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SECTION

WIPER, WASHER & HORN

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PRECAUTION

< SERVICE INFORMATION >

SERVICE INFORMATION

PRECAUTION

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

INFOID:000000005214368

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 "SUPPLEMENTAL RESTRAINT SYSTEM" and "SEAT BELTS" 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 "SUPPLEMENTAL RESTRAINT SYSTEM".
- 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 WHEN USING POWER TOOLS (AIR OR ELECTRIC) AND HAMMERS

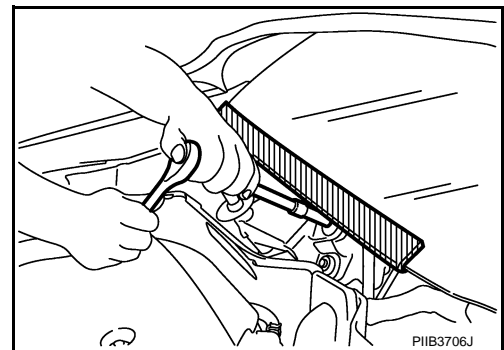
WARNING:

- When working near the Air Bag Diagnosis Sensor Unit or other Air Bag System sensors with the ignition ON or engine running, DO NOT use air or electric power tools or strike near the sensor(s) with a hammer. Heavy vibration could activate the sensor(s) and deploy the air bag(s), possibly causing serious injury.
- When using air or electric power tools or hammers, always switch the ignition OFF, disconnect the battery, and wait at least 3 minutes before performing any service.

Precaution for Procedure without Cowl Top Cover

INFOID:000000004158720

When performing the procedure after removing cowl top cover, cover the lower end of windshield with urethane, etc.



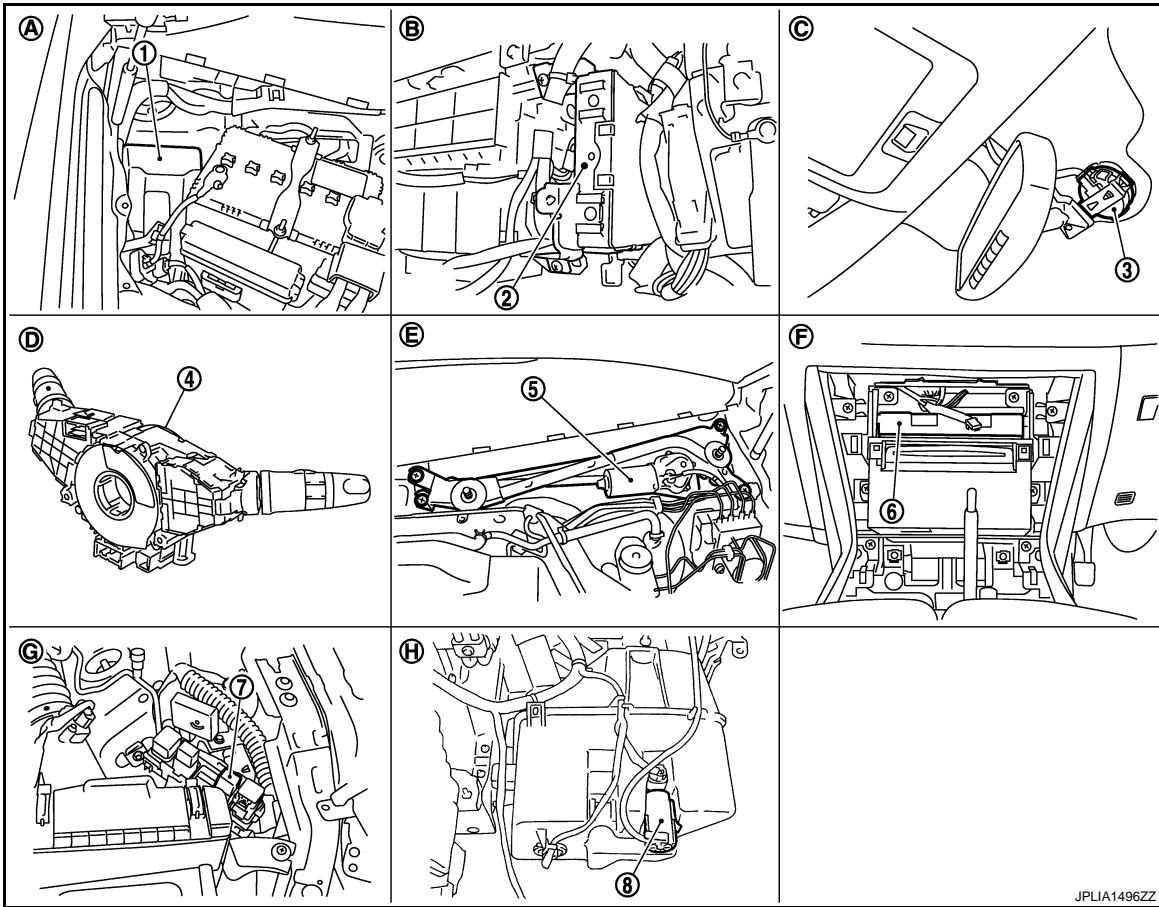
FRONT WIPER AND WASHER SYSTEM

< SERVICE INFORMATION >

FRONT WIPER AND WASHER SYSTEM

Component Parts and Harness Connector Location

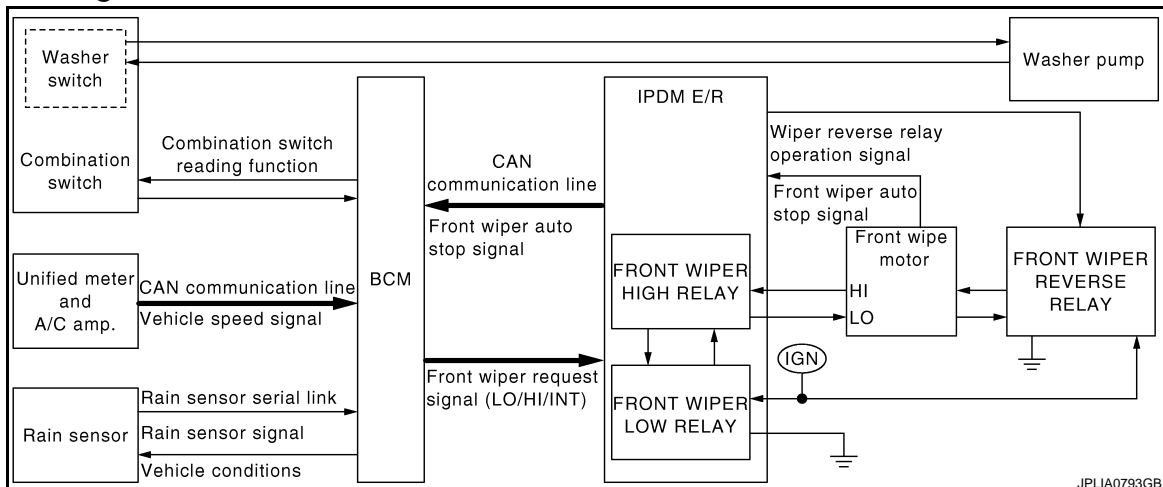
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- | | | |
|---------------------------------|---------------------------------------|-------------------------------|
| 1. IPDM E/R | 2. BCM | 3. Rain sensor |
| 4. Combination switch | 5. Front wiper motor | 6. Unified meter and A/C amp. |
| 7. Front wiper reverse relay | 8. Front washer pump | |
| A. Engine room dash panel (RH) | B. Behind glove box | C. Wind shield upper |
| D. Steering column cover inside | E. Cowl top, left side of engine room | F. Behind cluster lid C |
| G. Engine room (Right side) | H. Radiator core support (RH) | |

System Diagram

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FRONT WIPER AND WASHER SYSTEM

< SERVICE INFORMATION >

System Description

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OUTLINE

- Front wiper low relay and front wiper high relay are included in IPDM E/R (intelligent power distribution module engine room).
- Front wiper reverse relay is included in relay box-1.
- BCM detects the wiper switch (combination switch) condition by the combination switch reading function.
- BCM controls front wiper LO, HI and AUTO (rain sensing wiper) operation and requests front wiper operation to IPDM E/R via CAN communication.
- IPDM E/R operates wiper motor according to the request from BCM.
- Front wiper motor switches LOW speed to/from HIGH speed by BCM function to change polarity.
- BCM controls front wiper AUTO (Rain sensing) operation

FRONT WIPER BASIC OPERATION

- BCM detects the combination switch condition by the combination switch reading function.
- BCM transmits the front wiper request signal to IPDM E/R via CAN communication depending on each operating condition of the front wiper.
- IPDM E/R turns ON/OFF front wiper low relay, front wiper high relay and front wiper reverse relay according to the front wiper request signal. IPDM E/R provides the power supply to operate the front wiper HI/LO operation.

FRONT WIPER LO OPERATION

- BCM transmits the front wiper request signal (LO) to IPDM E/R via CAN communication according to the front wiper LO operating condition.

Front wiper LO operating condition

- Ignition switch ON
- Front wiper switch LO or front wiper switch MIST (while pressing)
- IPDM E/R turns ON front wiper low relay according to the front wiper request signal (LO).
- Power is supplied;
 - from fuse
 - through front wiper low relay
 - through front wiper high relay
 - to front wiper motor.
- Ground is supplied;
 - to front wiper motor
 - through front wiper reverse relay
 - from ground.

FRONT WIPER HI OPERATION

- BCM transmits the front wiper request signal (HI) to IPDM E/R via CAN communication according to the front wiper HI operating condition.

Front wiper HI operating condition

- Ignition switch ON
- Front wiper switch HI
- IPDM E/R turns ON front wiper high relay and front wiper reverse relay according to the front wiper request signal (HI).
- Power is supplied;
 - from fuse
 - through front wiper reverse relay
 - to front wiper motor.
- Ground is supplied;
 - to front wiper motor
 - through front wiper high relay
 - through front wiper low relay
 - from ground.

FRONT WIPER AUTO OPERATION (RAIN SENSING WIPER)

Rain Sensing

Rain level and sensor conditions are detected by rain sensor.

FRONT WIPER AND WASHER SYSTEM

< SERVICE INFORMATION >

- BCM transmits the vehicle conditions (vehicle speed, front wiper condition, rain sensor sensitivity setting, etc.) to the rain sensor via the rain sensor serial link. A
- Rain sensor judges a wiping speed for front wiper by rain condition and the vehicle conditions. And it transmits the wiping speed request signal to the BCM via the rain sensor serial link. B

Auto Wiping Operation

- BCM receives the wiping speed request signal from the rain sensor via the rain sensor serial link. B
- BCM controls front wiper operation according to the wiping speed request signals. And it transmits the front wiper request signals (LO or HI) to the IPDM E/R via CAN communication line. C

Front wiper AUTO operating condition

- Ignition switch ON
- Front wiper switch INT D

NOTE:

When the front wiper switch is turned to INT position, front wiper operates once regardless of a rainy condition.

Rain Sensor Sensitivity Setting

BCM determines rain sensor sensitivity according to a wiper volume. E

| Wiper intermittent dial position | Sensitivity | F |
|----------------------------------|-------------------------|---|
| 1 | High sensitivity | |
| 2 | | |
| 3 | Medium-high sensitivity | G |
| 4 | | |
| 5 | Low-medium sensitivity | H |
| 6 | | |
| 7 | Low sensitivity | I |

NOTE:

When the wiper volume is turned up at 1 level with front wiper AUTO operating condition, front wiper operates once. J

FRONT WIPER AUTO STOP OPERATION

- BCM stops transmitting the front wiper request signal when the front wiper switch is turned OFF.
- IPDM E/R detects the front wiper stop position signal from the front wiper motor and detects the front wiper motor position (stop position/except stop position).
- When the front wiper request signal is stopped, IPDM E/R turns ON the front wiper low relay until the front wiper motor returns to the stop position. WW

NOTE:

- BCM stops the transmitting of the front wiper request signal when the ignition switch is OFF. L
- IPDM E/R turns front wiper relays OFF when the ignition switch is OFF.

FRONT WIPER OPERATION LINKED WITH WASHER

- BCM transmits the front wiper request signal (LO) to IPDM E/R via CAN communication according to the washer linked operating condition of the front wiper. M
- BCM transmits the front wiper request signal (LO) so that the front wiper operates approximately 3 times when the front washer switch OFF is detected. N

Washer linked operating condition of front wiper

- Ignition switch ON
- Front washer switch ON (0.4 second or more) O
- IPDM E/R turns ON the integrated front wiper low relay according to the front wiper request signal (LO).
- The washer pump is grounded through the combination switch with the front washer switch ON. P

FAIL-SAFE FUNCTION

CAN Communication Error

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.)

Front Wiper Motor Protection

IPDM E/R performs the fail-safe function when the front wiper auto stop circuit is malfunctioning.

FRONT WIPER AND WASHER SYSTEM

< SERVICE INFORMATION >

- IPDM E/R detects the front wiper stop position with the front wiper auto stop signal.
- When the front wiper auto stop signal is in the conditions listed below, IPDM E/R repeats a front wiper 10 seconds operation and 20 seconds stop until ignition switch is turned OFF.

| Ignition switch | Front wiper switch | Front wiper auto stop signal |
|-----------------|--------------------|--|
| ON | ON | The front wiper auto stop signal (stop position) cannot be input for 10 seconds. |
| | OFF | The front wiper auto stop signal does not change for 10 seconds. |

Rain Sensor Malfunction

- BCM judges the rain sensor serial link error by the rain sensor serial link condition and detects the rain sensor malfunction by rain sensor malfunction signal.
- When BCM detects the rain sensor serial link error or the rain sensor malfunction while front wiper AUTO operation, BCM operates a fail-safe control.

NOTE:

If rain sensor malfunction is detected when ignition switch is turned OFF ⇒ ON and front wiper switch is INT position, BCM operates front wiper LO.

COMBINATION SWITCH READING FUNCTION

Refer to [BCS-7, "Combination Switch Reading Function"](#).

CAN Communication System Description

INFOID:000000004158724

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.

CAN Communication Unit

INFOID:000000004158725

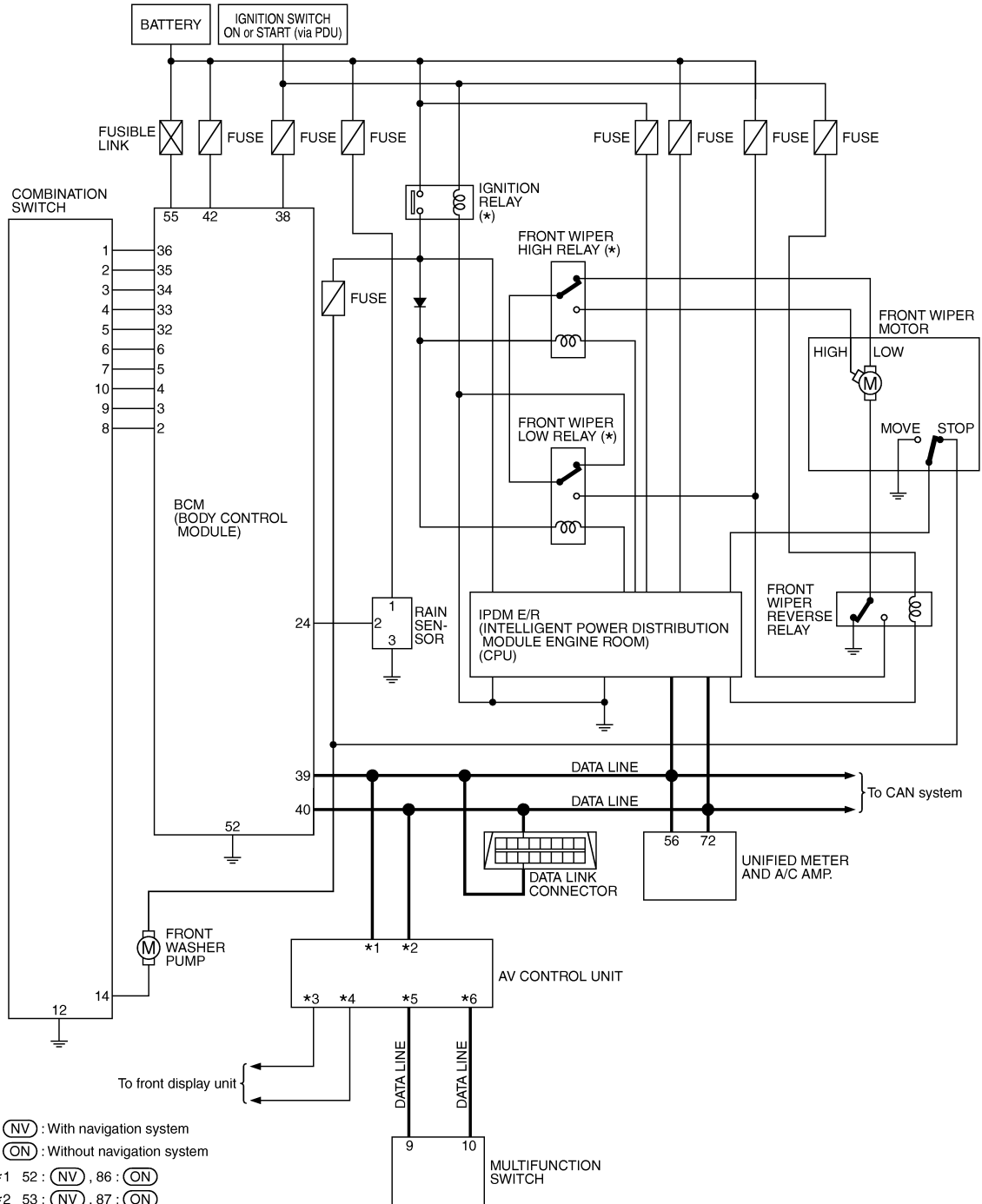
Refer to [LAN-29, "CAN System Specification Chart"](#).

FRONT WIPER AND WASHER SYSTEM

< SERVICE INFORMATION >

Schematic

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(NV) : With navigation system
 (ON) : Without navigation system

- *1 52 : (NV) , 86 : (ON)
- *2 53 : (NV) , 87 : (ON)
- *3 102 : (NV) , 56 : (ON)
- *4 103 : (NV) , 44 : (ON)
- *5 50 : (NV) , 88 : (ON)
- *6 51 : (NV) , 89 : (ON)

* : This relay is built into the IPDM E/R (Intelligent power distribution module engine room).

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FRONT WIPER AND WASHER SYSTEM

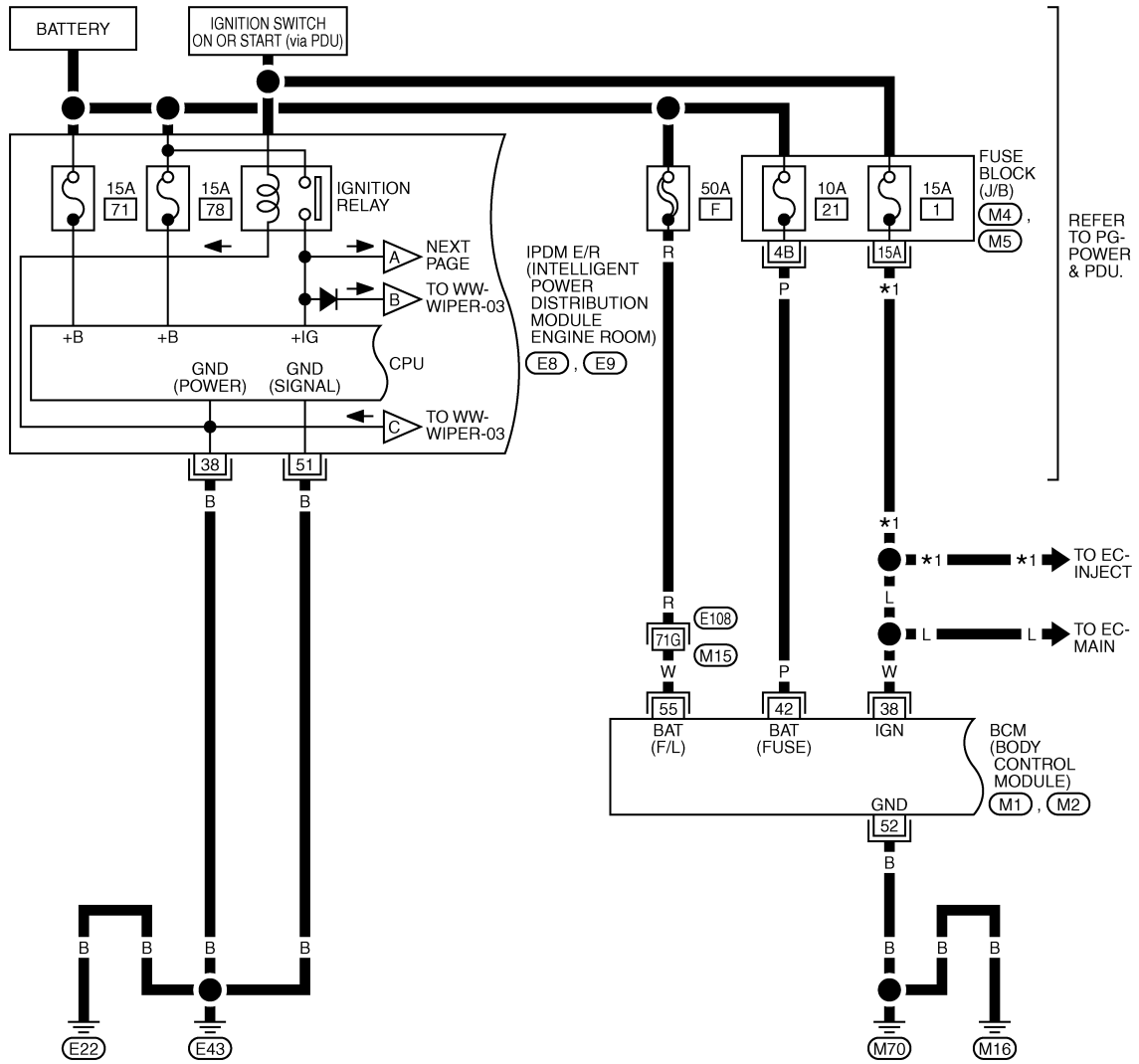
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Wiring Diagram - WIPER -

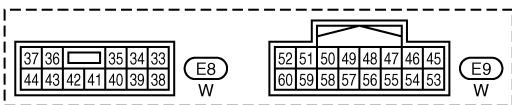
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WW-WIPER-01

VQ : WITH VQ ENGINE *1 W : VQ
VK : WITH VK ENGINE SB : VK



REFER TO PG-POWER & PDU.



REFER TO THE FOLLOWING.

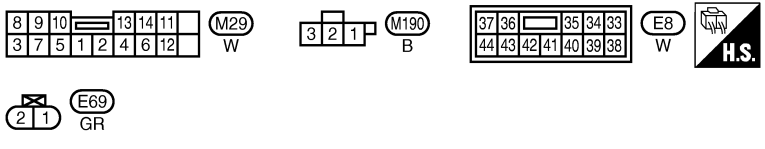
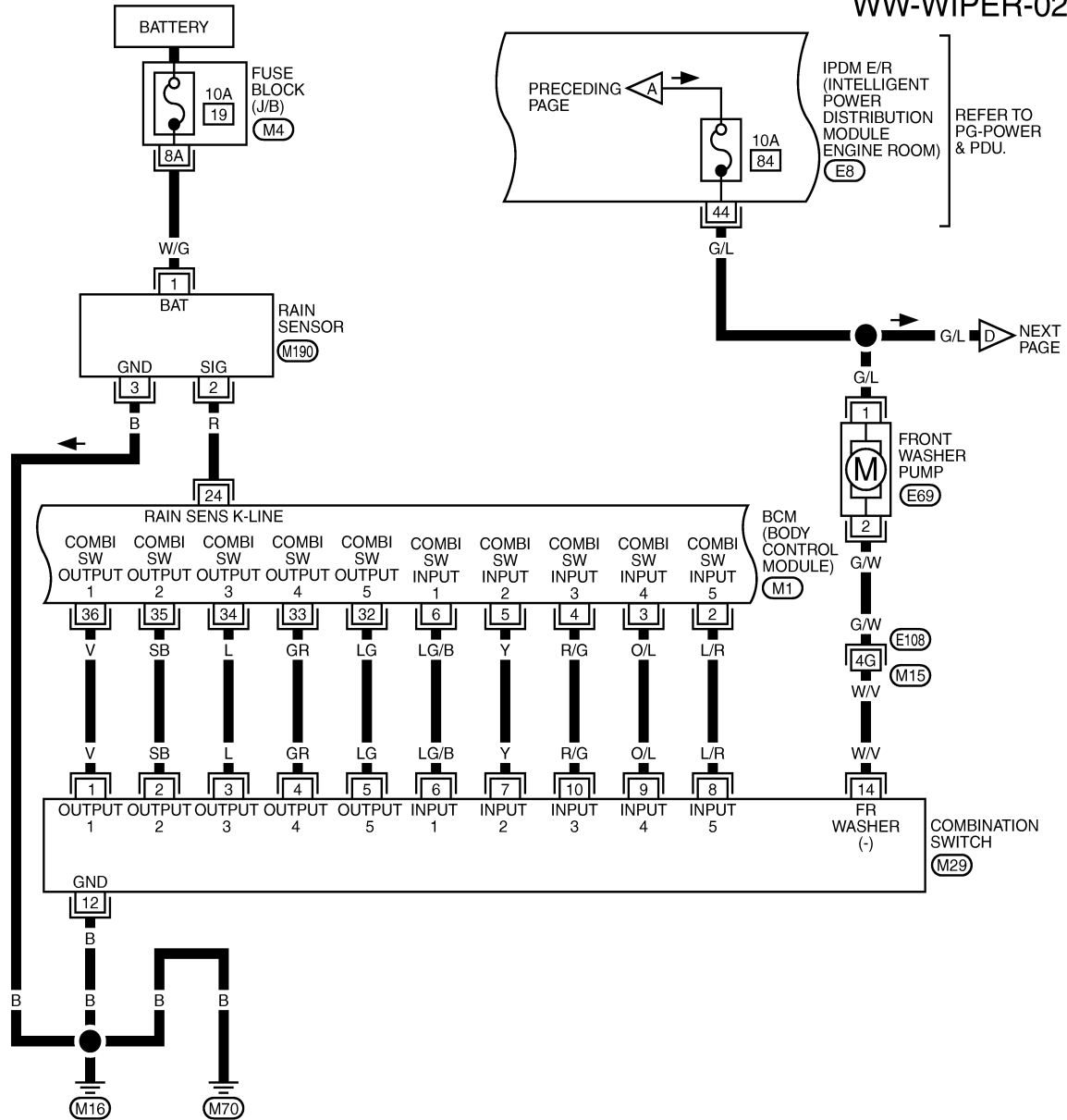
- (E108) - SUPER MULTIPLE JUNCTION (SMJ)
- (M4), (M5) - FUSE BLOCK-JUNCTION BOX (J/B)
- (M1), (M2) - ELECTRICAL UNITS

TKWT8247E

FRONT WIPER AND WASHER SYSTEM

< SERVICE INFORMATION >

WW-WIPER-02



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

TKWT6873E

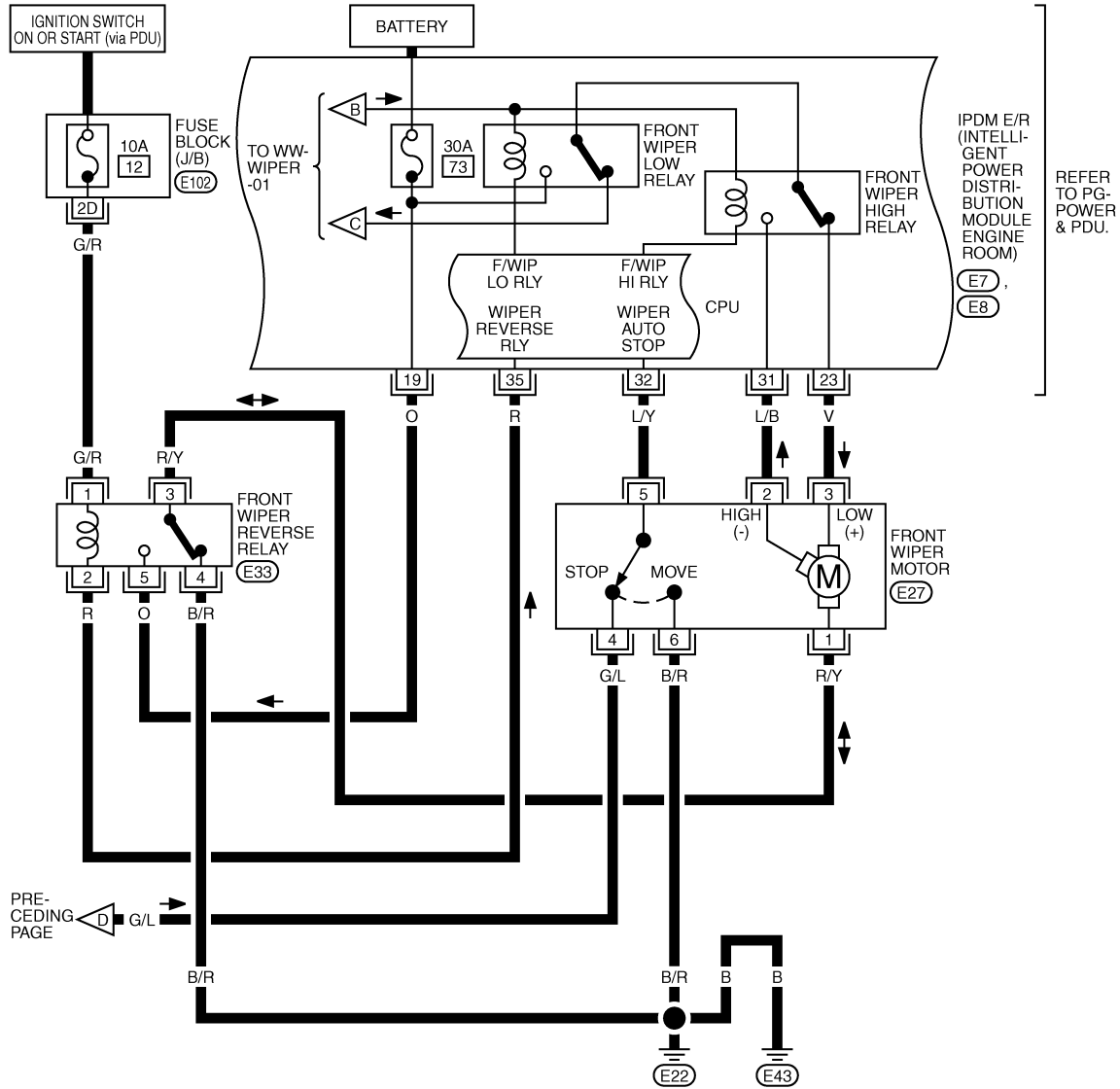
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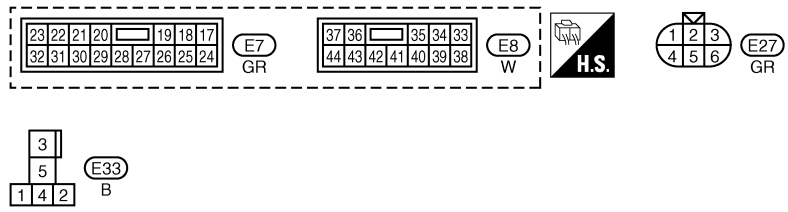
FRONT WIPER AND WASHER SYSTEM

< SERVICE INFORMATION >

WW-WIPER-03



IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM) (E7, E8)
REFER TO PG-POWER & PDU.



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

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FRONT WIPER AND WASHER SYSTEM

< SERVICE INFORMATION >

WW-WIPER-04

▬ : DATA LINE

◊NV : WITH NAVIGATION SYSTEM

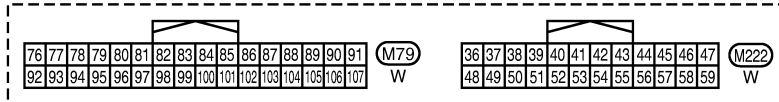
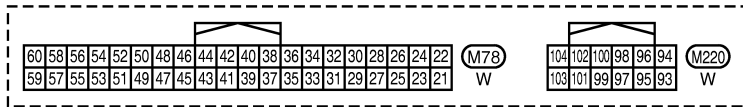
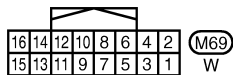
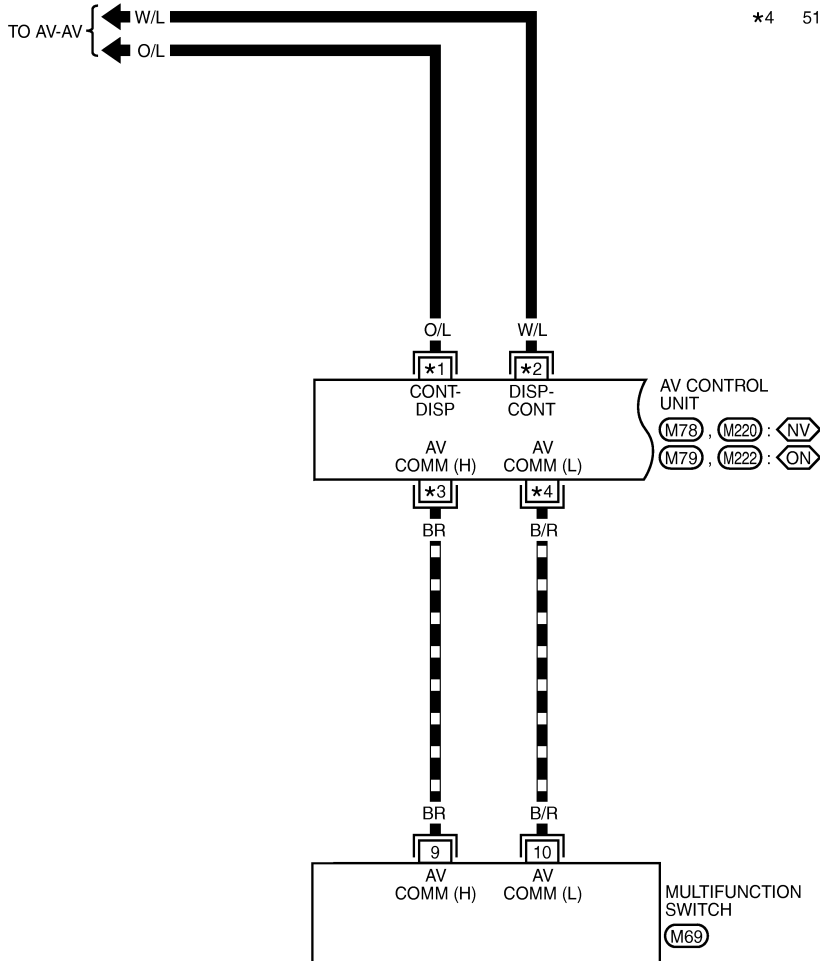
◊ON : WITHOUT NAVIGATION SYSTEM

*1 102 : ◊NV , 56 : ◊ON

*2 103 : ◊NV , 44 : ◊ON

*3 50 : ◊NV , 88 : ◊ON

*4 51 : ◊NV , 89 : ◊ON



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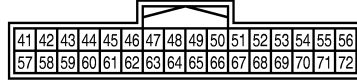
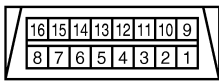
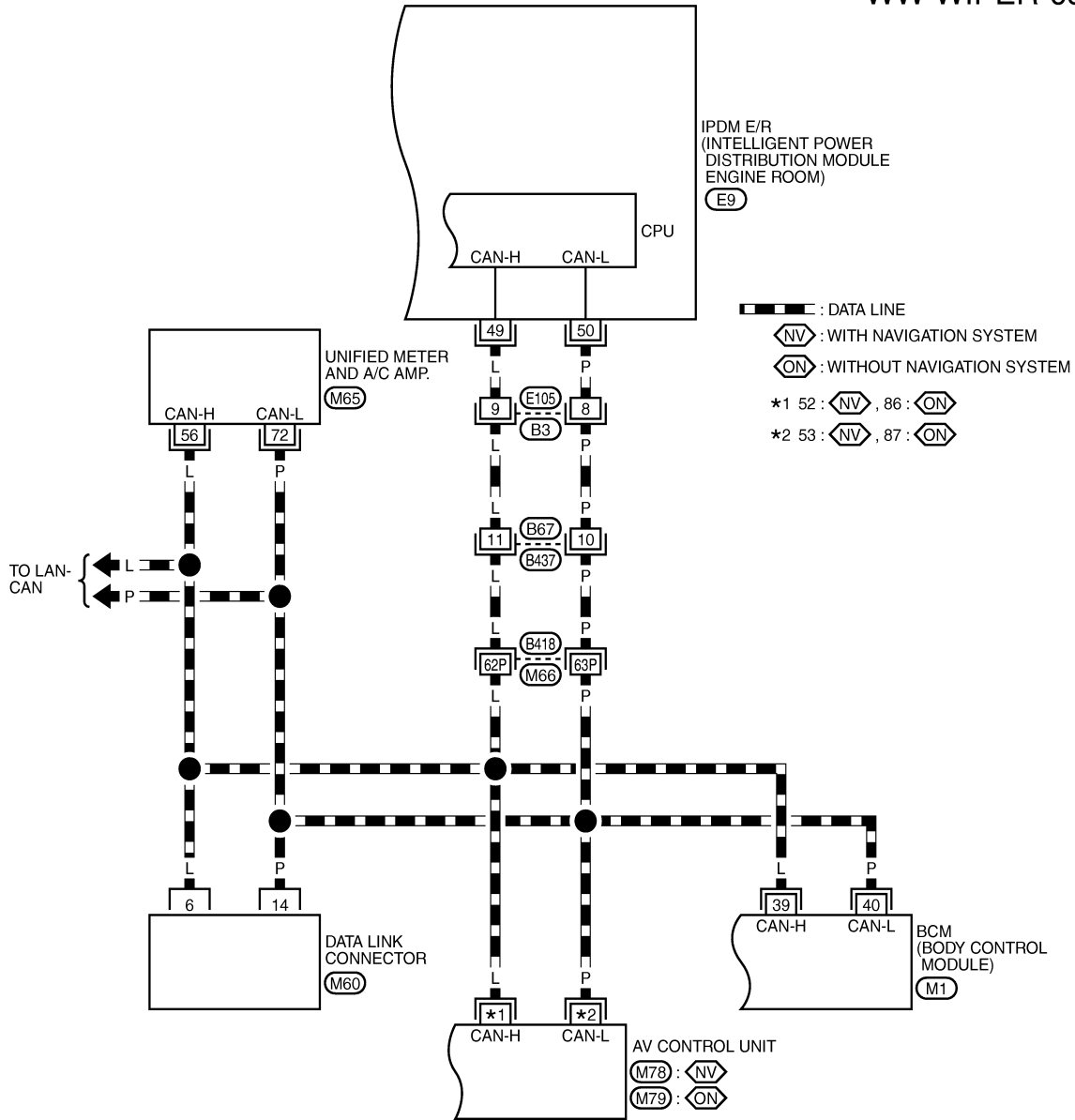
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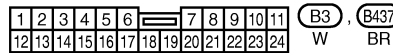
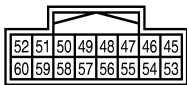
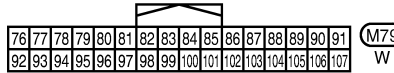
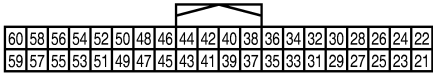
FRONT WIPER AND WASHER SYSTEM

< SERVICE INFORMATION >

WW-WIPER-05



REFER TO THE FOLLOWING.
 (B418) - SUPER MULTIPLE JUNCTION (SMJ)
 (M1) - ELECTRICAL UNITS



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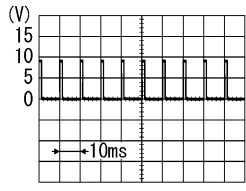
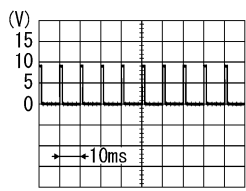
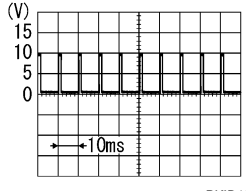
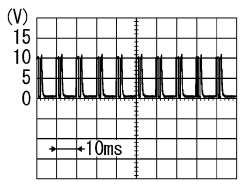
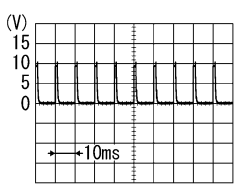
Terminal and Reference Value for BCM

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-III. Refer to [WW-17, "CONSULT-III Functions \(BCM\)"](#).

FRONT WIPER AND WASHER SYSTEM

< SERVICE INFORMATION >

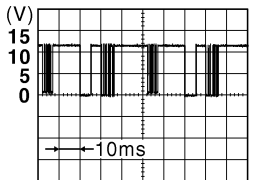
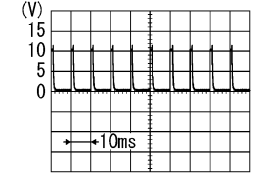
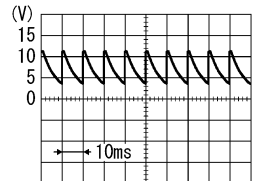
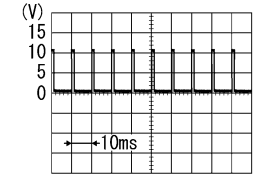
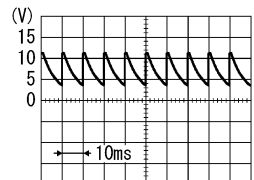
| Terminal No. | Wire color | Signal name | Measuring condition | | Reference value |
|--------------|------------|----------------------------|---------------------|--|--|
| | | | Ignition switch | Operation or condition | |
| 4 | R/G | Combination switch input 3 | ON | Lighting, turn, wiper OFF (Wiper dial position 4) |  <p style="text-align: right; font-size: small;">PKIB4957J</p> <p style="text-align: center;">Approx. 1.0 V</p> |
| | | | | OFF | Approx. 0 V |
| 5 | Y | Combination switch input 2 | ON | Lighting, turn, wiper OFF |  <p style="text-align: right; font-size: small;">PKIB4957J</p> <p style="text-align: center;">Approx. 1.0 V</p> |
| | | | | OFF (Wiper dial position 4) | Approx. 0 V |
| 6 | LG/B | Combination switch input 1 | ON | Lighting, turn, wiper OFF |  <p style="text-align: right; font-size: small;">PKIB4959J</p> <p style="text-align: center;">Approx. 1.0 V</p> |
| | | | | Lighting, turn, wiper OFF |  <p style="text-align: right; font-size: small;">PKIB4952J</p> <p style="text-align: center;">Approx. 1.7 V</p> |
| | | | | Lighting, turn, wiper OFF |  <p style="text-align: right; font-size: small;">PKIB4955J</p> <p style="text-align: center;">Approx. 0.8 V</p> |
| | | | | OFF (Wiper dial position 4) | Approx. 0 V |

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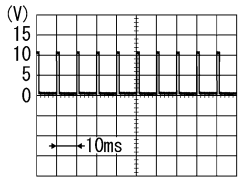
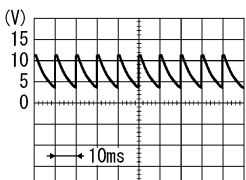
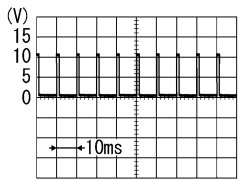
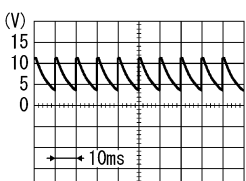
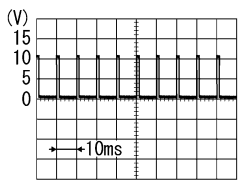
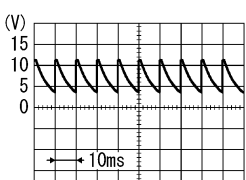
FRONT WIPER AND WASHER SYSTEM

< SERVICE INFORMATION >

| Terminal No. | Wire color | Signal name | Measuring condition | | Reference value |
|--------------|------------|-----------------------------|---------------------|---|--|
| | | | Ignition switch | Operation or condition | |
| 24 | R | Rain sensor serial link | ON | — |  <p style="text-align: right; font-size: small;">JPMA0156GB</p> <p style="text-align: center;">Approx. 8.7 V</p> |
| 32 | LG | Combination switch output 5 | ON | Lighting, turn, wiper OFF |  <p style="text-align: right; font-size: small;">PKIB4956J</p> <p style="text-align: center;">Approx. 1.0 V</p> |
| | | | | Any of several conditions below <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; font-size: small;">PKIB4960J</p> <p style="text-align: center;">Approx. 7.0 - 7.5 V</p> |
| 33 | GR | Combination switch output 4 | ON | Lighting, turn, wiper OFF |  <p style="text-align: right; font-size: small;">PKIB4958J</p> <p style="text-align: center;">Approx. 1.2 V</p> |
| | | | | Any of several conditions below <ul style="list-style-type: none"> • Wiper dial position 1 • Wiper dial position 5 • Wiper dial position 6 |  <p style="text-align: right; font-size: small;">PKIB4960J</p> <p style="text-align: center;">Approx. 7.0 - 7.5 V</p> |

FRONT WIPER AND WASHER SYSTEM

< SERVICE INFORMATION >

| Terminal No. | Wire color | Signal name | Measuring condition | | Reference value |
|--------------|------------|-----------------------------|---------------------|--|---|
| | | | Ignition switch | Operation or condition | |
| 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> |
| 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;">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> |
| 38 | W | Ignition switch (ON) | ON | — | Battery voltage |

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FRONT WIPER AND WASHER SYSTEM

< SERVICE INFORMATION >

| Terminal No. | Wire color | Signal name | Measuring condition | | Reference value |
|--------------|------------|----------------------|---------------------|------------------------|-----------------|
| | | | Ignition switch | Operation or condition | |
| 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 |

Terminal and Reference Value for IPDM E/R

INFOID:000000004158729

| 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 Diagnosis

INFOID:000000004158730

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-16, "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

Preliminary Check

INFOID:000000004158731

CHECK POWER SUPPLY AND GROUND CIRCUIT

1. CHECK FUSES AND FUSIBLE LINK

Check for blown fuses and fusible link.

FRONT WIPER AND WASHER SYSTEM

< SERVICE INFORMATION >

| 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-8. "Wiring Diagram - WIPER -"](#).

OK or NG

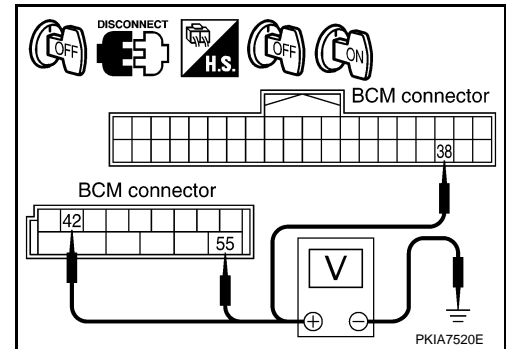
OK >> GO TO 2.

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-4](#).

2. CHECK POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM connectors.
3. 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 |
| M2 | 42 | | Battery voltage | Battery voltage |
| | 55 | | Battery voltage | Battery voltage |



OK or NG

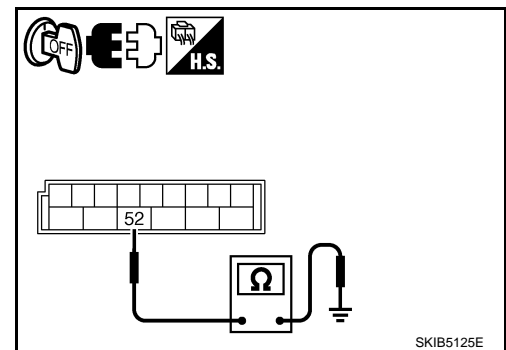
OK >> GO TO 3.

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.

CONSULT-III Functions (BCM)

INFOID:000000004158732

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

| Diagnosis mode | Description |
|-----------------------|--|
| DATA MONITOR | Displays BCM input data in real time. |
| ACTIVE TEST | Device operation can be checked by applying a drive signal to device. |
| 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. |

FRONT WIPER AND WASHER SYSTEM

< SERVICE INFORMATION >

DATA MONITOR

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

Display Item List

| Test item | Indication on CONSULT-III 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.

CONSULT-III Functions (IPDM E/R)

INFOID:000000004158733

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

| Diagnosis Mode | Description |
|-----------------------|--|
| SELF-DIAG RESULTS | Refer to PG-20, "CONSULT-III Function (IPDM E/R)" . |
| 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. |

DATA MONITOR

All Signals, Main Signals, Selection From Menu

| Item name | CONSULT-III 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:

FRONT WIPER AND WASHER SYSTEM

< SERVICE INFORMATION >

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

| Test item | CONSULT-III 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 Does Not Operate

INFOID:000000004158734

CAUTION:

During IPDM E/R fail-safe control, front wipers may not operate. Refer to [PG-19, "System Description"](#) in "PG IPDM E/R" to make sure that it is not in fail-safe status.

1. ACTIVE TEST

With CONSULT-III

1. Select "FRONT WIPER" of IPDM E/R active test item.
2. With operating the test item, check that front wiper LO and HI operation.

Without CONSULT-III

Start up auto active test. Refer to [PG-22, "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-III

1. Select "FR WIPER INT", "FR WIPER LOW", and "FR WIPER HI" of BCM data monitor item.
2. With operating the wiper switch, check the monitor status.

Without CONSULT-III

Refer to [LT-175, "Combination Switch Inspection"](#).

OK or NG

- OK >> GO TO 3.
NG >> Check combination switch (wiper switch). Refer to [LT-175, "Combination Switch Inspection"](#).

3. CHECK CIRCUIT BETWEEN IPDM E/R AND BCM

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

Displayed self-diagnosis results

- NO DTC >> Replace BCM. Refer to [BCS-14, "Removal and Installation of BCM"](#).
CAN COMM CIRCUIT >> Check CAN communication line of BCM. Refer to [LAN-29, "CAN System Specification Chart"](#).

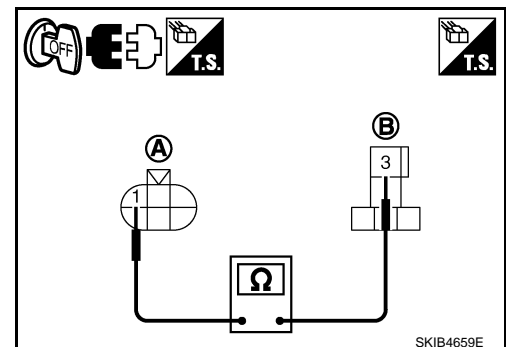
4. CHECK CIRCUIT BETWEEN FRONT WIPER MOTOR AND FRONT WIPER REVERSE RELAY

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.



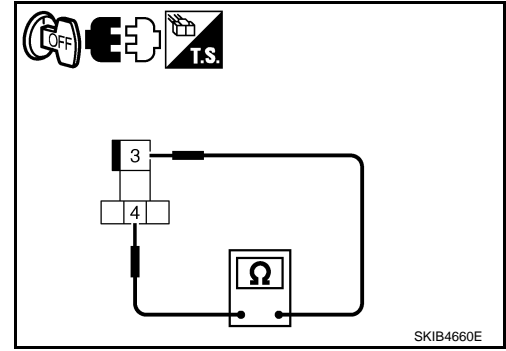
FRONT WIPER AND WASHER SYSTEM

< SERVICE INFORMATION >

5. CHECK FRONT WIPER REVERSE RELAY

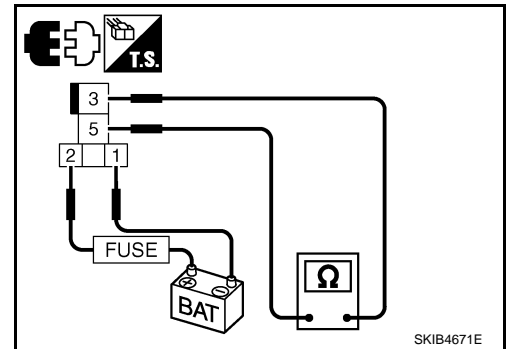
1. Check continuity between front wiper reverse relay terminals.

| 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 |



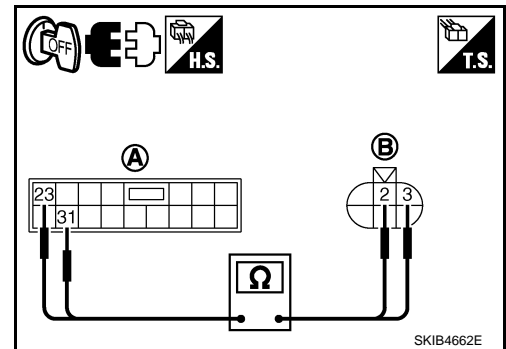
OK or NG

- OK >> GO TO 6.
- NG >> Replace front wiper reverse relay.

6. CHECK FRONT WIPER CIRCUIT

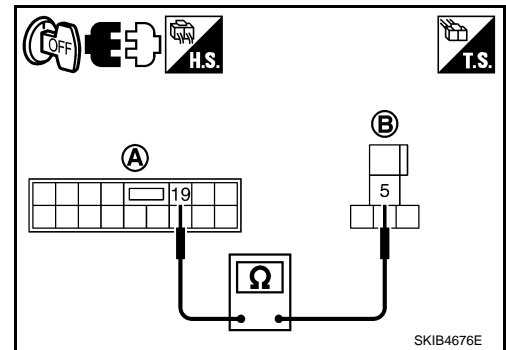
1. Disconnect IPDM E/R connector.
2. Check continuity between IPDM E/R harness connector (A) and front wiper motor harness connector (B).

| 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 |



FRONT WIPER AND WASHER SYSTEM

< SERVICE INFORMATION >

- 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.

7. CHECK IPDM E/R

Ⓜ With CONSULT-III

- Connect IPDM E/R connector and front wiper motor connector.
- Install front wiper reverse relay.
- Select "FRONT WIPER" of IPDM E/R active test item.
- With operating the test item, check voltage between IPDM E/R harness connector and ground.

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

ⓧ Without CONSULT-III

- Connect IPDM E/R connector and front wiper motor connector.
- Install front wiper reverse relay.
- Start up auto active test. Refer to [PG-22, "Auto Active Test"](#).
- With operating the test item, check voltage between IPDM E/R harness connector and ground.

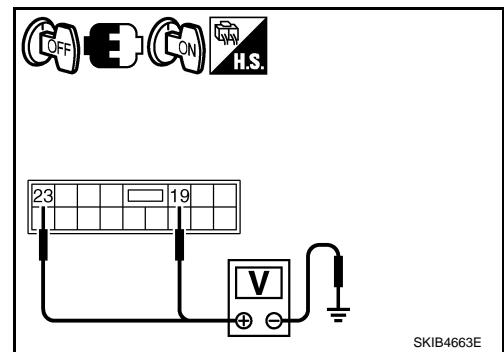
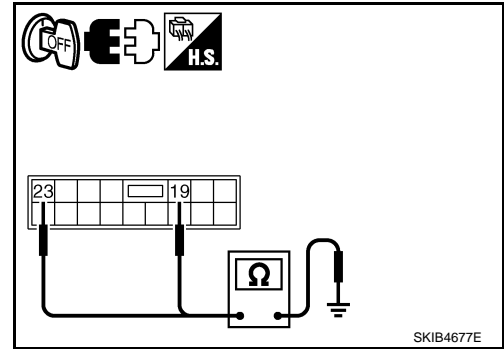
| Terminal | | Condition | Voltage (Approx.) |
|--------------------|----------|--------------|-------------------|
| (+) | (-) | | |
| IPDM E/R connector | Terminal | | |
| E7 | 19 | Stopped | Battery voltage |
| | | HI operation | |
| | 23 | Stopped | 0 V |
| | | LO operation | Battery voltage |

OK or NG

- OK >> Replace front wiper motor. Refer to [WW-32, "Disassembly and Assembly of Front Wiper Drive Assembly"](#).
- NG >> Replace IPDM E/R. Refer to [PG-27, "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 Operation Five Times, They Become Inoperative)

CAUTION:



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< SERVICE INFORMATION >

- 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

④ With CONSULT-III

1. Select “WIP AUTO STOP” of IPDM E/R data monitor item.
2. Check that “WIP AUTO STOP” turns “ACT P” - “STOP P” linked with wiper operation.

⊗ Without CONSULT-III

GO TO 2.

OK or NG

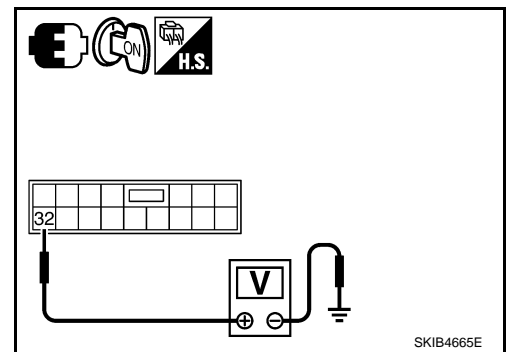
OK >> Replace IPDM E/R. Refer to [PG-27, "Removal and Installation of IPDM E/R"](#).

NG >> GO TO 2.

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



OK or NG

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

NG >> GO TO 3.

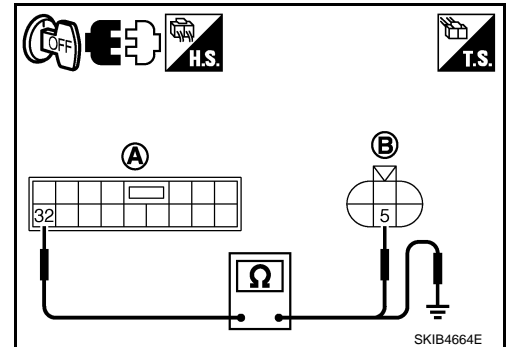
3. CHECK FRONT WIPER AUTO STOP CIRCUIT

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 | 32 | E27 | 5 | Yes |

4. 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-32, "Disassembly and Assembly of Front Wiper Drive Assembly"](#).

NG >> Repair harness or connector.

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

FRONT WIPER AND WASHER SYSTEM

< SERVICE INFORMATION >

After Repeating the Operation Five Times, They Become Inoperative)

INFOID:000000004158736

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-III

1. Select “WIP AUTO STOP” of IPDM E/R data monitor item.
2. Check that “WIP AUTO STOP” turns “ACT P” - “STOP P” linked with wiper LO operation.

☒ Without CONSULT-III

GO TO 2.

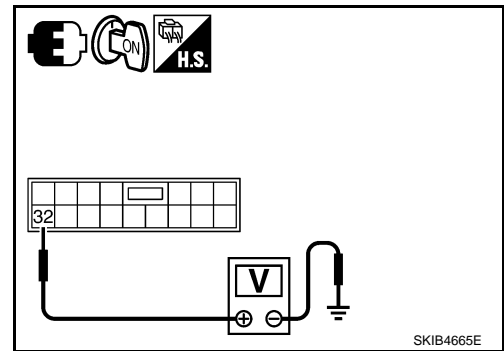
OK or NG

- OK >> Replace IPDM E/R. Refer to [PG-27. "Removal and Installation of IPDM E/R"](#).
- NG >> GO TO 2.

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



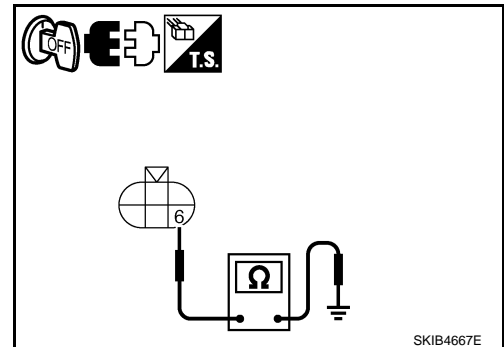
OK or NG

- OK >> Replace IPDM E/R. Refer to [PG-27. "Removal and Installation of IPDM E/R"](#).
- NG >> GO TO 3.

3. CHECK CIRCUIT BETWEEN FRONT WIPER MOTOR AND GROUND

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

| Front wiper motor connector | Terminal | Ground | Continuity |
|-----------------------------|----------|--------|------------|
| E27 | 6 | | |



OK or NG

- OK >> Replace front wiper motor. Refer to [WW-32. "Disassembly and Assembly of Front Wiper Drive Assembly"](#).
- NG >> Repair harness or connector.

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 Operation Five Times, They Become Inoperative)

INFOID:000000004158737

CAUTION:

FRONT WIPER AND WASHER SYSTEM

< SERVICE INFORMATION >

- 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

④ With CONSULT-III

1. Select “WIP AUTO STOP” of IPDM E/R data monitor item.
2. Check that “WIP AUTO STOP” turns “ACT P” - “STOP P” linked with wiper HI operation.

⊗ Without CONSULT-III

GO TO 2.

OK or NG

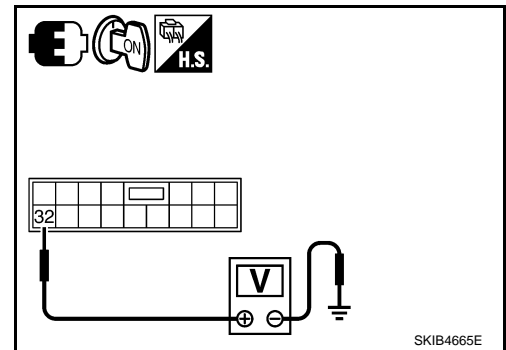
OK >> Replace IPDM E/R. Refer to [PG-27, "Removal and Installation of IPDM E/R"](#).

NG >> GO TO 2.

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 is operating.

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



OK or NG

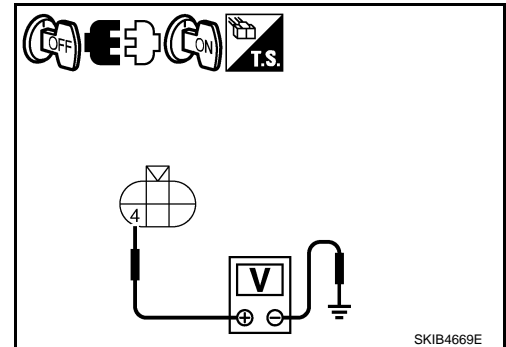
OK >> Replace IPDM E/R. Refer to [PG-27, "Removal and Installation of IPDM E/R"](#).

NG >> GO TO 3.

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 | | Condition | Voltage (Approx.) |
|-----------------------------|----------|-----------------|-------------------|
| (+) | (-) | | |
| Front wiper motor connector | Terminal | | |
| E27 | 4 | Wiper stopped | Battery voltage |
| | | Wiper operating | 0 V |



OK or NG

OK >> Replace front wiper motor. Refer to [WW-32, "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.

FRONT WIPER AND WASHER SYSTEM

< SERVICE INFORMATION >

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

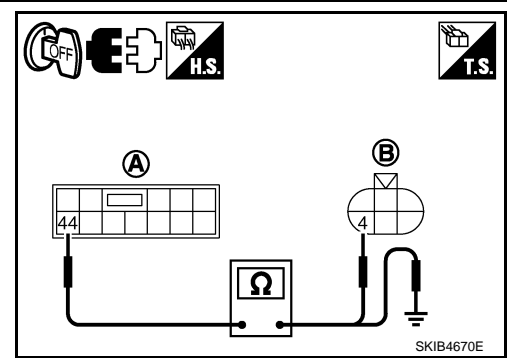
| A | | B | | Continuity |
|-----------|----------|-----------|----------|------------|
| Connector | Terminal | Connector | Terminal | |
| E8 | 44 | E27 | 4 | Yes |

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-27, "Removal and Installation of IPDM E/R"](#).
 NG >> Repair harness or connector.



Only Front Wiper Low Does Not Operate

INFOID:000000004158738

1. ACTIVE TEST

With CONSULT-III

- Select "FRONT WIPER" of IPDM E/R active test item.
- With operating the test item, check that front wiper LO operation.

Without CONSULT-III

Start up auto active test. Refer to [PG-22, "Auto Active Test"](#).

Does front wiper operate normally?

- YES >> Refer to [LT-175, "Combination Switch Inspection"](#).
 NO >> GO TO 2.

2. CHECK IPDM E/R

With CONSULT-III

- Select "FRONT WIPER" of IPDM E/R active test item.
- With operating the test item, check voltage between IPDM E/R harness connector and ground.

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

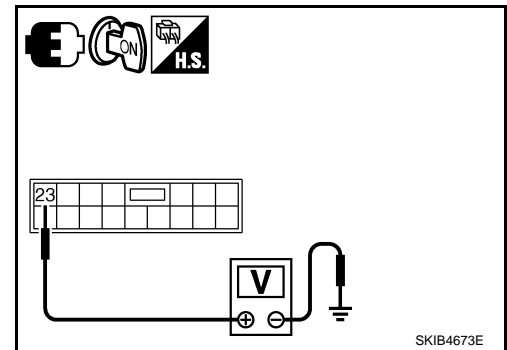
Without CONSULT-III

- Start up auto active test. Refer to [PG-22, "Auto Active Test"](#).
- Check voltage between IPDM E/R harness connector and ground.

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



FRONT WIPER AND WASHER SYSTEM

< SERVICE INFORMATION >

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-32. "Disassembly and Assembly of Front Wiper Drive Assembly"](#).
- NG >> Repair harness or connector.

Only Front Wiper HI Does Not Operate

1. ACTIVE TEST

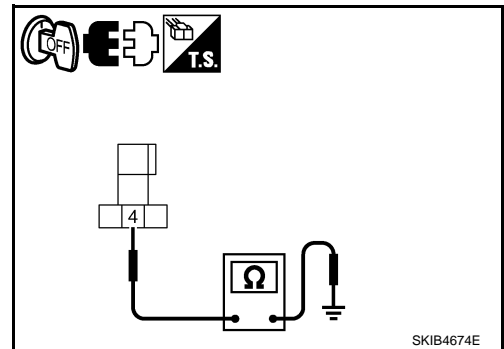
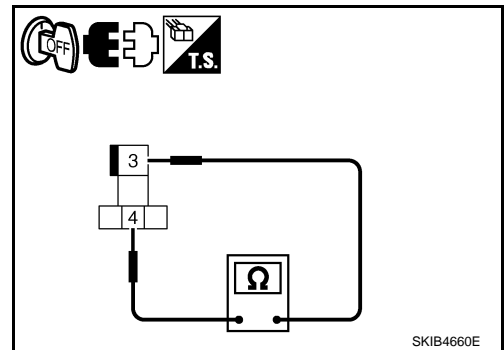
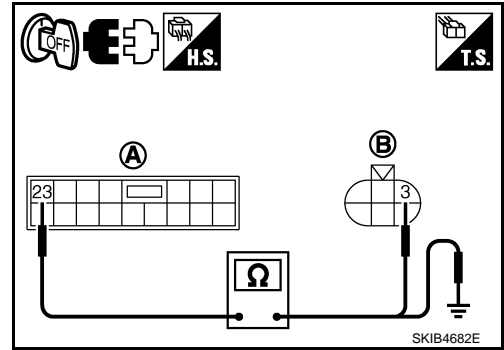
 With CONSULT-III

1. Select "FRONT WIPER" of IPDM E/R active test item.
2. With operating the test item, check that front wiper HI operation.

 Without CONSULT-III

Start up auto active test. Refer to [PG-22. "Auto Active Test"](#).

Does front wiper operate normally?



INFOID:000000004158739

FRONT WIPER AND WASHER SYSTEM

< SERVICE INFORMATION >

- YES >> Refer to [LT-175. "Combination Switch Inspection"](#).
 NO >> GO TO 2.

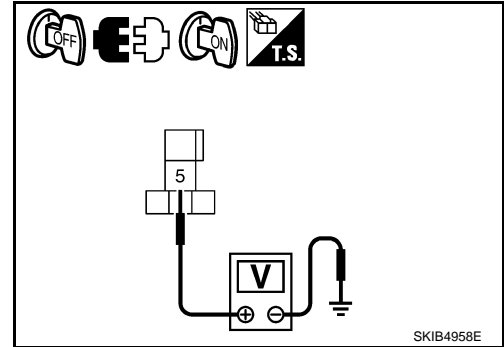
2.CHECK IPDM E/R OUTPUT SIGNAL

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

| 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

- Disconnect IPDM E/R connector.
- 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 |

- 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-27. "Removal and Installation of IPDM E/R"](#).
 NG >> Repair harness or connector.

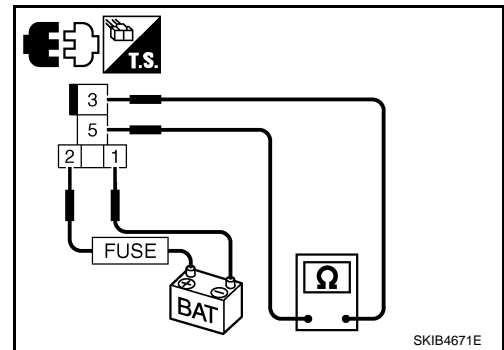
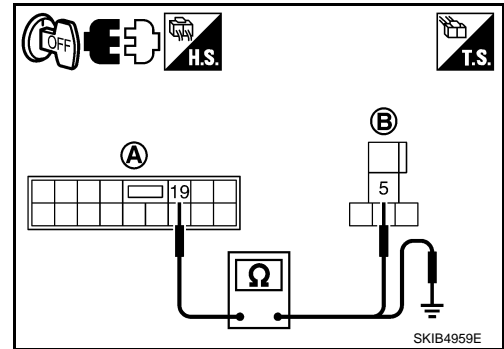
4.CHECK FRONT WIPER REVERSE RELAY

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

- Turn ignition switch OFF.
- Disconnect IPDM E/R connector and front wiper motor connector.

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

WW

FRONT WIPER AND WASHER SYSTEM

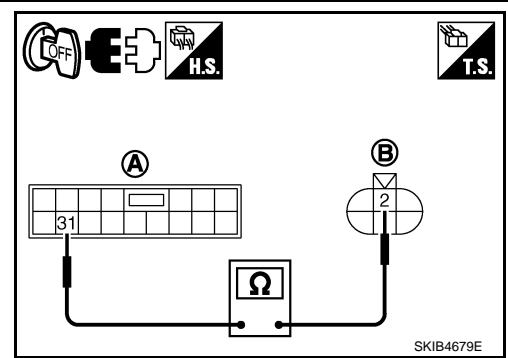
< SERVICE INFORMATION >

- 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.

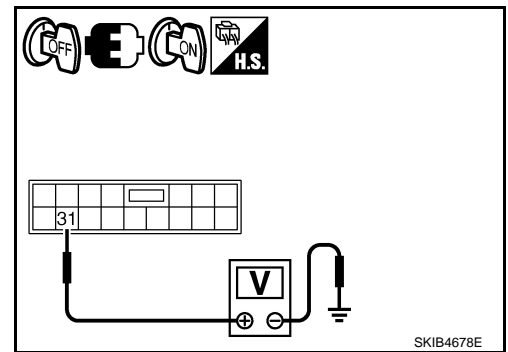


6. CHECK IPDM E/R

Ⓜ With CONSULT-III

- Connect IPDM E/R connector and front wiper motor connector.
- Install front wiper reverse relay.
- Select "FRONT WIPER" of IPDM E/R active test item.
- Check voltage between IPDM E/R harness connector and ground while front wiper HI is operating.

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



ⓧ Without CONSULT-III

- Connect IPDM E/R connector and front wiper motor connector.
- Install front wiper reverse relay.
- Start up auto active test. Refer to [PG-22, "Auto Active Test"](#).
- Check voltage between IPDM E/R harness connector and ground while front wiper HI is operating.

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

OK or NG

- OK >> Replace front wiper motor. Refer to [WW-32, "Disassembly and Assembly of Front Wiper Drive Assembly"](#).
- NG >> Replace IPDM E/R. Refer to [PG-27, "Removal and Installation of IPDM E/R"](#).

Only Front Wiper Auto Does Not Operate

INFOID:000000004158740

NOTE:

When the front wiper switch is turned to INT position, front wiper operates once regardless of a rainy condition.

1. CHECK CONDITIONS OF WINDSHIELD (RAIN SENSOR DETECTION AREA)

Check rain sensor detection area of windshield for dirt such as greases.

OK or NG

- OK >> GO TO 2.
- NG >> Clean rain sensor detection area of windshield fully.

2. CHECK RAIN SENSOR POWER SUPPLY

- Turn ignition switch OFF.
- Disconnect rain sensor connector.
- Turn ignition switch ON.
- Check voltage between rain sensor harness connector and ground.

FRONT WIPER AND WASHER SYSTEM

< SERVICE INFORMATION >

| Terminal | | Voltage |
|-----------------------|----------|-----------------|
| (+) | | |
| Rain sensor connector | Terminal | (-) |
| M190 | 1 | Ground |
| | | Battery voltage |

OK or NG

- OK >> GO TO 3.
- NG >> Repair or replace harness.

3. CHECK RAIN SENSOR GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Check continuity between rain sensor harness connector and ground.

| Rain sensor | | Ground | Continuity |
|-------------|----------|--------|------------|
| Connector | Terminal | | |
| M190 | 3 | | Yes |

OK or NG

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

4. CHECK RAIN SENSOR SIGNAL

1. Connect rain sensor connector.
2. Turn ignition switch ON.
3. Check signal between BCM harness connector and ground with oscilloscope.

| Terminal | | Condition | Signal (Reference value) |
|---------------|----------|-----------|-----------------------------|
| (+) | | | |
| BCM connector | Terminal | (-) | |
| M1 | 24 | Ground | Ignition switch ON |
| | | | |

OK or NG

- OK >> Replace rain sensor. Refer to [WW-36. "Removal and Installation of Rain Sensor"](#).
- NG >> GO TO 5.

5. CHECK RAIN SENSOR SIGNAL CIRCUIT

1. Disconnect BCM connector.
2. Check continuity between BCM harness connector and rain sensor harness connector.

| BCM | | Rain sensor | | Continuity |
|-----------|----------|-------------|----------|------------|
| Connector | Terminal | Connector | Terminal | |
| M1 | 24 | M190 | 2 | Yes |

3. Check continuity between BCM harness connector and ground.

FRONT WIPER AND WASHER SYSTEM

< SERVICE INFORMATION >

| BCM | | Ground | Continuity |
|-----------|----------|--------|------------|
| Connector | Terminal | | |
| M1 | 24 | | No |

OK or NG

- OK >> Replace BCM. Refer to [BCS-14, "Removal and Installation of BCM"](#).
- NG >> Repair or replace harness.

Front Wiper Intermittent Operation Switch Position Cannot Be Adjusted

INFOID:000000004158741

1. CHECK CIRCUIT BETWEEN COMBINATION SWITCH AND BCM

Ⓟ With CONSULT-III

1. Select "INT VOLUME" of BCM data monitor item.
2. Check that "INT VOLUME", changes in order from 1 to 7 according to wiper switch operation.

ⓧ Without CONSULT-III

Refer to [LT-175, "Combination Switch Inspection"](#).

OK or NG

- OK >> Replace BCM. Refer to [BCS-14, "Removal and Installation of BCM"](#).
- NG >> Check combination switch (wiper switch). Refer to [LT-175, "Combination Switch Inspection"](#).

Wiper Does Not Wipe When Front Washer Operates

INFOID:000000004158742

1. CHECK CIRCUIT BETWEEN COMBINATION SWITCH AND BCM

Ⓟ With CONSULT-III

1. Select "FR WASHER SW" of BCM data monitor item.
2. Check that "FR WASHER SW" turn ON-OFF according to front wiper switch operation.

ⓧ Without CONSULT-III

Refer to [LT-175, "Combination Switch Inspection"](#).

OK or NG

- OK >> Replace BCM. Refer to [BCS-14, "Removal and Installation of BCM"](#).
- NG >> Check combination switch (wiper switch). Refer to [LT-175, "Combination Switch Inspection"](#).

Front Wiper Does Not Stop

INFOID:000000004158743

1. CHECK CIRCUIT BETWEEN COMBINATION SWITCH AND BCM

Ⓟ With CONSULT-III

1. Select "FR WIPER INT", "FR WIPER LOW", "FR WIPER HI", and "FR WASHER SW" of BCM data monitor item.
2. With operating the wiper switch, check the monitor status.

ⓧ Without CONSULT-III

Refer to [LT-175, "Combination Switch Inspection"](#).

OK or NG

- OK >> Replace IPDM E/R. Refer to [PG-27, "Removal and Installation of IPDM E/R"](#).
- NG >> Check combination switch (wiper switch). Refer to [LT-175, "Combination Switch Inspection"](#).

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

INFOID:000000004158744

REMOVAL

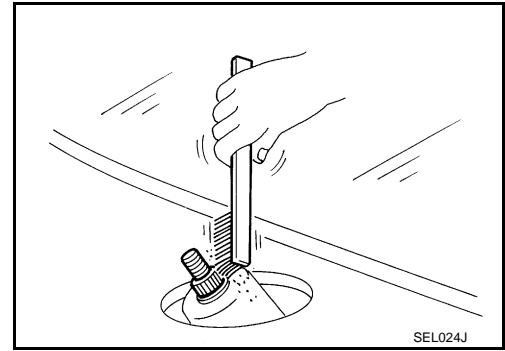
1. Turn wiper switch ON to operate wiper motor, and then turn wiper switch OFF (auto stop).
2. Open hood, remove arm caps, and remove wiper arm nuts.
3. Raise wiper arms, and remove wiper arms from the vehicle.

INSTALLATION

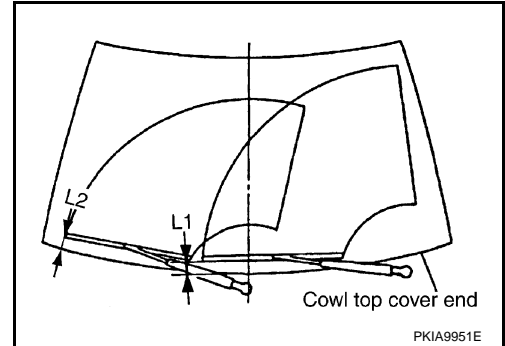
FRONT WIPER AND WASHER SYSTEM

< SERVICE INFORMATION >

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 ± 0.295 in)

Clearance "L2" : 33.2 ± 7.5 mm (1.307 ± 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 "INSTALLATION".

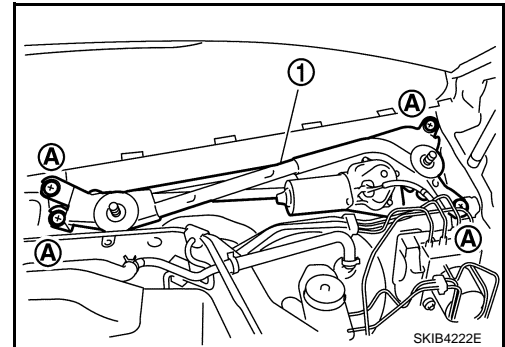
Removal and Installation of Front Wiper Drive Assembly

INFOID:000000004158745

WW

REMOVAL

1. Operate front wiper motor, and stop at the auto stop position.
2. Remove wiper arms. Refer to [WW-30. "Removal and Installation of Front Wiper Arms. Adjustment of Wiper Arms Stop Location"](#).
3. Remove cowl top cover. Refer to [EI-30](#).
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 AND WASHER SYSTEM

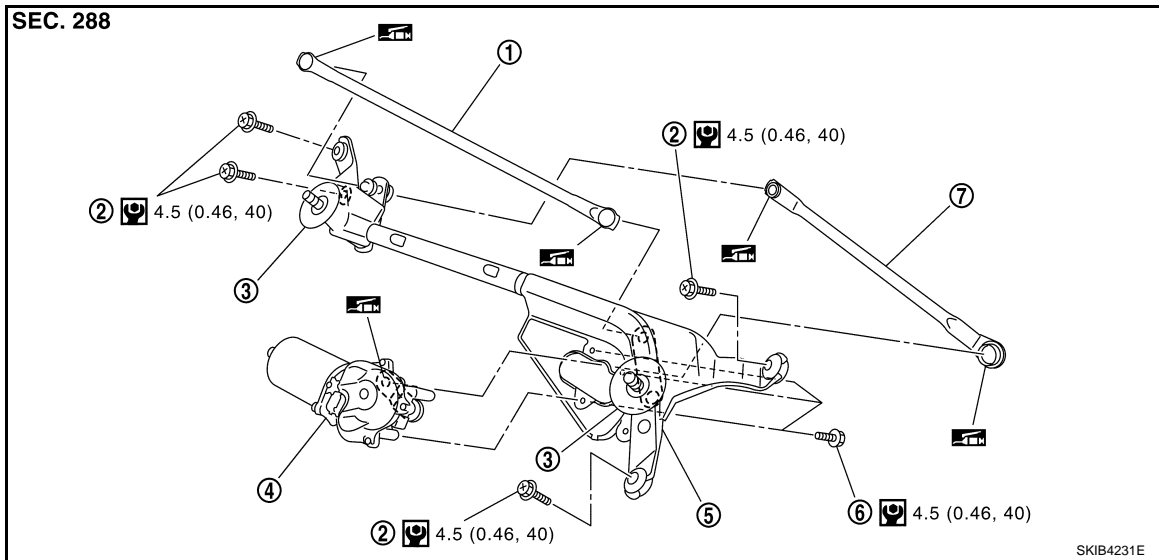
< SERVICE INFORMATION >

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-30](#).
4. Attach wiper arms. Refer to [WW-30. "Removal and Installation of Front Wiper Arms. Adjustment of Wiper Arms Stop Location"](#).
5. Adjustment of wiper arm stop location.
6. Install arm caps.


Disassembly and Assembly of Front Wiper Drive Assembly

INFOID:000000004158746



- | | | |
|--------------------|----------------|---------------|
| 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.

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.

FRONT WIPER AND WASHER SYSTEM

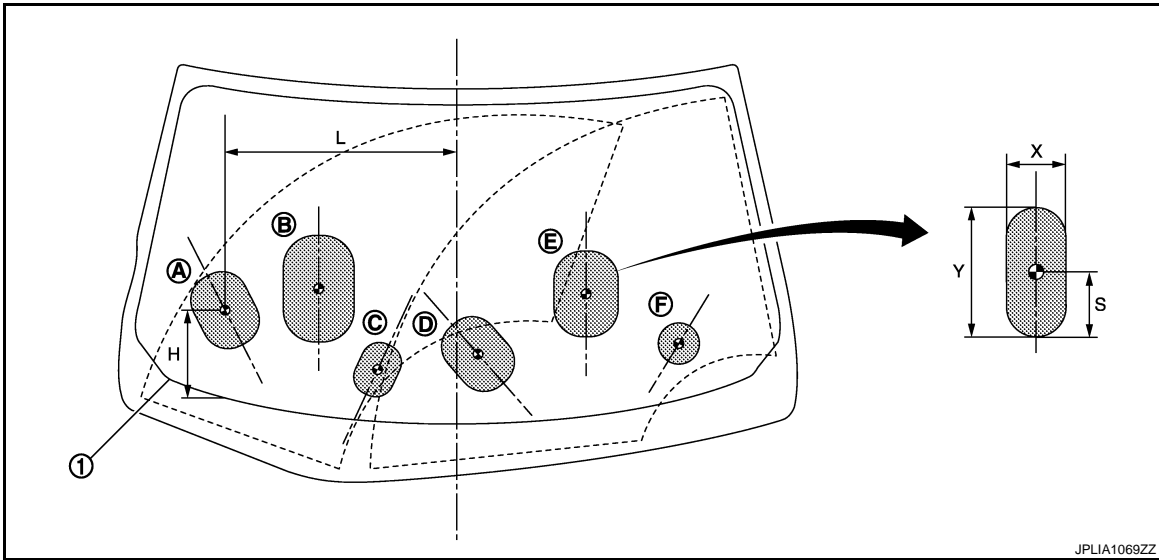
< SERVICE INFORMATION >

- Check grease conditions of the motor arm and wiper linkage joint (at retainer). Apply grease if necessary.

Washer Nozzle Adjustment

INFOID:000000004404286

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



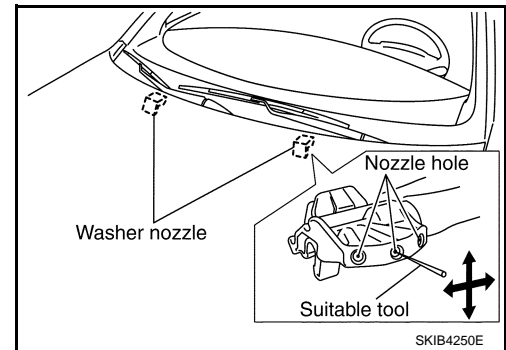
1. Black printed frame line

: Spray area

: Target

| Unit: mm (in) | | | | | |
|----------------|---------------|---------------|--------------|------------|-------------|
| Spray position | H (Height) | L (Width) | X | Y | S |
| A | 193.9 (7.63) | 514.2 (20.24) | 130.8 (5.15) | 180 (7.09) | 90 (3.54) |
| B | 288.7 (11.37) | 307.5 (12.11) | 150 (5.91) | 240 (9.45) | 120 (4.72) |
| C | 119.7 (4.71) | 175.6 (6.91) | 80 (3.15) | 130 (5.12) | 65 (2.56) |
| D | 158.0 (6.22) | 42.7 (1.68) | 130 (5.12) | 165 (6.50) | 83 (3.27) |
| E | 279.0 (10.98) | 280.3 (11.04) | 140 (5.51) | 200 (7.87) | 100 (3.94) |
| F | 127.6 (5.02) | 488.4 (19.23) | 85 (3.35) | 95 (3.74) | 47.5 (1.87) |

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

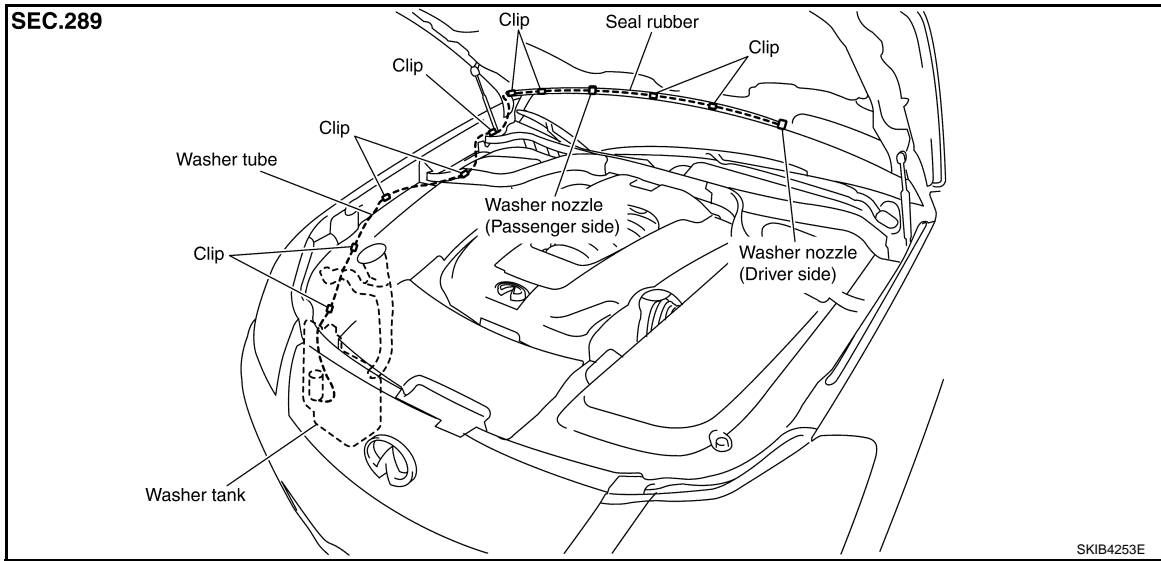


FRONT WIPER AND WASHER SYSTEM

< SERVICE INFORMATION >

Washer Tube Layout

INFOID:000000004158748

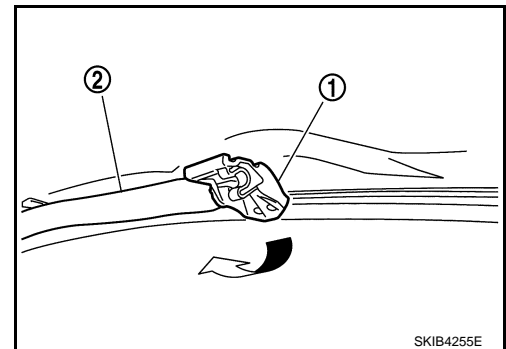


Removal and Installation of Front Washer Nozzle

INFOID:000000004158749

REMOVAL

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-33. "Washer Nozzle Adjustment"](#).

CAUTION:

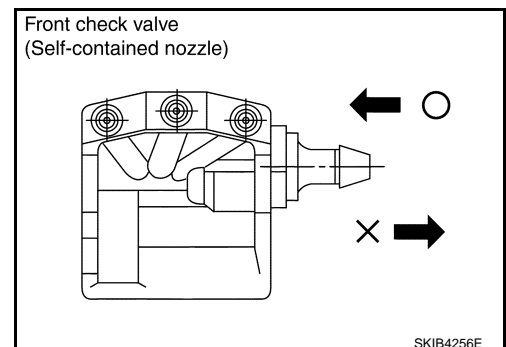
The spray points differ, so be sure to install left and right nozzles correctly.

Inspection for Washer Nozzle

INFOID:000000004158750

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.



FRONT WIPER AND WASHER SYSTEM

< SERVICE INFORMATION >

Inspection of Front Wiper and Washer Switch Circuit

INFOID:000000004158751

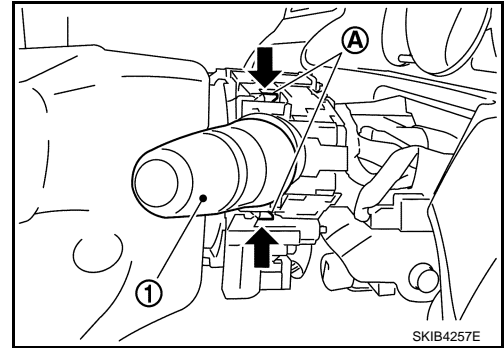
Refer to [LT-175, "Combination Switch Inspection"](#).

Removal and Installation of Front Wiper and Washer Switch

INFOID:000000004158752

REMOVAL

1. Remove steering column cover. Refer to [IP-12](#).
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.



INSTALLATION

Installation is the reverse order of removal.

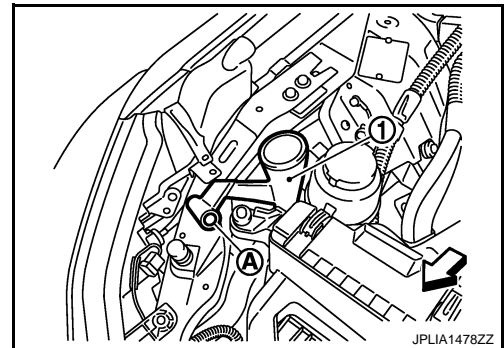
Removal and Installation of Washer Tank

INFOID:000000004158753

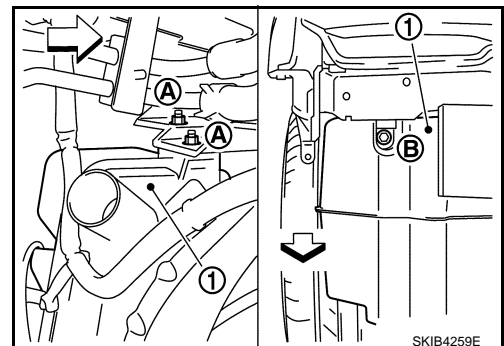
↔: Vehicle front

REMOVAL

1. Remove engine room cover (RH). Refer to [EM-14, "Component"](#) (VQ35HR) or [EM-168, "Component"](#) (VK45DE).
2. Remove clip (A) and pull washer tank inlet (1) out of washer tank.



3. Remove front bumper. Refer to [EI-13, "STANDARD TYPE : Component Parts Location"](#).
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.

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WW

FRONT WIPER AND WASHER SYSTEM

< SERVICE INFORMATION >

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)

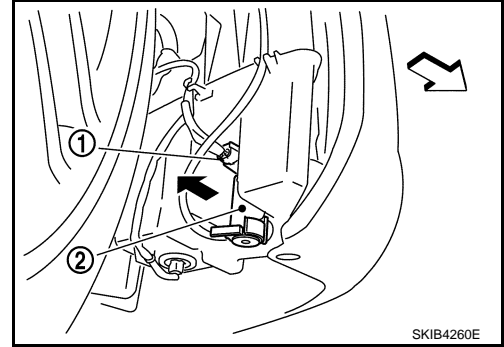
Removal and Installation of Washer Pump

INFOID:000000004158754

←: Vehicle front

REMOVAL

1. Remove fender protector (front) RH. Refer to [EI-32](#).
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 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.

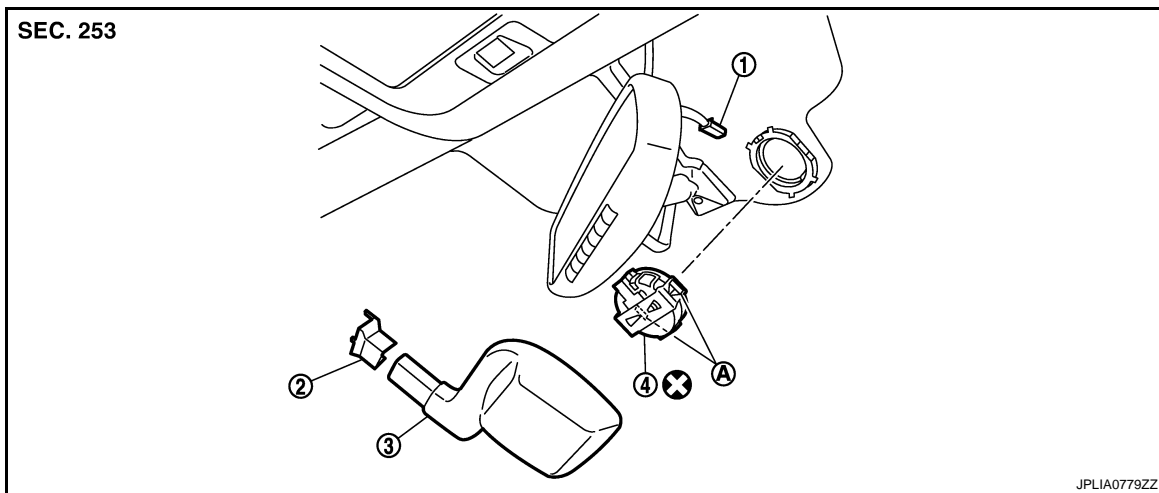
Removal and Installation of Rain Sensor

INFOID:000000004158755

CAUTION:

When the rain sensor is removed from windshield, the rain sensor cannot be re-used.

EXPLODED VIEW



1. Rain sensor connector

2. Rain sensor cover (upper)

3. Rain sensor cover (lower)

4. Rain sensor

A. Metal spring clip

Refer to [GI-9, "Component"](#) for symbols in the figure.

REMOVAL

FRONT WIPER AND WASHER SYSTEM

< SERVICE INFORMATION >

1. Remove the rain sensor cover (upper and lower).
2. Disengage the both sides of metal spring clips, and remove the rain sensor from the windshield.
3. Disconnect rain sensor connector.

INSTALLATION

Install in the reverse order of removal.

CAUTION:

- **Surface of windshield should be cleaned.**
- **Never touch gel/adhesive of new part.**
- **Lock the metal spring clips and install the rain sensor securely.**

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CIGARETTE LIGHTER

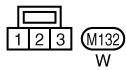
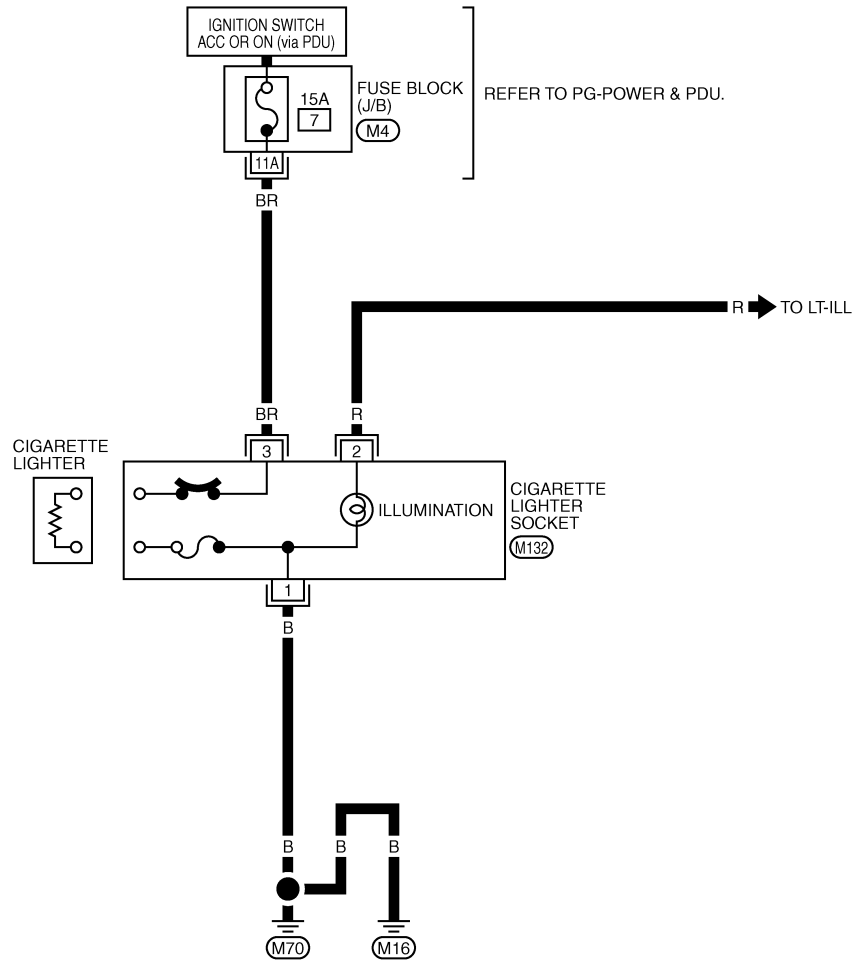
< SERVICE INFORMATION >

CIGARETTE LIGHTER

Wiring Diagram - CIGAR -

INFOID:000000004158756

WW-CIGAR-01



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

TKWT7188E

Removal and Installation

REMOVAL

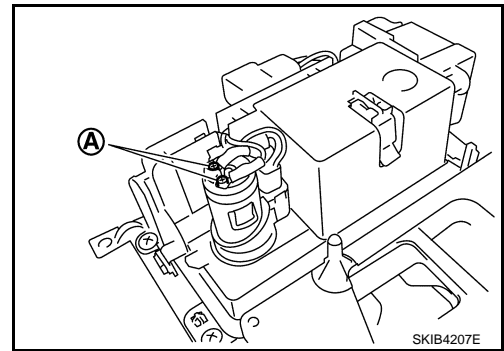
1. Remove A/T console finisher. Refer to [IP-12](#).

INFOID:000000004158757

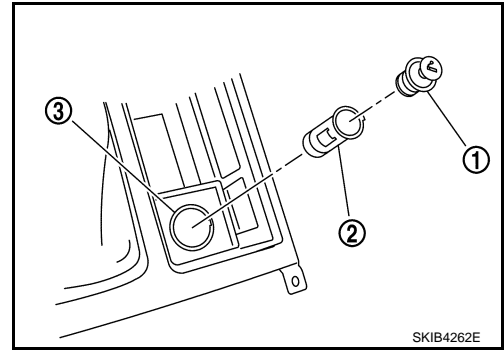
CIGARETTE LIGHTER

< SERVICE INFORMATION >

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.

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POWER SOCKET


< SERVICE INFORMATION >

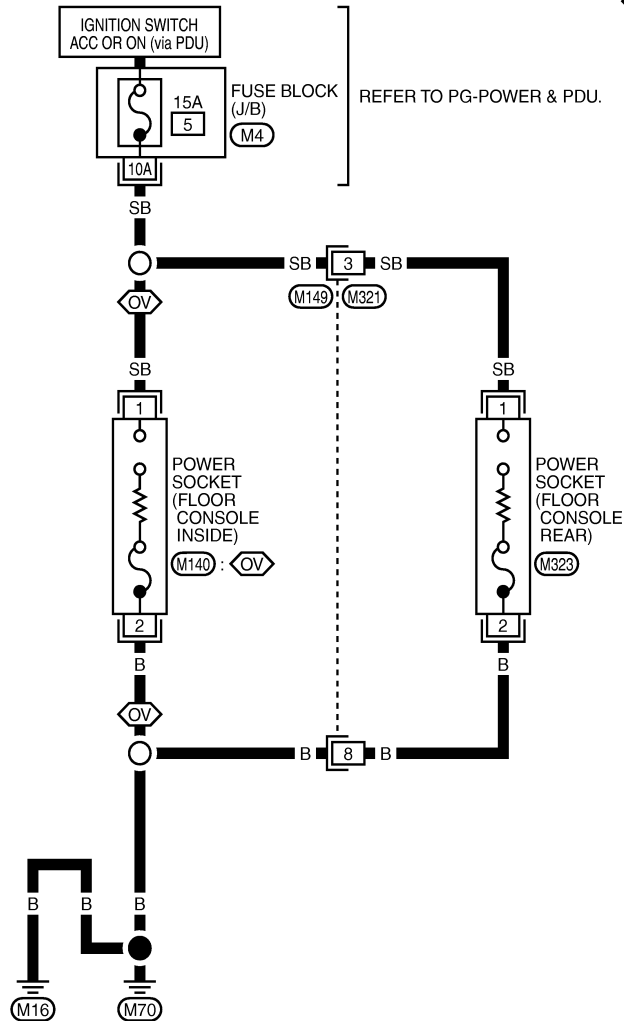
POWER SOCKET

Wiring Diagram - P/SCKT -


INFOID:000000004158758

WW-P/SCKT-01

 : WITHOUT DVD PLAYER



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

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

TKWT6876E

Removal and Installation of Center Console Box Power Socket

INFOID:000000004158759

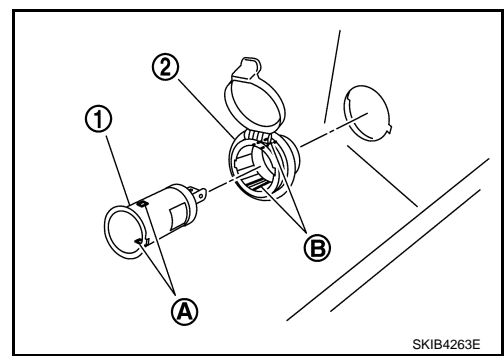
REMOVAL

1. Remove console box. Refer to [IP-12](#).

POWER SOCKET

< SERVICE INFORMATION >

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.

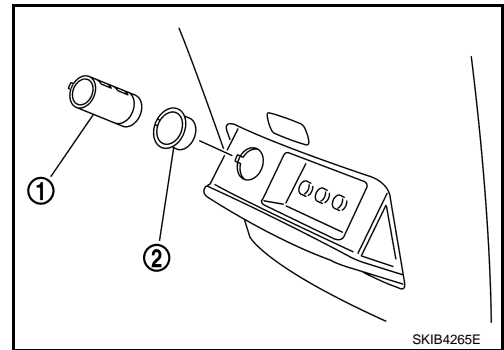
CAUTION:

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

Removal and Installation of Center Console Box Rear Side Power Socket INFOID:000000004158760

REMOVAL

1. Remove the console rear finisher. Refer to [IP-22. "CENTER CONSOLE : Component Parts Location"](#).
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.

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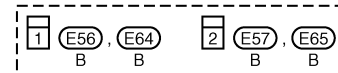
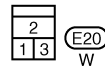
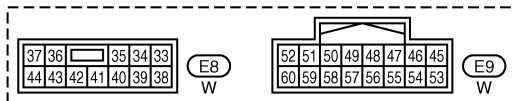
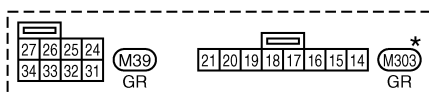
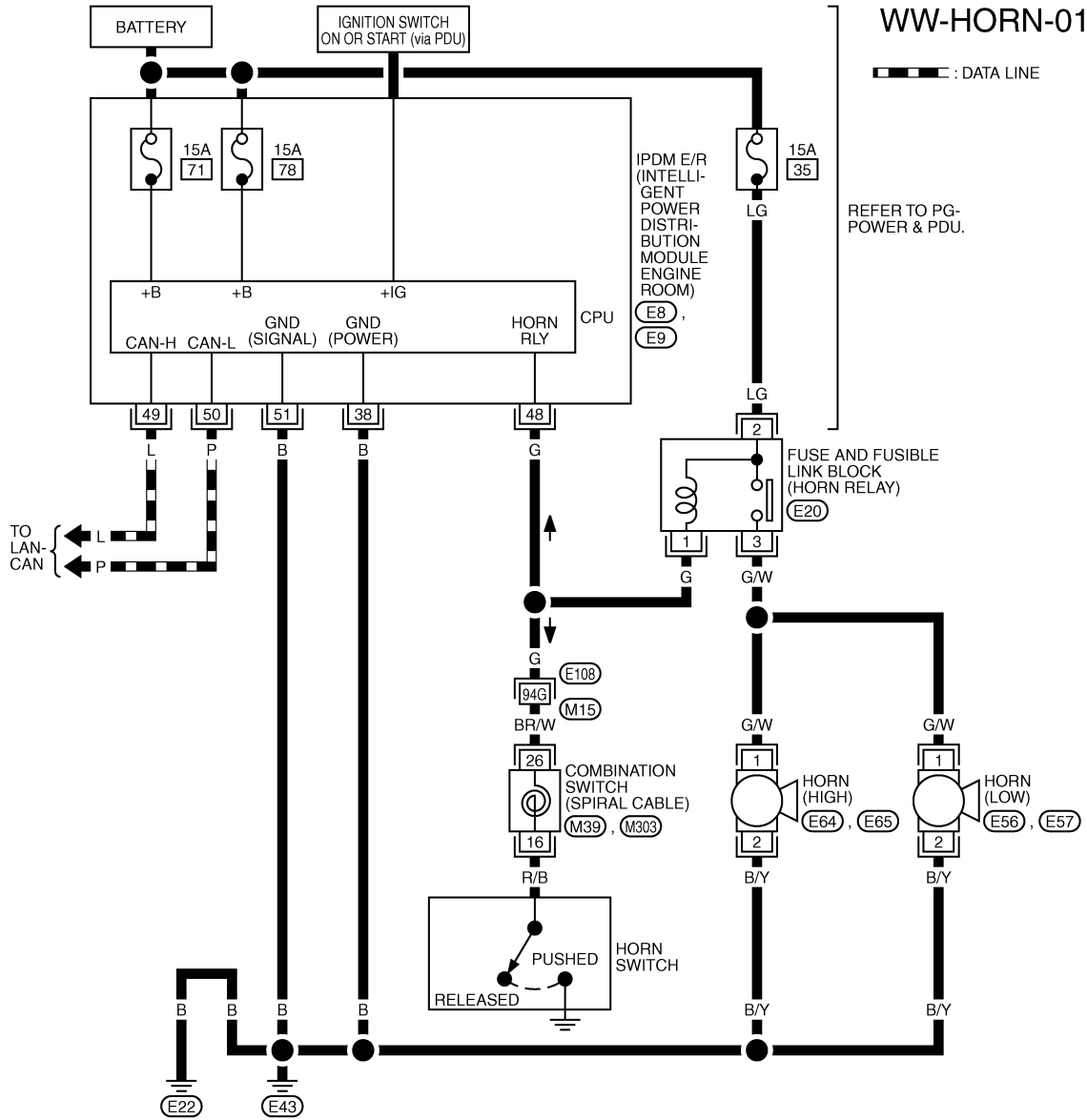
HORN

< SERVICE INFORMATION >

HORN

Wiring Diagram - HORN -

INFOID:000000004158761



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

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

TKWT8249E

Removal and Installation

INFOID:000000004158762

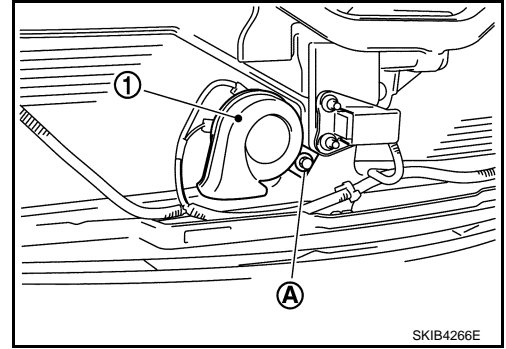
REMOVAL

1. Remove front grille. Refer to [EI-28](#).

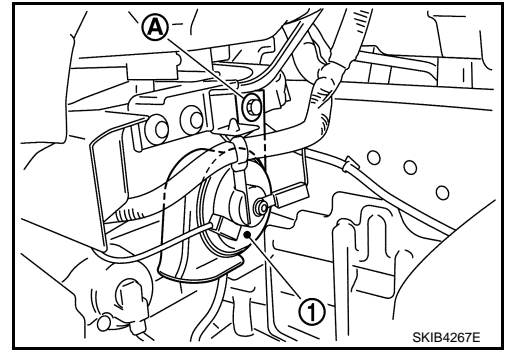
HORN

< SERVICE INFORMATION >

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.)

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