

A
B
C

SECTION **WW**

WIPER & WASHER

CONTENTS

| | | | | |
|--|----|---|----|----|
| BASIC INSPECTION | 3 | Diagnosis Procedure | 22 | F |
| DIAGNOSIS AND REPAIR WORKFLOW | 3 | FRONT WIPER MOTOR GROUND CIRCUIT ... | 24 | |
| Work Flow | 3 | Diagnosis Procedure | 24 | G |
| SYSTEM DESCRIPTION | 6 | WASHER SWITCH | 25 | |
| FRONT WIPER AND WASHER SYSTEM | 6 | Description | 25 | H |
| System Diagram | 6 | Component Inspection | 25 | |
| System Description | 6 | WASHER MOTOR CIRCUIT | 26 | |
| Component Parts Location | 9 | Diagnosis Procedure | 26 | I |
| Component Description | 10 | ECU DIAGNOSIS INFORMATION | 28 | |
| DIAGNOSIS SYSTEM (BCM) | 11 | BCM (BODY CONTROL MODULE) | 28 | J |
| COMMON ITEM | 11 | Reference Value | 28 | |
| COMMON ITEM : CONSULT Function (BCM - | | Terminal Layout | 33 | |
| COMMON ITEM) | 11 | Physical Values | 33 | K |
| WIPER | 11 | Fail Safe | 49 | |
| WIPER : CONSULT Function (BCM - WIPER) | 12 | DTC Inspection Priority Chart | 50 | |
| DIAGNOSIS SYSTEM (IPDM E/R) | 13 | DTC Index | 51 | WW |
| Diagnosis Description | 13 | IPDM E/R (INTELLIGENT POWER DISTRI- | | |
| CONSULT Function (IPDM E/R) | 15 | BUTION MODULE ENGINE ROOM) | 54 | M |
| DTC/CIRCUIT DIAGNOSIS | 17 | Reference Value | 54 | |
| WIPER AND WASHER FUSE | 17 | Fail Safe | 60 | |
| Description | 17 | DTC Index | 62 | N |
| Diagnosis Procedure | 17 | WIRING DIAGRAM | 63 | |
| FRONT WIPER MOTOR LO CIRCUIT | 18 | FRONT WIPER AND WASHER SYSTEM | 63 | O |
| Component Function Check | 18 | Wiring Diagram | 63 | |
| Diagnosis Procedure | 18 | SYMPTOM DIAGNOSIS | 68 | |
| FRONT WIPER MOTOR HI CIRCUIT | 20 | FRONT WIPER AND WASHER SYSTEM | | P |
| Component Function Check | 20 | SYMPTOMS | 68 | |
| Diagnosis Procedure | 20 | Symptom Table | 68 | |
| FRONT WIPER AUTO STOP SIGNAL CIR- | | FRONT WIPER DOES NOT OPERATE | 70 | |
| CUIT | 22 | Description | 70 | |
| Component Function Check | 22 | Diagnosis Procedure | 70 | |

| | | | |
|--|----|--|----|
| NORMAL OPERATING CONDITION | 72 | FRONT WASHER | 80 |
| Description | 72 | WASHER TUBE | 80 |
| PRECAUTION | 73 | WASHER TUBE : Layout | 80 |
| PRECAUTIONS | 73 | FRONT WASHER NOZZLE | 80 |
| Precaution for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TEN- SIONER" | 73 | FRONT WASHER NOZZLE : Removal and Instal- lation | 80 |
| Precaution for Procedure without Cowl Top Cover.. | 73 | FRONT WASHER NOZZLE : Adjustment | 81 |
| REMOVAL AND INSTALLATION | 74 | WASHER TANK | 81 |
| FRONT WIPER | 74 | WASHER TANK : Removal and Installation | 81 |
| Exploded View | 74 | FRONT WASHER PUMP | 82 |
| FRONT WIPER BLADE REFILL | 74 | FRONT WASHER PUMP : Removal and Installa- tion | 82 |
| FRONT WIPER BLADE REFILL : Removal and Installation | 74 | WASHER LEVEL SWITCH | 84 |
| FRONT WIPER BLADE | 77 | Removal and Installation | 84 |
| FRONT WIPER BLADE : Removal and Installa- tion | 77 | FRONT WIPER AND WASHER SWITCH | 85 |
| FRONT WIPER ARMS | 78 | Removal and Installation | 85 |
| FRONT WIPER ARMS : Removal and Installation.. | 78 | SERVICE DATA AND SPECIFICATIONS (SDS) | 86 |
| FRONT WIPER DRIVE ASSEMBLY | 78 | SERVICE DATA AND SPECIFICATIONS (SDS) | 86 |
| FRONT WIPER DRIVE ASSEMBLY : Removal and Installation | 78 | Specifications | 86 |

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

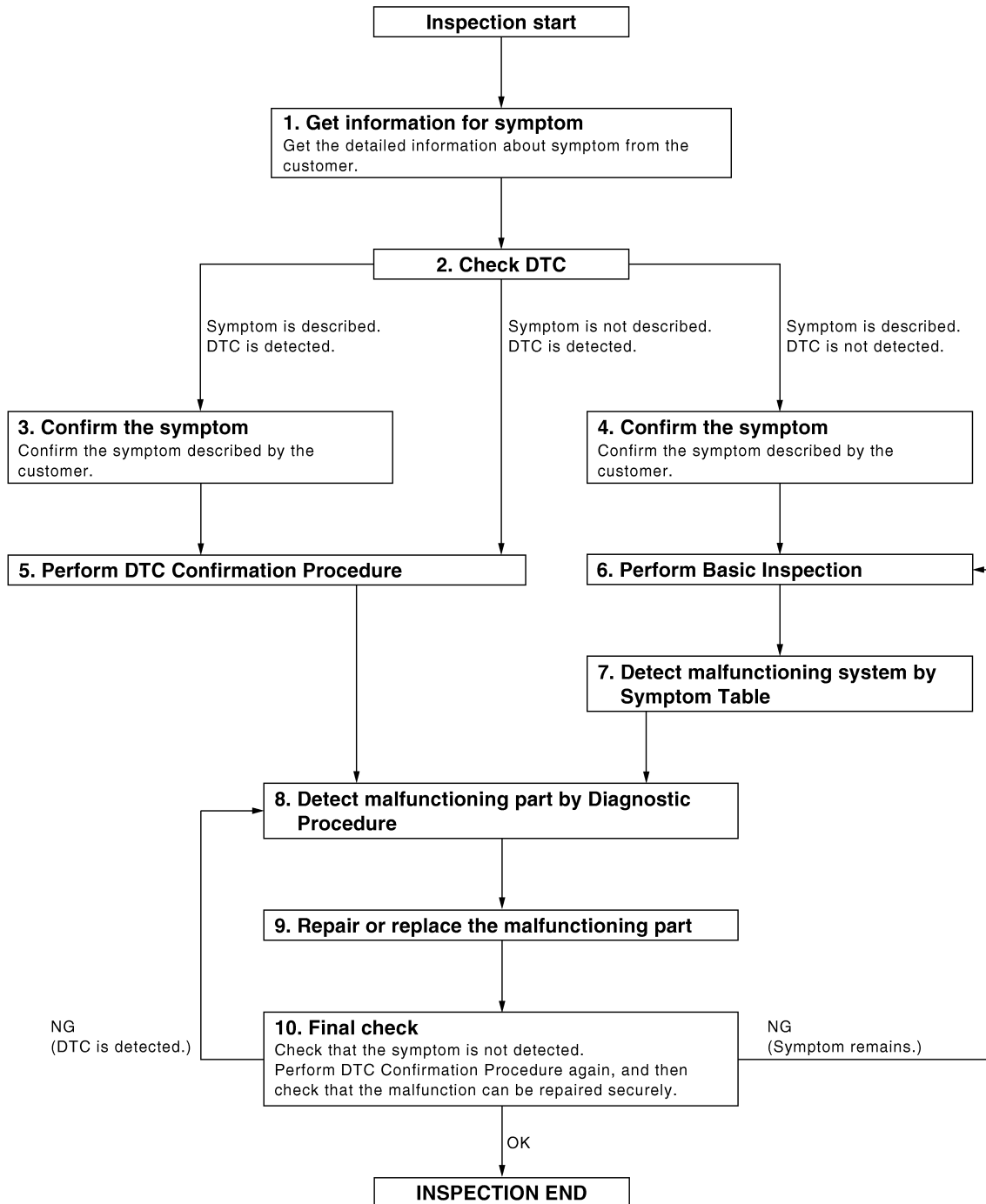
BASIC INSPECTION

DIAGNOSIS AND REPAIR WORKFLOW

Work Flow

INFOID:000000008635755

OVERALL SEQUENCE



DETAILED FLOW

Revision: August 2012

WW-3

JMKIA0101GB

2013 Maxima

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

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

1. GET INFORMATION FOR SYMPTOM

Get the detailed information from the customer about the symptom (the condition and the environment when the incident/malfunction occurred).

>> GO TO 2

2. CHECK DTC

1. Check DTC.
2. Perform the following procedure if DTC is displayed.
 - Record DTC and freeze frame data (Print them out with CONSULT.)
 - Erase DTC.
 - Study the relationship between the cause detected by DTC and the symptom described by the customer.
3. Check related service bulletins for information.

Is any symptom described and any DTC detected?

Symptom is described, DTC is displayed>>GO TO 3

Symptom is described, DTC is not displayed>>GO TO 4

Symptom is not described, DTC is displayed>>GO TO 5

3. CONFIRM THE SYMPTOM

Confirm the symptom described by the customer.

Connect CONSULT to the vehicle in "DATA MONITOR" mode and check real time diagnosis results.

Verify relation between the symptom and the condition when the symptom is detected.

>> GO TO 5

4. CONFIRM THE SYMPTOM

Confirm the symptom described by the customer.

Connect CONSULT to the vehicle in "DATA MONITOR" mode and check real time diagnosis results.

Verify relation between the symptom and the condition when the symptom is detected.

>> GO TO 6

5. PERFORM DTC CONFIRMATION PROCEDURE

Perform DTC Confirmation Procedure for the displayed DTC, and then check that DTC is detected again.

At this time, always connect CONSULT to the vehicle, and check diagnostic results in real time.

If two or more DTCs are detected, refer to [BCS-63. "DTC Inspection Priority Chart"](#) and determine trouble diagnosis order.

NOTE:

- Freeze frame data is useful if the DTC is not detected.
- Perform Component Function Check if DTC Confirmation Procedure is not included in Service Manual. This simplified check procedure is an effective alternative though DTC cannot be detected during this check. If the result of Component Function Check is NG, it is the same as the detection of DTC by DTC Confirmation Procedure.

Is DTC detected?

YES >> GO TO 8

NO >> Refer to [GI-45. "Intermittent Incident"](#).

6. PERFORM BASIC INSPECTION

Perform [WW-3. "Work Flow"](#).

Inspection End>>GO TO 7

7. DETECT MALFUNCTIONING SYSTEM BY SYMPTOM TABLE

Detect malfunctioning system according to [WW-68. "Symptom Table"](#) based on the confirmed symptom in step 4, and determine the trouble diagnosis order based on possible causes and symptom.

>> GO TO 8

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

8. DETECT MALFUNCTIONING PART BY DIAGNOSTIC PROCEDURE

Inspect according to Diagnostic Procedure of the system.

NOTE:

The Diagnostic Procedure described is based on open circuit inspection. A short circuit inspection is also required for the circuit check in the Diagnostic Procedure.

Is malfunctioning part detected?

YES >> GO TO 9

NO >> Check voltage of related BCM terminals using CONSULT.

9. REPAIR OR REPLACE THE MALFUNCTIONING PART

1. Repair or replace the malfunctioning part.
2. Reconnect parts or connectors disconnected during Diagnostic Procedure again after repair and replacement.
3. Check DTC. If DTC is displayed, erase it.

>> GO TO 10

10. FINAL CHECK

When DTC was detected in step 2, perform DTC Confirmation Procedure or Component Function Check again, and then check that the malfunction has been repaired securely.

When symptom was described from the customer, refer to confirmed symptom in step 3 or 4, and check that the symptom is not detected.

Does the symptom reappear?

YES (DTC is detected)>>GO TO 8

YES (Symptom remains)>>GO TO 6

NO >> Inspection End.

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

WW

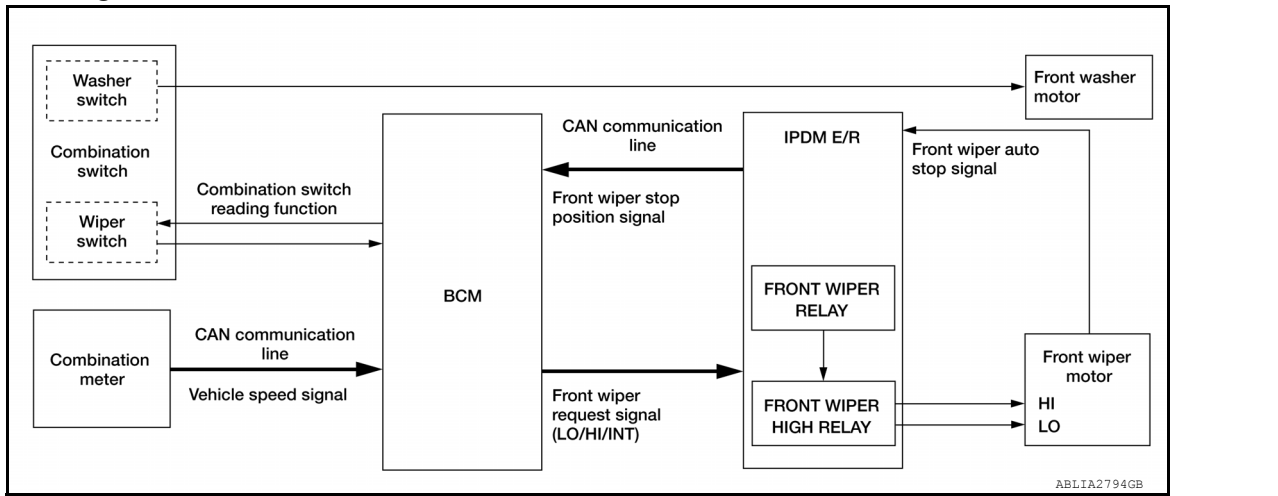
FRONT WIPER AND WASHER SYSTEM

< SYSTEM DESCRIPTION >

SYSTEM DESCRIPTION

FRONT WIPER AND WASHER SYSTEM

System Diagram



System Description

INFOID:000000008635757

OUTLINE

The front wiper is controlled by each function of BCM and IPDM E/R.

Control by BCM

- Combination switch reading function
- Front wiper control function

Control by IPDM E/R

- Front wiper control function
- Relay control function

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 with CAN communication depending on each operating condition of the front wiper.
- IPDM E/R turns ON/OFF the integrated front wiper relay and the front wiper high 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 with 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 the integrated front wiper relay according to the front wiper request signal (LO).

FRONT WIPER HI OPERATION

- BCM transmits the front wiper request signal (HI) to IPDM E/R with 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 the integrated front wiper relay and the front wiper high relay according to the front wiper request signal (HI).

FRONT WIPER INT OPERATION

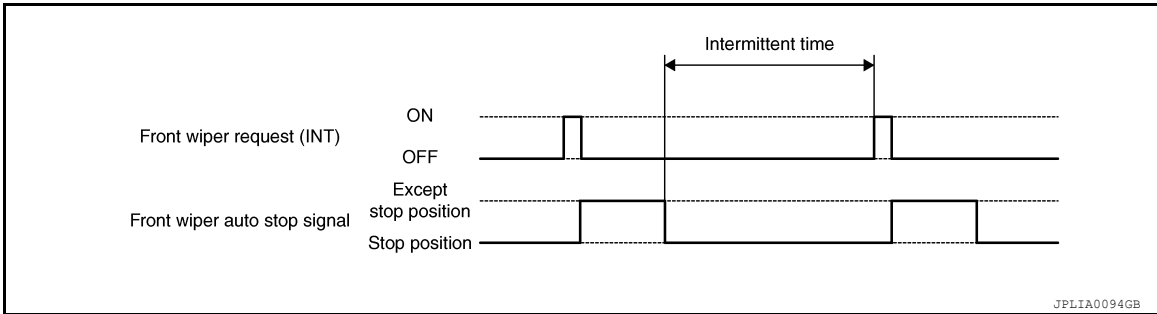
FRONT WIPER AND WASHER SYSTEM

< SYSTEM DESCRIPTION >

- BCM transmits the front wiper request signal (INT) to IPDM E/R with CAN communication depending on the front wiper INT operating condition and intermittent operation delay interval according to the wiper intermittent dial position.

Front wiper INT operating condition

- Ignition switch ON
- Front wiper switch INT
- IPDM E/R turns ON the integrated front wiper relay so that the front wiper is operated only once according to the front wiper request signal (INT).
- BCM detects stop position/except stop position of the front wiper motor according to the front wiper auto stop signal received from IPDM E/R with CAN communication.
- BCM transmits the front wiper request signal (INT) again after the intermittent operation delay interval.



NOTE:

Front wiper intermittent operation can be set to the operation with vehicle speed by CONSULT. Refer to [BCS-23, "WIPER : CONSULT Function \(BCM - WIPER\)"](#).

Front wiper intermittent operation with vehicle speed

- BCM calculates the intermittent operation delay interval from the following
 - Vehicle speed signal (received from the combination meter with CAN communication)
 - Wiper intermittent dial position

| Wiper intermittent dial position | Intermittent operation interval | Intermittent operation delay Interval (s) | | | |
|----------------------------------|---------------------------------|---|--|--|---------------------------|
| | | Vehicle speed | | | |
| | | Vehicle stopped or less than 5 km/h (3.1 MPH) | 5 km/h (3.1MPH) or more or less than 35km/h (21.7 MPH) | 35 km/h (21.7 MPH) or more or less than 65km/h (40.4 MPH)* | 65 km/h (40.4MPH) or more |
| 1 | Short ↑ | 0.8 | 0.6 | 0.4 | 0.24 |
| 2 | | 4 | 3 | 2 | 1.2 |
| 3 | | 10 | 7.5 | 5 | 3 |
| 4 | | 16 | 12 | 8 | 4.8 |
| 5 | | 24 | 18 | 12 | 7.2 |
| 6 | Long ↓ | 32 | 24 | 16 | 9.6 |
| 7 | | 42 | 31.5 | 21 | 12.6 |

*: When without vehicle speed setting

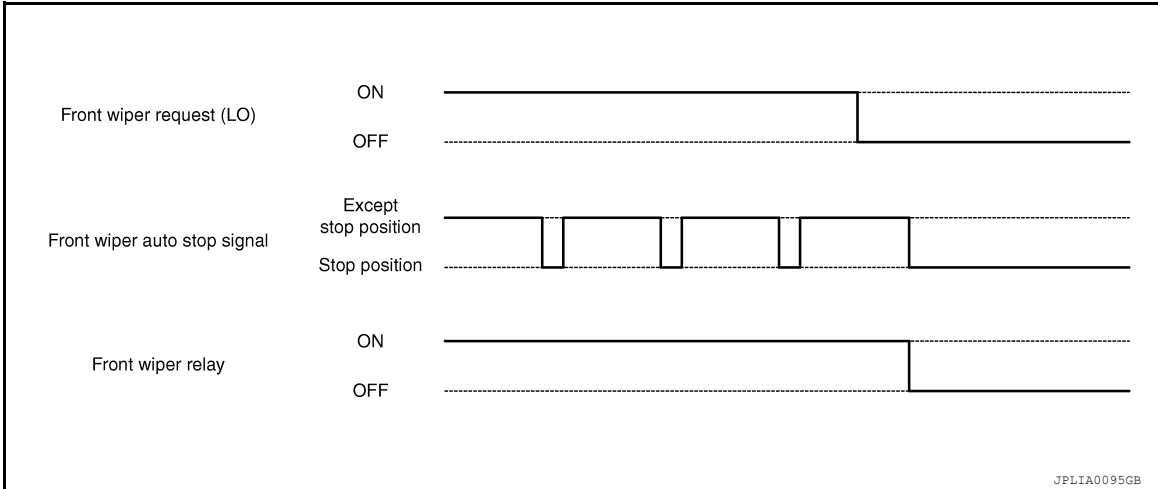
FRONT WIPER AUTO STOP OPERATION

- BCM stops transmitting the front wiper request signal when the front wiper switch is turned OFF.
- IPDM E/R detects the front wiper auto stop signal from the front wiper motor and detects the front wiper motor position (stop position/except stop position).

FRONT WIPER AND WASHER SYSTEM

< SYSTEM DESCRIPTION >

- When the front wiper request signal is stopped, IPDM E/R turns ON the front wiper relay until the front wiper motor returns to the stop position.



NOTE:

- BCM stops the transmitting of the front wiper request signal when the ignition switch is OFF.
- IPDM E/R turns the front wiper relay 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 with CAN communication according to the washer linked operating condition of the front wiper.
- BCM transmits the front wiper request signal (LO) so that the front wiper operates approximately 2 times when the front washer switch OFF is detected.

Washer linked operating condition of front wiper

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

FRONT WIPER FAIL-SAFE OPERATION

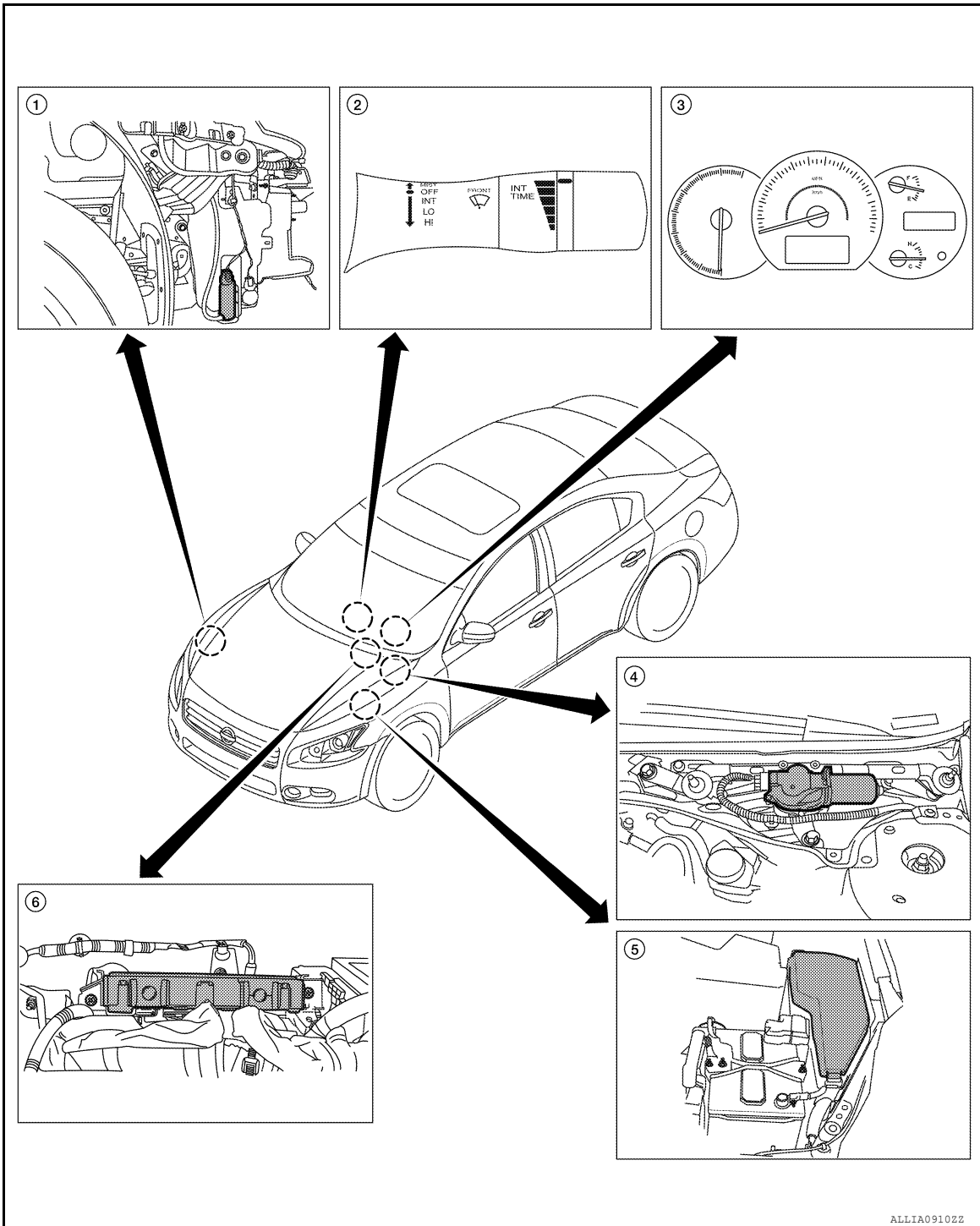
When the front wiper auto stop circuit is malfunctioning, IPDM E/R performs the fail-safe function. Refer to [PCS-25. "Fail Safe"](#).

FRONT WIPER AND WASHER SYSTEM

< SYSTEM DESCRIPTION >

Component Parts Location

INFOID:000000008635758



- | | | |
|---|---|--|
| 1. Front washer motor E226 (view with front bumper cover removed) | 2. Combination switch (wiper and washer switch) M28 | 3. Combination meter M24 |
| 4. Front wiper motor E25 | 5. IPDM E/R E17, E18, E20 | 6. BCM M16, M17, M18, M19 (view with instrument panel removed) |

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

WW

FRONT WIPER AND WASHER SYSTEM

< SYSTEM DESCRIPTION >

Component Description

INFOID:000000008635759

| Part | Description |
|---|---|
| BCM | <ul style="list-style-type: none">• Judges the switch status by the combination switch reading function.• Requests (with CAN communication) the front wiper relay and the front wiper high relay ON to IPDM E/R. |
| IPDM E/R | <ul style="list-style-type: none">• Controls the integrated relay according to the request (with CAN communication) from BCM.• Performs the auto stop control of the front wiper. |
| Combination switch (Wiper and washer switch) | Refer to WW-6, "System Description" . |
| Combination meter | Transmits the vehicle speed signal to BCM with CAN communication. |
| Front wiper motor | <ul style="list-style-type: none">• Drives windshield wipers in HI or LO mode.• Sends wiper stop signal to IPDM E/R. |
| Front washer motor | Pumps windshield washer fluid to windshield in wash mode. |

DIAGNOSIS SYSTEM (BCM)

< SYSTEM DESCRIPTION >

DIAGNOSIS SYSTEM (BCM)

COMMON ITEM

COMMON ITEM : CONSULT Function (BCM - COMMON ITEM)

INFOID:000000008778964

APPLICATION ITEM

CONSULT performs the following functions via CAN communication with BCM.

| Direct Diagnostic Mode | Description |
|------------------------|---|
| Ecu Identification | The BCM part number is displayed. |
| Self Diagnostic Result | Displays the diagnosis results judged by BCM. |
| Data Monitor | The BCM input/output signals are displayed. |
| Active Test | The signals used to activate each device are forcibly supplied from BCM. |
| Work support | Changes the setting for each system function. |
| Configuration | <ul style="list-style-type: none"> Enables to read and save the vehicle specification. Enables to write the vehicle specification when replacing BCM. |
| CAN Diag Support Mntr | Monitors the reception status of CAN communication viewed from BCM. |

SYSTEM APPLICATION

BCM can perform the following functions.

| System | Sub System | Direct Diagnostic Mode | | | | | | |
|--------------------------------------|----------------------|------------------------|------------------------|--------------|-------------|--------------|---------------|-----------------------|
| | | Ecu Identification | Self Diagnostic Result | Data Monitor | Active Test | Work support | Configuration | CAN Diag Support Mntr |
| Door lock | DOOR LOCK | | × | × | × | × | | |
| Rear window defogger | REAR DEFOGGER | | | × | × | | | |
| Warning chime | BUZZER | | | × | × | | | |
| Interior room lamp timer | INT LAMP | | | × | × | × | | |
| Exterior lamp | HEADLAMP | | | × | × | × | | |
| Wiper and washer | WIPER | | | × | × | × | | |
| Turn signal and hazard warning lamps | FLASHER | | | × | × | × | | |
| Intelligent Key system | INTELLIGENT KEY | | | × | × | × | | |
| Combination switch | COMB SW | | | × | | | | |
| BCM | BCM | × | × | | | × | × | × |
| Immobilizer | IMMU | | × | × | × | | | |
| Interior room lamp battery saver | BATTERY SAVER | | | × | × | × | | |
| Trunk open | TRUNK | | | × | × | | | |
| Vehicle security system | THEFT ALM | | | × | × | × | | |
| RAP system | RETAINED PWR | | | × | | | | |
| Signal buffer system | SIGNAL BUFFER | | | × | × | | | |
| TPMS | AIR PRESSURE MONITOR | | × | × | × | × | | |

WIPER

DIAGNOSIS SYSTEM (BCM)

< SYSTEM DESCRIPTION >

WIPER : CONSULT Function (BCM - WIPER)

INFOID:000000008778965

DATA MONITOR

| Monitor Item [Unit] | Description |
|------------------------|---|
| PUSH SW [On/Off] | Indicates condition of push button ignition switch |
| VEH SPEED 1 [km/h] | Indicates vehicle speed signal received from ABS on CAN communication line |
| FR WIPER HI [On/Off] | Indicates condition of wiper operation of combination switch |
| FR WIPER LOW [On/Off] | |
| FR WASHER SW [On/Off] | |
| FR WIPER INT [On/Off] | |
| FR WIPER STOP [On/Off] | Indicates front wiper auto stop signal received from IPDM E/R on CAN communication line |
| INT VOLUME [1 - 7] | Indicates condition of intermittent wiper operation of combination switch |

ACTIVE TEST

| Test Item | Description |
|-----------|---|
| FR WIPER | This test is able to check front wiper operation [INT/Lo/Hi/Off]. |

WORK SUPPORT

| Support Item | Setting | Description |
|---------------------|---------|---|
| WIPER SPEED SETTING | On | Front wiper intermittent time linked with vehicle speed and wiper dial position |
| | Off* | Front wiper intermittent time linked with wiper dial position |

* : Initial setting

DIAGNOSIS SYSTEM (IPDM E/R)

< SYSTEM DESCRIPTION >

DIAGNOSIS SYSTEM (IPDM E/R)

Diagnosis Description

INFOID:000000008778966

AUTO ACTIVE TEST

Description

In auto active test mode, the IPDM E/R sends a drive signal to the following systems to check their operation.

- Oil pressure warning lamp
- Front wiper (LO, HI)
- Parking lamps
- Side marker lamps
- License plate lamps
- Tail lamps
- Front fog lamps (if equipped)
- Headlamps (LO, HI)
- A/C compressor (magnet clutch)
- Cooling fans

Operation Procedure

1. Close the hood and lift the wiper arms from the windshield. (Prevent windshield damage due to wiper operation)
NOTE:
When auto active test is performed with hood opened, sprinkle water on windshield beforehand.
2. Turn ignition switch OFF.
3. Turn the ignition switch ON, and within 20 seconds, press the front door switch LH 10 times. Then turn the ignition switch OFF.
CAUTION:
Close front door RH.
4. Turn the ignition switch ON within 10 seconds. After that the horn sounds once and the auto active test starts.
5. The oil pressure warning lamp starts blinking when the auto active test starts.
6. After a series of the following operations is repeated 3 times, auto active test is completed.

NOTE:

When auto active test mode has to be cancelled halfway through test, turn ignition switch OFF.

CAUTION:

- **If auto active test mode cannot be actuated, check door switch system. Refer to [DLK-67](#), "[Component Function Check](#)".**
- **Do not start the engine.**

Inspection in Auto Active Test Mode

When auto active test mode is actuated, the following 6 steps are repeated 3 times.

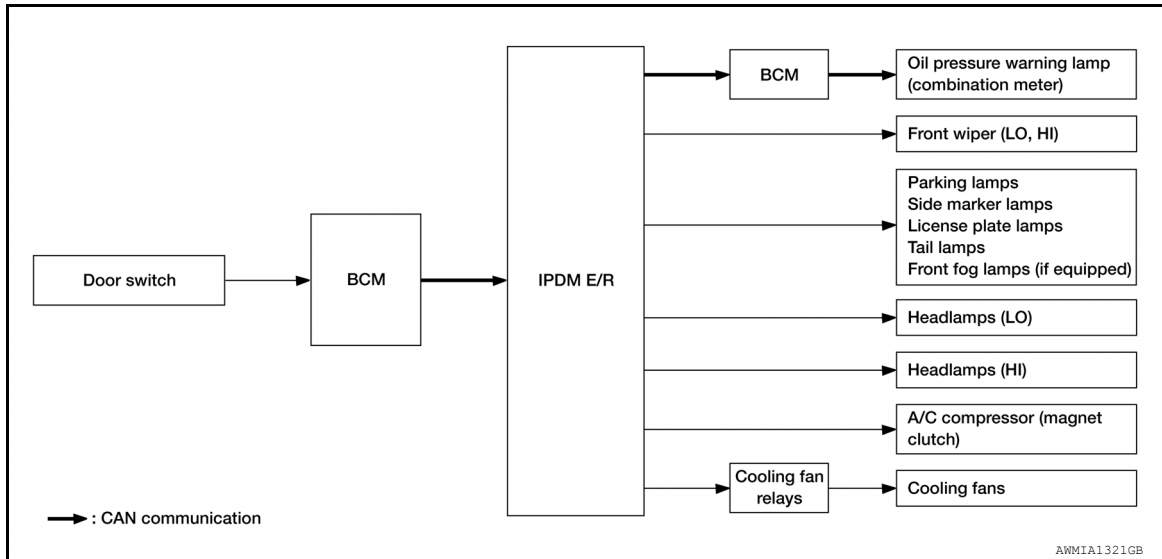
| Operation sequence | Inspection Location | Operation |
|--------------------|--|--|
| 1 | Oil pressure warning lamp | Blinks continuously during operation of auto active test |
| 2 | Front wiper | LO for 5 seconds → HI for 5 seconds |
| 3 | <ul style="list-style-type: none">• Parking lamps• Side marker lamps• License plate lamps• Tail lamps• Front fog lamps (if equipped) | 10 seconds |
| 4 | Headlamps | LO ↔ HI 5 times |
| 5 | A/C compressor (magnet clutch) | ON ↔ OFF 5 times |
| 6* | Cooling fans | MID for 5 seconds → HI for 5 seconds |

*: Outputs duty ratio of 50% for 5 seconds → duty ratio of 100% for 5 seconds on the cooling fan control module.

DIAGNOSIS SYSTEM (IPDM E/R)

< SYSTEM DESCRIPTION >

Concept of auto active test



- IPDM E/R starts the auto active test with the door switch signals transmitted by BCM via CAN communication. Therefore, the CAN communication line between IPDM E/R and BCM is considered normal if the auto active test starts successfully.
- The auto active test facilitates troubleshooting if any systems controlled by IPDM E/R cannot be operated.

Diagnosis chart in auto active test mode

| Symptom | Inspection contents | Possible cause |
|---|--|--|
| Any of the following components do not operate <ul style="list-style-type: none"> • Parking lamps • Side marker lamps • License plate lamps • Tail lamps • Front fog lamps (if equipped) • Headlamp (HI, LO) • Front wiper | Perform auto active test. Does the applicable system operate? | YES BCM signal input circuit |
| | | NO • Lamp or motor • Lamp or motor ground circuit • Harness or connector between IPDM E/R and applicable system • IPDM E/R |
| A/C compressor does not operate | Perform auto active test. Does the magnet clutch operate? | YES • Combination meter signal input circuit • CAN communication signal between combination meter and ECM • CAN communication signal between ECM and IPDM E/R |
| | | NO • Magnet clutch • Harness or connector between IPDM E/R and magnet clutch • IPDM E/R |

DIAGNOSIS SYSTEM (IPDM E/R)

< SYSTEM DESCRIPTION >

| Symptom | Inspection contents | | Possible cause |
|--|--|-----|--|
| Oil pressure warning lamp does not operate | Perform auto active test. Does the oil pressure warning lamp blink? | YES | <ul style="list-style-type: none"> • Harness or connector between IPDM E/R and oil pressure switch • Oil pressure switch • IPDM E/R |
| | | NO | <ul style="list-style-type: none"> • CAN communication signal between IPDM E/R and BCM • CAN communication signal between BCM and combination meter • Combination meter |
| Cooling fan does not operate | Perform auto active test. Does the cooling fan operate? | YES | <ul style="list-style-type: none"> • ECM signal input circuit • CAN communication signal between ECM and IPDM E/R |
| | | NO | <ul style="list-style-type: none"> • Cooling fan • Harness or connector between cooling fan and cooling fan relays • Cooling fan relays • Harness or connector between IPDM E/R and cooling fan relays • IPDM E/R |

CONSULT Function (IPDM E/R)

INFOID:000000008778967

APPLICATION ITEM

CONSULT performs the following functions via CAN communication with IPDM E/R.

| Direct Diagnostic Mode | Description |
|------------------------|---|
| ECU Identification | The IPDM E/R part number is displayed. |
| Self Diagnostic Result | The IPDM E/R self diagnostic results are displayed. |
| Data Monitor | The IPDM E/R input/output data is displayed in real time. |
| Active Test | The IPDM E/R activates outputs to test components. |
| CAN Diag Support Mntr | The result of transmit/receive diagnosis of CAN communication is displayed. |

ECU IDENTIFICATION

The IPDM E/R part number is displayed.

SELF DIAGNOSTIC RESULT

Refer to [PCS-27, "DTC Index"](#).

DATA MONITOR

| Monitor Item [Unit] | Main Signals | Description |
|-------------------------|--------------|---|
| MOTOR FAN REQ [1/2/3/4] | × | Indicates cooling fan speed signal received from ECM on CAN communication line |
| AC COMP REQ [On/Off] | × | Indicates A/C compressor request signal received from ECM on CAN communication line |
| TAIL&CLR REQ [On/Off] | × | Indicates position light request signal received from BCM on CAN communication line |
| HL LO REQ [On/Off] | × | Indicates low beam request signal received from BCM on CAN communication line |

DIAGNOSIS SYSTEM (IPDM E/R)

< SYSTEM DESCRIPTION >

| Monitor Item [Unit] | Main Signals | Description |
|-------------------------------|--------------|---|
| HL HI REQ [On/Off] | × | Indicates high beam request signal received from BCM on CAN communication line |
| FR FOG REQ [On/Off] | × | Indicates front fog light request signal received from BCM on CAN communication line |
| FR WIP REQ [Stop/1LOW/Low/Hi] | × | Indicates front wiper request signal received from BCM on CAN communication line |
| WIP AUTO STOP [STOP P/ACT P] | × | Indicates condition of front wiper auto stop signal |
| WIP PROT [Off/BLOCK] | × | Indicates condition of front wiper fail-safe operation |
| IGN RLY1 -REQ [On/Off] | | Indicates ignition switch ON signal received from BCM on CAN communication line |
| IGN RLY [On/Off] | × | Indicates condition of ignition relay-1 |
| PUSH SW [On/Off] | | Indicates condition of push-button ignition switch |
| INTER/NP SW [On/Off] | | Indicates condition of CVT shift position |
| ST RLY CONT [On/Off] | | Indicates starter relay status signal received from BCM on CAN communication line |
| IHBT RLY -REQ [On/Off] | | Indicates starter control relay signal received from BCM on CAN communication line |
| ST/INH1 RLY [Off/ ST /INH1] | | Indicates condition of starter relay and starter control relay |
| DETENT SW [On/Off] | | Indicates condition of CVT shift selector (park position switch) |
| DTRL REQ [Off] | | Indicates daytime light request signal received from BCM on CAN communication line |
| OIL P SW [Open/Close] | | Indicates condition of oil pressure switch |
| THFT HRN REQ [On/Off] | | Indicates theft warning horn request signal received from BCM on CAN communication line |
| HORN CHIRP [On/Off] | | Indicates horn reminder signal received from BCM on CAN communication line |

ACTIVE TEST

| Test item | Description |
|----------------|--|
| HORN | This test is able to check horn operation [On]. |
| FRONT WIPER | This test is able to check wiper motor operation [Hi/Lo/Off]. |
| MOTOR FAN | This test is able to check cooling fan operation [4/3/2/1]. |
| EXTERNAL LAMPS | This test is able to check external lamp operation [Fog/Hi/Lo/Tail/Off]. |

CAN DIAG SUPPORT MNTR

Refer to [LAN-12, "CAN Diagnostic Support Monitor"](#).

WIPER AND WASHER FUSE

< DTC/CIRCUIT DIAGNOSIS >

DTC/CIRCUIT DIAGNOSIS

WIPER AND WASHER FUSE

Description

INFOID:000000008635764

Fuse list

| Unit | Location | Fuse No. | Capacity |
|--------------------|----------|----------|----------|
| Front wiper motor | IPDM E/R | 55 | 30 A |
| Front washer motor | IPDM E/R | 38 | 10 A |

Diagnosis Procedure

INFOID:000000008635765

1. CHECK FUSES

Check that the following fuses are not blown.

| Unit | Location | Fuse No. | Capacity |
|--------------------|----------|----------|----------|
| Front wiper motor | IPDM E/R | 55 | 30 A |
| Front washer motor | IPDM E/R | 38 | 10 A |

Is the fuse blown?

- YES >> Replace the blown fuse after repairing the affected circuit.
- NO >> The fuse is normal.

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

WW

FRONT WIPER MOTOR LO CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

FRONT WIPER MOTOR LO CIRCUIT

Component Function Check

INFOID:000000008635766

1. CHECK FRONT WIPER LO OPERATION

⊗ IPDM E/R AUTO ACTIVE TEST

1. Start IPDM E/R auto active test. Refer to [PCS-11, "Diagnosis Description"](#).
2. Check that the front wiper operates at the LO operation.

Ⓟ CONSULT ACTIVE TEST

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

LO : Front wiper LO operation

OFF : Stop the front wiper.

Does the front wiper operate?

- YES >> Front wiper motor LO circuit is normal.
 NO >> Refer to [WW-18, "Diagnosis Procedure"](#).

Diagnosis Procedure

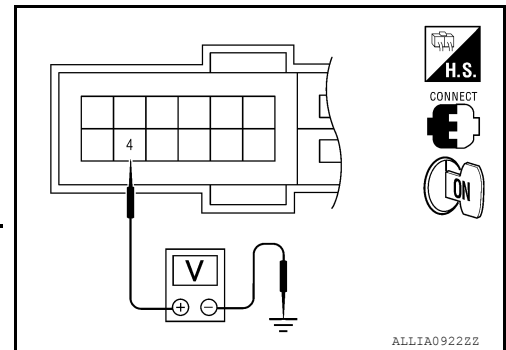
INFOID:000000008635767

Regarding Wiring Diagram information, refer to [WW-63, "Wiring Diagram"](#).

1. CHECK FRONT WIPER MOTOR (LO) OUTPUT VOLTAGE

Ⓟ CONSULT ACTIVE TEST

1. Turn the ignition switch OFF.
2. Disconnect front wiper motor.
3. Turn the ignition switch ON.
4. Select "FRONT WIPER" of IPDM E/R active test item.
5. While operating the test item, check voltage between IPDM E/R harness connector and ground.



| Terminals | | Test item | Voltage (V) (Approx.) |
|-----------|----------|-------------|-----------------------|
| (+) | (-) | | |
| IPDM E/R | | FRONT WIPER | Battery voltage |
| Connector | Terminal | | |
| E18 | 4 | LO | Battery voltage |
| | | OFF | 0V |

Is the measurement normal?

- YES >> GO TO 2
 NO >> Replace IPDM E/R. Refer to [PCS-35, "Removal and Installation"](#).

2. CHECK FRONT WIPER MOTOR (LO) OPEN CIRCUIT

FRONT WIPER MOTOR LO CIRCUIT

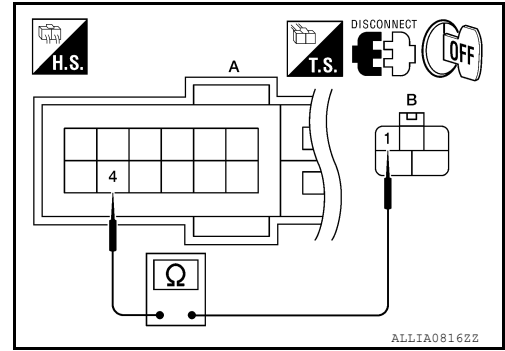
< DTC/CIRCUIT DIAGNOSIS >

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

| IPDM E/R | | Front wiper motor | | Continuity |
|-----------|----------|-------------------|----------|------------|
| Connector | Terminal | Connector | Terminal | |
| E18 (A) | 4 | E25 (B) | 1 | Yes |

Does continuity exist?

- YES >> Replace front wiper motor. Refer to [WW-78, "FRONT WIPER DRIVE ASSEMBLY : Removal and Installation"](#).
- NO >> Repair or replace harness.



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

WW

FRONT WIPER MOTOR HI CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

FRONT WIPER MOTOR HI CIRCUIT

Component Function Check

INFOID:000000008635768

1. CHECK FRONT WIPER HI OPERATION

⊗ IPDM E/R AUTO ACTIVE TEST

1. Start IPDM E/R auto active test. Refer to [PCS-11, "Diagnosis Description"](#).
2. Check that the front wiper operates at the HI operation.

Ⓟ CONSULT ACTIVE TEST

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

HI : Front wiper HI operation

OFF : Stop the front wiper.

Does the front wiper operate?

- YES >> The front wiper motor HI circuit is normal.
NO >> Refer to [WW-20, "Diagnosis Procedure"](#).

Diagnosis Procedure

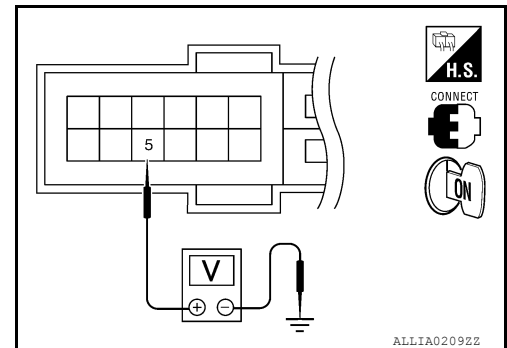
INFOID:000000008635769

Regarding Wiring Diagram information, refer to [WW-63, "Wiring Diagram"](#).

1. CHECK FRONT WIPER MOTOR (HI) OUTPUT VOLTAGE

Ⓟ CONSULT ACTIVE TEST

1. Turn the ignition switch OFF.
2. Disconnect front wiper motor.
3. Turn the ignition switch ON.
4. Select "FRONT WIPER" of IPDM E/R active test item.
5. While operating the test item, check voltage between IPDM E/R harness connector and ground.



| Terminals | | Test item | Voltage (V) (Approx.) |
|-----------|----------|-------------|--------------------------|
| (+) | (-) | | |
| IPDM E/R | | FRONT WIPER | Battery voltage |
| Connector | Terminal | | |
| E18 | 5 | HI | Battery voltage |
| | | OFF | 0V |

Is the measurement normal?

- YES >> GO TO 2
NO >> Replace IPDM E/R. Refer to [PCS-35, "Removal and Installation"](#).

2. CHECK FRONT WIPER MOTOR (HI) OPEN CIRCUIT

FRONT WIPER MOTOR HI CIRCUIT

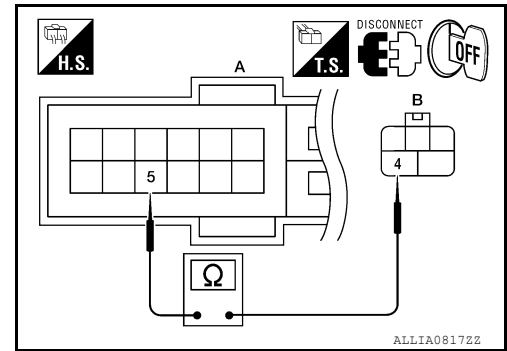
< DTC/CIRCUIT DIAGNOSIS >

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

| IPDM E/R | | Front wiper motor | | Continuity |
|-----------|----------|-------------------|----------|------------|
| Connector | Terminal | Connector | Terminal | |
| E18 (A) | 5 | E25 (B) | 4 | Yes |

Does continuity exist?

- YES >> Replace front wiper motor. Refer to [WW-78, "FRONT WIPER DRIVE ASSEMBLY : Removal and Installation"](#).
- NO >> Repair or replace harness.



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

WW

FRONT WIPER AUTO STOP SIGNAL CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

FRONT WIPER AUTO STOP SIGNAL CIRCUIT

Component Function Check

INFOID:000000008635770

1. CHECK FRONT WIPER (AUTO STOP) OPERATION

Ⓢ CONSULT DATA MONITOR

1. Select "WIP AUTO STOP" of IPDM E/R DATA MONITOR item.
2. Operate the front wiper.
3. With the front wiper operation, check the monitor status.

| Monitor item | Condition | | Monitor status |
|---------------|-------------------|----------------------|----------------|
| WIP AUTO STOP | Front wiper motor | Stop position | STOP P |
| | | Except stop position | ACT P |

Is the status of item normal?

- YES >> Auto stop signal circuit is normal.
 NO >> Refer to [WW-22, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:000000008635771

Regarding Wiring Diagram information, refer to [WW-63, "Wiring Diagram"](#).

1. CHECK IPDM E/R OUTPUT VOLTAGE

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

| Terminals | | Voltage (V) (Approx.) |
|-------------------|----------|-----------------------|
| (+) | (-) | |
| Front wiper motor | | Battery voltage |
| Connector | Terminal | |
| E25 | 5 | |

Is the measurement normal?

- YES >> Replace front wiper motor. Refer to [WW-78, "FRONT WIPER DRIVE ASSEMBLY : Removal and Installation"](#).
 NO >> GO TO 2

2. CHECK FRONT WIPER MOTOR (AUTO STOP) CIRCUIT CONTINUITY

1. Turn the ignition switch OFF.
2. Disconnect IPDM E/R connector E18.
3. Check continuity between IPDM E/R harness connector and front wiper motor harness connector.

| IPDM E/R | | Front wiper motor | | Continuity |
|-----------|----------|-------------------|----------|------------|
| Connector | Terminal | Connector | Terminal | |
| E18 | 16 | E25 | 5 | Yes |

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

| IPDM E/R | | Ground | Continuity |
|-----------|----------|--------|------------|
| Connector | Terminal | | |
| E18 | 16 | | No |

FRONT WIPER AUTO STOP SIGNAL CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

Is the inspection result normal?

YES >> Replace IPDM E/R. Refer to [PCS-35, "Removal and Installation"](#).

NO >> Repair or replace harness.

A

B

C

D

E

F

G

H

I

J

K

WW

M

N

O

P

FRONT WIPER MOTOR GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

FRONT WIPER MOTOR GROUND CIRCUIT

Diagnosis Procedure

INFOID:000000008635772

Regarding Wiring Diagram information, refer to [WW-63. "Wiring Diagram"](#).

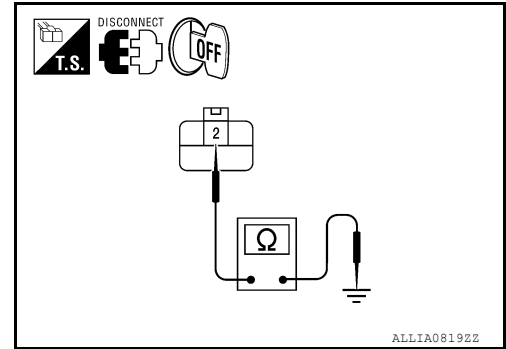
1. CHECK FRONT WIPER MOTOR (GND) OPEN CIRCUIT

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

| Front wiper motor | | Ground | Continuity |
|-------------------|----------|--------|------------|
| Connector | Terminal | | |
| E25 | 2 | | Yes |

Does continuity exist?

- YES >> Front wiper motor ground circuit is normal.
NO >> Repair or replace harness.



WASHER SWITCH

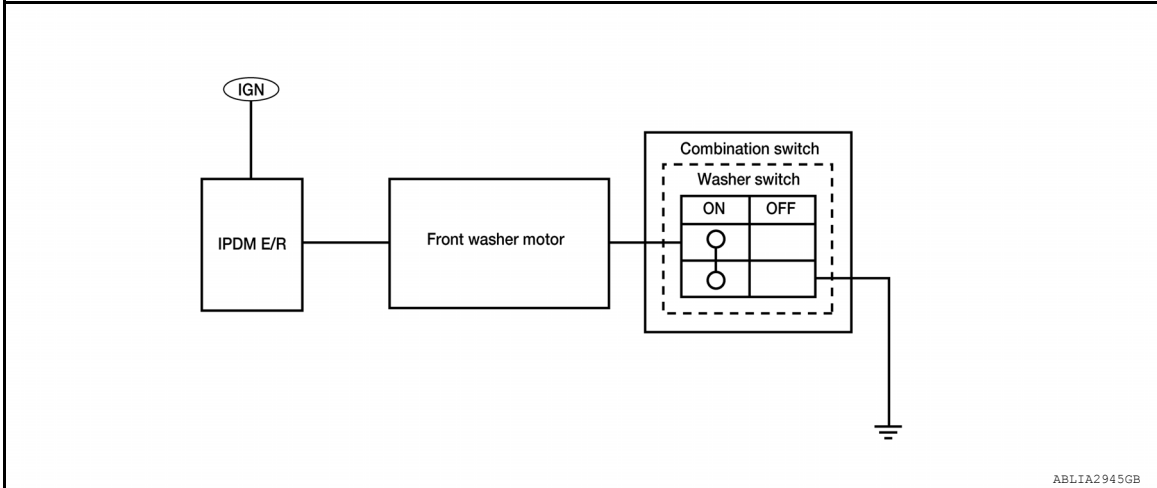
< DTC/CIRCUIT DIAGNOSIS >

WASHER SWITCH

Description

INFOID:000000008635773

- Washer switch is integrated with combination switch (wiper and washer switch).
- Combination switch (wiper and washer switch) supplies ground and fuse # 38 from the IPDM E/R supplies power for the front washer motor to operate.



Component Inspection

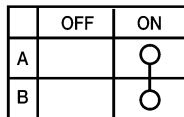
INFOID:000000008635774

Regarding Wiring Diagram information, refer to [WW-63. "Wiring Diagram"](#).

1. CHECK WASHER SWITCH

1. Turn the ignition switch OFF.
2. Disconnect combination switch (wiper and washer switch).
3. Check continuity between the combination switch (wiper and washer switch) terminals.

A: Terminal 1
B: Terminal 6



ALLIA0546GB

| Combination switch (wiper and washer switch) | | Condition | Continuity |
|--|---|-------------------|------------|
| Terminal | | | |
| 1 | 6 | Washer switch ON | Yes |
| | | Washer switch OFF | No |

Is the measurement normal?

YES >> Washer switch is normal.

NO >> Replace combination switch (wiper and washer switch). Refer to [WW-85. "Removal and Installation"](#).

WASHER MOTOR CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

WASHER MOTOR CIRCUIT

Diagnosis Procedure

INFOID:000000008635775

Regarding Wiring Diagram information, refer to [WW-63. "Wiring Diagram"](#).

1. CHECK FRONT WASHER MOTOR FUSE

1. Turn the ignition switch OFF.
2. Check that the following fuse is not blown.

| Unit | Location | Fuse No. | Capacity |
|--------------------|----------|----------|----------|
| Front washer motor | IPDM E/R | 38 | 10A |

Is the fuse blown?

- YES >> Replace the fuse after repairing the affected circuit.
NO >> GO TO 2

2. CHECK FRONT WASHER MOTOR POWER SUPPLY

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

| Terminals | | Voltage (Approx.) |
|--------------------|----------|----------------------|
| (+) | (-) | |
| Front washer motor | | Battery voltage |
| Connector | Terminal | |
| E226 | 1 | |

Is the measurement value normal?

- YES >> GO TO 3.
NO >> GO TO 5.

3. CHECK FRONT WASHER MOTOR CIRCUIT CONTINUITY

1. Turn the ignition switch OFF.
2. Disconnect combination switch (wiper and washer switch).
3. Check continuity between combination switch (wiper and washer switch) harness connector and front washer motor.

| Combination switch (wiper and washer switch) | | Front washer motor | | Continuity |
|--|----------|--------------------|----------|------------|
| Connector | Terminal | Connector | Terminal | |
| M28 | 1 | E226 | 2 | Yes |

Is the measurement normal?

- YES >> GO TO 4
NO >> Repair or replace harness.

4. CHECK WIPER AND WASHER SWITCH GROUND CIRCUIT

Check continuity between combination switch (wiper and washer switch) harness connector and ground.

| Combination switch (wiper and washer switch) | | Ground | Continuity |
|--|----------|--------|------------|
| Connector | Terminal | | |
| M28 | 6 | | Yes |

Does continuity exist?

WASHER MOTOR CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

- YES >> GO TO 6
NO >> Repair or replace harness.

5. CHECK FRONT WASHER MOTOR OPEN CIRCUIT

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

| IPDM E/R | | Front washer motor | | Continuity |
|-----------|----------|--------------------|----------|------------|
| Connector | Terminal | Connector | Terminal | |
| E200 | 88 | E226 | 1 | Yes |

Does continuity exist?

- YES >> Replace IPDM E/R. Refer to [PCS-35. "Removal and Installation"](#).
NO >> Repair or replace harness.

6. CHECK WIPER AND WASHER SWITCH

Check wiper and washer switch. Refer to [WW-25. "Component Inspection"](#).

Is the inspection result normal?

- YES >> Replace front washer motor. Refer to [WW-82. "FRONT WASHER PUMP : Removal and Installation"](#).
NO >> Replace wiper and washer switch. Refer to [WW-85. "Removal and Installation"](#).

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

WW

BCM (BODY CONTROL MODULE)

< ECU DIAGNOSIS INFORMATION >

ECU DIAGNOSIS INFORMATION

BCM (BODY CONTROL MODULE)

Reference Value

INFOID:000000008778968

NOTE:

The Signal Tech II Tool (J-50190) can be used to perform the following functions. Refer to the Signal Tech II User Guide for additional information.

- Activate and display TPMS transmitter IDs
- Display tire pressure reported by the TPMS transmitter
- Read TPMS DTCs
- Register TPMS transmitter IDs
- Check Intelligent Key relative signal strength
- Confirm vehicle Intelligent Key antenna signal strength

VALUES ON THE DIAGNOSIS TOOL

| Monitor Item | Condition | Value/Status |
|----------------|---|----------------------------------|
| FR WIPER HI | Other than front wiper switch HI | OFF |
| | Front wiper switch HI | ON |
| FR WIPER LOW | Other than front wiper switch LO | OFF |
| | Front wiper switch LO | ON |
| FR WASHER SW | Front washer switch OFF | OFF |
| | Front washer switch ON | ON |
| FR WIPER INT | Other than front wiper switch INT | OFF |
| | Front wiper switch INT | ON |
| FR WIPER STOP | Front wiper is not in STOP position | OFF |
| | Front wiper is in STOP position | ON |
| INT VOLUME | Wiper intermittent dial is in a dial position 1 - 7 | Wiper intermittent dial position |
| TURN SIGNAL R | Other than turn signal switch RH | OFF |
| | Turn signal switch RH | ON |
| TURN SIGNAL L | Other than turn signal switch LH | OFF |
| | Turn signal switch LH | ON |
| TAIL LAMP SW | Other than lighting switch 1ST and 2ND | OFF |
| | Lighting switch 1ST or 2ND | ON |
| HI BEAM SW | Other than lighting switch HI | OFF |
| | Lighting switch HI | ON |
| HEAD LAMP SW 1 | Other than lighting switch 2ND | OFF |
| | Lighting switch 2ND | ON |
| HEAD LAMP SW 2 | Other than lighting switch 2ND | OFF |
| | Lighting switch 2ND | ON |
| PASSING SW | Other than lighting switch PASS | OFF |
| | Lighting switch PASS | ON |
| AUTO LIGHT SW | Other than lighting switch AUTO | OFF |
| | Lighting switch AUTO | ON |
| FR FOG SW | Front fog lamp switch OFF | OFF |
| | Front fog lamp switch ON | ON |
| DOOR SW-DR | Driver door closed | OFF |
| | Driver door opened | ON |

BCM (BODY CONTROL MODULE)

< ECU DIAGNOSIS INFORMATION >

| Monitor Item | Condition | Value/Status | |
|----------------|---|--------------|----|
| DOOR SW-AS | Passenger door closed | OFF | A |
| | Passenger door opened | ON | |
| DOOR SW-RR | Rear door RH closed | OFF | B |
| | Rear door RH opened | ON | |
| DOOR SW-RL | Rear door LH closed | OFF | C |
| | Rear door LH opened | ON | |
| CDL LOCK SW | Other than power door lock switch LOCK | OFF | D |
| | Power door lock switch LOCK | ON | |
| CDL UNLOCK SW | Other than power door lock switch UNLOCK | OFF | |
| | Power door lock switch UNLOCK | ON | |
| KEY CYL LK-SW | Other than driver door key cylinder LOCK position | OFF | E |
| | Driver door key cylinder LOCK position | ON | |
| KEY CYL UN-SW | Other than driver door key cylinder UNLOCK position | OFF | F |
| | Driver door key cylinder UNLOCK position | ON | |
| HAZARD SW | When hazard switch is not pressed | OFF | G |
| | When hazard switch is pressed | ON | |
| REAR DEF SW | When rear window defogger switch is pressed | ON | |
| TR CANCEL SW | Trunk lid opener cancel switch OFF | OFF | H |
| | Trunk lid opener cancel switch ON | ON | |
| TR/BD OPEN SW | Trunk lid opener switch OFF | OFF | I |
| | While the trunk lid opener switch is turned ON | ON | |
| TRNK/HAT MNTR | Trunk lid closed | OFF | J |
| | Trunk lid opened | ON | |
| RKE-LOCK | When LOCK button of Intelligent Key is not pressed | OFF | K |
| | When LOCK button of Intelligent Key is pressed | ON | |
| RKE-UNLOCK | When UNLOCK button of Intelligent Key is not pressed | OFF | |
| | When UNLOCK button of Intelligent Key is pressed | ON | |
| RKE-TR/BD | When TRUNK OPEN button of Intelligent Key is not pressed | OFF | WW |
| | When TRUNK OPEN button of Intelligent Key is pressed | ON | |
| RKE-PANIC | When PANIC button of Intelligent Key is not pressed | OFF | M |
| | When PANIC button of Intelligent Key is pressed | ON | |
| RKE-P/W OPEN | When UNLOCK button of Intelligent Key is not pressed and held | OFF | N |
| | When UNLOCK button of Intelligent Key is pressed and held | ON | |
| RKE-MODE CHG | When LOCK/UNLOCK button of Intelligent Key is not pressed and held simultaneously | OFF | O |
| | When LOCK/UNLOCK button of Intelligent Key is pressed and held simultaneously | ON | |
| OPTICAL SENSOR | When outside of the vehicle is bright | Close to 5 V | P |
| | When outside of the vehicle is dark | Close to 0 V | |
| REQ SW -DR | When front door request switch is not pressed (driver side) | OFF | |
| | When front door request switch is pressed (driver side) | ON | |
| REQ SW -AS | When front door request switch is not pressed (passenger side) | OFF | |
| | When front door request switch is pressed (passenger side) | ON | |
| REQ SW -RL | When rear door request switch is not pressed (driver side) | OFF | |
| | When rear door request switch is pressed (driver side) | ON | |

BCM (BODY CONTROL MODULE)

< ECU DIAGNOSIS INFORMATION >

| Monitor Item | Condition | Value/Status |
|---------------|---|-----------------------------------|
| REQ SW -RR | When rear door request switch is not pressed (passenger side) | OFF |
| | When rear door request switch is pressed (passenger side) | ON |
| REQ SW -BD/TR | When trunk request switch is not pressed | OFF |
| | When trunk request switch is pressed | ON |
| PUSH SW | When engine switch (push switch) is not pressed | OFF |
| | When engine switch (push switch) is pressed | ON |
| IGN RLY2 -F/B | Ignition switch OFF or ACC | OFF |
| | Ignition switch ON | ON |
| ACC RLY -F/B | Ignition switch OFF | OFF |
| | Ignition switch ACC or ON | ON |
| BRAKE SW 1 | When the brake pedal is not depressed | ON |
| | When the brake pedal is depressed | OFF |
| DETE/CANCL SW | When selector lever is in P position | OFF |
| | When selector lever is in any position other than P | ON |
| SFT PN/N SW | When selector lever is in any position other than P or N | OFF |
| | When selector lever is in P or N position | ON |
| UNLK SEN -DR | Driver door UNLOCK status | OFF |
| | Driver door LOCK status | ON |
| PUSH SW -IPDM | When engine switch (push switch) is not pressed | OFF |
| | When engine switch (push switch) is pressed | ON |
| IGN RLY1 -F/B | Ignition switch OFF or ACC | OFF |
| | Ignition switch ON | ON |
| DETE SW -IPDM | When selector lever is in P position | OFF |
| | When selector lever is in any position other than P | ON |
| SFT PN -IPDM | When selector lever is in any position other than P or N | OFF |
| | When selector lever is in P or N position | ON |
| SFT P -MET | When selector lever is in any position other than P | OFF |
| | When selector lever is in P position | ON |
| SFT N -MET | When selector lever is in any position other than N | OFF |
| | When selector lever is in N position | ON |
| ENGINE STATE | Engine stopped | STOP |
| | While the engine stalls | STALL |
| | At engine cranking | CRANK |
| | Engine running | RUN |
| VEH SPEED 1 | While driving | Equivalent to speedometer reading |
| VEH SPEED 2 | While driving | Equivalent to speedometer reading |
| DOOR STAT-DR | Driver door LOCK status | LOCK |
| | Wait with selective UNLOCK operation (5 seconds) | READY |
| | Driver door UNLOCK status | UNLK |
| DOOR STAT-AS | Passenger door LOCK status | LOCK |
| | Wait with selective UNLOCK operation (5 seconds) | READY |
| | Passenger door UNLOCK status | UNLK |
| ID OK FLAG | Ignition switch ACC or ON | RESET |
| | Ignition switch OFF | SET |

BCM (BODY CONTROL MODULE)

< ECU DIAGNOSIS INFORMATION >

| Monitor Item | Condition | Value/Status | |
|----------------|---|--|----|
| PRMT ENG STRT | When the engine start is prohibited | RESET | A |
| | When the engine start is permitted | SET | |
| KEY SW -SLOT | When Intelligent Key is not inserted into key slot | OFF | B |
| | When Intelligent Key is inserted into key slot | ON | |
| RKE OPE COUN1 | During the operation of Intelligent Key | Operation frequency of Intelligent Key | |
| CONFIRM ID ALL | The key ID that the key slot receives does not accord with any key ID registered to BCM. | YET | C |
| | The key ID that the key slot receives accords with any key ID registered to BCM. | DONE | D |
| CONFIRM ID4 | The key ID that the key slot receives does not accord with the fourth key ID registered to BCM. | YET | E |
| | The key ID that the key slot receives accords with the fourth key ID registered to BCM. | DONE | |
| CONFIRM ID3 | The key ID that the key slot receives does not accord with the third key ID registered to BCM. | YET | F |
| | The key ID that the key slot receives accords with the third key ID registered to BCM. | DONE | |
| CONFIRM ID2 | The key ID that the key slot receives does not accord with the second key ID registered to BCM. | YET | G |
| | The key ID that the key slot receives accords with the second key ID registered to BCM. | DONE | H |
| CONFIRM ID1 | The key ID that the key slot receives does not accord with the first key ID registered to BCM. | YET | I |
| | The key ID that the key slot receives accords with the first key ID registered to BCM. | DONE | |
| TP 4 | The ID of fourth key is not registered to BCM | YET | J |
| | The ID of fourth key is registered to BCM | DONE | |
| TP 3 | The ID of third key is not registered to BCM | YET | K |
| | The ID of third key is registered to BCM | DONE | |
| TP 2 | The ID of second key is not registered to BCM | YET | |
| | The ID of second key is registered to BCM | DONE | |
| TP 1 | The ID of first key is not registered to BCM | YET | WW |
| | The ID of first key is registered to BCM | DONE | |
| AIR PRESS FL | Ignition switch ON (only when the signal from the transmitter is received) | Air pressure of front LH tire | M |
| AIR PRESS FR | Ignition switch ON (only when the signal from the transmitter is received) | Air pressure of front RH tire | |
| AIR PRESS RR | Ignition switch ON (only when the signal from the transmitter is received) | Air pressure of rear RH tire | N |
| AIR PRESS RL | Ignition switch ON (only when the signal from the transmitter is received) | Air pressure of rear LH tire | O |
| ID REGST FL1 | When ID of front LH tire transmitter is registered | DONE | |
| | When ID of front LH tire transmitter is not registered | YET | P |
| ID REGST FR1 | When ID of front RH tire transmitter is registered | DONE | |
| | When ID of front RH tire transmitter is not registered | YET | |
| ID REGST RR1 | When ID of rear RH tire transmitter is registered | DONE | |
| | When ID of rear RH tire transmitter is not registered | YET | |
| ID REGST RL1 | When ID of rear LH tire transmitter is registered | DONE | |
| | When ID of rear LH tire transmitter is not registered | YET | |

BCM (BODY CONTROL MODULE)

< ECU DIAGNOSIS INFORMATION >

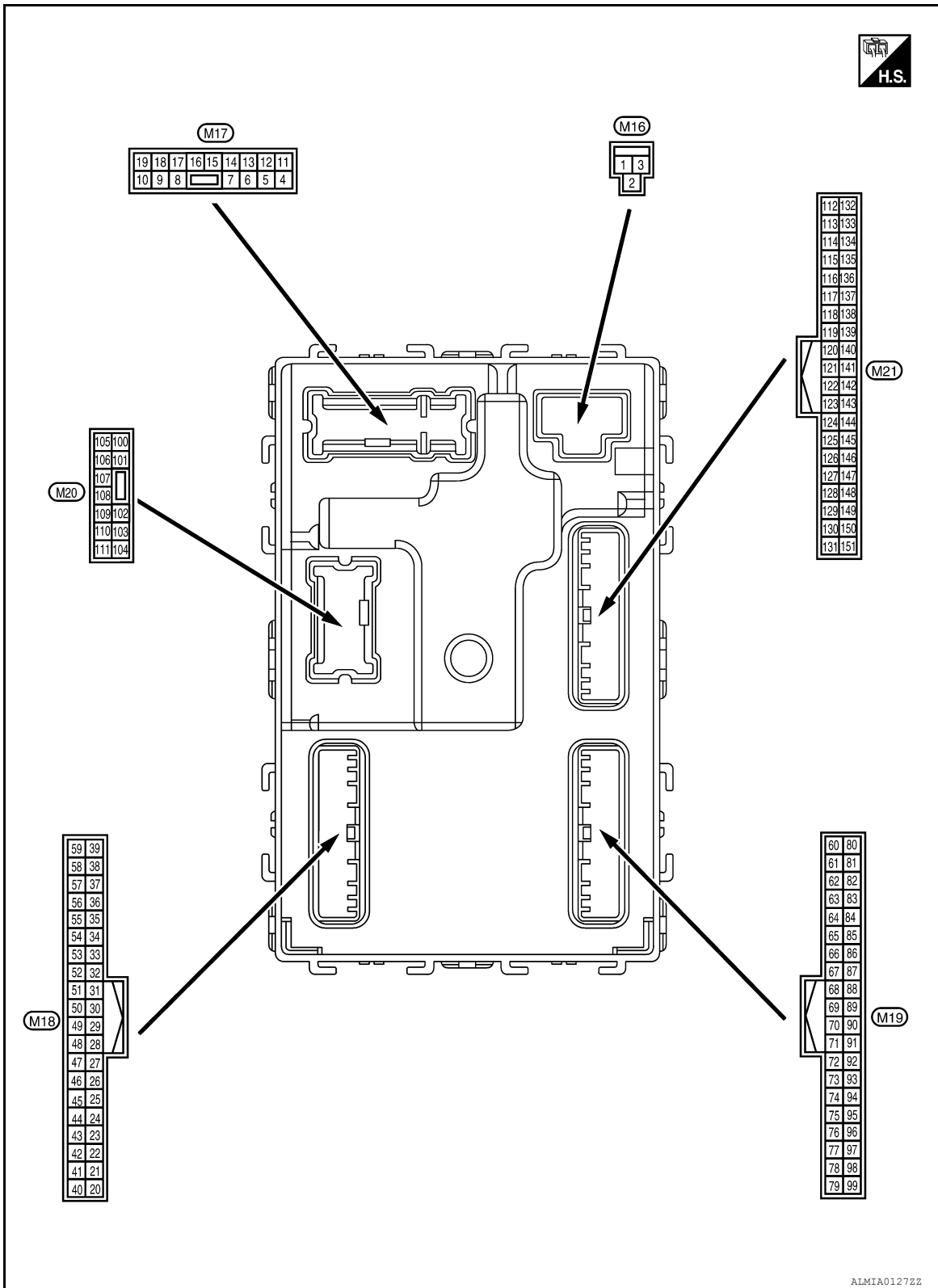
| Monitor Item | Condition | Value/Status |
|--------------|---|--------------|
| WARNING LAMP | Tire pressure indicator OFF | OFF |
| | Tire pressure indicator ON | ON |
| BUZZER | Tire pressure warning alarm is not sounding | OFF |
| | Tire pressure warning alarm is sounding | ON |

BCM (BODY CONTROL MODULE)

< ECU DIAGNOSIS INFORMATION >

Terminal Layout

INFOID:000000008778969

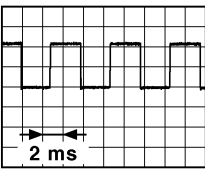


Physical Values

INFOID:000000008778970

BCM (BODY CONTROL MODULE)

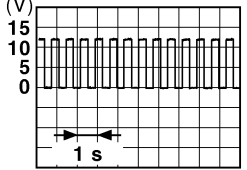
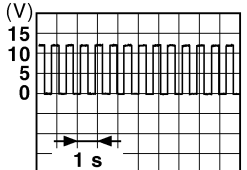
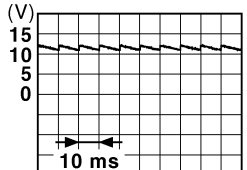
< ECU DIAGNOSIS INFORMATION >

| Terminal No. (Wire color) | | Description | | Condition | | Value (Approx.) |
|------------------------------|--------|---|------------------|--|---|---|
| | | Signal name | Input/ Output | | | |
| (+) | (-) | | | | | |
| 1 (W/B) | Ground | Battery power supply | Input | Ignition switch OFF | | Battery voltage |
| 2 (R/Y) | Ground | Battery power supply output | Output | Ignition switch OFF | | Battery voltage |
| 3 (L/W) | Ground | Ignition power supply output | Output | Ignition switch ON | | Battery voltage |
| 4 (P/W) | Ground | Interior room lamp power supply | Output | After passing the interior room lamp battery saver operation time | | 0V |
| | | | | Any other time after passing the interior room lamp battery saver operation time | | Battery voltage |
| 5 (G) | Ground | Front door RH UNLOCK | Output | Front door RH | UNLOCK (actuator is activated) | Battery voltage |
| | | | | | Other than UNLOCK (actuator is not activated) | 0V |
| 7 (R/W) | Ground | Step lamp | Output | Step lamp | ON | 0V |
| | | | | | OFF | Battery voltage |
| 8 (V) | Ground | All doors LOCK | Output | All doors | LOCK (actuator is activated) | Battery voltage |
| | | | | | Other than LOCK (actuator is not activated) | 0V |
| 9 (L) | Ground | Front door LH UNLOCK | Output | Front door LH | UNLOCK (actuator is activated) | Battery voltage |
| | | | | | Other than UNLOCK (actuator is not activated) | 0V |
| 10 (G) | Ground | Rear door RH and rear door LH UNLOCK | Output | Rear door RH and rear door LH | UNLOCK (actuator is activated) | Battery voltage |
| | | | | | Other than UNLOCK (actuator is not activated) | 0V |
| 11 (Y/R) | Ground | Battery power supply | Input | Ignition switch OFF | | Battery voltage |
| 13 (B) | Ground | Ground | — | Ignition switch ON | | 0V |
| 14 (GR/W) | Ground | Engine switch (push switch) illumination ground | Input | Tail lamp | OFF | 0V |
| | | | | | ON | NOTE: When the illumination brightening/dimming level is in the neutral position  |
| 15 (Y/L) | Ground | ACC indicator lamp | Output | Ignition switch | OFF | Battery voltage |
| | | | | | ACC or ON | 0V |

JSNIA0010GB

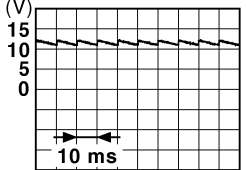
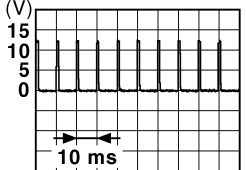

BCM (BODY CONTROL MODULE)

< ECU DIAGNOSIS INFORMATION >

| Terminal No. (Wire color) | | Description | | Condition | Value (Approx.) |
|------------------------------|--------|---|------------------|---|---|
| (+) | (-) | Signal name | Input/ Output | | |
| 17 (G/B) | Ground | Turn signal (RH) | Output | Ignition switch ON | Turn signal switch OFF 0V |
| | | | | Turn signal switch RH |  6.5 V |
| 18 (G/Y) | Ground | Turn signal (LH) | Output | Ignition switch ON | Turn signal switch OFF 0V |
| | | | | Turn signal switch LH |  6.5 V |
| 19 (Y) | Ground | Room lamp timer control | Output | Interior room lamp | OFF Battery voltage |
| | | | | ON | 0V |
| 21 (P/B) | Ground | Optical sensor signal | Input | Ignition switch ON | When outside of the vehicle is bright Close to 5V |
| | | | | When outside of the vehicle is dark Close to 0V | |
| 24 (R/W) | Ground | Stop lamp switch 1 | Input | — | Battery voltage |
| 26 (O/L) | Ground | Stop lamp switch 2 | Input | Stop lamp switch | OFF (brake pedal is released) 0V |
| | | | | ON (brake pedal is depressed) Battery voltage | |
| 27 (O) | Ground | Front door lock assembly LH (unlock sensor) | Input | Front door LH | LOCK status  11.8V |
| | | | | UNLOCK status 0V | |
| 29 (Y) | Ground | Key slot switch | Input | When Intelligent Key is inserted into key slot Battery voltage | |
| | | | | When Intelligent Key is not inserted into key slot 0V | |
| 31 (G) | Ground | Rear window defogger feedback signal | Input | Rear window defogger switch | OFF 0V |
| | | | | ON Battery voltage | |

BCM (BODY CONTROL MODULE)

< ECU DIAGNOSIS INFORMATION >

| Terminal No. (Wire color) | | Description | | Condition | | Value (Approx.) |
|------------------------------|--------|--|------------------|--|--|---|
| (+) | (-) | Signal name | Input/ Output | | | |
| 32 (R/B) | Ground | Front door RH switch | Input | Front door RH switch | OFF (when front door RH closes) |  <p style="text-align: right; font-size: small;">JPMIA0011GB</p> <p style="text-align: center;">11.8 V</p> |
| | | | | | ON (when front door RH opens) | 0V |
| 37 (O) | Ground | Trunk lid opener cancel switch | Input | Trunk lid opener cancel switch | CANCEL |  <p style="text-align: right; font-size: small;">JPMIA0012GB</p> <p style="text-align: center;">1.1V</p> |
| | | | | | ON | 0V |
| 38 (GR/W) | Ground | Rear window defogger ON signal | Input | Rear window defogger switch | OFF | 5V |
| | | | | | ON | 0V |
| 40 (Y/G) | Ground | Power window serial link | Input/ Output | Ignition switch ON |  <p style="text-align: right; font-size: small;">JPMIA0013GB</p> <p style="text-align: center;">10.2V</p> | |
| | | | | Ignition switch OFF or ACC | 0V | |
| 41 (W) | Ground | Engine switch (push switch) illumination | Output | Engine switch (push switch) illumination | ON | 5.5V |
| | | | | | OFF | 0V |
| 42 (R) | Ground | LOCK indicator lamp | Output | LOCK indicator lamp | ON | 0V |
| | | | | | OFF | Battery voltage |
| 45 (P) | Ground | Receiver & sensor ground | Input | Ignition switch ON | | 0V |
| 46 (V/W) | Ground | Receiver & sensor power supply output | Output | Ignition switch | OFF | 0V |
| | | | | | ACC or ON | 5.0V |

BCM (BODY CONTROL MODULE)

< ECU DIAGNOSIS INFORMATION >

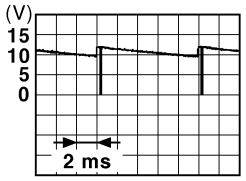
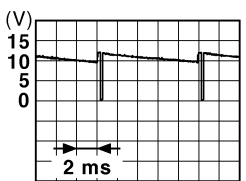
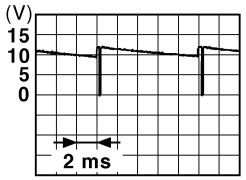
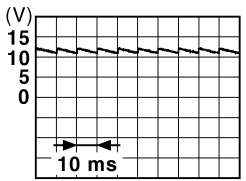
| Terminal No. (Wire color) | | Description | | Condition | Value (Approx.) |
|------------------------------|--------|---|------------------|--|--|
| (+) | (-) | Signal name | Input/ Output | | |
| 47 (G/O) | Ground | Tire pressure receiver signal | Input/ Output | Ignition switch ON | <p style="text-align: right;">OCC3881D</p> |
| | | | | When receiving the signal from the transmitter | <p style="text-align: right;">OCC3880D</p> |
| 48 (R/G) | Ground | Selector lever transmission range switch signal | Input | Selector lever | P or N position 12.0V |
| | | | | Except P and N positions | 0V |
| 49 (L/O) | Ground | Security indicator signal | Output | Security indicator | ON 0V |
| | | | | Blinking | <p style="text-align: right;">JPMIA0014GB</p> <p style="text-align: center;">11.3V</p> |
| 50 (LG/B) | Ground | Combination switch OUTPUT 5 | Input | Combination switch (Wiper intermittent dial 4) | All switch OFF 0V |
| | | | | Lighting switch 1ST | <p style="text-align: right;">JPMIA0031GB</p> <p style="text-align: center;">10.7V</p> |
| | | | | Lighting switch high-beam | |
| | | | | Lighting switch 2ND | |
| Turn signal switch RH | 0V | | | | |
| 51 (L/W) | Ground | Combination switch OUTPUT 1 | Input | Combination switch | All switch OFF (Wiper intermittent dial 4) 0V |
| | | | | Front wiper switch HI (Wiper intermittent dial 4) Any of the conditions below with all switch OFF <ul style="list-style-type: none"> • Wiper intermittent dial 1 • Wiper intermittent dial 2 • Wiper intermittent dial 3 • Wiper intermittent dial 6 • Wiper intermittent dial 7 | <p style="text-align: right;">JPMIA0032GB</p> <p style="text-align: center;">10.7V</p> |

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

WW

BCM (BODY CONTROL MODULE)

< ECU DIAGNOSIS INFORMATION >

| Terminal No. (Wire color) | | Description | | Condition | Value (Approx.) | |
|------------------------------|--------|---|------------------|---|---|---|
| (+) | (-) | Signal name | Input/ Output | | | |
| 52 (G/B) | Ground | Combination switch OUTPUT 2 | Input | Combination switch | All switch OFF (Wiper intermittent dial 4) | 0V |
| | | | | | Front washer switch ON (Wiper intermittent dial 4) |  <p style="text-align: right; font-size: small;">JPMIA0033GB</p> |
| | | | | | Any of the conditions below with all switch OFF | |
| | | | | | <ul style="list-style-type: none"> • Wiper intermittent dial 1 • Wiper intermittent dial 5 • Wiper intermittent dial 6 | |
| | | | | | 10.7V | |
| 53 (LG/ R) | Ground | Combination switch OUTPUT 3 | Input | Combination switch (Wiper intermit- tent dial 4) | All switch OFF | 0V |
| | | | | | Front wiper switch INT |  <p style="text-align: right; font-size: small;">JPMIA0034GB</p> |
| | | | | | Front wiper switch LO | |
| | | | | | Lighting switch AUTO | |
| | | | | | 10.7V | |
| 54 (G/Y) | Ground | Combination switch OUTPUT 4 | Input | Combination switch (Wiper intermit- tent dial 4) | All switch OFF | 0V |
| | | | | | Front fog lamp switch ON |  <p style="text-align: right; font-size: small;">JPMIA0035GB</p> |
| | | | | | Lighting switch 2ND | |
| | | | | | Lighting switch flash-to- pass | |
| | | | | | 10.7V | |
| 57 (W) | Ground | Tire pressure warn- ing check switch | Input | — | 5V | |
| 58 (SB) | Ground | Front door LH switch | Input | Front door LH switch | OFF (front door LH CLOSE) |  <p style="text-align: right; font-size: small;">JPMIA0011GB</p> |
| | | | | | ON (front door LH OPEN) | |
| 59 (G/R) | Ground | Rear window defog- ger relay | Output | Rear window de- fogger | Active | Battery voltage |
| | | | | Not activated | 0V | |

BCM (BODY CONTROL MODULE)

< ECU DIAGNOSIS INFORMATION >

| Terminal No. (Wire color) | | Description | | Condition | Value (Approx.) |
|------------------------------|--------|-------------------------------------|------------------|--|--------------------|
| (+) | (-) | Signal name | Input/ Output | | |
| 60 (B/R) | Ground | Front console antenna 2 (-) | Output | Ignition switch OFF | <p>JMKIA0062GB</p> |
| | | | | When Intelligent Key is not in the passenger compartment | <p>JMKIA0063GB</p> |
| 61 (W/R) | Ground | Center console antenna 2 (+) | Output | Ignition switch OFF | <p>JMKIA0062GB</p> |
| | | | | When Intelligent Key is not in the passenger compartment | <p>JMKIA0063GB</p> |
| 62 (V) | Ground | Front outside handle RH antenna (-) | Output | When the front door RH request switch is operated with ignition switch OFF | <p>JMKIA0062GB</p> |
| | | | | When Intelligent Key is not in the antenna detection area | <p>JMKIA0063GB</p> |

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

WW

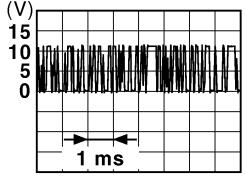
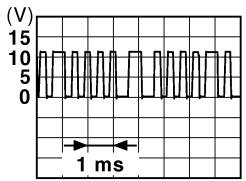
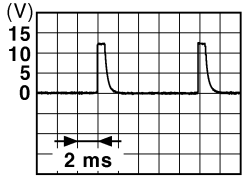
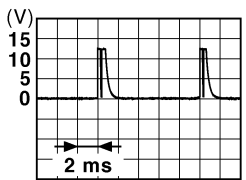
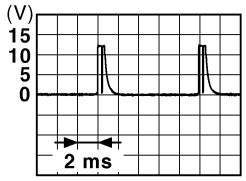
BCM (BODY CONTROL MODULE)

< ECU DIAGNOSIS INFORMATION >

| Terminal No. (Wire color) | | Description | | Condition | Value (Approx.) |
|------------------------------|--------|--|------------------|--|---|
| (+) | (-) | Signal name | Input/ Output | | |
| 63 (P) | Ground | Front outside handle RH antenna (+) | Output | When Intelligent Key is in the antenna detection area | <p style="text-align: right; font-size: small;">JMKIA0062GB</p> |
| | | | | When the front door RH request switch is operat- ed with ignition switch OFF | <p style="text-align: right; font-size: small;">JMKIA0063GB</p> |
| 64 (V) | Ground | Front outside handle LH antenna (-) | Output | When Intelligent Key is in the antenna detection area | <p style="text-align: right; font-size: small;">JMKIA0062GB</p> |
| | | | | When the front door LH request switch is operat- ed with ignition switch OFF | <p style="text-align: right; font-size: small;">JMKIA0063GB</p> |
| 65 (P) | Ground | Front outside handle LH antenna (+) | Output | When Intelligent Key is in the antenna detection area | <p style="text-align: right; font-size: small;">JMKIA0062GB</p> |
| | | | | When the front door LH request switch is operat- ed with ignition switch OFF | <p style="text-align: right; font-size: small;">JMKIA0063GB</p> |

BCM (BODY CONTROL MODULE)

< ECU DIAGNOSIS INFORMATION >

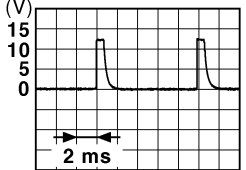
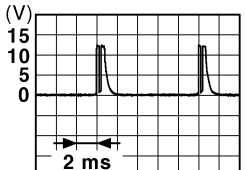

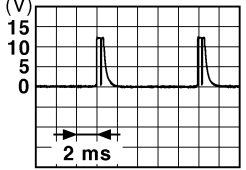
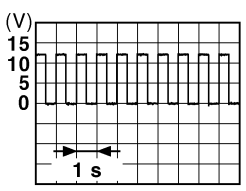
| Terminal No. (Wire color) | | Description | | Condition | | Value (Approx.) |
|------------------------------|--------|---|------------------|---|--|---|
| | | Signal name | Input/ Output | | | |
| (+) | (-) | | | | | |
| 68 (G/O) | Ground | NATS antenna amp (built in key slot) | Input/ Output | During waiting | Ignition switch is pressed while inserting the Intelli- gent Key into the key slot. | Just after pressing ignition switch. Pointer of tester should move. |
| 69 (O) | Ground | NATS antenna amp (built in key slot) | Input/ Output | During waiting | Ignition switch is pressed while inserting the Intelli- gent Key into the key slot. | Just after pressing ignition switch. Pointer of tester should move. |
| 70 (R/B) | Ground | Ignition relay-2 con- trol | Output | Ignition switch | OFF or ACC | 0V |
| | | | | | ON | Battery voltage |
| 71 (L/O) | Ground | Remote keyless entry receiver signal | Input/ Output | During waiting | |  <p style="text-align: right; font-size: small;">JMKIA0064GB</p> |
| | | | | When operating either button on Intelligent Key | |  <p style="text-align: right; font-size: small;">JMKIA0065GB</p> |
| 75 (R/Y) | Ground | Combination switch INPUT 5 | Output | Combination switch | All switch OFF (Wiper intermittent dial 4) |  <p style="text-align: right; font-size: small;">JPMIA0041GB</p> <p style="text-align: center;">1.4V</p> |
| | | | | | Front fog lamp switch ON (Wiper intermittent dial 4) |  <p style="text-align: right; font-size: small;">JPMIA0037GB</p> <p style="text-align: center;">1.3V</p> |
| | | | | | Any of the conditions below with all switch OFF • Wiper intermittent dial 1 • Wiper intermittent dial 2 • Wiper intermittent dial 6 • Wiper intermittent dial 7 |  <p style="text-align: right; font-size: small;">JPMIA0040GB</p> <p style="text-align: center;">1.3V</p> |

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

WW

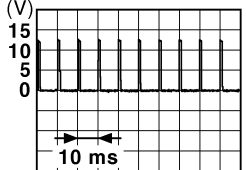
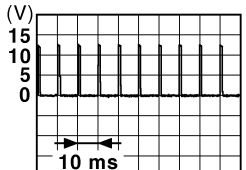
BCM (BODY CONTROL MODULE)

< ECU DIAGNOSIS INFORMATION >

| Terminal No. (Wire color) | | Description | | Condition | Value (Approx.) | |
|------------------------------|--------|-------------------------------|------------------|----------------------------|--|---|
| (+) | (-) | Signal name | Input/ Output | | | |
| 76 (R/G) | Ground | Combination switch INPUT 3 | Output | Combination switch | All switch OFF (Wiper intermittent dial 4) |  <p style="text-align: right; font-size: small;">JPMIA0041GB</p> <p style="text-align: center;">1.4V</p> |
| | | | | | Lighting switch high-beam (Wiper intermittent dial 4) |  <p style="text-align: right; font-size: small;">JPMIA0036GB</p> <p style="text-align: center;">1.3V</p> |
| | | | | | Lighting switch 2ND (Wiper intermittent dial 4) |  <p style="text-align: right; font-size: small;">JPMIA0037GB</p> <p style="text-align: center;">1.3V</p> |
| | | | | | Any of the conditions below with all switch OFF | <ul style="list-style-type: none"> • Wiper intermittent dial 1 • Wiper intermittent dial 2 • Wiper intermittent dial 3  <p style="text-align: right; font-size: small;">JPMIA0040GB</p> <p style="text-align: center;">1.3V</p> |
| 78 (P) | Ground | CAN-L | Input/ Output | — | — | |
| 79 (L) | Ground | CAN-H | Input/ Output | — | — | |
| 80 (R/L) | Ground | Key slot illumination | Output | Key slot illumina- tion | OFF | Battery voltage |
| | | | | | Blinking |  <p style="text-align: right; font-size: small;">JPMIA0015GB</p> <p style="text-align: center;">6.5V</p> |
| 81 (LG) | Ground | ON indicator lamp | Output | Ignition switch | ON | 0V |
| | | | | | OFF or ACC | 0V |
| | | | | | ON | Battery voltage |

BCM (BODY CONTROL MODULE)

< ECU DIAGNOSIS INFORMATION >

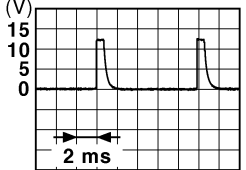

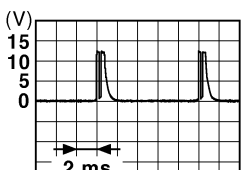
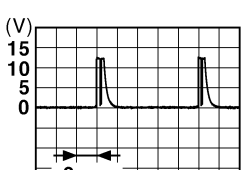
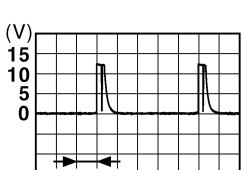
| Terminal No. (Wire color) | | Description | | Condition | | Value (Approx.) |
|------------------------------|--------|--|------------------|------------------------------|---------------------------|--|
| (+) | (-) | Signal name | Input/ Output | | | |
| 83 (L) | Ground | ACC relay control | Output | Ignition switch | OFF | 0V |
| | | | | | ACC or ON | Battery voltage |
| 84 (Y/R) | Ground | CVT shift selector | Output | — | | Battery voltage |
| 87 (G/B) | Ground | Selector lever P position switch | Input | Selector lever | P position | 0V |
| | | | | | Any position other than P | Battery voltage |
| 88 (R) | Ground | Front door RH request switch | Input | Front door RH request switch | ON (pressed) | 0V |
| | | | | | OFF (not pressed) |  <p style="text-align: center;">1.0V</p> |
| 89 (R) | Ground | Front door LH request switch | Input | Front door LH request switch | ON (pressed) | 0V |
| | | | | | OFF (not pressed) |  <p style="text-align: center;">1.0V</p> |
| 90 (Y) | Ground | Blower fan motor relay control | Output | Ignition switch | OFF or ACC | 0V |
| | | | | | ON | Battery voltage |
| 91 (L/R) | Ground | Remote keyless entry receiver power supply | Output | Ignition switch OFF | | Battery voltage |

A
B
C
D
E
F
G
H
I
J
K

WW

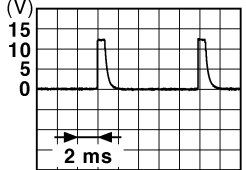
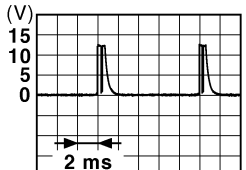
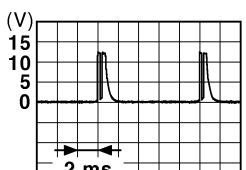
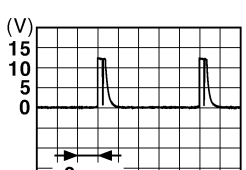
BCM (BODY CONTROL MODULE)

< ECU DIAGNOSIS INFORMATION >

| Terminal No. (Wire color) | | Description | | Condition | Value (Approx.) |
|------------------------------|--------|-------------------------------|------------------|--|--|
| (+) | (-) | Signal name | Input/ Output | | |
| 95 (R/W) | Ground | Combination switch INPUT 1 | Output | Combination switch (Wiper intermittent dial 4) | All switch OFF <div style="text-align: right;">  <p>1.4V</p> </div> |
| | | | | | Turn signal switch LH <div style="text-align: right;">  <p>1.3V</p> </div> |
| | | | | | Turn signal switch RH <div style="text-align: right;">  <p>1.3V</p> </div> |
| | | | | | Front wiper switch LO <div style="text-align: right;">  <p>1.3V</p> </div> |
| | | | | | Front washer switch ON <div style="text-align: right;">  <p>1.3V</p> </div> |

BCM (BODY CONTROL MODULE)

< ECU DIAGNOSIS INFORMATION >

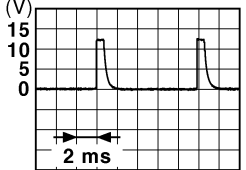

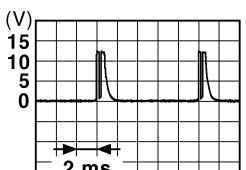
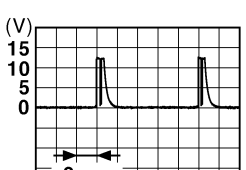
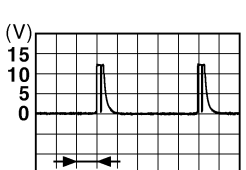
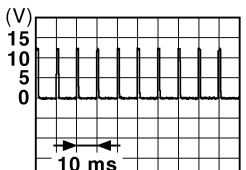
| Terminal No. (Wire color) | | Description | | Condition | Value (Approx.) |
|------------------------------|--------|-------------------------------|---------------------------------|---|---|
| (+) | (-) | Signal name | Input/ Output | | |
| 96 (P/B) | Ground | Combination switch INPUT 4 | Output Combination switch | All switch OFF (Wiper intermittent dial 4) |  <p style="text-align: center;">1.4V</p> |
| | | | | Lighting switch AUTO (Wiper intermittent dial 4) |  <p style="text-align: center;">1.3V</p> |
| | | | | Lighting switch 1ST (Wiper intermittent dial 4) |  <p style="text-align: center;">1.3V</p> |
| | | | | Any of the conditions below with all switch OFF | <ul style="list-style-type: none"> • Wiper intermittent dial 1 • Wiper intermittent dial 5 • Wiper intermittent dial 6  <p style="text-align: center;">1.3V</p> |

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

WW

BCM (BODY CONTROL MODULE)

< ECU DIAGNOSIS INFORMATION >

| Terminal No. (Wire color) | | Description | | Condition | Value (Approx.) | |
|------------------------------|--------|-------------------------------|------------------|--|-------------------------------|--|
| (+) | (-) | Signal name | Input/ Output | | | |
| 97 (R/B) | Ground | Combination switch INPUT 2 | Output | Combination switch (Wiper intermittent dial 4) | All switch OFF |  <p style="text-align: right;">1.4V</p> |
| | | | | | Lighting switch flash-to-pass |  <p style="text-align: right;">1.3V</p> |
| | | | | | Lighting switch 2ND |  <p style="text-align: right;">1.3V</p> |
| | | | | | Front wiper switch INT |  <p style="text-align: right;">1.3V</p> |
| | | | | | Front wiper switch HI |  <p style="text-align: right;">1.3V</p> |
| | | | | | Pressed | 0 V |
| 98 (G/O) | Ground | Hazard switch | Input | Hazard switch | Not pressed |  <p style="text-align: right;">1.1V</p> |

BCM (BODY CONTROL MODULE)

< ECU DIAGNOSIS INFORMATION >

| Terminal No. (Wire color) | | Description | | Condition | Value (Approx.) | |
|------------------------------|--------|--------------------------|------------------|---------------------|--|-----------------|
| (+) | (-) | Signal name | Input/ Output | | | |
| 103 (V) | Ground | Trunk lid opening. | Output | Trunk lid | Open (trunk lid opener actuator is activated) | Battery voltage |
| | | | | | Close (trunk lid opener actuator is not activated) | 0V |
| 110 (V/W) | Ground | Trunk room lamp | Output | Trunk room lamp | ON | 0V |
| | | | | | OFF | Battery voltage |
| 114 (B) | Ground | Trunk room antenna 1 (-) | Output | Ignition switch OFF | When Intelligent Key is in the passenger compartment | |
| | | | | | When Intelligent Key is not in the passenger compartment | |
| 115 (W) | Ground | Trunk room antenna 1 (+) | Output | Ignition switch OFF | When Intelligent Key is in the passenger compartment | |
| | | | | | When Intelligent Key is not in the passenger compartment | |

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

WW

BCM (BODY CONTROL MODULE)

< ECU DIAGNOSIS INFORMATION >

| Terminal No. (Wire color) | | Description | | Condition | Value (Approx.) |
|------------------------------|--------|-----------------------------------|------------------|--|--|
| (+) | (-) | Signal name | Input/ Output | | |
| 118 (L/O) | Ground | Rear bumper antenna (-) | Output | When the trunk lid request switch is operated with ignition switch OFF | |
| | | | | When Intelligent Key is in the antenna detection area | |
| 119 (BR/W) | Ground | Rear bumper antenna (+) | Output | When the trunk lid request switch is operated with ignition switch OFF | |
| | | | | When Intelligent Key is not in the antenna detection area | |
| 127 (BR/W) | Ground | Ignition relay (IPDM E/R) control | Output | Ignition switch | OFF or ACC Battery voltage ON 0V |
| | | | | OFF (trunk is closed) | |
| 130 (W) | Ground | Trunk room lamp switch | Input | Trunk room lamp switch | OFF (trunk is closed) 11.8V ON (trunk is open) 0V |
| | | | | When selector lever is in P or N position and the brake is depressed | Battery voltage |
| 132 (R) | Ground | Starter motor relay control | Output | Ignition switch ON | When selector lever is in P or N position and the brake is not depressed 0V |

BCM (BODY CONTROL MODULE)

< ECU DIAGNOSIS INFORMATION >

| Terminal No. (Wire color) | | Description | | Condition | Value (Approx.) |
|------------------------------|--------|-----------------------------|------------------|---------------------------------|--------------------------------|
| (+) | (-) | Signal name | Input/ Output | | |
| 140 (BR) | Ground | Engine switch (push switch) | Input | Engine switch (push switch) | Pressed 0V |
| | | | | Not pressed Battery voltage | |
| 141 (BR) | Ground | Trunk request switch | Input | Trunk request switch | ON (pressed) 0V |
| | | | | OFF (not pressed) | |
| 144 (GR) | Ground | Request switch buzzer | Output | Request switch buzzer | Sounding 0V |
| | | | | Not sounding Battery voltage | |
| 147 (L/R) | Ground | Trunk lid opener switch | Input | Trunk lid opener switch | Pressed 0V |
| | | | | Not pressed Battery voltage | |
| 148 (R/W) | Ground | Rear door RH switch | Input | Rear door RH switch | OFF (when rear door RH closes) |
| | | | | ON (when rear door RH opens) | |
| 149 (R/B) | Ground | Rear door LH switch | Input | Rear door LH switch | OFF (when rear door LH closes) |
| | | | | ON (when rear door LH opens) | |

Fail Safe

INFOID:000000008778971

| Display contents of CONSULT | Fail-safe | Cancellation |
|-----------------------------|-------------------------|--|
| B2190: NATS ANTENNA AMP | Inhibit engine cranking | Erase DTC |
| B2191: DIFFERENCE OF KEY | Inhibit engine cranking | Erase DTC |
| B2192: ID DISCORD BCM-ECM | Inhibit engine cranking | Erase DTC |
| B2193: CHAIN OF BCM-ECM | Inhibit engine cranking | Erase DTC |
| B2195: ANTI-SCANNING | Inhibit engine cranking | Erase DTC |
| B2560: STARTER CONT RELAY | Inhibit engine cranking | 500 ms after the following CAN signal communication status has become consistent <ul style="list-style-type: none"> • Starter control relay signal • Starter relay status signal |

BCM (BODY CONTROL MODULE)

< ECU DIAGNOSIS INFORMATION >

| Display contents of CONSULT | Fail-safe | Cancellation |
|-----------------------------|---|---|
| B2562: LO VOLTAGE | Inhibit engine cranking | 100 ms after the power supply voltage increases to more than 8.8 V |
| B2608: STARTER RELAY | Inhibit engine cranking | 500 ms after the following signal communication status becomes consistent <ul style="list-style-type: none"> • Starter motor relay control signal • Starter relay status signal (CAN) |
| B260A: IGNITION RELAY | Inhibit engine cranking | 500 ms after the following conditions are fulfilled <ul style="list-style-type: none"> • IGN relay (IPDM E/R) control signal: OFF (Battery voltage) • Ignition ON signal (CAN to IPDM E/R): OFF (Request signal) • Ignition ON signal (CAN from IPDM E/R): OFF (Condition signal) |
| B260F: ENG STATE SIG LOST | Maintains the power supply position attained at the time of DTC detection | When any of the following conditions is fulfilled <ul style="list-style-type: none"> • Power position changes to ACC • Receives engine status signal (CAN) |
| B2617: STARTER RELAY CIRC | Inhibit engine cranking | 1 second after the starter motor relay control inside BCM becomes normal |
| B2618: BCM | Inhibit engine cranking | 1 second after the ignition relay (IPDM E/R) control inside BCM becomes normal |
| B26E1: ENG STATE NO RECIV | Inhibit engine cranking | When any of the following conditions are fulfilled <ul style="list-style-type: none"> • Power position changes to ACC • Receives engine status signal (CAN) |

DTC Inspection Priority Chart

INFOID:000000008778972

If some DTCs are displayed at the same time, perform inspections one by one based on the following priority chart.

| Priority | DTC |
|----------|---|
| 1 | <ul style="list-style-type: none"> • B2562: LO VOLTAGE |
| 2 | <ul style="list-style-type: none"> • U1000: CAN COMM CIRCUIT • U1010: CONTROL UNIT (CAN) |
| 3 | <ul style="list-style-type: none"> • B2190: NATS ANTENNA AMP • B2191: DIFFERENCE OF KEY • B2192: ID DISCORD BCM-ECM • B2193: CHAIN OF BCM-ECM |
| 4 | <ul style="list-style-type: none"> • B2553: IGNITION RELAY • B2555: STOP LAMP • B2556: PUSH-BTN IGN SW • B2557: VEHICLE SPEED • B2560: STARTER CONT RELAY • B2601: SHIFT POSITION • B2602: SHIFT POSITION • B2603: SHIFT POSI STATUS • B2604: PNP SWITCH • B2605: PNP SWITCH • B2608: STARTER RELAY • B260A: IGNITION RELAY • B260F: ENG STATE SIG LOST • B2614: ACC RELAY CIRC • B2615: BLOWER RELAY CIRC • B2616: IGN RELAY CIRC • B2617: STARTER RELAY CIRC • B2618: BCM • B261A: PUSH-BTN IGN SW • B26E1: ENG STATE NO RECIV • C1729: VHCL SPEED SIG ERR • U0415: VEHICLE SPEED SIG |

BCM (BODY CONTROL MODULE)

< ECU DIAGNOSIS INFORMATION >

| Priority | DTC | |
|----------|---|---------------------------------|
| 5 | <ul style="list-style-type: none"> • C1704: LOW PRESSURE FL • C1705: LOW PRESSURE FR • C1706: LOW PRESSURE RR • C1707: LOW PRESSURE RL • C1708: [NO DATA] FL • C1709: [NO DATA] FR • C1710: [NO DATA] RR • C1711: [NO DATA] RL • C1712: [CHECKSUM ERR] FL • C1713: [CHECKSUM ERR] FR • C1714: [CHECKSUM ERR] RR • C1715: [CHECKSUM ERR] RL • C1716: [PRESSDATA ERR] FL • C1717: [PRESSDATA ERR] FR • C1718: [PRESSDATA ERR] RR • C1719: [PRESSDATA ERR] RL • C1720: [CODE ERR] FL • C1721: [CODE ERR] FR • C1722: [CODE ERR] RR • C1723: [CODE ERR] RL • C1724: [BATT VOLT LOW] FL • C1725: [BATT VOLT LOW] FR • C1726: [BATT VOLT LOW] RR • C1727: [BATT VOLT LOW] RL • C1734: CONTROL UNIT | A B C D E F G |
| 6 | <ul style="list-style-type: none"> • B2622: INSIDE ANTENNA • B2623: INSIDE ANTENNA | H |

DTC Index

INFOID:000000008778973

NOTE:

- Details of time display
- CRNT: Displays when there is a malfunction now or after returning to the normal condition until turning ignition switch OFF → ON again.
- 1 - 39: Displayed if any previous malfunction is present when current condition is normal. It increases 1 → 2 → 3...38 → 39 after returning to the normal condition whenever ignition switch OFF → ON. The counter remains at 39 even if the number of cycles exceeds it. It is counted from 1 again when turning ignition switch OFF → ON after returning to the normal condition if the malfunction is detected again.

| CONSULT display | Fail-safe | Intelligent Key warning lamp ON | Tire pressure monitor warning lamp ON | Reference page | WW |
|--|-----------|---------------------------------|---------------------------------------|------------------------|----|
| No DTC is detected. further testing may be required. | — | — | — | — | M |
| U1000: CAN COMM CIRCUIT | — | — | — | BCS-32 | N |
| U1010: CONTROL UNIT (CAN) | — | — | — | BCS-33 | |
| U0415: VEHICLE SPEED SIG | — | — | — | BCS-34 | |
| B2190: NATS ANTENNA AMP | × | — | — | SEC-37 | O |
| B2191: DIFFERENCE OF KEY | × | — | — | SEC-40 | |
| B2192: ID DISCORD BCM-ECM | × | — | — | SEC-41 | P |
| B2193: CHAIN OF BCM-ECM | × | — | — | SEC-42 | |
| B2553: IGNITION RELAY | — | — | — | PCS-46 | |
| B2555: STOP LAMP | — | — | — | SEC-43 | |
| B2556: PUSH-BTN IGN SW | — | × | — | SEC-46 | |
| B2557: VEHICLE SPEED | × | × | — | SEC-48 | |
| B2560: STARTER CONT RELAY | × | × | — | SEC-49 | |

BCM (BODY CONTROL MODULE)

< ECU DIAGNOSIS INFORMATION >

| CONSULT display | Fail-safe | Intelligent Key warning lamp ON | Tire pressure monitor warning lamp ON | Reference page |
|---------------------------|-----------|------------------------------------|---|------------------------|
| B2562: LOW VOLTAGE | — | — | — | BCS-35 |
| B2601: SHIFT POSITION | × | × | — | SEC-50 |
| B2602: SHIFT POSITION | × | × | — | SEC-53 |
| B2603: SHIFT POSI STATUS | × | × | — | SEC-56 |
| B2604: PNP SWITCH | × | × | — | SEC-59 |
| B2605: PNP SWITCH | × | × | — | SEC-61 |
| B2608: STARTER RELAY | × | × | — | SEC-63 |
| B260A: IGNITION RELAY | × | × | — | PCS-48 |
| B260F: ENG STATE SIG LOST | × | × | — | SEC-65 |
| B2614: ACC RELAY CIRC | — | × | — | PCS-50 |
| B2615: BLOWER RELAY CIRC | — | × | — | PCS-53 |
| B2616: IGN RELAY CIRC | — | × | — | PCS-56 |
| B2617: STARTER RELAY CIRC | × | × | — | SEC-67 |
| B2618: BCM | × | × | — | PCS-59 |
| B261A: PUSH-BTN IGN SW | — | × | — | PCS-60 |
| B2622: INSIDE ANTENNA | — | — | — | DLK-60 |
| B2623: INSIDE ANTENNA | — | — | — | DLK-63 |
| B26E1: ENG STATE NO RES | × | × | — | SEC-66 |
| C1704: LOW PRESSURE FL | — | — | × | WT-43 |
| C1705: LOW PRESSURE FR | — | — | × | WT-43 |
| C1706: LOW PRESSURE RR | — | — | × | WT-43 |
| C1707: LOW PRESSURE RL | — | — | × | WT-43 |
| C1708: [NO DATA] FL | — | — | × | WT-13 |
| C1709: [NO DATA] FR | — | — | × | WT-13 |
| C1710: [NO DATA] RR | — | — | × | WT-13 |
| C1711: [NO DATA] RL | — | — | × | WT-13 |
| C1712: [CHECKSUM ERR] FL | — | — | × | WT-15 |
| C1713: [CHECKSUM ERR] FR | — | — | × | WT-15 |
| C1714: [CHECKSUM ERR] RR | — | — | × | WT-15 |
| C1715: [CHECKSUM ERR] RL | — | — | × | WT-15 |
| C1716: [PRESSDATA ERR] FL | — | — | × | WT-17 |
| C1717: [PRESSDATA ERR] FR | — | — | × | WT-17 |
| C1718: [PRESSDATA ERR] RR | — | — | × | WT-17 |
| C1719: [PRESSDATA ERR] RL | — | — | × | WT-17 |
| C1720: [CODE ERR] FL | — | — | × | WT-15 |
| C1721: [CODE ERR] FR | — | — | × | WT-15 |
| C1722: [CODE ERR] RR | — | — | × | WT-15 |
| C1723: [CODE ERR] RL | — | — | × | WT-15 |
| C1724: [BATT VOLT LOW] FL | — | — | × | WT-15 |
| C1725: [BATT VOLT LOW] FR | — | — | × | WT-15 |
| C1726: [BATT VOLT LOW] RR | — | — | × | WT-15 |
| C1727: [BATT VOLT LOW] RL | — | — | × | WT-15 |

BCM (BODY CONTROL MODULE)

< ECU DIAGNOSIS INFORMATION >

| CONSULT display | Fail-safe | Intelligent Key warning lamp ON | Tire pressure monitor warning lamp ON | Reference page |
|---------------------------|-----------|---------------------------------|---------------------------------------|-----------------------|
| C1729: VHCL SPEED SIG ERR | — | — | × | WT-19 |
| C1734: CONTROL UNIT | — | — | × | WT-20 |

A

B

C

D

E

F

G

H

I

J

K

WW

M

N

O

P

IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)

< ECU DIAGNOSIS INFORMATION >

IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)

Reference Value

INFOID:000000008778974

VALUES ON THE DIAGNOSIS TOOL

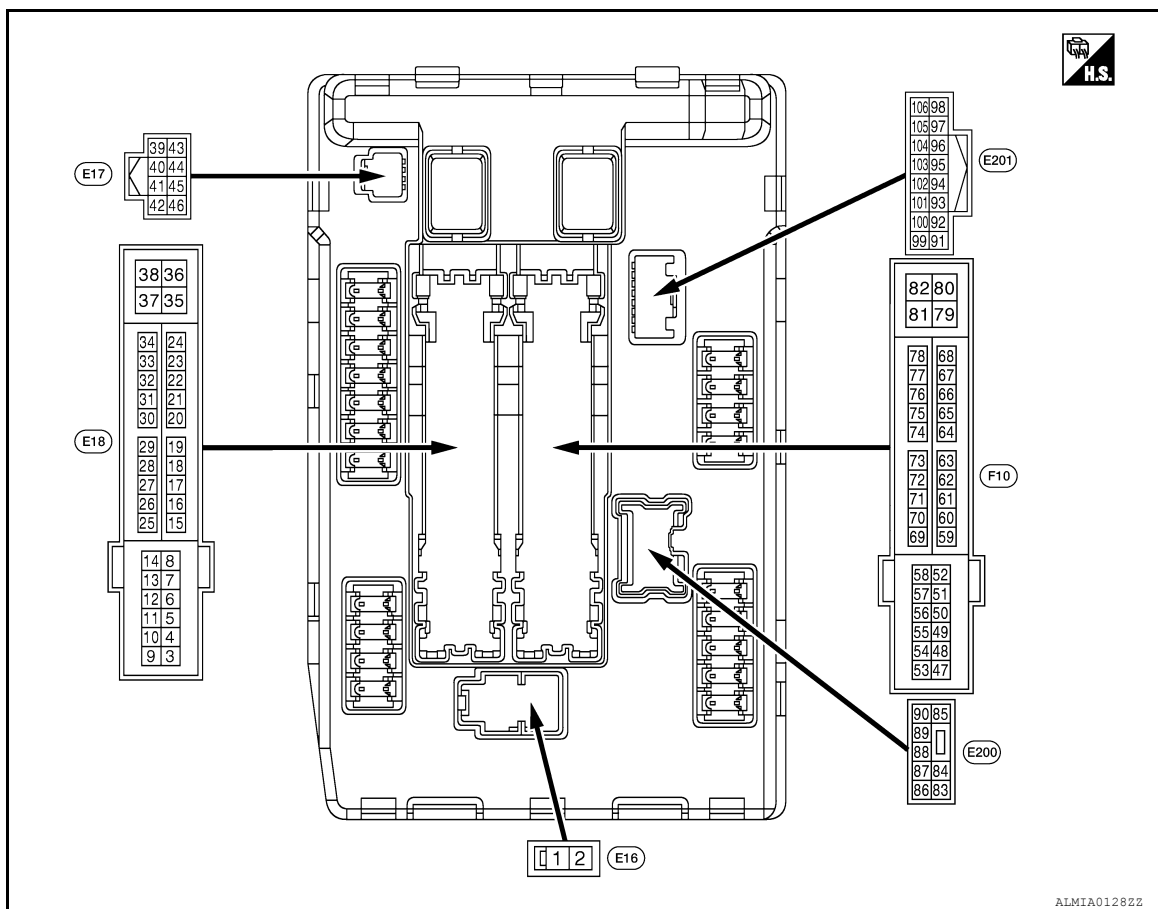
| Monitor Item | Condition | | Value/Status |
|---------------|---|--|--------------|
| MOTOR FAN REQ | Engine idle speed | Changes depending on engine coolant temperature, air conditioner operation status, vehicle speed, etc. | 1,2,3,4 |
| AC COMP REQ | Engine running | A/C switch OFF | Off |
| | | A/C switch ON (Compressor is operating) | On |
| TAIL&CLR REQ | Lighting switch OFF | | Off |
| | Lighting switch 1ST, 2ND, HI or AUTO (Light is illuminated) | | On |
| HL LO REQ | Lighting switch OFF | | Off |
| | Lighting switch 2ND HI or AUTO (Light is illuminated) | | On |
| HL HI REQ | Lighting switch OFF | | Off |
| | Lighting switch HI | | On |
| FR FOG REQ | Lighting switch 2ND or AUTO (Light is illuminated) | Front fog lamp switch OFF | Off |
| | | <ul style="list-style-type: none"> • Front fog lamp switch ON • Daytime running light activated (Only for Canada models) | On |
| FR WIP REQ | Ignition switch ON | Front wiper switch OFF | STOP |
| | | Front wiper switch INT | 1LOW |
| | | Front wiper switch LO | Low |
| | | Front wiper switch HI | Hi |
| WIP AUTO STOP | Ignition switch ON | Front wiper stop position | STOP P |
| | | Any position other than front wiper stop position | ACT P |
| WIP PROT | Ignition switch ON | Front wiper operates normally | Off |
| | | Front wiper stops at fail-safe operation | BLOCK |
| IGN RLY1 -REQ | Ignition switch OFF or ACC | | Off |
| | Ignition switch ON | | On |
| IGN RLY | Ignition switch OFF or ACC | | Off |
| | Ignition switch ON | | On |
| PUSH SW | Release the push-button ignition switch | | Off |
| | Press the push-button ignition switch | | On |
| INTER/NP SW | Ignition switch ON | CVT selector lever in any position other than P or N | Off |
| | Ignition switch ON | CVT selector lever in P or N position | On |
| ST RLY CONT | Ignition switch ON | | Off |
| | At engine cranking | | On |
| IHBT RLY -REQ | Ignition switch ON | | Off |
| | At engine cranking | | On |

IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)

< ECU DIAGNOSIS INFORMATION >

| Monitor Item | Condition | Value/Status |
|--------------|---|--------------|
| ST/INHI RLY | Ignition switch ON | Off |
| | At engine cranking | ST → INHI |
| | The status of starter relay or starter control relay cannot be recognized by the battery voltage malfunction, etc. when the starter relay is ON and the starter control relay is OFF | UNKWN |
| DETENT SW | Ignition switch ON <ul style="list-style-type: none"> • Press the selector button with CVT selector lever in P position • CVT selector lever in any position other than P | Off |
| | Release the CVT selector button with CVT selector lever in P position | On |
| DTRL -REQ | DTRL ON | On |
| | DTRL OFF | Off |
| OIL P SW | Ignition switch OFF, ACC or engine running | Open |
| | Ignition switch ON | Close |
| THFT HRN REQ | Not operated | Off |
| | <ul style="list-style-type: none"> • Panic alarm is activated • Horn is activated with VEHICLE SECURITY (THEFT WARNING) SYSTEM | On |
| HORN CHIRP | Not operated | Off |
| | Door locking with Intelligent Key (horn chirp mode) | On |

TERMINAL LAYOUT



PHYSICAL VALUES

IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)

< ECU DIAGNOSIS INFORMATION >

| Terminal No. (Wire color) | | Description | | Condition | | Value (Approx.) |
|------------------------------|--------|---|--------|---|---|--------------------|
| | | | | | | |
| + | - | | | | | |
| 1 (R) | Ground | Battery power supply | Input | Ignition switch OFF | | Battery voltage |
| 2 (L) | Ground | Battery power supply | Input | Ignition switch OFF | | Battery voltage |
| 4 (LG) | Ground | Front wiper LO | Output | Ignition switch ON | Front wiper switch OFF | 0 V |
| | | | | | Front wiper switch LO | Battery voltage |
| 5 (Y) | Ground | Front wiper HI | Output | Ignition switch ON | Front wiper switch OFF | 0 V |
| | | | | | Front wiper switch HI | Battery voltage |
| 6 (L) | Ground | Daytime light relay power supply (Canada models only) | Output | Ignition switch OFF | | Battery voltage |
| 7 (GR) | Ground | Tail, license plate lamps & interior lamps | Output | Ignition switch ON | Lighting switch OFF | 0 V |
| | | | | | Lighting switch 1ST | Battery voltage |
| 10 (BR) | Ground | ECM relay power supply | Output | Ignition switch OFF (For a few seconds after turning ignition switch OFF) | | 0 V |
| | | | | <ul style="list-style-type: none"> • Ignition switch ON • Ignition switch OFF (More than a few seconds after turning ignition switch OFF) | | Battery voltage |
| 12 (B) | Ground | Ground | — | Ignition switch ON | | 0 V |
| 13 (SB) | Ground | Fuel pump power supply | Output | Approximately 1 second or more after turning the ignition switch ON | | 0 V |
| | | | | <ul style="list-style-type: none"> • Approximately 1 second after turning the ignition switch ON • Engine running | | Battery voltage |
| 15 (W) | Ground | Ignition relay-1 power supply | Output | Ignition switch OFF | | 0 V |
| | | | | Ignition switch ON | | Battery voltage |
| 16 (R) | Ground | Front wiper auto stop | Input | Ignition switch ON | Front wiper stop position | 0 V |
| | | | | | Any position other than front wiper stop position | Battery voltage |
| 19 (Y) | Ground | Ignition relay-1 power supply | Output | Ignition switch OFF | | 0 V |
| | | | | Ignition switch ON | | Battery voltage |
| 20 (L) | Ground | Ambient sensor ground | — | Ignition switch ON | | 0V |
| 21 (LG) | Ground | Ambient sensor | — | Ignition switch ON | | 5V |
| 22 (SB) | Ground | Refrigerant pressure sensor ground | — | Ignition switch ON | | 0V |
| 23 (GR) | Ground | Refrigerant pressure sensor | — | <ul style="list-style-type: none"> • Ignition switch ON (READY) • Both A/C switch and blower motor switch ON (electric compressor operates) | | 1.0 - 4.0V |
| 24 (G) | Ground | Refrigerant pressure sensor power supply | — | Ignition switch ON | | 5V |
| 25 (GR) | Ground | Ignition relay-1 power supply | Output | Ignition switch OFF | | 0 V |
| | | | | Ignition switch ON | | Battery voltage |

IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)

< ECU DIAGNOSIS INFORMATION >

| Terminal No. (Wire color) | | Description | | Condition | Value (Approx.) | | |
|------------------------------|--------|---------------------------------------|------------------|---|---|-----------------|----|
| + | - | Signal name | Input/ Output | | | | |
| 27 (W) | Ground | Ignition relay monitor | Input | Ignition switch OFF or ACC | Battery voltage | A | |
| | | | | Ignition switch ON | 0 V | B | |
| 28 (SB) | Ground | Push-button ignition switch | Input | Press the push-button ignition switch | 0 V | C | |
| | | | | Release the push-button ignition switch | Battery voltage | | |
| 30 (BR) | Ground | Starter relay control | Input | CVT selector lever in any position other than P or N (ignition switch ON) | 0 V | D | |
| | | | | CVT selector lever P or N (ignition switch ON) | Battery voltage | | |
| 34 (O) | Ground | Cooling fan relay-3 control | Input | Ignition switch OFF or ACC | 0 V | E | |
| | | | | Ignition switch ON | 0.7 V | | |
| 35 (P) | Ground | Cooling fan motor control | Output | Ignition switch OFF or ACC | 0 V | F | |
| | | | | Ignition switch ON | 0.7 V | | |
| 36 (G) | Ground | Battery power supply | Input | Ignition switch OFF | Battery voltage | | |
| 38 (GR) | Ground | Cooling fan motor control | Output | Ignition switch OFF or ACC | 0 V | G | |
| | | | | Ignition switch ON | 0.7 V | | |
| 39 (P) | — | CAN - L | Input/ Output | — | — | H | |
| 40 (L) | — | CAN - H | Input/ Output | — | — | | |
| 41 (B) | Ground | Ground | — | Ignition switch ON | 0 V | I | |
| 42 (SB) | Ground | Cooling fan relay-2 control | Input | Ignition switch OFF or ACC | 0 V | J | |
| | | | | Ignition switch ON | 0.7 V | | |
| 43 (Y) | Ground | CVT shift selector (Detention switch) | Input | Ignition switch ON | Press the CVT selector button (CVT selector lever P) | Battery voltage | K |
| | | | | | <ul style="list-style-type: none"> • CVT selector lever in any position other than P • Release the CVT selector button (CVT selector lever P) | 0 V | WW |
| 44 (W) | Ground | Horn relay control | Input | The horn is deactivated | Battery voltage | M | |
| | | | | The horn is activated | 0 V | | |
| 45 (GR) | Ground | Anti theft horn relay control | Input | The horn is deactivated | Battery voltage | N | |
| | | | | The horn is activated | 0 V | | |
| 46 (BR) | Ground | Starter relay control | Input | CVT selector lever in any position other than P or N (ignition switch ON) | 0 V | O | |
| | | | | CVT selector lever P or N (ignition switch ON) | Battery voltage | | |
| 48 (W) | Ground | A/C relay power supply | Output | Engine running | A/C switch OFF | 0 V | P |
| | | | | | A/C switch ON (A/C compressor is operating) | Battery voltage | |

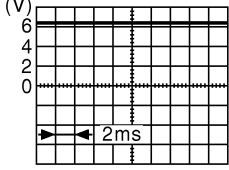
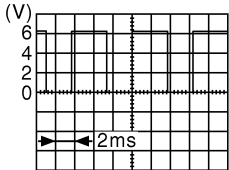
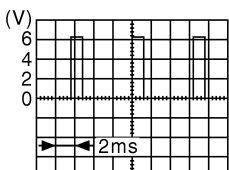
IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)

< ECU DIAGNOSIS INFORMATION >

| Terminal No. (Wire color) | | Description | | Condition | | Value (Approx.) |
|------------------------------|--------|---|------------------|---|---|--|
| + | - | Signal name | Input/ Output | | | |
| 49 (R/G) | Ground | ECM relay power supply | Output | Ignition switch OFF (For a few seconds after turning ignition switch OFF) | | 0 V |
| | | | | <ul style="list-style-type: none"> Ignition switch ON Ignition switch OFF (More than a few seconds after turning ignition switch OFF) | | Battery voltage |
| 51 (LG) | Ground | Ignition relay power supply | Output | Ignition switch OFF | | 0 V |
| | | | | Ignition switch ON | | Battery voltage |
| 52 (Y/G) | Ground | Ignition relay power supply | Output | Ignition switch OFF | | 0 V |
| | | | | Ignition switch ON | | Battery voltage |
| 53 (R/W) | Ground | ECM relay power supply | Output | Ignition switch OFF (For a few seconds after turning ignition switch OFF) | | 0 V |
| | | | | <ul style="list-style-type: none"> Ignition switch ON Ignition switch OFF (More than a few seconds after turning ignition switch OFF) | | Battery voltage |
| 54 (G/W) | Ground | Throttle control motor relay power supply | Output | Ignition switch OFF (For a few seconds after turning ignition switch OFF) | | 0 V |
| | | | | <ul style="list-style-type: none"> Ignition switch ON Ignition switch OFF (More than a few seconds after turning ignition switch OFF) | | Battery voltage |
| 55 (W/L) | Ground | ECM power supply | Output | Ignition switch OFF | | Battery voltage |
| 56 (R/Y) | Ground | Ignition relay power supply | Output | Ignition switch OFF | | 0 V |
| | | | | Ignition switch ON | | Battery voltage |
| 57 (O) | Ground | Ignition relay power supply | Output | Ignition switch OFF | | 0 V |
| | | | | Ignition switch ON | | Battery voltage |
| 58 (Y) | Ground | Ignition relay power supply | Output | Ignition switch OFF | | 0 V |
| | | | | Ignition switch ON | | Battery voltage |
| 69 (W/B) | Ground | ECM relay control | Output | Ignition switch OFF (For a few seconds after turning ignition switch OFF) | | Battery voltage |
| | | | | <ul style="list-style-type: none"> Ignition switch ON Ignition switch OFF (More than a few seconds after turning ignition switch OFF) | | 0 - 1.5 V |
| 70 (O) | Ground | Throttle control motor relay control | Output | Ignition switch ON → OFF | | 0 -1.0 V ↓ Battery voltage ↓ 0 V |
| | | | | Ignition switch ON | | 0 - 1.0 V |
| 72 (R/B) | Ground | Transmission range switch signal | Input | Ignition switch ON | CVT selector lever in P or N position | Battery voltage |
| | | | | | CVT selector lever in any position other than P or N position | 0 V |

IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)

< ECU DIAGNOSIS INFORMATION >

| Terminal No. (Wire color) | | Description | | Condition | | Value (Approx.) |
|------------------------------|--------|---------------------------------|------------------|---|--|---|
| + | - | Signal name | Input/ Output | | | |
| 75 (LG) | Ground | Oil pressure switch | Input | Ignition switch ON | Engine stopped | 0 V |
| | | | | | Engine running | Battery voltage |
| 76 (SB) | Ground | Power generation command signal | Output | Ignition switch ON | |  6.3 V |
| | | | | 40% is set on "Active test", "ALTERNATOR DUTY" of "ENGINE" | |  3.8 V |
| | | | | 80% is set on "Active test", "ALTERNATOR DUTY" of "ENGINE" | |  1.4 V |
| 77 (GR) | Ground | Fuel pump relay control | Output | <ul style="list-style-type: none"> Approximately 1 second after turning the ignition switch ON Engine running | | 0 - 1.0 V |
| | | | | Approximately 1 second or more after turning the ignition switch ON | | Battery voltage |
| 80 (B) | Ground | Starter motor | Output | At engine cranking | | Battery voltage |
| 83 (R/Y) | Ground | Headlamp LO (RH) | Output | Ignition switch ON | Lighting switch OFF | 0 V |
| | | | | | Lighting switch 2ND | Battery voltage |
| 84 (L) | Ground | Headlamp LO (LH) | Output | Ignition switch ON | Lighting switch OFF | 0 V |
| | | | | | Lighting switch 2ND | Battery voltage |
| 86 (W/R) | Ground | Front fog lamp (RH) | Output | Lighting switch 2ND | <ul style="list-style-type: none"> Front fog lamp switch ON Daytime running light activated (Only for Canada models) | Battery voltage |
| | | | | | Front fog lamp switch OFF | 0 V |
| 87 (L/Y) | Ground | Front fog lamp (LH) | Output | Lighting switch 2ND | <ul style="list-style-type: none"> Front fog lamp switch ON Daytime running light activated (Only for Canada models) | Battery voltage |
| | | | | | Front fog lamp switch OFF | 0 V |

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

IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)

< ECU DIAGNOSIS INFORMATION >

| Terminal No. (Wire color) | | Description | | Condition | | Value (Approx.) |
|------------------------------|--------|--|------------------|---|--|--------------------|
| + | - | Signal name | Input/ Output | | | |
| 88 (R/W) | Ground | Washer pump power supply | Output | Ignition switch ON | | Battery voltage |
| 89 (L/W) | Ground | Headlamp HI (RH) | Output | Ignition switch ON | • Lighting switch HI • Lighting switch PASS | Battery voltage |
| | | | | | Lighting switch OFF | 0 V |
| 90 (G) | Ground | Headlamp HI (LH) | Output | Ignition switch ON | • Lighting switch HI • Lighting switch PASS | Battery voltage |
| | | | | | Lighting switch OFF | 0 V |
| 91 (LG/R) | Ground | Parking lamp (RH) | Output | Ignition switch ON | Lighting switch 1ST | Battery voltage |
| | | Side marker lamp (RH) | | | Lighting switch OFF | 0 V |
| 92 (LG/B) | Ground | Parking lamp (LH) | Output | Ignition switch ON | Lighting switch 1ST | Battery voltage |
| | | Side marker lamp (LH) | | | Lighting switch OFF | 0 V |
| 99 (BR/W) | Ground | Ambient sensor ground | — | Ignition switch ON | | 0V |
| 100 (SB) | Ground | Ambient sensor | — | Ignition switch ON | | 5V |
| 101 (W) | Ground | Refrigerant pressure sensor ground | — | Ignition switch ON | | 0V |
| 102 (R) | Ground | Refrigerant pressure sensor | — | • Ignition switch ON (READY) • Both A/C switch and blower motor switch ON (electric compressor operates) | | 1.0 - 4.0V |
| 103 (P) | Ground | Refrigerant pressure sensor power supply | — | Ignition switch ON | | 5V |
| 105 (V) | Ground | Daytime light relay control (Only for Canada models) | Output | Ignition switch ON | Daytime light system active | Battery voltage |
| | | | | Ignition switch ON | Daytime light system inactive | 0 V |

Fail Safe

INFOID:000000008778975

CAN COMMUNICATION CONTROL

When CAN communication with ECM and BCM is impossible, IPDM E/R performs fail-safe control. After CAN communication recovers normally, it also returns to normal control.

If No CAN Communication Is Available With ECM

| Control part | Fail-safe in operation |
|----------------|--|
| Cooling fan | • Signals cooling fans ON when the ignition switch is turned ON • Signals cooling fans OFF when the ignition switch is turned OFF |
| A/C compressor | A/C relay OFF |
| Generator | Outputs the power generation command signal (PWM signal) 0% |

If No CAN Communication Is Available With BCM

IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)

< ECU DIAGNOSIS INFORMATION >

| Control part | Fail-safe in operation |
|---|--|
| Headlamp | <ul style="list-style-type: none"> • Turns ON the headlamp low relay when the ignition switch is turned ON • Turns OFF the headlamp low relay when the ignition switch is turned OFF • Headlamp high relay OFF |
| <ul style="list-style-type: none"> • Parking lamps • Side marker lamps • License plate lamps • Illumination • Tail lamps | <ul style="list-style-type: none"> • Turns ON the tail lamp relay when the ignition switch is turned ON • Turns OFF the tail lamp relay when the ignition switch is turned OFF |
| Front wiper | <ul style="list-style-type: none"> • The status just before activation of fail-safe control is maintained until the ignition switch is turned OFF while the front wiper is operating at LO or HI speed. • The wiper is operated at LO speed until the ignition switch is turned OFF if the fail-safe control is activated while the front wiper is set in the INT mode and the front wiper motor is operating. |
| Front fog lamps (if equipped) | Front fog lamp relay OFF |
| Horn | Horn OFF |
| Ignition relay | The status just before activation of fail-safe is maintained. |
| Starter motor | Starter control relay OFF |

IGNITION RELAY MALFUNCTION DETECTION FUNCTION

- IPDM E/R monitors the voltage at the contact circuit and excitation coil circuit of the ignition relay-1 inside it.
- IPDM E/R judges the ignition relay-1 error if the voltage differs between the contact circuit and the excitation coil circuit.
- If the ignition relay-1 cannot turn OFF due to contact seizure, it activates the tail lamp relay for 10 minutes to alert the user to the ignition relay-1 malfunction when the ignition switch is turned OFF.

| DTC | Ignition switch | Ignition relay-1 | Tail lamp relay |
|----------------------|-----------------|------------------|-----------------|
| — | ON | ON | — |
| — | OFF | OFF | — |
| B2098: IGN RELAY ON | OFF | ON | ON (10 minutes) |
| B2099: IGN RELAY OFF | ON | OFF | — |

NOTE:

The tail lamp turns OFF when the ignition switch is turned ON.

FRONT WIPER CONTROL

IPDM E/R detects front wiper stop position by a front wiper auto stop signal.

When a front wiper auto stop signal is in the conditions listed below, IPDM E/R stops power supply to wiper after repeating a front wiper 10 seconds activation and 20 seconds stop five times.

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

NOTE:

This operation status can be confirmed on the IPDM E/R “Data Monitor” that displays “BLOCK” for the item “WIP PROT” while the wiper is stopped.

STARTER MOTOR PROTECTION FUNCTION

IPDM E/R turns OFF the starter control relay to protect the starter motor when the starter control relay remains active for 90 seconds.

IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)

< ECU DIAGNOSIS INFORMATION >

DTC Index

INFOID:000000008778976

| CONSULT display | Fail-safe | TIME ^{NOTE} | | Refer to |
|--|-----------|----------------------|--------|------------------------|
| No DTC is detected. further testing may be required. | — | — | — | — |
| U1000: CAN COMM CIRCUIT | × | CRNT | 1 – 39 | PCS-15 |
| B2098: IGN RELAY ON | × | CRNT | 1 – 39 | PCS-16 |
| B2099: IGN RELAY OFF | — | CRNT | 1 – 39 | PCS-17 |
| B210B: START CONT RLY ON | — | CRNT | 1 – 39 | SEC-69 |
| B210C: START CONT RLY OFF | — | CRNT | 1 – 39 | SEC-70 |
| B210D: STARTER RELAY ON | — | CRNT | 1 – 39 | SEC-71 |
| B210E: STARTER RELAY OFF | — | CRNT | 1 – 39 | SEC-72 |
| B210F: INTRLCK/PNP SW ON | — | CRNT | 1 – 39 | SEC-74 |
| B2110: INTRLCK/PNP SW OFF | — | CRNT | 1 – 39 | SEC-76 |

NOTE:

The details of TIME display are as follows.

- CRNT: The malfunctions that are detected now
- 1 - 39: The number is indicated when it is normal at present and a malfunction was detected in the past. It increases like 0 → 1 → 2 ··· 38 → 39 after returning to the normal condition whenever IGN OFF → ON. It is fixed to 39 until the self-diagnosis results are erased if it is over 39. It returns to 0 when a malfunction is detected again in the process.

FRONT WIPER AND WASHER SYSTEM

< WIRING DIAGRAM >

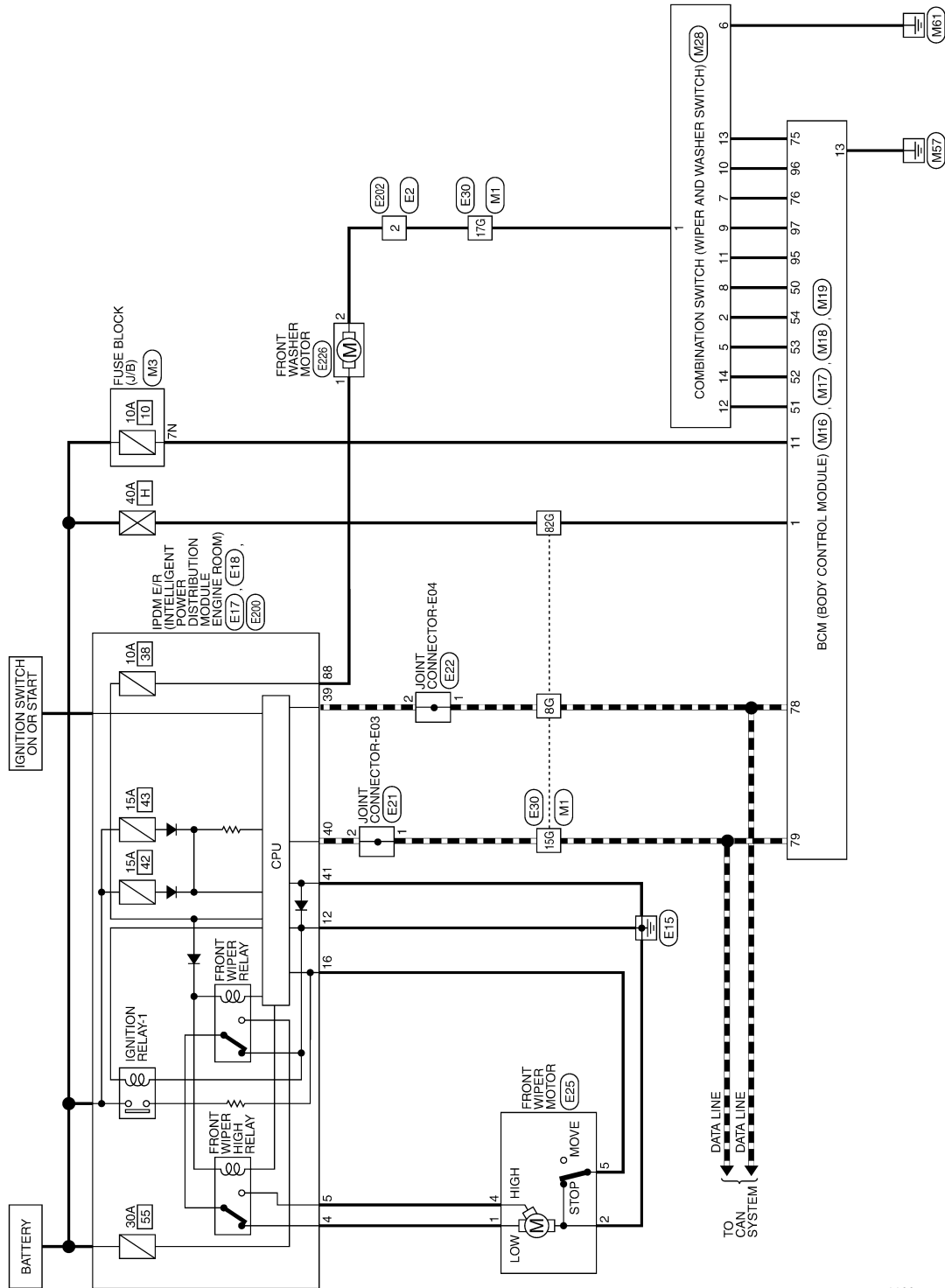
WIRING DIAGRAM

FRONT WIPER AND WASHER SYSTEM

Wiring Diagram

INFOID:000000008635785

FRONT WIPER AND WASHER SYSTEM



ABLWA1188GB

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

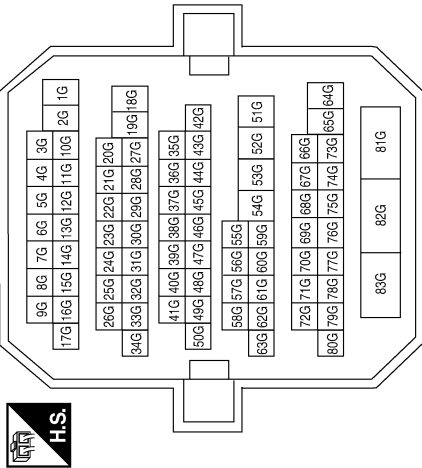
WW

FRONT WIPER AND WASHER SYSTEM

< WIRING DIAGRAM >

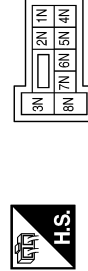
FRONT WIPER AND WASHER SYSTEM CONNECTORS

| | |
|-----------------|--------------|
| Connector No. | M1 |
| Connector Name | WIRE TO WIRE |
| Connector Color | WHITE |



| Terminal No. | Color of Wire | Signal Name |
|--------------|---------------|-------------|
| 8G | P | - |
| 15G | L | - |
| 17G | R/L | - |
| 82G | W/B | - |

| | |
|-----------------|------------------|
| Connector No. | M3 |
| Connector Name | FUSE BLOCK (J/B) |
| Connector Color | WHITE |



| Terminal No. | Color of Wire | Signal Name |
|--------------|---------------|-------------|
| 7N | Y/R | - |

| | |
|-----------------|---------------------------|
| Connector No. | M16 |
| Connector Name | BCM (BODY CONTROL MODULE) |
| Connector Color | BLACK |



| Terminal No. | Color of Wire | Signal Name |
|--------------|---------------|-------------|
| 1 | W/B | BATT (F/L) |

| | |
|-----------------|---------------------------|
| Connector No. | M17 |
| Connector Name | BCM (BODY CONTROL MODULE) |
| Connector Color | WHITE |



| Terminal No. | Color of Wire | Signal Name |
|--------------|---------------|--------------|
| 11 | Y/R | BAT BCM FUSE |
| 13 | B | GND1 |

| | |
|-----------------|---------------------------|
| Connector No. | M18 |
| Connector Name | BCM (BODY CONTROL MODULE) |
| Connector Color | GREEN |



| Terminal No. | Color of Wire | Signal Name |
|--------------|---------------|-------------|
| 50 | LG/B | INPUT 5 |
| 51 | L/W | INPUT 1 |
| 52 | G/B | INPUT 2 |
| 53 | LG/R | INPUT 3 |
| 54 | G/Y | INPUT 4 |

FRONT WIPER AND WASHER SYSTEM

< WIRING DIAGRAM >

| Terminal No. | Color of Wire | Signal Name |
|--------------|---------------|-------------|
| 96 | P/B | OUTPUT 4 |
| 97 | R/B | OUTPUT 2 |

| | |
|-----------------|---------------------------|
| Connector No. | M19 |
| Connector Name | BCM (BODY CONTROL MODULE) |
| Connector Color | BLACK |



| | | | | | | | | | | | | | | | | | | | |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 79 | 78 | 77 | 76 | 75 | 74 | 73 | 72 | 71 | 70 | 69 | 68 | 67 | 66 | 65 | 64 | 63 | 62 | 61 | 60 |
| 89 | 88 | 87 | 86 | 85 | 84 | 83 | 82 | 81 | 80 | 79 | 78 | 77 | 76 | 75 | 74 | 73 | 72 | 71 | 70 |

| Terminal No. | Color of Wire | Signal Name |
|--------------|---------------|-------------|
| 75 | R/Y | OUTPUT 5 |
| 76 | R/G | OUTPUT 3 |
| 78 | P | CAN-L |
| 79 | L | CAN-H |
| 95 | R/W | OUTPUT 1 |

| Terminal No. | Color of Wire | Signal Name |
|--------------|---------------|-------------|
| 11 | R/W | INPUT 1 |
| 12 | L/W | OUTPUT 1 |
| 13 | R/Y | INPUT 5 |
| 14 | G/B | OUTPUT 2 |

| | |
|-----------------|--------------------|
| Connector No. | M28 |
| Connector Name | COMBINATION SWITCH |
| Connector Color | WHITE |



| | | | | | |
|----|----|---|----|----|----|
| 1 | 2 | 3 | 4 | 5 | 6 |
| 7 | 8 | 9 | 10 | 11 | 12 |
| 13 | 14 | | | | |

| Terminal No. | Color of Wire | Signal Name |
|--------------|---------------|-------------|
| 1 | R/L | WASHER MTR |
| 2 | G/Y | OUTPUT 4 |
| 5 | LG/R | OUTPUT 3 |
| 6 | B | GND |
| 7 | R/G | INPUT 3 |
| 8 | LG/B | OUTPUT 5 |
| 9 | R/B | INPUT 2 |
| 10 | P/B | INPUT 4 |

| | |
|-----------------|--------------|
| Connector No. | E2 |
| Connector Name | WIRE TO WIRE |
| Connector Color | WHITE |



| | | |
|---|---|---|
| 1 | 2 | 3 |
| 4 | 5 | 6 |
| 7 | 8 | |

| Terminal No. | Color of Wire | Signal Name |
|--------------|---------------|-------------|
| 2 | GR | - |

ABLIA3988GB

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

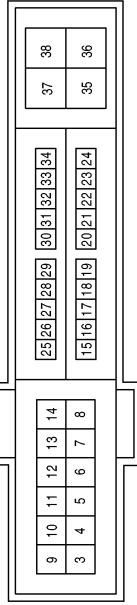
WW

FRONT WIPER AND WASHER SYSTEM

< WIRING DIAGRAM >

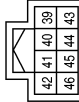
| Terminal No. | Color of Wire | Signal Name |
|--------------|---------------|----------------|
| 12 | B | GND (POWER) |
| 16 | R | WIPER AUTOSTOP |

| Connector No. | E18 |
|-----------------|--|
| Connector Name | IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM) |
| Connector Color | WHITE |



| Terminal No. | Color of Wire | Signal Name |
|--------------|---------------|-------------|
| 4 | LG | FR WIPER LO |
| 5 | Y | FR WIPER HI |

| Connector No. | E17 |
|-----------------|--|
| Connector Name | IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM) |
| Connector Color | WHITE |



| Terminal No. | Color of Wire | Signal Name |
|--------------|---------------|--------------|
| 39 | P | CAN-L |
| 40 | L | CAN-H |
| 41 | B | GND (SIGNAL) |

| Connector No. | E25 |
|-----------------|-------------------|
| Connector Name | FRONT WIPER MOTOR |
| Connector Color | GRAY |



| Terminal No. | Color of Wire | Signal Name |
|--------------|---------------|-------------|
| 1 | LG | - |
| 2 | B/Y | - |
| 3 | - | - |
| 4 | Y | - |
| 5 | R | - |

| Connector No. | E22 |
|-----------------|---------------------|
| Connector Name | JOINT CONNECTOR-E04 |
| Connector Color | WHITE |



| Terminal No. | Color of Wire | Signal Name |
|--------------|---------------|-------------|
| 1 | P | - |
| 2 | P | - |

| Connector No. | E21 |
|-----------------|---------------------|
| Connector Name | JOINT CONNECTOR-E03 |
| Connector Color | WHITE |



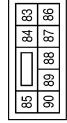
| Terminal No. | Color of Wire | Signal Name |
|--------------|---------------|-------------|
| 1 | L | - |
| 2 | L | - |

ABLIA3989GB

FRONT WIPER AND WASHER SYSTEM

< WIRING DIAGRAM >

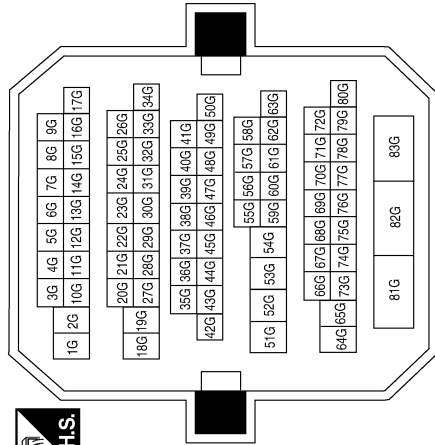
| | |
|-----------------|--|
| Connector No. | E200 |
| Connector Name | IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM) |
| Connector Color | WHITE |



| | | |
|--------------|---------------|-------------|
| Terminal No. | Color of Wire | Signal Name |
| 88 | R/W | WASHER MTR |

| Terminal No. | Color of Wire | Signal Name |
|--------------|---------------|-------------|
| 8G | P | - |
| 15G | L | - |
| 17G | GR | - |
| 82G | LG | - |

| | |
|-----------------|--------------|
| Connector No. | E30 |
| Connector Name | WIRE TO WIRE |
| Connector Color | WHITE |



| | |
|-----------------|--------------------|
| Connector No. | E226 |
| Connector Name | FRONT WASHER MOTOR |
| Connector Color | BLACK |



| | | |
|--------------|---------------|-------------|
| Terminal No. | Color of Wire | Signal Name |
| 1 | R/W | - |
| 2 | R/L | - |

| | |
|-----------------|--------------|
| Connector No. | E202 |
| Connector Name | WIRE TO WIRE |
| Connector Color | WHITE |



| | | |
|--------------|---------------|-------------|
| Terminal No. | Color of Wire | Signal Name |
| 2 | R/L | - |

ABL1A1704GB

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

WW

FRONT WIPER AND WASHER SYSTEM SYMPTOMS

< SYMPTOM DIAGNOSIS >

SYMPTOM DIAGNOSIS

FRONT WIPER AND WASHER SYSTEM SYMPTOMS

Symptom Table

INFOID:000000008635786

CAUTION:

Perform the self-diagnosis with CONSULT before performing the diagnosis by symptom. Perform the diagnosis by DTC if DTC is detected.

| Symptom | | Probable malfunction location | Inspection item |
|------------------------------|-----------------|---|---|
| Front wiper does not operate | HI only | <ul style="list-style-type: none"> Combination switch (wiper and washer switch) Harness between combination switch (wiper and washer switch) and BCM BCM | Combination switch (wiper and washer switch) Refer to BCS-10, "System Description" . |
| | | <ul style="list-style-type: none"> IPDM E/R Harness between IPDM E/R and wiper motor Front wiper motor | Front wiper motor (HI) circuit Refer to WW-20, "Component Function Check" . |
| | | Front wiper request signal <ul style="list-style-type: none"> BCM IPDM E/R | IPDM E/R Data monitor "FR WIP REQ" |
| | LO and INT | <ul style="list-style-type: none"> Combination switch (wiper and washer switch) Harness between combination switch (wiper and washer switch) and BCM BCM | Combination switch (wiper and washer switch) Refer to BCS-10, "System Description" . |
| | | <ul style="list-style-type: none"> IPDM E/R Harness between IPDM E/R and wiper motor Front wiper motor | Front wiper motor (LO) circuit Refer to WW-18, "Component Function Check" . |
| | | Front wiper request signal <ul style="list-style-type: none"> BCM IPDM E/R | IPDM E/R Data monitor "FR WIP REQ" |
| | INT only | <ul style="list-style-type: none"> Combination switch (wiper and washer switch) Harness between combination switch (wiper and washer switch) and BCM BCM | Combination switch (wiper and washer switch) Refer to BCS-10, "System Description" . |
| | | Front wiper request signal <ul style="list-style-type: none"> BCM IPDM E/R | IPDM E/R Data monitor "FR WIP REQ" |
| | HI, LO, and INT | SYMPTOM DIAGNOSIS Refer to WW-70, "Diagnosis Procedure" . | |

FRONT WIPER AND WASHER SYSTEM SYMPTOMS

< SYMPTOM DIAGNOSIS >

| Symptom | | Probable malfunction location | Inspection item |
|--|---|---|---|
| Front wiper does not stop | HI only | <ul style="list-style-type: none"> Combination switch (wiper and washer switch) BCM | Combination switch (wiper and washer switch) Refer to BCS-10. "System Description" . |
| | | Front wiper request signal <ul style="list-style-type: none"> BCM IPDM E/R | IPDM E/R Data monitor "FR WIP REQ" |
| | | IPDM E/R | — |
| | LO only | <ul style="list-style-type: none"> Combination switch (wiper and washer switch) BCM | Combination switch (wiper and washer switch) Refer to BCS-10. "System Description" . |
| | | Front wiper request signal <ul style="list-style-type: none"> BCM IPDM E/R | IPDM E/R Data monitor "FR WIP REQ" |
| | | IPDM E/R | — |
| | INT only | <ul style="list-style-type: none"> Combination switch (wiper and washer switch) BCM | Combination switch (wiper and washer switch) Refer to BCS-10. "System Description" . |
| | | Front wiper request signal <ul style="list-style-type: none"> BCM IPDM E/R | IPDM E/R Data monitor "FR WIP REQ" |
| | Front wiper does not operate normally | Intermittent adjustment cannot be performed | <ul style="list-style-type: none"> Combination switch (wiper and washer switch) Harness between combination switch (wiper and washer switch) and BCM BCM |
| BCM | | | — |
| Intermittent control linked with vehicle speed cannot be performed | | Check the vehicle speed detection wiper setting. Refer to BCS-23. "WIPER : CONSULT Function (BCM - WIPER)" . | |
| Wiper is not linked to the washer operation | | <ul style="list-style-type: none"> Combination switch (wiper and washer switch) Harness between combination switch (wiper and washer switch) and BCM BCM | Combination switch (wiper and washer switch) Refer to BCS-10. "System Diagram" . |
| | | BCM | — |
| Does not return to stop position (Repeatedly operates for 10 seconds and then stops for 20 seconds. After that, it stops the operation.) | <ul style="list-style-type: none"> IPDM E/R Harness between IPDM E/R and front wiper motor Front wiper motor | Front wiper auto stop signal circuit Refer to WW-22. "Component Function Check" . | |
| Front washer motor does not operate | Front washer motor does not operate when washing the windshield. | <ul style="list-style-type: none"> Combination switch (wiper and washer switch) Harness between combination switch (wiper and washer switch) and BCM BCM | Combination switch (wiper and washer switch) Refer to BCS-10. "System Diagram" . |
| | | <ul style="list-style-type: none"> IPDM E/R Harness between IPDM E/R and front washer motor Front washer motor | Washer motor circuit Refer to WW-26. "Diagnosis Procedure" . |
| | BCM | — | |

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

WW

FRONT WIPER DOES NOT OPERATE

< SYMPTOM DIAGNOSIS >

FRONT WIPER DOES NOT OPERATE

Description

INFOID:000000008635787

The front wiper does not operate under any operation conditions

Diagnosis Procedure

INFOID:000000008635788

Regarding Wiring Diagram information, refer to [WW-63, "Wiring Diagram"](#).

1. CHECK WIPER RELAY OPERATION

⊗ IPDM E/R AUTO ACTIVE TEST

1. Start IPDM E/R auto active test. Refer to [PCS-11, "Diagnosis Description"](#).
2. Check that the front wiper operates at the LO/HI operation.

Ⓟ CONSULT ACTIVE TEST

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

- LO** : Front wiper LO operation
HI : Front wiper HI operation
OFF : Stop the front wiper.

Does the front wiper operate?

- YES >> GO TO 5
NO >> GO TO 2

2. CHECK FRONT WIPER MOTOR FUSE

1. Turn the ignition switch OFF.
2. Check that the front wiper motor fuse 30A (No. 55, located in the IPDM E/R) is not blown.

Is the fuse blown?

- YES >> Replace the fuse after repairing the affected circuit.
NO >> GO TO 3

3. CHECK FRONT WIPER MOTOR (GND) OPEN CIRCUIT

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

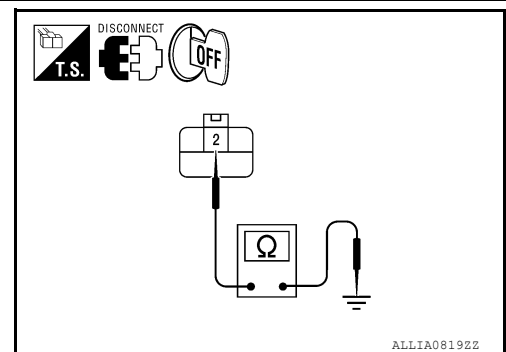
| Front wiper motor | | Ground | Continuity |
|-------------------|----------|--------|------------|
| Connector | Terminal | | |
| E25 | 2 | | Yes |

Does continuity exist?

- YES >> GO TO 4
NO >> Repair or replace harness.

4. CHECK FRONT WIPER MOTOR OUTPUT VOLTAGE

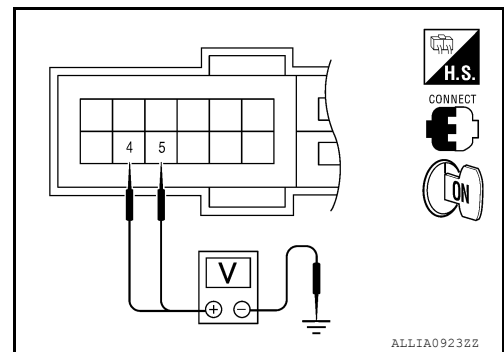
Ⓟ CONSULT ACTIVE TEST



FRONT WIPER DOES NOT OPERATE

< SYMPTOM DIAGNOSIS >

1. Turn the ignition switch OFF.
2. Disconnect front wiper motor.
3. Turn the ignition switch ON.
4. Select "FRONT WIPER" of IPDM E/R active test item.
5. While operating the test item, check voltage between IPDM E/R harness connector and ground.



| Terminals | | Test item | Voltage (V) (Approx.) | | |
|-----------|----------|-------------|--------------------------|----|-----------------|
| (+) | (-) | | | | |
| IPDM E/R | | FRONT WIPER | Voltage (V) (Approx.) | | |
| Connector | Terminal | | | | |
| E18 | 4 | | | LO | Battery voltage |
| | 5 | | | HI | Battery voltage |
| | | OFF | 0 V | | |
| | | OFF | 0 V | | |

Is the measurement normal?

YES LO circuit>>Refer to [WW-18. "Diagnosis Procedure"](#).

YES HI circuit>>Refer to [WW-20. "Diagnosis Procedure"](#).

NO >> Replace IPDM E/R. Refer to [PCS-35. "Removal and Installation"](#).

5. CHECK FRONT WIPER REQUEST SIGNAL INPUT

CONSULT DATA MONITOR

1. Select "FR WIP REQ" of IPDM E/R "DATA MONITOR" item.
2. Switch the front wiper switch to HI and LO.
3. While operating the front wiper switch, check the monitor status.

| Monitor item | While operating the front wiper switch condition | | Monitor status |
|--------------|--|-----|----------------|
| FR WIP REQ | Front wiper switch HI | ON | HI |
| | | OFF | STOP |
| | Front wiper switch LO | ON | LOW |
| | | OFF | STOP |

Is the status of item normal?

YES >> Replace IPDM E/R. Refer to [PCS-35. "Removal and Installation"](#).

NO >> GO TO 6

6. CHECK COMBINATION SWITCH (WIPER AND WASHER SWITCH)

Perform the inspection of the combination switch (wiper and washer switch). Refer to [BCS-10. "System Description"](#).

Is combination switch (wiper and washer switch) normal?

YES >> Replace BCM. Refer to [BCS-79. "Removal and Installation"](#).

NO >> Repair or replace the malfunctioning parts.

NORMAL OPERATING CONDITION

< SYMPTOM DIAGNOSIS >

NORMAL OPERATING CONDITION

Description

INFOID:000000008635789

FRONT WIPER MOTOR PROTECTION FUNCTION

- IPDM E/R may stop the front wiper to protect the front wiper motor if any obstruction (operation resistance) such as a large amount of snow is detected during the front wiper operation.
- At that time turn OFF the front wiper and remove the foreign object. Then wait for approximately 20 seconds or more and reactivate the front wiper. The wiper will operate normally.

PRECAUTIONS

< PRECAUTION >

PRECAUTION

PRECAUTIONS

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

INFOID:000000008635790

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 SR 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 SR section.
- Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.

PRECAUTIONS WHEN USING POWER TOOLS (AIR OR ELECTRIC) AND HAMMERS

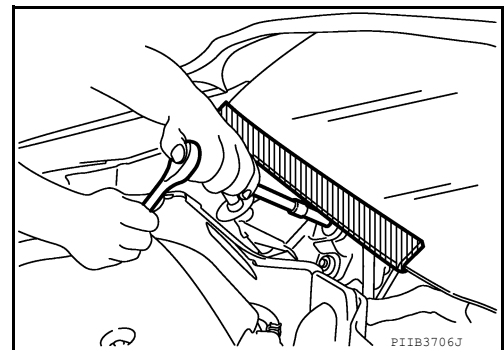
WARNING:

- When working near the Airbag Diagnosis Sensor Unit or other Airbag 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:000000008635791

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



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

FRONT WIPER

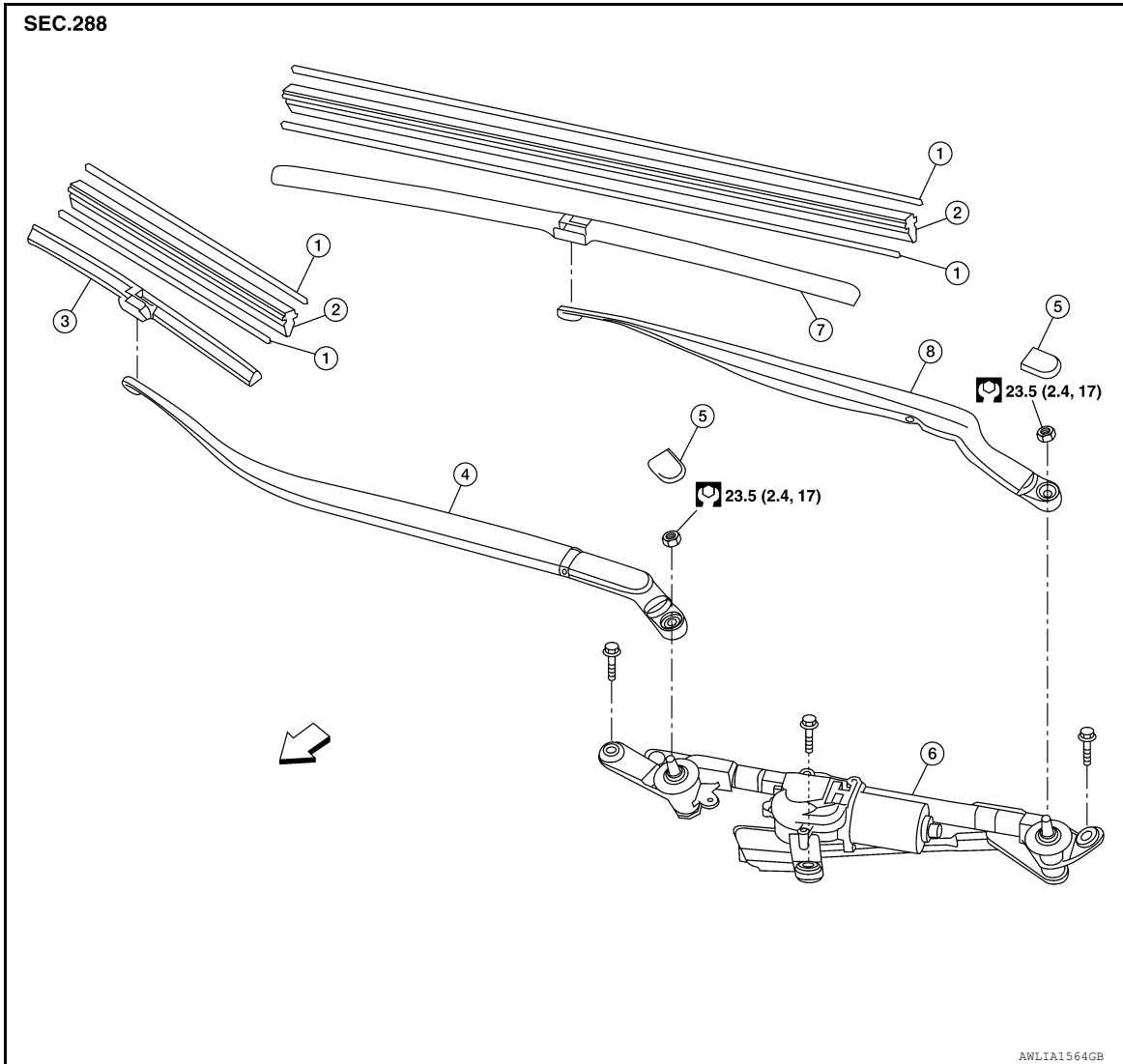
< REMOVAL AND INSTALLATION >

REMOVAL AND INSTALLATION

FRONT WIPER

Exploded View

INFOID:000000008635792



- | | | |
|--|-----------------------|--|
| 1. Rib (part of wiper blade refill) | 2. Wiper blade refill | 3. Front RH wiper blade assembly (includes wiper blade refill) |
| 4. Front RH wiper arm | 5. Wiper arm cap | 6. Front wiper drive assembly |
| 7. Front LH wiper blade assembly (includes wiper blade refill) | 8. Front LH wiper arm | ⇐ Front |

FRONT WIPER BLADE REFILL

FRONT WIPER BLADE REFILL : Removal and Installation

INFOID:000000008635793

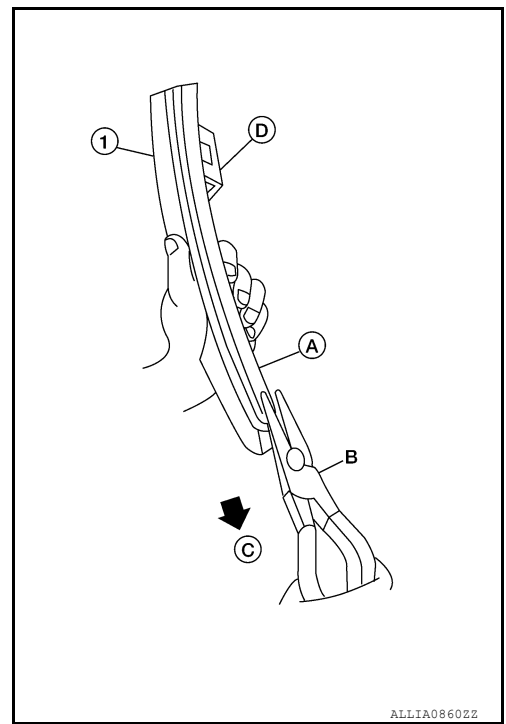
REMOVAL

1. Remove the front wiper blade. Refer to [WW-77, "FRONT WIPER BLADE : Removal and Installation"](#).

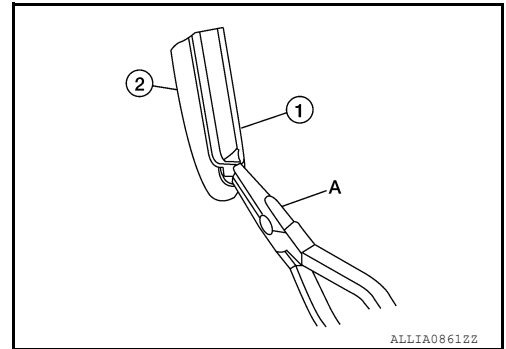
FRONT WIPER

< REMOVAL AND INSTALLATION >

2. Hold the wiper blade refill lip at the end (A) of the front wiper blade (1) with a suitable tool (B) as shown, and pull it firmly in the direction (C).
 - U clip (part of the front wiper blade assembly) (D)

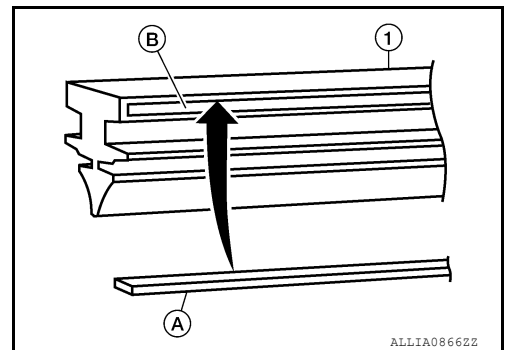


- If the wiper blade refill lip is torn due to wear, insert a suitable tool (A) into the space between the end of the wiper blade refill (1) and the front wiper blade (2) and pull the wiper blade refill (1) out as shown.



INSTALLATION

1. If the rib (A) has become detached from the wiper blade refill (1), check that the curve of the rib (A) is in the same direction as the curve of the wiper blade refill (1) and insert the rib (A) into the slit (B) in the wiper blade refill (1) as shown.

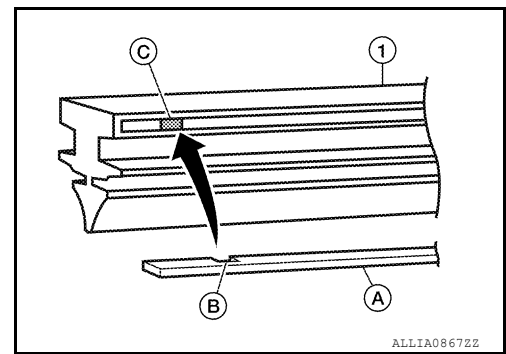


A
B
C
D
E
F
G
H
I
J
K
WW
M
N
O
P

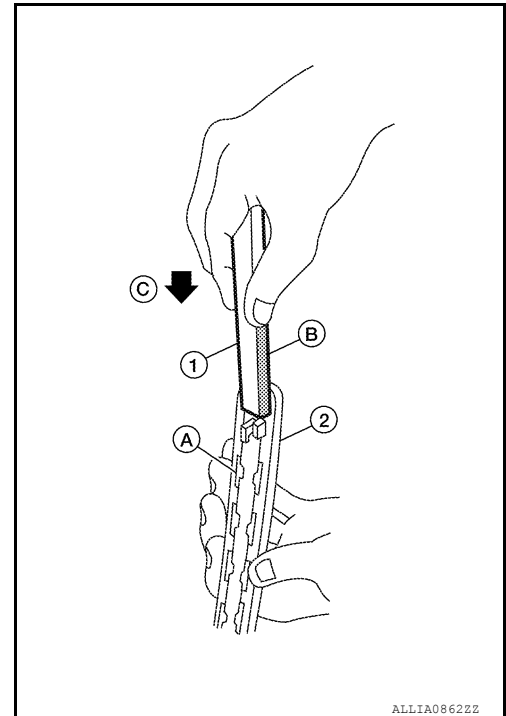
FRONT WIPER

< REMOVAL AND INSTALLATION >

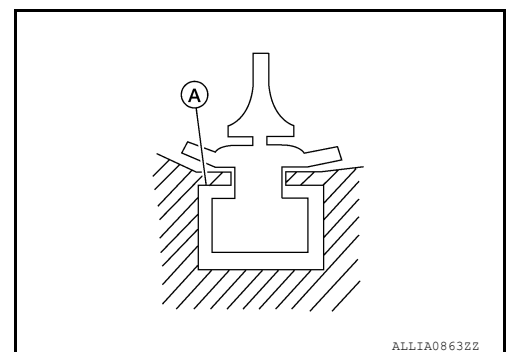
- If the rib (A) has a notch (B), insert the rib (A) into the wiper blade refill (1) so the notch (B) fits over the protrusion (C) in the wiper blade refill (1) as shown.



2. Insert the wiper blade refill (1) tip into the end of the front wiper blade (2) in the direction (C). Push the wiper blade refill (1) in while pressing it into the end of the front wiper blade (2) as shown. After the wiper blade refill is fully inserted, remove the holder (B).
- Tab [part of front wiper blade (2)] (A)



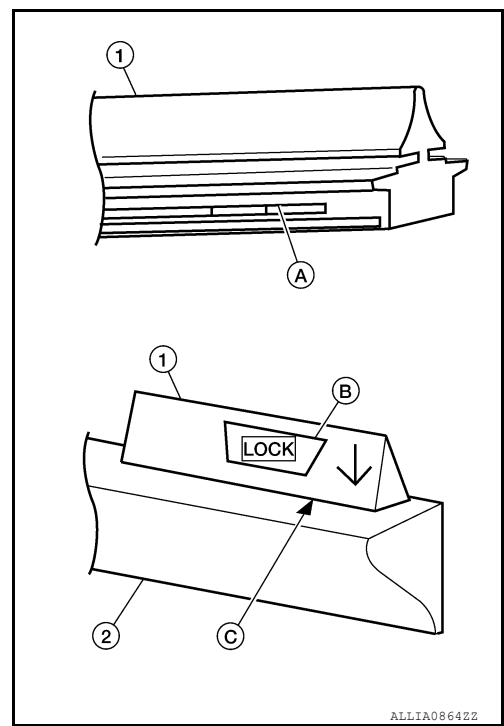
- Make sure to slide the refill into the front wiper blade so that the wiper blade refill is held by the tabs (A) on the front wiper blade as shown.



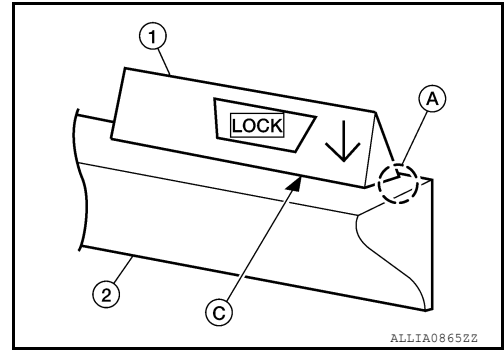
FRONT WIPER

< REMOVAL AND INSTALLATION >

3. Push the wiper blade refill (1) until the tabs on the front wiper blade (2) fit into the stoppers (A) in the end of the wiper blade refill (1). Make sure the LOCK mark (B) on the wiper blade refill (1) is aligned with the lock point symbol (C) on the front wiper blade (2) as shown.



4. Before installing the front wiper blade assembly, make sure that the wiper blade refill (1) end is fully covered by the front wiper blade (2) in area (A) as shown.



5. Install the front wiper blade. Refer to [WW-77. "FRONT WIPER BLADE : Removal and Installation"](#).

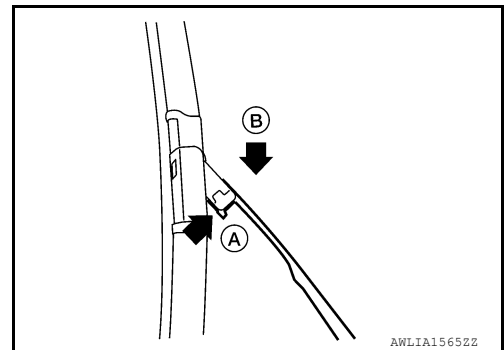
FRONT WIPER BLADE

FRONT WIPER BLADE : Removal and Installation

INFOID:000000008635794

REMOVAL

1. Lift the front wiper arm and wiper blade assembly away from the windshield.
2. Rotate the front wiper blade assembly and push the release tab (A), then move the front wiper blade assembly down (B) the front wiper arm.
3. Remove the front wiper blade assembly.



INSTALLATION

CAUTION:

- After the front wiper blade assembly installation, return the front wiper arm to the original position on the windshield to prevent damage when the hood is opened.

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

WW

FRONT WIPER

< REMOVAL AND INSTALLATION >

- Check that the front wiper blade assembly contacts the windshield properly; otherwise the front wiper arm may be damaged from wind pressure while driving.
1. Insert the front wiper blade assembly onto the front wiper arm and slide it up until it clicks into place.
 2. Rotate the front wiper blade assembly so the dimple is in the groove.
 3. Lay the front wiper arm and front wiper blade assembly back down on the windshield.

FRONT WIPER ARMS

FRONT WIPER ARMS : Removal and Installation

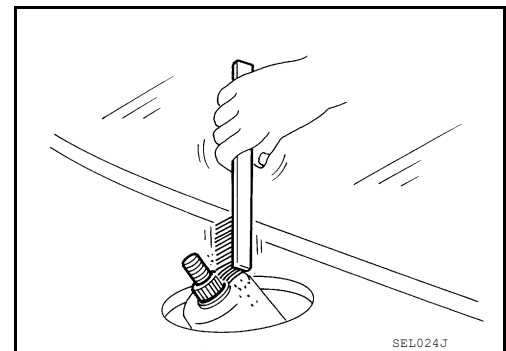
INFOID:000000008635795

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 arm, and remove wiper arm from the vehicle.

INSTALLATION

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



2. Prior to wiper arm installation, turn wiper switch ON to operate wiper motor and then turn wiper switch 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 immediately before temporarily tightening the wiper arm nuts.
5. Spray washer fluid. Turn wiper switch ON to operate wiper motor and then turn wiper switch OFF (auto stop).
6. Make sure that wiper blades stop within clearance (A), (B), (C) and (D).

- Windshield glass (1)

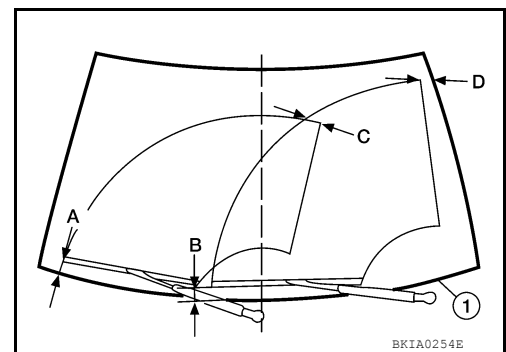
Clearance (A) : 62.5 ± 7.5 mm (2.461 ± 0.295 in)

Clearance (B) : 67.8 ± 7.5 mm (2.669 ± 0.295 in)

Clearance (C) : 29.2 mm (1.150 in)

Clearance (D) : 57.7 mm (2.272 in)

7. Tighten wiper arm nuts to specification. Refer to [WW-74](#), "Exploded View".
8. Attach wiper arm caps.



ADJUSTMENT

To adjust the wiper arm stop location, the wiper arm must be removed and installed. Follow the FRONT WIPER ARM removal and installation procedure.

FRONT WIPER DRIVE ASSEMBLY

FRONT WIPER DRIVE ASSEMBLY : Removal and Installation

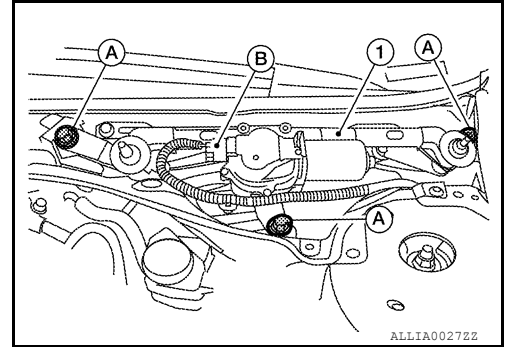
INFOID:000000008635796

REMOVAL

FRONT WIPER

< REMOVAL AND INSTALLATION >

1. Turn wiper switch ON to operate wiper motor and then turn wiper switch OFF (auto stop).
2. Remove wiper arms. Refer to [WW-78, "FRONT WIPER ARMS : Removal and Installation"](#).
3. Remove hood ledge covers.
4. Remove the cowl top grille. Refer to [EXT-20, "Exploded View"](#).
5. Disconnect washer hose from the lower cowl top extension brace.
6. Remove the lower cowl top extension brace. Refer to [EXT-21, "Removal and Installation"](#).
7. Detach the wiper drive harness clip from the wiper drive assembly frame.
8. Remove the front wiper drive assembly bolts (A), disconnect the wiper drive motor connector (B) and remove the front wiper drive assembly (1).



INSTALLATION

Installation is in the reverse order of removal.

- Adjust wiper arm stop location as necessary. Refer to [WW-78, "FRONT WIPER ARMS : Removal and Installation"](#).

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

WW

FRONT WASHER

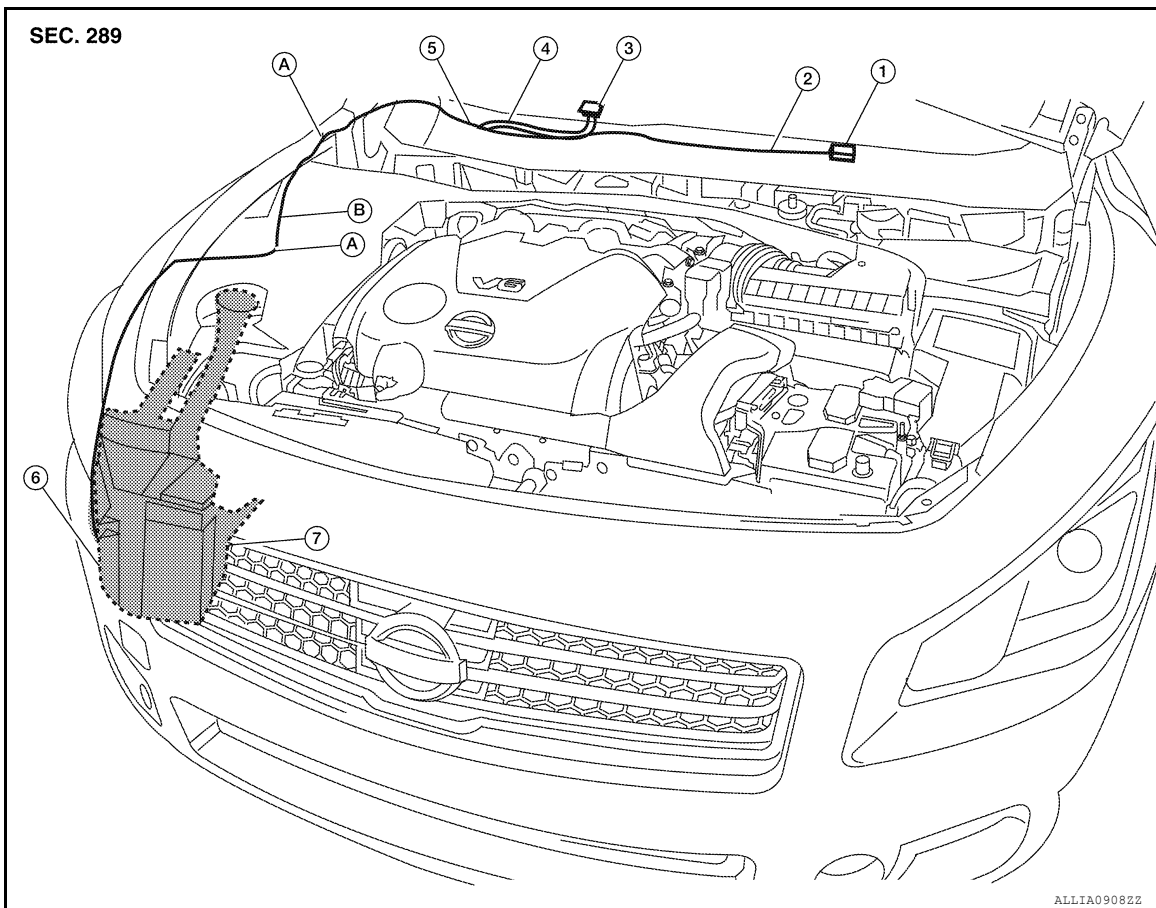
< REMOVAL AND INSTALLATION >

FRONT WASHER

WASHER TUBE

WASHER TUBE : Layout

INFOID:000000008635797



- | | | |
|--------------------------|--------------------------|---------------------|
| 1. Washer nozzle LH | 2. Washer nozzle hose LH | 3. Washer nozzle RH |
| 4. Washer nozzle hose RH | 5. Y-tube connector | 6. Washer tank hose |
| 7. Washer tank | A. Tube connectors | B. Clip |

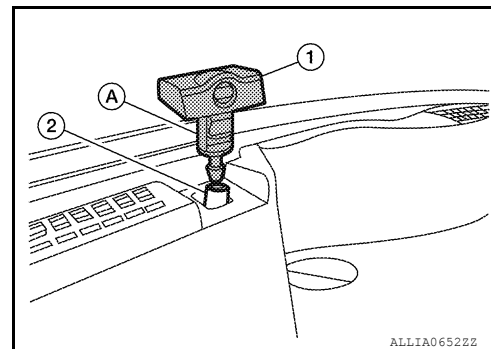
FRONT WASHER NOZZLE

FRONT WASHER NOZZLE : Removal and Installation

INFOID:000000008635798

REMOVAL

1. Remove the cowl top grille. Refer to [EXT-21, "Removal and Installation"](#).
2. Push washer nozzle tab (A) to release the washer nozzle (1) from the cowl top grille, then disconnect the washer nozzle hose (2).



INSTALLATION

FRONT WASHER

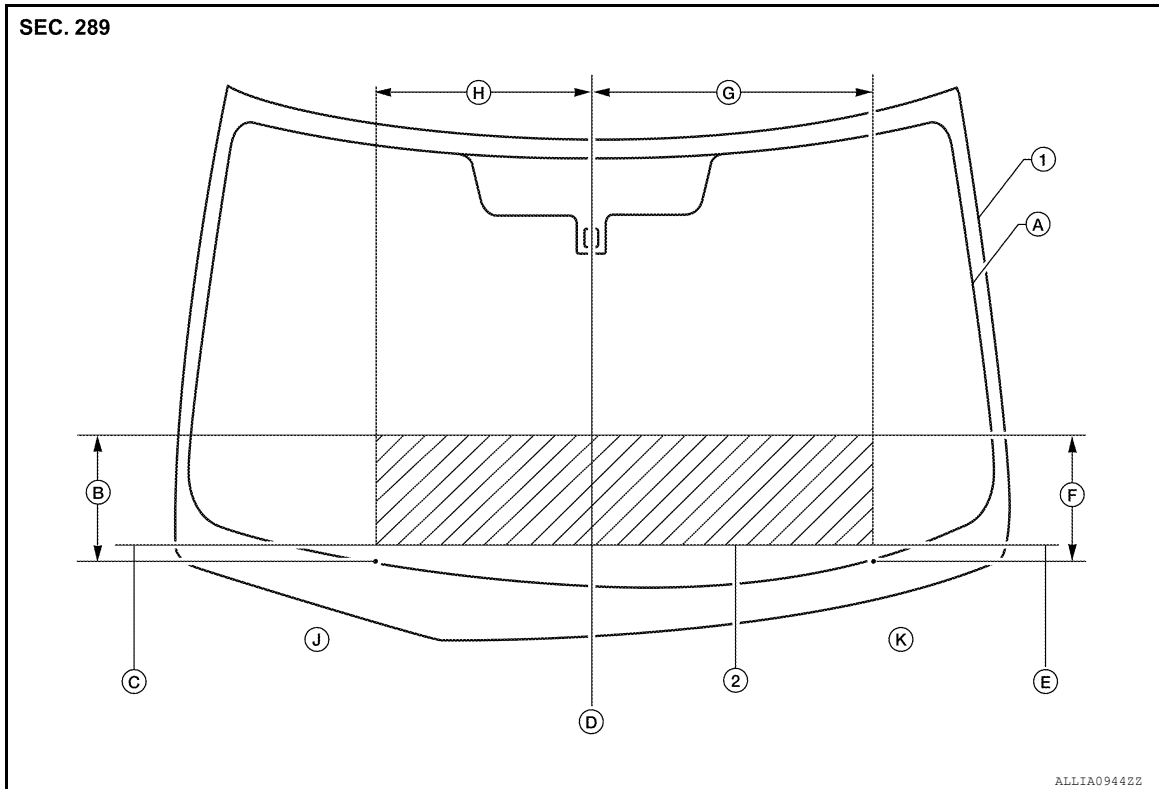
< REMOVAL AND INSTALLATION >

Installation is in the reverse order of removal.

- Adjust nozzle spray location. Refer to [WW-81, "FRONT WASHER NOZZLE : Adjustment"](#).

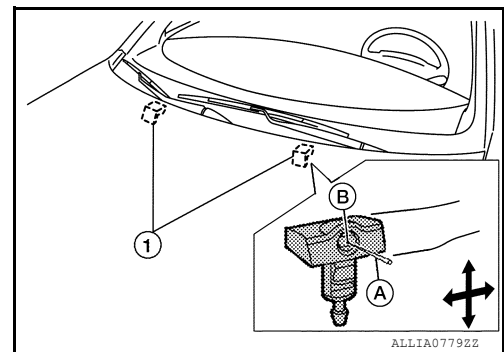
FRONT WASHER NOZZLE : Adjustment

INFOID:000000008635799



- | | | |
|------------------------|--------------------------|------------------------------------|
| 1. Windshield | 2. Spray zone | A. Black printed frame line |
| B. 301.6 mm (11.87 in) | C. 24.7 mm (0.97 in) | D. Windshield vertical center line |
| E. 24.4 mm (0.96 in) | F. 301.3 mm (11.86 in) | G. 502.3 mm (19.78 in) |
| H. 501.4 mm (19.74 in) | J. RH side of windshield | K. LH side of windshield |

- To adjust the front washer nozzles (1), insert a suitable tool (A) into the nozzle hole (B) and move it up or down and left or right to adjust the spray into the specified spray zone.



WASHER TANK

WASHER TANK : Removal and Installation

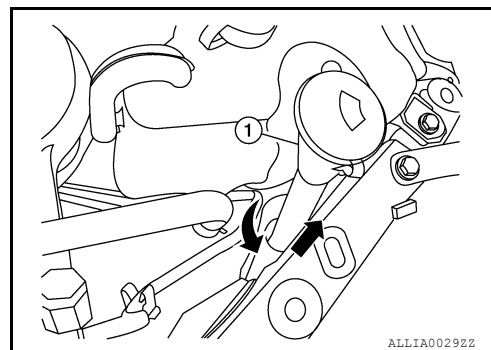
INFOID:000000008635800

REMOVAL

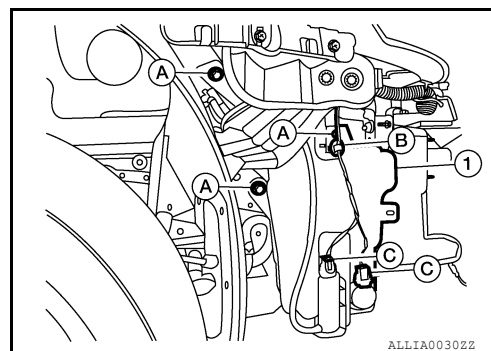
FRONT WASHER

< REMOVAL AND INSTALLATION >

1. Remove the washer tank filler tube (1).



2. Remove RH front tire. Refer to [WT-60. "Adjustment"](#).
3. Position the RH fender protector back. Refer to [EXT-23. "Exploded View"](#).
4. Remove engine under cover.
5. Remove side under cover.
6. Disconnect the washer pump and washer fluid level sensor connectors (C), then detach the connector harness clip (B).
7. Remove the washer tank bolts (A), disconnect the washer pump hose and remove the washer tank (1).



INSTALLATION

Installation is in the reverse order of removal.

- After installation, add NISSAN specified fluid up to the upper level of washer tank inlet, and check for leaks. Refer to [MA-16. "FOR USA AND CANADA : Fluids and Lubricants"](#) (for United States and Canada), [MA-17. "FOR MEXICO : Fluids and Lubricants"](#) (for Mexico).

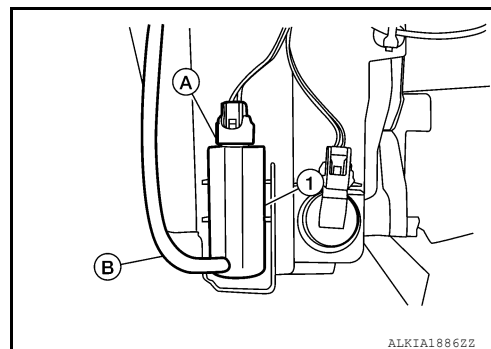
FRONT WASHER PUMP

FRONT WASHER PUMP : Removal and Installation

INFOID:000000008635801

REMOVAL

1. Position the RH front fender protector back. Refer to [EXT-24. "Removal and Installation"](#).
2. Remove the engine under cover.
3. Remove the RH front fender protector side cover. Refer to [EXT-24. "Removal and Installation"](#).
4. Disconnect the front washer pump connector (A), and washer pump hose (B).
5. Remove the front washer pump (1).
6. Remove the front washer pump grommet.



INSTALLATION

Installation is in the reverse order of removal.

FRONT WASHER

< REMOVAL AND INSTALLATION >

- After installation, add NISSAN specified fluid up to the upper level of washer tank inlet, and check for leaks. Refer to [MA-16, "FOR USA AND CANADA : Fluids and Lubricants"](#). (for United States and Canada), [MA-17, "FOR MEXICO : Fluids and Lubricants"](#) (for Mexico).

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

WW

WASHER LEVEL SWITCH

< REMOVAL AND INSTALLATION >

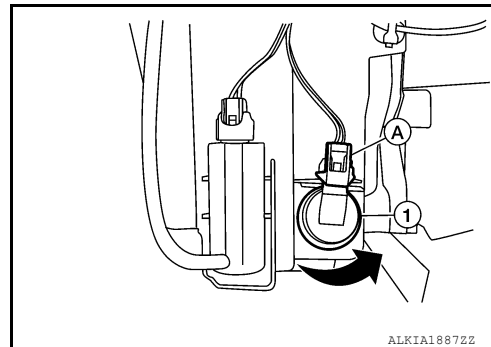
WASHER LEVEL SWITCH

Removal and Installation

INFOID:000000008635802

REMOVAL

1. Position the RH front fender protector back. Refer to [EXT-24, "Removal and Installation"](#).
2. Remove the engine under cover.
3. Remove the RH front fender protector side cover. Refer to [EXT-24, "Removal and Installation"](#).
4. Disconnect the front washer level switch connector (A).
5. Rotate washer level switch (1) counter clockwise and remove.



INSTALLATION

Installation is in the reverse order of removal.

- After installation, add NISSAN specified fluid up to the upper level of washer tank inlet, and check for leaks. Refer to [MA-16, "FOR USA AND CANADA : Fluids and Lubricants"](#) (for United States and Canada), [MA-17, "FOR MEXICO : Fluids and Lubricants"](#) (for Mexico).

FRONT WIPER AND WASHER SWITCH

< REMOVAL AND INSTALLATION >

FRONT WIPER AND WASHER SWITCH

Removal and Installation

INFOID:000000008635803

NOTE:

The front wiper and washer switch is part of the combination switch assembly.

REMOVAL

1. Disconnect battery.

CAUTION:

- Before servicing, disconnect both battery terminals and wait at least three minutes.
- Do not use air tools or electric tools for servicing.
- After the work is completed, make sure no system malfunction is detected by air bag warning lamp.
- In case a malfunction is detected by the air bag warning lamp, reset with the self-diagnosis function and delete the memory with CONSULT.
- If a malfunction is still detected after the above operation, perform self-diagnosis to repair malfunctions. Refer to [SRC-12, "SRS Operation Check"](#).

2. Remove steering column covers. Refer to [JP-19, "Removal and Installation"](#).
3. Rotate steering wheel clockwise to access first combination switch bolt and remove the bolt.
4. Rotate steering wheel counter-clockwise to access second combination switch bolt and remove the bolt. Disconnect electrical connectors and remove the combination switch.

INSTALLATION

Installation is in the reverse order of removal.

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

WW

SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

Specifications

INFOID:000000008635804

Windshield Washer Fluid

| | |
|---------------------------------------|--|
| Windshield washer fluid capacity | 4.5 ℓ (1 1/4 US gal, 1 Imp gal) |
| Windshield washer fluid specification | Refer to MA-16, "FOR USA AND CANADA : Fluids and Lubricants" (United States and Canada), MA-17, "FOR MEXICO : Fluids and Lubricants" (Mexico). |