWING.

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

TKWT3220E

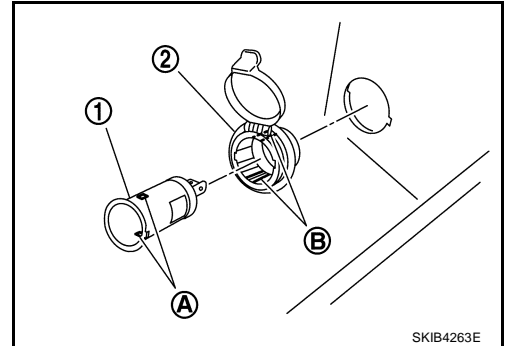
POWER SOCKET

Removal and Installation of Center Console Box Power Socket

NKS003XC

REMOVAL

1. Remove console box. Refer to [IP-10, "INSTRUMENT PANEL ASSEMBLY"](#) .
2. Remove inner socket (1) from the ring (2) while pressing the hook (B) on the ring out from square hole (A).
3. Remove ring from console box while pressing pawls.



INSTALLATION

Note the following, and installation is the reverse order of removal.

CAUTION:

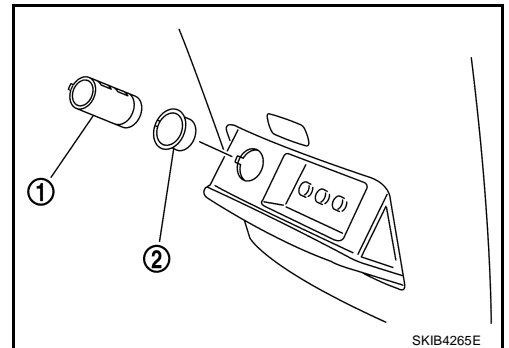
Align notches of inner socket and ring, and console box when installing.

Removal and Installation of Center Console Box Rear Side Power Socket

NKS003XD

REMOVAL

1. Remove the console rear finisher. Refer to [IP-19, "CENTER CONSOLE ASSEMBLY"](#) .
2. Remove inner socket (1) and ring (2) from the console rear finisher while pressing the hook on ring from square hole.



INSTALLATION

Note the following, and installation is the reverse order of removal.

CAUTION:

Align notches of inner socket and ring, and console box when installing.

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

WW

HORN

PFP:25610

NKS003XE

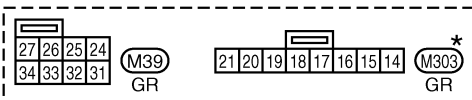
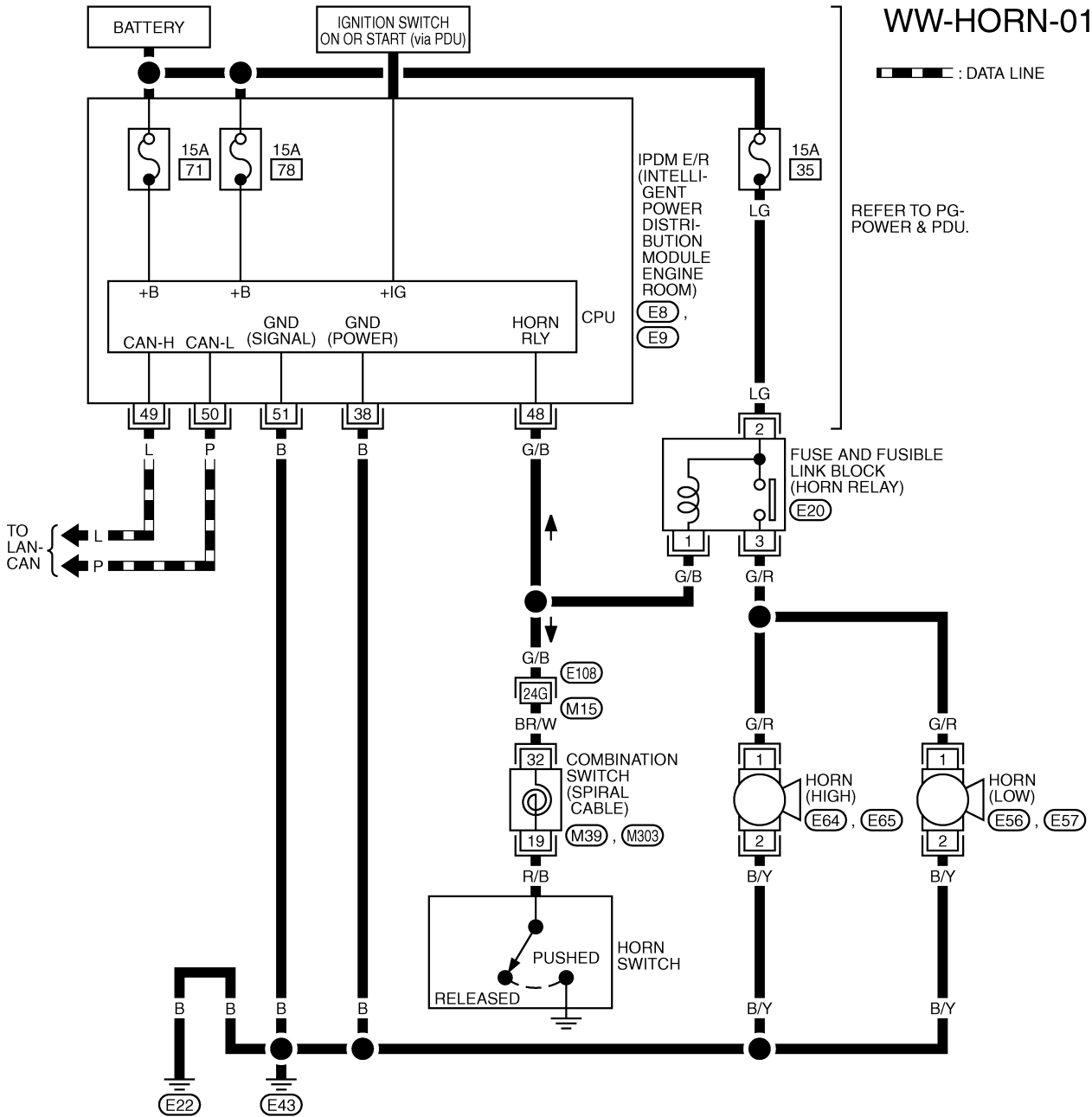
HORN

Wiring Diagram — HORN —

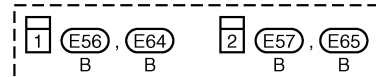
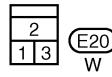
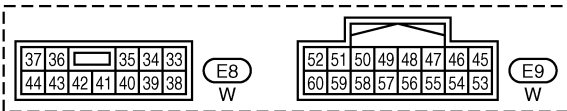
WW-HORN-01

— : DATA LINE

REFER TO PG-POWER & PDU.



REFER TO THE FOLLOWING.
 (E108) -SUPER MULTIPLE JUNCTION (SMJ)



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

TKWT3221E

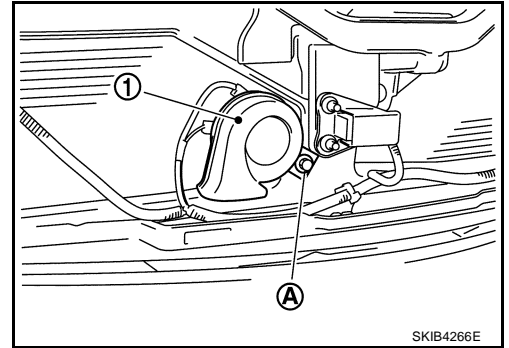
HORN

Removal and Installation

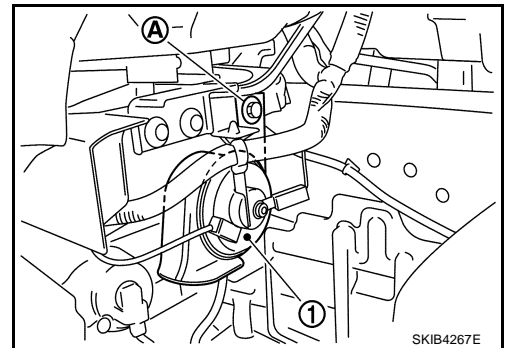
NKS003XF

REMOVAL

1. Remove front grille. Refer to [EI-16, "FRONT GRILLE"](#) .
2. Disconnect horn (HI) connectors.
3. Remove horn (HI) mounting bolt (A), and remove horn (HI) (1) from vehicle.



4. Remove fender protector (front) LH to obtain work space between the fender protector and fender.
5. Disconnect horn (LO) connectors.
6. Remove horn (LO) mounting bolts (A), and remove horn (LO) (1) from vehicle.



INSTALLATION

Tighten horn bolt to specified torque.

Horn mounting bolt  :17.1 N·m (1.7 kg-m, 13 ft-lb.)

A
B
C
D
E
F
G
H
I
J

WW

L
M

HORN
