# SECTION DEF
# DEFOGGER



## CONTENTS

# BASIC INSPECTION

## DIAGNOSIS AND REPAIR WORKFLOW

### Work Flow

INFOID:0000000001189045

DETAILED FLOW

#### 1.OBTAIN INFORMATION ABOUT SYMPTOM

Interview the customer to obtain the malfunction information (conditions and environment when the malfunction occurred) as much as possible when the customer brings the vehicle in.

>> GO TO 2.

#### 2.CHECK DTC

Perform self diagnosis with CONSULT-III

Is any DTC detected?

YES >> Refer to BCS-62, "DTC Index".
NO >> GO TO 3.

#### 3.REPRODUCE THE MALFUNCTION INFORMATION

Check the malfunction on the vehicle that the customer describes.
Inspect the relation of the symptoms and the condition when the symptoms occur.

>> GO TO 4.

#### 4.IDENTIFY THE MALFUNCTIONING SYSTEM WITH “SYMPTOM DIAGNOSIS”

Use “Symptom diagnosis” from the symptom inspection result in step 3. Then identify where to start performing the diagnosis based on possible causes and symptoms.

>> GO TO 5.

#### 5.IDENTIFY MALFUNCTIONING PARTS WITH “COMPONENT DIAGNOSIS”

Perform the diagnosis with “Component diagnosis” of the applicable system.

>> GO TO 6.

#### 6.REPAIR OR REPLACE THE MALFUNCTIONING PARTS

Repair or replace the specified malfunctioning parts.

>> GO TO 7.

#### 7.FINAL CHECK

Check that malfunctions are not reproduced when obtaining the malfunction information from the customer, referring to the symptom inspection result in step 3.

Are all malfunctions corrected?

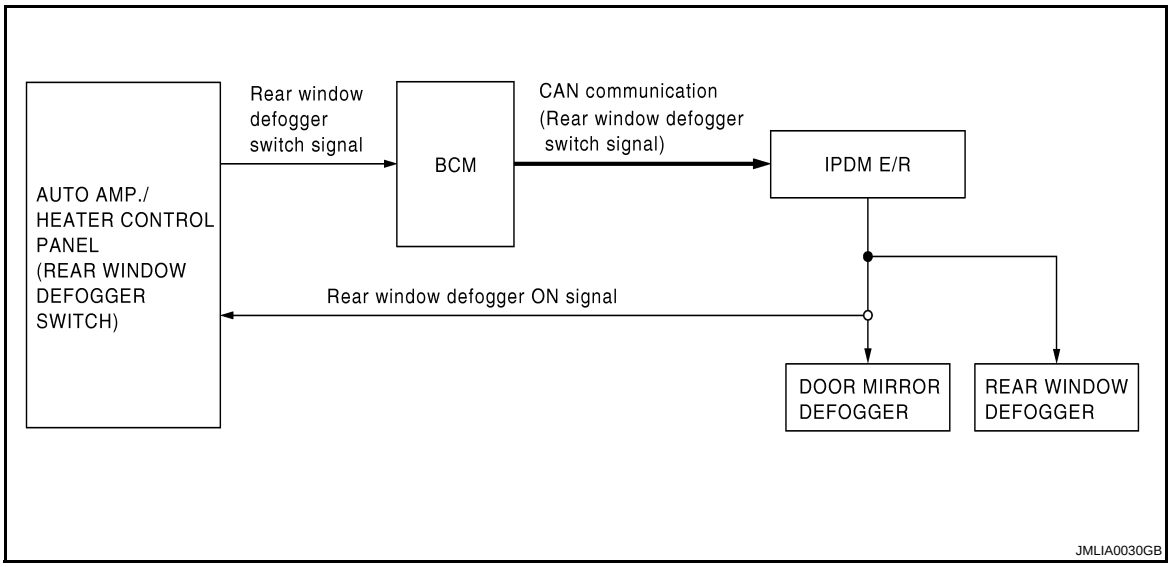
YES >> INSPECTION END
NO >> GO TO 4.

# FUNCTION DIAGNOSIS

## REAR WINDOW DEFOGGER SYSTEM

### System Diagram

INFOID:0000000001189046




### System Description

INFOID:0000000001189047

#### OPERATION DESCRIPTION

- BCM detects that the rear window defogger switch is turned ON when the ignition switch is ON, and then transmits the rear window defogger switch signal to IPDM E/R via CAN communication for approximately 15 minutes.
- IPDM E/R turns rear window defogger relay ON when it receives the rear window defogger switch signal. Then, it transmits the rear window defogger ON signal to ECM via CAN communication.
- The power is supplied to the rear window defogger and door mirror defogger (with mirror defogger) when the rear window defogger relay is turned ON.

#### TIMER FUNCTION

- BCM transmits the rear window defogger switch signal to IPDM E/R for approximately 15 minutes when the rear window defogger switch is turned ON with the ignition switch ON. Then, IPDM E/R operates the rear window defogger and door mirror defogger (with mirror defogger).
- The timer is cancelled if the rear window defogger switch is pressed again during timer operation. BCM stops the output of rear window defogger switch signal. The same reaction also occurs during timer operation if the ignition switch is turned OFF.

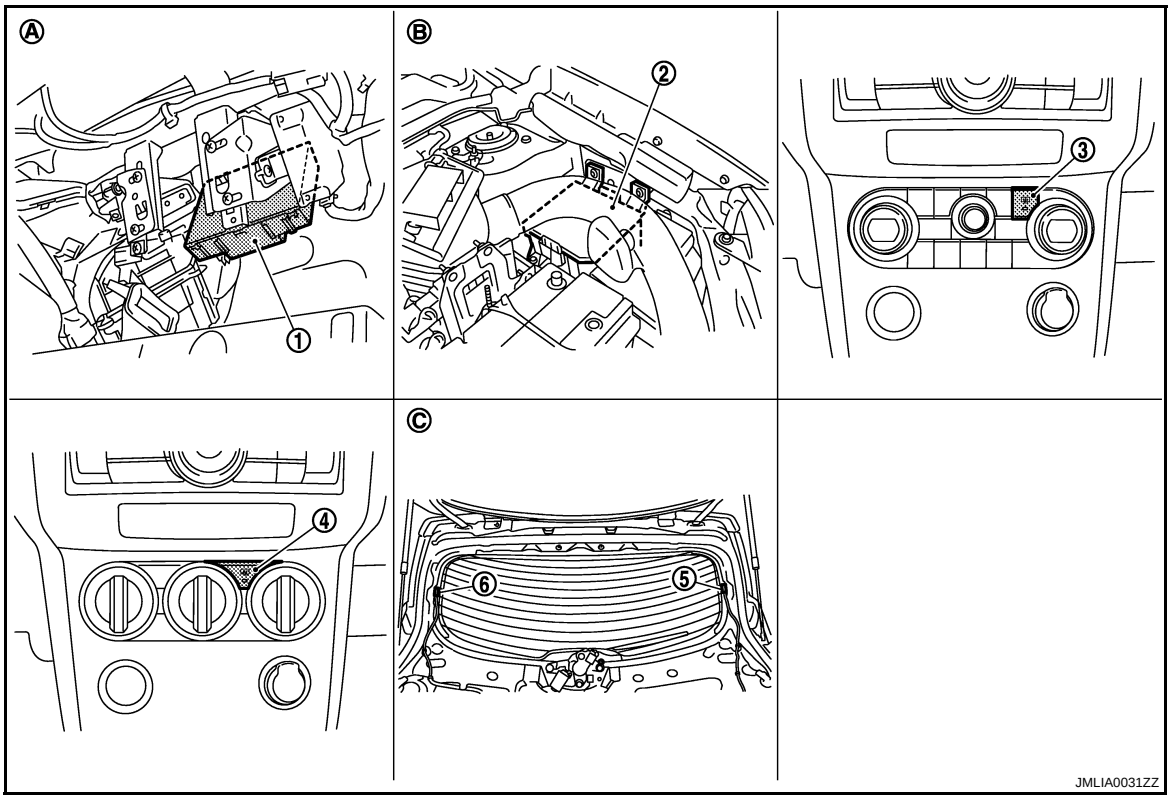
#### INPUT/OUTPUT SIGNAL CHART

| Switch | Input signal to BCM | BCM function | Acutuator |
|---|---|---|---|
| Rear window defogger switch | Defogger switch signal | Rear window defogger & Door mirror defogger* control | Rear window defogger<br>Door mirror defogger * |
| Ignition switch | Ignition signal | | |

*: With mirror defogger

## Component Parts Location

INFOID:0000000001189048




| | | | | | |
|---|---|---|---|---|---|
| 1. | BCM M65,M66,M67 | 2. | IPDM E/R E10,E12,E14 | 3. | Rear window defogger switch (built in AUTO AMP. M53) |
| 4. | Rear window defogger switch (built in heater control panel M54) | 5. | Rear window defogger B58 | 6. | Rear window defogger D155 |
| A. | Behind glove box | B. | Engine room dash panel (LH) | C. | Behind back door trim finisher |

## Component Description

INFOID:0000000001189049

| | |
|---|---|
| BCM | • Rear window defogger switch operation is transmitted IPDM E/R via CAN communication.<br>• Performs the timer control of rear window defogger. |
| Rear window defogger relay | • Operates the rear window defogger and the door mirror defogger* with the control signal from IPDM E/R. |
| IPDM E/R | • BCM controls rear window defogger relay via CAN communication, and then operates rear window defogger or door mirror defogger. |
| Auto amp. / Heater control panel (Rear window defogger switch) | • The rear window defogger switch is installed.<br>• Turns the indicator lamp ON when detecting the operation of rear window defogger. |
| Rear window defogger | • Heats the heating wire with the power supply from the rear window defogger relay to prevent the rear window from fogging up. |
| Door mirror defogger* | • Heats the heating wire with the power supply from the rear window defogger relay to prevent the door mirror from fogging up. |

*With mirror defogger

# DIAGNOSIS SYSTEM (BCM)

## COMMON ITEM

### COMMON ITEM : CONSULT-III Function (BCM - COMMON ITEM)

INFOID:0000000001555106

#### APPLICATION ITEM

CONSULT-III performs the following functions via CAN communication with BCM.

| Diagnosis mode | Function Description |
|---|---|
| Work Support | Changes the setting for each system function. |
| Self Diagnostic Result | Displays the diagnosis results judged by BCM. Refer to BCS-62, "DTC Index". |
| CAN Diag Support Monitor | Monitors the reception status of CAN communication viewed from BCM. |
| Data Monitor | The BCM input/output signals are displayed. |
| Active Test | The signals used to activate each device are forcibly supplied from BCM. |
| Ecu Identification | The BCM part number is displayed. |
| Configuration | • Enables to read and save the vehicle specification.<br>• Enables to write the vehicle specification when replacing BCM. |

#### SYSTEM APPLICATION

BCM can perform the following functions for each system.

**NOTE:**

It can perform the diagnosis modes except the following for all sub system selection items.

×: Applicable item

| System | Sub system selection item | Diagnosis mode | | |
|---|---|---|---|---|
| | | WORK SUPPORT | DATA MONITOR | ACTIVE TEST |
| — | BCM | × | | |
| Door lock | DOOR LOCK | × | × | × |
| Rear window defogger | REAR DEFOGGER | × | × | × |
| Warning chime | BUZZER | | × | × |
| Interior room lamp | INT LAMP | × | × | × |
| Remote keyless entry system | MULTI REMOTE ENT | × | × | × |
| Exterior lamp | HEAD LAMP | × | × | × |
| Wiper and washer | WIPER | × | × | × |
| Turn signal and hazard warning lamps | FLASHER | | × | × |
| Air conditioner | AIR CONDITONER | | × | |
| Intelligent Key system | INTELLIGENT KEY | | × | |
| Combination switch | COMB SW | | × | |
| Immobilizer | IMMU | | × | × |
| Interior room lamp battery saver | BATTERY SAVER | × | × | × |
| Back door open | TRUNK | | × | × |
| Vehicle security system | THEFT ALM | × | × | × |
| Signal buffer system | SIGNAL BUFFER | | × | × |
| PTC heater system | PTC HEATER | | × | × |

## REAR WINDOW DEFOGGER

### REAR WINDOW DEFOGGER : CONSULT-III Function (BCM - REAR DEFOGGER)

INFOID:0000000001189051

Data monitor

| Monitor Item | Description |
|---|---|
| REAR DEF SW | Displays “Press (ON)/other (OFF)” status determined with the rear window defogger switch. |
| IGN ON SW | Indicates [ON/OFF] condition of ignition switch in ON position. |
| ACC ON SW | Indicates [ON/OFF] condition of ignition switch in ACC position. |

## ACTIVE TEST

| Test Item | Description |
|---|---|
| REAR DEFOGGER | Give a drive signal to the rear window defogger relay to activate it. |

# DIAGNOSIS SYSTEM (IPDM E/R)

## Diagnosis Description

INFOID:0000000001555128

### 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
- Rear window defogger
- Front wiper (LO, HI)
- Parking lamps
- License plate lamps
- Tail lamps
- Front fog lamps
- Headlamps (LO, HI)
- A/C compressor (magnet clutch)
- Cooling fan (LO, HI)

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 driver door switch 10 times. Then turn the ignition switch OFF.
   **CAUTION:**
   **Close passenger door.**
4. Turn the ignition switch ON within 10 seconds. Then 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.

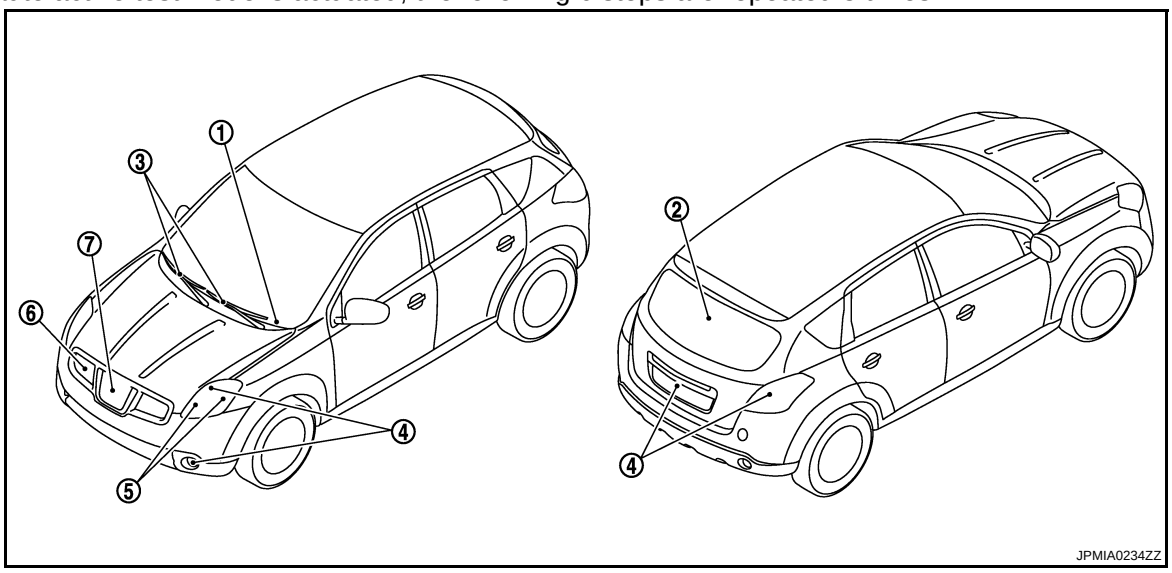
**NOTE:**
When auto active test mode has to be cancelled halfway through test, turn ignition switch OFF.

**CAUTION:**

- **If auto active test mode cannot be actuated, check door switch system.**
- **Never start the engine.**

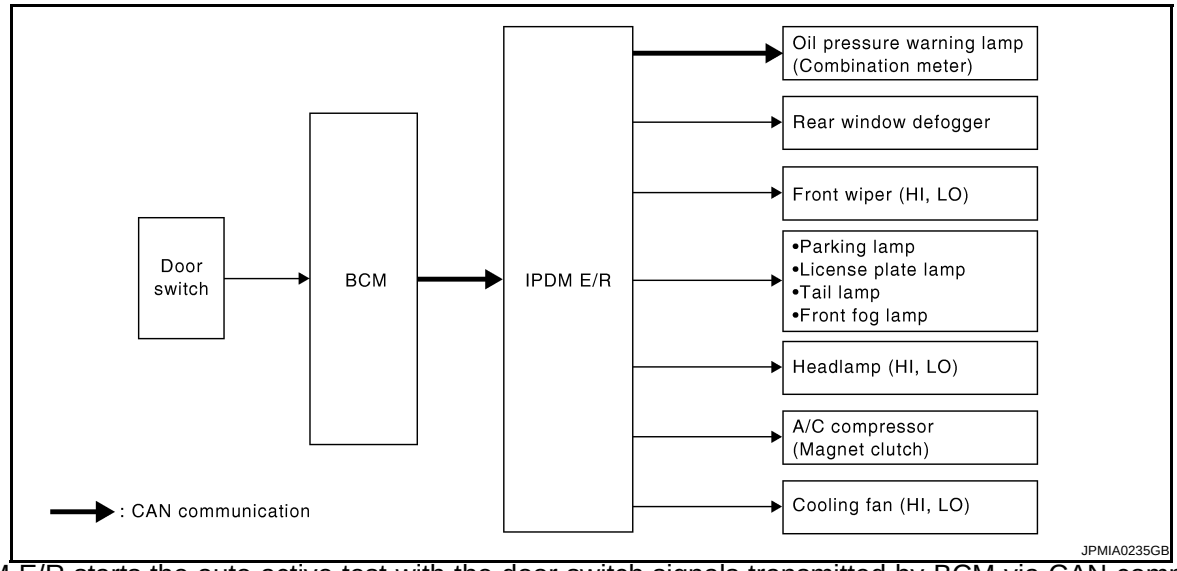
Inspection in auto active test mode

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 | Rear window defogger | 10 seconds |
| 3 | Front wiper | LO for 5 seconds → HI for 5 seconds |
| 4 | • Parking lamps<br>• License plate lamps<br>• Tail lamps<br>• Front fog lamps | 10 seconds |
| 5 | Headlamps | LO ⇔ HI 5 times |
| 6 | A/C compressor (magnet clutch) | ON ⇔ OFF 5 times |
| 7 | Cooling fan | LO for 5 seconds → HI for 5 seconds |

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 |
|---|---|---|---|
| Rear window defogger does not operate | Perform auto active test. Does the rear window defogger operate? | YES | BCM signal input circuit |
| | | NO | • Rear window defogger<br>• Rear window defogger ground circuit<br>• Harness or connector between IPDM E/R and rear window defogger<br>• IPDM E/R |
| Any of the following components do not operate<br>• Parking lamps<br>• License plate lamps<br>• Tail lamps<br>• Front fog lamps<br>• Headlamp (HI, LO)<br>• Front wiper (HI, LO) | Perform auto active test. Does the applicable system operate? | YES | BCM signal input circuit |
| | | NO | • Lamp or motor<br>• Lamp or motor ground circuit<br>• Harness or connector between IPDM E/R and applicable system<br>• IPDM E/R |

| Symptom | Inspection contents | | Possible cause |
|---|---|---|---|
| A/C compressor does not operate | Perform auto active test. Does the magnet clutch operate? | YES | • Communication signal between BCM and auto amp. (with auto A/C)<br>• Communication signal between BCM and heater control panel (without auto A/C, with manual A/C)<br>• BCM<br>• CAN communication signal between BCM and ECM<br>• CAN communication signal between ECM and IPDM E/R |
| | | NO | • Magnet clutch<br>• Harness or connector between IPDM E/R and magnet clutch<br>• IPDM E/R |
| Oil pressure warning lamp does not operate | Perform auto active test. Does the oil pressure warning lamp blink? | YES | • Harness or connector between IPDM E/R and oil pressure switch<br>• Oil pressure switch<br>• IPDM E/R |
| | | NO | • CAN communication signal between IPDM E/R and BCM<br>• CAN communication signal between BCM and combination meter<br>• Combination meter |
| Cooling fan does not operate | Perform auto active test. Does the cooling fan operate? | YES | • ECM signal input circuit<br>• CAN communication signal between ECM and IPDM E/R |
| | | NO | • Cooling fan<br>• Cooling fan ground circuit<br>• Harness or connector between IPDM E/R and cooling fan<br>• IPDM E/R<br>• Cooling fan relay-3*<br>• Harness or connector between IPDM E/R and cooling fan relay-3*<br>• Harness or connector between cooling fan and cooling fan relay-3* |

**NOTE:**

*: MR engine and K9K engine models

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

INFOID:0000000001555129

### APPLICATION ITEM

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

| Diagnosis mode | Description |
|---|---|
| Ecu Identification | Allows confirmation of IPDM E/R part number. |
| Self Diagnostic Result | Displays the diagnosis results judged by IPDM E/R. |
| Data Monitor | Displays the real-time input/output data from IPDM E/R input/output data. |
| Active Test | IPDM E/R can provide a drive signal to electronic components to check their operations. |
| CAN Diag Support Monitor | The results of transmit/receive diagnosis of CAN communication can be read. |

### SELF DIAGNOSTIC

Refer to PCS-31, "DTC Index".

### DATA MONITOR

Monitor item

| Monitor Item [Unit] | MAIN SIGNALS | Description |
|---|---|---|
| MOTOR FAN REQ [1 - 4] | × | Displays the value of the cooling fan speed signal received from ECM via CAN communication. |
| AC COMP REQ [Off/On] | × | Displays the status of the A/C compressor request signal received from ECM via CAN communication. |
| TAIL&CLR REQ [Off/On] | × | Displays the status of the position light request signal received from BCM via CAN communication. |
| HL LO REQ [Off/On] | × | Displays the status of the low beam request signal received from BCM via CAN communication. |
| HL HI REQ [Off/On] | × | Displays the status of the high beam request signal received from BCM via CAN communication. |
| FR FOG REQ [Off/On] | × | Displays the status of the front fog light request signal received from BCM via CAN communication. |
| HL WASHER REQ [Off/On] | | Displays the status of the headlamp washer request signal received from BCM via CAN communication. |
| FR WIP REQ [Stop/1LOW/Low/Hi] | × | Displays the status of the front wiper request signal received from BCM via CAN communication. |
| WIP AUTO STOP [STOP P/ACT P] | × | Displays the status of the front wiper auto stop signal judged by IPDM E/R. |
| WIP PROT [Off/BLOCK] | × | Displays the status of the front wiper fail-safe operation judged by IPDM E/R. |
| ST RLY REQ [Off/On] | | Displays the status of the ignition and starter request signal received from BCM via CAN communication. |
| IGN RLY [Off/On] | × | Displays the status of the ignition relay judged by IPDM E/R. |
| RR DEF REQ [Off/On] | × | Displays the status of the rear defogger request signal received from BCM via CAN communication. |
| OIL P SW [Open/Close] | | Displays the status of the oil pressure switch judged by IPDM E/R. |
| REV SW [Off/On] | | Displays the status of the reverse switch judged by IPDM E/R. |
| HOOD SW [Off/On] | | Displays the status of the hood switch judged by IPDM E/R.<br>**NOTE:**<br>This item is monitored only the vehicle with the Vehicle Security (Theft Warning) system. |
| THFT HRN REQ [Off/On] | | Displays the status of the theft warning horn request signal received from BCM via CAN communication.<br>**NOTE:**<br>This item is monitored only the vehicle with the Vehicle Security (Theft Warning) system. |
| HORN CHIRP [Off/On] | | **NOTE:**<br>This item is indicated, but not monitored. |
| IGN ON SW [Off/On] | | Displays the status of the ignition switch judged by IPDM E/R. |

## ACTIVE TEST

### Test item

| Test item | Operation | Description |
|---|---|---|
| REAR DEFOGGER | Off | OFF |
| | On | Operates the rear window defogger relay. |
| FRONT WIPER | Off | OFF |
| | Lo | Operates the front wiper relay. |
| | Hi | Operates the front wiper relay and front wiper high relay. |

| Test item | Operation | Description |
|---|---|---|
| MOTOR FAN | 1 | OFF |
| | 2 | Operates the cooling fan relay (low operation). |
| | 3 | Operates the cooling fan relay (high operation). |
| | 4 | |
| HEAD LAMP WASHER | On | Operates the headlamp washer relay for 1 second. |
| EXTERNAL LAMPS | Off | OFF |
| | TAIL | Operates the tail lamp relay. |
| | Lo | Operates the headlamp low relay. |
| | Hi | Operates the headlamp low relay and ON/OFF the headlamp high relay at 1 second intervals. |
| | Fog | Operates the front fog lamp relay. |
| HORN | On | Operates horn relay for 20 ms. |

# COMPONENT DIAGNOSIS

## REAR WINDOW DEFOGGER SWITCH WITH AUTO A/C

### WITH AUTO A/C : Description

INFOID:0000000001189054

The rear window defogger is operated by turning the rear window defogger switch ON.

### WITH AUTO A/C : Component Function Check

INFOID:0000000001189055

#### 1.CHECK REAR WINDOW DEFOGGER SWITCH OPERATION

Check (“REAR DEF SW”, “IGN ON SW”) in DATA MONITOR mode with CONSULT-III. Refer to DEF-6, "REAR WINDOW DEFOGGER : CONSULT-III Function (BCM - REAR DEFOGGER)".

**When rear window defogger switch is turned to ON**

**REAR DEF SW :ON**

OK or NG

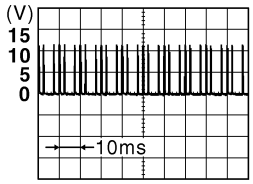
OK >> Rear window defogger switch is OK.
NG >> Refer to DEF-13, "WITH AUTO A/C : Diagnosis Procedure".

### WITH AUTO A/C : Diagnosis Procedure

INFOID:0000000001189056

#### 1.CHECK REAR WINDOW DEFOGGER SWITCH OPERATION

1. Turn ignition switch ON.
2. Check voltage between BCM harness connector and ground.

| BCM | | Ground | Condition | Voltage (V) (Approx.) |
|---|---|---|---|---|
| Connector | Terminal | | | |
| M65 | 21 | Ground | Rear window defogger switch is pressed. | 0 |
| | | | Rear window defogger switch is OFF. |  |



JPMIA0154GB

Is the inspection result normal?

YES >> GO TO 6.
NO >> GO TO 2.

#### 2.CHECK REAR WINDOW DEFOGGER SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM connector and auto amp. connector.
3. Check continuity between BCM harness connector and auto amp. harness connector.

| BCM | | Auto amp. | | Continuity |
|---|---|---|---|---|
| Connector | Terminal | Connector | Terminal | |
| M65 | 21 | M53 | 23 | Yes |

4. Check continuity between BCM harness connector and ground.

| BCM | | Ground | Continuity |
|---|---|---|---|
| Connector | Terminal | | |
| M65 | 21 | Ground | No |

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair or replace harness between BCM and auto amp.

## 3.CHECK REAR WINDOW DEFOGGER SWITCH GROUND CIRCUIT

1. Check continuity between auto amp. harness connector and ground.

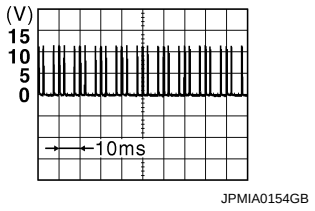
| Auto amp. | | Ground | Continuity |
|---|---|---|---|
| Connector | Terminal | | |
| M53 | 17 | Ground | Existed |

Is the inspection result normal?

YES >> GO TO 4.
NO >> Repair or replace harness between auto amp. and ground.

## 4.CHECK BCM OUTPUT SIGNAL

1. Connect BCM connector.
2. Turn ignition switch ON.
3. Check voltage between BCM harness connector and ground.

| BCM | | Ground | Voltage (V) (Approx.) |
|---|---|---|---|
| Connector | Terminal | | |
| M65 | 21 | Ground |  |



JPMIA0154GB

Is the inspection result normal?

YES >> GO TO 5.
NO >> GO TO 6.

## 5.CHECK IINTERMITTENT INCDENT

Check intermittent incident.
Refer to GI-39, "Intermittent Incident".

Is the inspection result normal?

YES >> Replace auto amp. Refer toVTL-22, "Removal and Installation"
NO >> Repair or replace the malfunctioning parts.

## 6.CHECK IINTERMITTENT INCDENT

Check intermittent incident.
Refer to GI-39, "Intermittent Incident".

>> INSPECTION END

# WITHOUT AUTO A/C

## WITHOUT AUTO A/C : Description

INFOID:0000000001189057

The rear window defogger is operated by turning the rear window defogger switch ON.

## WITHOUT AUTO A/C : Component Function Check

INFOID:0000000001189058

### 1.CHECK REAR WINDOW DEFOGGER SWITCH OPERATION

Check (“REAR DEF SW”, “IGN ON SW”) in DATA MONITOR mode with CONSULT-III. Refer to DEF-6, "REAR WINDOW DEFOGGER : CONSULT-III Function (BCM - REAR DEFOGGER)".

**When rear window defogger switch is turned to ON**

**REAR DEF SW :ON**

OK or NG

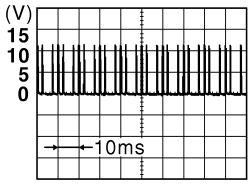
OK >> Rear window defogger switch is OK.
NG >> Refer to DEF-15, "WITHOUT AUTO A/C : Diagnosis Procedure".

## WITHOUT AUTO A/C : Diagnosis Procedure

INFOID:0000000001189059

### 1.CHECK REAR WINDOW DEFOGGER SWITCH OPERATION

1. Turn ignition switch ON.
2. Check voltage between BCM harness connector and ground.

| BCM | | Ground | Condition | Voltage (V) (Approx.) |
|---|---|---|---|---|
| Connector | Terminal | | | |
| M65 | 21 | Ground | Rear window defogger switch is pressed. | 0 |
| | | | Rear window defogger switch is OFF. |  JPMIA0154GB |

Is the inspection result normal?

YES >> GO TO 6.
NO >> GO TO 2.

### 2.CHECK REAR WINDOW DEFOGGER SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM connector and heater control panel connector.
3. Check continuity between BCM harness connector and heater control panel harness connector.

| BCM | | Heater control panel | | Continuity |
|---|---|---|---|---|
| Connector | Terminal | Connector | Terminal | |
| M65 | 21 | M54 | 18 | Yes |

4. Check continuity between BCM harness connector and ground

| BCM | | Ground | Continuity |
|---|---|---|---|
| Connector | Terminal | | |
| M65 | 21 | Ground | No |

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair or replace harness between BCM and heater control panel.

### 3.CHECK REAR WINDOW DEFOGGER SWITCH GROUND CIRCUIT

1. Check continuity between heater control panel harness connector and ground.

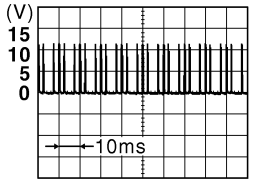
| Heater control panel | | Ground | Continuity |
|---|---|---|---|
| Connector | Terminal | | |
| M54 | 20 | Ground | Existed |

Is the inspection result normal?

YES >> GO TO 4.
NO >> Repair or replace harness between heater control panel and ground.

## 4.CHECK BCM OUTPUT SIGNAL

1. Connect BCM connector.
2. Turn ignition switch ON.
3. Check voltage between BCM harness connector and ground.

| BCM | | Ground | Voltage (V) (Approx.) |
|---|---|---|---|
| Connector | Terminal | | |
| M65 | 21 | Ground |  |



JPMIA0154GB

Is the inspection result normal?

YES >> GO TO 5.
NO >> GO TO 6.

## 5.CHECK REAR WINDOW DEFOGGER SWITCH

Check rear window defogger switch.
Refer to DEF-16, "WITHOUT AUTO A/C : Component Inspection".

Is the inspection result normal?

YES >> GO TO 6.
NO >> Replace heater control panel (rear window defogger switch). Refer to VTL-81, "Removal and Installation".

## 6.CHECK INTERMITTENT INCDENT

Check intermittent incident.
Refer to GI-39, "Intermittent Incident".

>> INSPECTION END.

## WITHOUT AUTO A/C : Component Inspection

INFOID:0000000001189060

## 1.CHECK HEATER CONTROL PANEL (REAR WINDOW DEFOGGER SWITCH)

Check heater control panel (rear window defogger switch connector).

| Heater control panel | | | Condition | Continuity |
|---|---|---|---|---|
| Connector | Terminal | | | |
| M54 | 18 | 20 | Rear window defogger switch is pressed | Existed |
| | | | Rear window defogger switch: OFF | Not existed |

Is the inspection result normal?

YES >> INSPECTION END.
NO >> Replace heater control panel (rear window defogger switch). Refer to VTL-81, "Removal and Installation".

# REAR WINDOW DEFOGGER RELAY

## Description

INFOID:0000000001524229

The rear window defogger is operated by turning the rear window defogger switch ON.

## Component Function Check

INFOID:0000000001524230

### 1.CHECK REAR WINDOW DEFOGGER SWITCH OPERATION

Check (“REAR DEF SW”, “IGN ON SW”) in DATA MONITOR mode with CONSULT-III. Refer to DEF-6, "REAR WINDOW DEFOGGER : CONSULT-III Function (BCM - REAR DEFOGGER)".

**When rear window defogger switch is turned to ON**

**REAR DEF SW :ON**

OK or NG

OK >> Rear window defogger switch is OK.
NG >> Refer to DEF-17, "Diagnosis Procedure".

## Diagnosis Procedure

INFOID:0000000001524231

### 1.CHECK FUSE

1. Turn ignition switch OFF.
2. Check the following.

- 15A fuse (No. 41, located in IPDM E/R)
- 15A fuse (No. 42, located in IPDM E/R)

Is the inspection result normal?

YES >> GO TO 2.
NO >> Replace the blown fuse after repairing the affected circuit if a fuse is blown.

### 2.CHECK IPDM E/R OUTPUT SIGNAL

1. Turn ignition switch ON.
2. Check voltage between IPDM E/R harness connector and ground.

| IPDM E/R | | Ground | Condition of rear window defogger switch | Voltage (V) (Approx.) |
|---|---|---|---|---|
| Connector | Terminal | | | |
| E14 | 49 | Ground | ON | Battery voltage |
| | | | OFF | 0 |

Is the inspection result normal?

YES >> GO TO 3.
NO >> Replace IPDM E/R. Refer toPCS-33, "Removal and Installation"

### 3.CHECK INTERMITTENT INCIDENT

Refer to GI-39, "Intermittent Incident"

>> INSPECTION END

# REAR WINDOW DEFOGGER

## Description

INFOID:0000000001524232

Heats the heating wire with the power supply from the rear window defogger relay to prevent the rear window from fogging up.

## Component Function Check

INFOID:0000000001524233

### 1.CHECK REAR WINDOW DEFOGGER

Check that the heating wire of rear window defogger is heated when turning the rear window defogger switch ON.

Is the inspection result normal?

YES >> Rear window defogger is OK.
NO >> Refer to DEF-18, "Diagnosis Procedure".

## Diagnosis Procedure

INFOID:0000000001524234

### 1.CHECK REAR WINDOW DEFOGGER POWER SUPPLY CIRCUIT

1. Turn ignition switch ON.
2. Check voltage between rear window defogger harness connector and ground.

| Rear window defogger | | Ground | Condition of rear window defogger switch | Voltage (V) (Approx.) |
|---|---|---|---|---|
| Connector | Terminal | | | |
| B58 | 1 | Ground | ON | Battery voltage |
| | | | OFF | 0 |

Is the inspection result normal?

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

### 2.CHECK REAR WINDOW DEFOGGER GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect rear window defogger connector.
3. Check continuity between rear window defogger harness connector and ground.

| Rear window defogger | | Ground | Continuity |
|---|---|---|---|
| Connector | Terminal | | |
| D155 | 2 | Ground | Existed |

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair or replace harness between rear window defogger and ground.

### 3.CHECK FILAMENT

Check filament.
Refer to DEF-19, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 5.
NO >> Repair filament.

### 4.CHECK REAR WINDOW DEFOGGER POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector and rear window defogger connector.
3. Check continuity between IPDM E/R harness connector and rear window defogger harness connector.

| IPDM E/R | | Rear window defogger | | Continuity |
|---|---|---|---|---|
| Connector | Terminal | Connector | Terminal | |
| E14 | 49 | B58 | 1 | Existed |

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

| IPDM E/R | | Ground | Continuity |
|---|---|---|---|
| Connector | Terminal | | |
| E14 | 49 | Ground | Not existed |

Is the inspection result normal?

YES >> GO TO 5.
NO >> Repair or replace harness between IPDM E/R and rear window defogger.

## 5.CHECK INTERMITTENT INCIDENT

Refer to GI-39, "Intermittent Incident"

>> INSPECTION END

## Component Inspection

INFOID:0000000001524235

## 1.CHECK FILAMENT

Check the filament for damage or blown.
Refer to DEF-74, "Inspection and Repair".

Is the inspection result normal?

YES >> INSPECTION END.
NO >> Repair filament.

# DOOR MIRROR DEFOGGER
## DRIVER SIDE

### DRIVER SIDE : Description

INFOID:0000000001524236

Heats the heating wire with the power supply from the rear window defogger relay to prevent the door mirror from fogging up.

### DRIVER SIDE : Component Function Check

INFOID:0000000001524237

#### 1.CHECK DRIVER SIDE DOOR MIRROR DEFOGGER

Check that heating wire of driver side door mirror defogger is heated when turning the rear window defogger switch ON.

Is the inspection result normal?

YES >> Driver side door mirror defogger is OK.
NO >> Refer to DEF-20, "DRIVER SIDE : Diagnosis Procedure".

### DRIVER SIDE : Diagnosis Procedure

INFOID:0000000001524238

#### 1.CHECK FUSE

1. Turn ignition switch OFF.
2. Check 10A fuse (No. 6, located in fuse and fusible link box).

Is the inspection result normal?

YES >> GO TO 2.
NO >> Replace the blown fuse after repairing the affected circuit if fuse is blown.

#### 2.CHECK DOOR MIRROR DEFOGGER POWER SUPPLY CIRCUIT

1. Turn ignition switch ON.
2. Check voltage between door mirror (driver side) harness connector and ground.

| | Door mirror (driver side) | | Ground | Condition of rear window defogger switch | Voltage (V) (Approx.) |
|---|---|---|---|---|---|
| | Connector | Terminal | | | |
| LHD | D3 | 7 | Ground | ON | Battery voltage |
| RHD | D23 | | | OFF | 0 |

Is the inspection result normal?

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

#### 3.CHECK DOOR MIRROR DEFOGGER GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect door mirror (driver side) connector.
3. Check continuity between door mirror (driver side) harness connector and ground.

| | Door mirror (driver side) | | Ground | Continuity |
|---|---|---|---|---|
| | Connector | Terminal | | |
| LHD | D3 | 8 | Ground | Existed |
| RHD | D23 | | | |

Is the inspection result normal?

YES >> GO TO 4.
NO >> Repair or replace harness between door mirror (driver side) and ground.

#### 4.CHECK DRIVER SIDE DOOR MIRROR DEFOGGER

Check driver side door mirror defogger.
Refer to DEF-21, "DRIVER SIDE : Component Inspection".

Is the inspection result normal?

YES >> GO TO 6.
NO >> Replace door mirror glass (driver side). Refer to MIR-20, "Removal and Installation".

## 5.CHECK DOOR MIRROR CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector and door mirror (driver side) connector.
3. Check continuity between door mirror (driver side) harness connector and IPDM E/R harness connector.

| | Door mirror (driver side) | | IPDM E/R | | Continuity |
|---|---|---|---|---|---|
| | Connector | Terminal | Connector | Terminal | |
| LHD | D3 | 7 | E14 | 49 | Existed |
| RHD | D23 | | | | |

4. Check continuity between door mirror (driver side) harness connector and ground.

| | Door mirror (driver side) | | Ground | Continuity |
|---|---|---|---|---|
| | Connector | Terminal | | |
| LHD | D3 | 7 | Ground | Not existed |
| RHD | D23 | | | |

Is the inspection result normal?

YES >> GO TO 6.
NO >> Repair or replace harness between door mirror (driver side) and IPDM E/R.

## 6.CHECK INTERMITTENT

Refer to GI-39, "Intermittent Incident"

>> INSPECTION END

# DRIVER SIDE : Component Inspection

INFOID:0000000001524239

## 1.CHECK DRIVER SIDE DOOR MIRROR DEFOGGER

1. Turn ignition switch OFF.
2. Disconnect door mirror (driver side) connector.
3. Check continuity between door mirror connector.

| | Door mirror (diver side) | | | Continuity |
|---|---|---|---|---|
| | Connector | Terminal | | |
| LHD | D3 | 7 | 8 | Existed |
| RHD | D23 | | | |

Is the inspection result normal?

YES >> INSPECTION END.
NO >> Replace door mirror glass (driver side). Refer to MIR-20, "Removal and Installation".

# PASSENGER SIDE

# PASSENGER SIDE : Description

INFOID:0000000001524240

Heats the heating wire with the power supply from the rear window defogger relay to prevent the door mirror from fogging up.

# PASSENGER SIDE : Component Function Check

INFOID:0000000001524241

## 1.CHECK PASSENGER SIDE DOOR MIRROR DEFOGGER

Check that heating wire of passenger side door mirror defogger is heated when turning the rear window defogger switch ON.

Is the inspection result normal?

YES >> Passenger side door mirror defogger is OK.
NO >> Refer to DEF-22, "PASSENGER SIDE : Diagnosis Procedure".

## PASSENGER SIDE : Diagnosis Procedure

INFOID:0000000001524242

### 1.CHECK FUSE

1. Turn ignition switch OFF.
2. Check 10A fuse (No. 6, located in fuse and fusible link box).

Is the inspection result normal?

YES >> GO TO 2.
NO >> Replace the blown fuse after repairing the affected circuit if fuse is blown.

### 2.CHECK DOOR MIRROR DEFOGGER POWER SUPPLY CIRCUIT

1. Turn ignition switch ON.
2. Check voltage between door mirror (passenger side) harness connector and ground.

| | Door mirror (passenger side) | | Ground | Condition of rear window defogger switch | Voltage (V) (Approx.) |
|---|---|---|---|---|---|
| | Connector | Terminal | | | |
| LHD | D43 | 7 | Ground | ON | Battery voltage |
| RHD | D63 | | | OFF | 0 |

Is the inspection result normal?

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

### 3.CHECK DOOR MIRROR DEFOGGER GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect door mirror (passenger side) connector.
3. Check continuity between door mirror (passenger side) harness connector and ground.

| | Door mirror (passenger side) | | Ground | Continuity |
|---|---|---|---|---|
| | Connector | Terminal | | |
| LHD | D43 | 8 | Ground | Existed |
| RHD | D63 | | | |

Is the inspection result normal?

YES >> GO TO 4.
NO >> Repair or replace harness between door mirror (passenger side) and ground.

### 4.CHECK PASSENGER SIDE DOOR MIRROR DEFOGGER

Check passenger side door mirror defogger.
Refer to DEF-23, "PASSENGER SIDE : Component Inspection".

Is the inspection result normal?

YES >> GO TO 6.
NO >> Replace door mirror glass (passenger side). Refer to MIR-20, "Removal and Installation".

### 5.CHECK DOOR MIRROR CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector and door mirror (passenger side) connector.
3. Check continuity between door mirror (passenger side) harness connector and IPDM E/R harness connector.

| | Door mirror (passenger side) | | IPDM E/R | | Continuity |
|---|---|---|---|---|---|
| | Connector | Terminal | Connector | Terminal | |
| LHD | D43 | 7 | E14 | 49 | Existed |
| RHD | D63 | | | | |

4. Check continuity between door mirror (passenger side) harness connector and ground.

| | Door mirror (passenger side) | | Ground | Continuity |
|---|---|---|---|---|
| | Connector | Terminal | | |
| LHD | D43 | 7 | Ground | Not existed |
| RHD | D63 | | | |

Is the inspection result normal?

YES >> GO TO 6.
NO >> Repair or replace harness between door mirror (passenger side) and IPDM E/R.

## 6.CHECK INTERMITTENT

Refer to GI-39, "Intermittent Incident"

>> INSPECTION END

## PASSENGER SIDE : Component Inspection

INFOID:0000000001524243

## 1.CHECK PASSENGER SIDE DOOR MIRROR DEFOGGER

1. Turn ignition switch OFF.
2. Disconnect door mirror (passenger side) connector.
3. Check continuity between door mirror connector.

| | Door mirror (passenger side) | | | Continuity |
|---|---|---|---|---|
| | Connector | Terminal | | |
| LHD | D43 | 7 | 8 | Existed |
| RHD | D63 | | | |

Is the inspection result normal?

YES >> INSPECTION END.
NO >> Replace door mirror glass (passenger side). Refer to MIR-20, "Removal and Installation".

# REAR WINDOW DEFOGGER ON SIGNAL WITH AUTO A/C

## WITH AUTO A/C : Description

INFOID:0000000001189073

Turns the indicator lamp in the rear window defogger switch ON when operating the rear window defogger.

## WITH AUTO A/C : Component Function Check

INFOID:0000000001189074

### 1.CHECK REAR WINDOW DEFOGGER ON SIGNAL

Check that the indicator lamps of rear window defogger switch are illuminated when turning the rear window defogger switch ON.

Is the inspection result normal?

OK >> Rear window defogger ON signal is OK.
NG >> Refer to DEF-24, "WITH AUTO A/C : Diagnosis Procedure"

## WITH AUTO A/C : Diagnosis Procedure

INFOID:0000000001189075

### 1.CHECK REAR WINDOW DEFOGGER INDICATOR LAMPS ON SIGNAL

1. Turn ignition switch ON.
2. Check voltage between auto amp. harness connector and ground.

| Auto amp. | | Ground | Condition | Voltage (V) (Approx.) |
|---|---|---|---|---|
| Connector | Terminal | | | |
| M53 | 22 | Ground | Rear window defogger switch is pressed. | Battery voltage |
| | | | Rear window defogger switch is OFF. | 0 |

Is the inspection result normal?

YES >> GO TO 3.
NO >> GO TO 2.

### 2.CHECK REAR WINDOW DEFOGGER INDICATOR LAMPS CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector and auto amp. connector.
3. Check continuity between IPDM E/R harness connector and auto amp. harness connector.

| IPDM E/R | | Auto amp. | | Continuity |
|---|---|---|---|---|
| Connector | Terminal | Connector | Terminal | |
| E14 | 49 | M53 | 22 | Existed |

4. Check continuity between BCM harness connector and ground.

| IPDM E/R | | Ground | Continuity |
|---|---|---|---|
| Connector | Terminal | | |
| E14 | 49 | Ground | Not existed |

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair or replace harness between IPDM E/R and auto amp.

### 3.CHECK IINTERMITTENT INCDENT

Check intermittent incident.
Refer to GI-39, "Intermittent Incident".

>> INSPECTION END.

# WITHOUT AUTO A/C

## WITHOUT AUTO A/C : Description

INFOID:0000000001189076

Turns the indicator lamp in the rear window defogger switch ON when operating the rear window defogger.

## WITHOUT AUTO A/C : Component Function Check

INFOID:0000000001189077

### 1.CHECK REAR WINDOW DEFOGGER ON SIGNAL

Check that the indicator lamps of rear window defogger switch are illuminated when turning the rear window defogger switch ON.

Is the inspection result normal?

OK >> Rear window defogger ON signal is OK.
NG >> Refer to DEF-25, "WITHOUT AUTO A/C : Diagnosis Procedure"

## WITHOUT AUTO A/C : Diagnosis Procedure

INFOID:0000000001189078

### 1.CHECK REAR WINDOW DEFOGGER INDICATOR LAMPS ON SIGNAL

1. Turn ignition switch ON.
2. Check voltage between heater control panel harness connector and ground.

| Heater control panel | | Ground | Condition | Voltage (V) (Approx.) |
|---|---|---|---|---|
| Connector | Terminal | | | |
| M54 | 19 | Ground | Rear window defogger switch is ON. | Battery voltage |
| | | | Rear window defogger switch is OFF. | 0 |

Is the inspection result normal?

YES >> GO TO 3.
NO >> GO TO 2.

### 2.CHECK REAR WINDOW DEFOGGER LAMPS CUIRCUIT

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector and heater control panel connector.
3. Check continuity between IPDM E/R harness connector and heater control panel harness connector.

| IPDM E/R | | Heater control panel | | Continuity |
|---|---|---|---|---|
| Connector | Terminal | Connector | Terminal | |
| E14 | 49 | M54 | 19 | Existed |

4. Check continuity between BCM connector and ground

| IPDM E/R | | Ground | Continuity |
|---|---|---|---|
| Connector | Terminal | | |
| E14 | 49 | Ground | Not existed |

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair or replace harness between IPDM E/R and heater control panel.

### 3.CHECK IINTERMITTENT INCDENT

Check intermittent incident.
Refer to GI-39, "Intermittent Incident".

>> INSPECTON END.

# ECU DIAGNOSIS

## BCM (BODY CONTROL MODULE)

### Reference Value

INFOID:0000000001555046

VALUES ON THE DIAGNOSIS TOOL

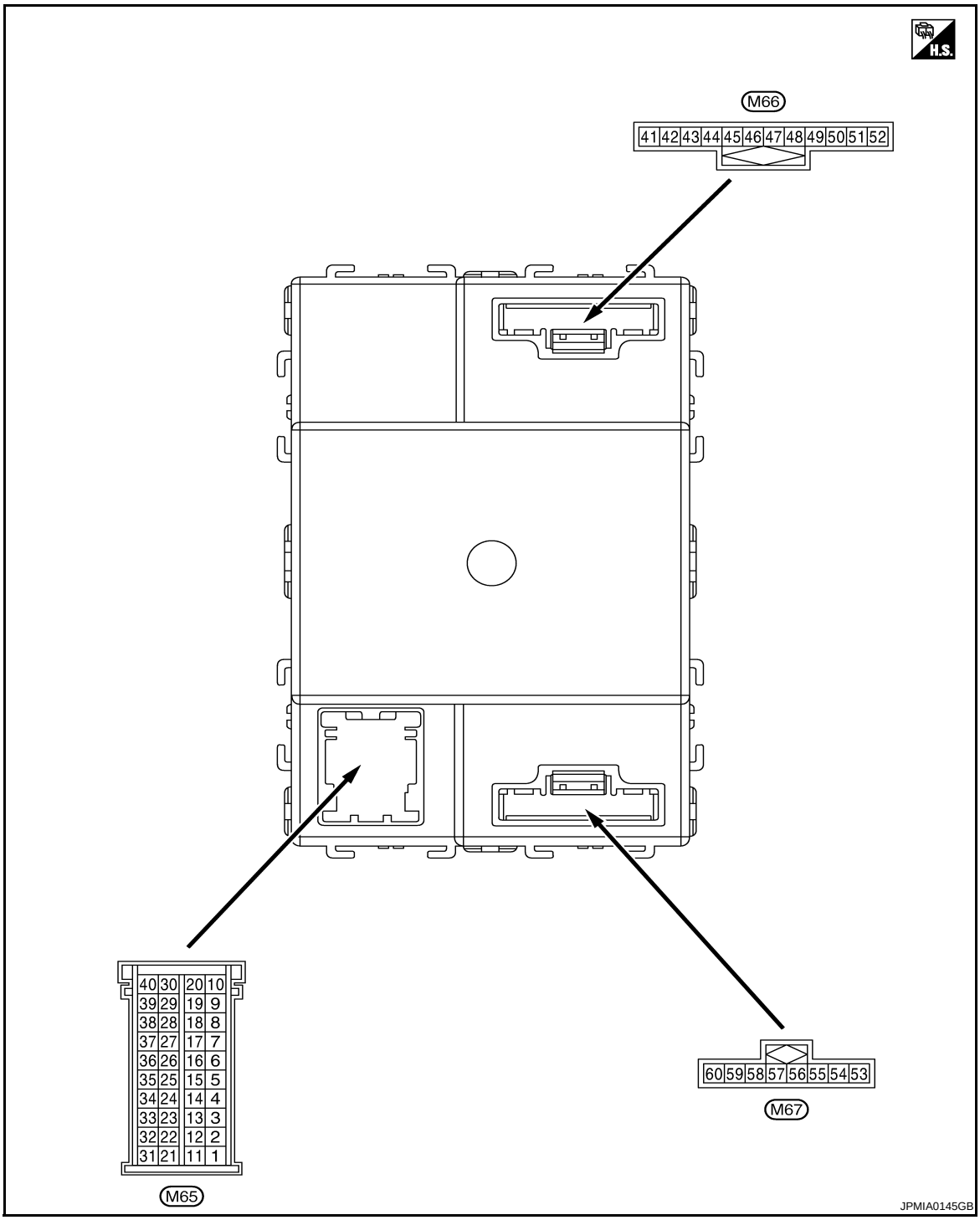
| Monitor Item | Condition | Value/Status |
|---|---|---|
| ACC ON SW | Ignition switch OFF | Off |
| | Ignition switch ACC or ON | On |
| AIR COND SW | A/C switch OFF | Off |
| | A/C switch ON | On |
| AUT LIGHT SYS | Outside of the room is bright | Off |
| | Outside of the room is dark | On |
| AUTO LIGHT SW | Lighting switch OFF | Off |
| | Lighting switch AUTO | On |
| AUTO RELOCK | Auto lock function does not operate | Off |
| | Auto lock function is operating | On |
| BACK DOOR SW | Back door closed | Off |
| | Back door opened | On |
| BATTERY VOLT<br>**NOTE:**<br>Diesel engine models only | Ignition switch ON | Approximately the same as power supply voltage |
| BRAKE SW | Brake pedal is not depressed | Off |
| | Brake pedal is depressed | On |
| CDL LOCK SW | Door lock/unlock switch does not operate | Off |
| | Press door lock/unlock switch to the LOCK side | On |
| CDL UNLOCK SW | Door lock/unlock switch does not operate | Off |
| | Press door lock/unlock switch to the UNLOCK side | On |
| DOOR SW-AS | Passenger door closed | Off |
| | Passenger door opened | On |
| DOOR SW-DR | Driver door closed | Off |
| | Driver door opened | On |
| DOOR SW-RL | Rear LH door closed | Off |
| | Rear LH door opened | On |
| DOOR SW-RR | Rear RH door closed | Off |
| | Rear RH door opened | On |

| Monitor Item | Condition | | Value/Status |
|---|---|---|---|
| ELEC PWR CUT<br>**NOTE:**<br>Diesel engine models only | Engine running | Fan switch ON (when engine coolant is cool)<br>**NOTE:**<br>Depending on the ambient temperature, battery voltage, etc. | Off |
| | | The current status maintained with the signal from ECM received. | FREEZ |
| | | • Fan switch OFF<br>• Fan switch ON after engine warming UP<br>**NOTE:**<br>Depending on the engine coolant temperature, ambient temperature, battery voltage, etc. | INHBT |
| ENG COOLNT T<br>**NOTE:**<br>Diesel engine models only | Engine running | | Approximately the same as water temperature gauge reading |
| ENGINE RPM<br>**NOTE:**<br>Diesel engine models only | Engine running | | Approximately the same as tachometer reading |
| ENGINE RUN | Engine stopped | | Off |
| | Engine running | | On |
| ENGINE STATUS<br>**NOTE:**<br>Diesel engine models only | Engine stopped | | STOP |
| | While the engine stalls | | STALL |
| | Engine running | | RUN |
| | At engine cranking | | CRA |
| FAN ON SIG | Fan switch OFF | | Off |
| | Fan switch ON | | On |
| FR FOG SW | Front fog lamp switch OFF | | Off |
| | Front fog lamp switch ON | | On |
| FR WASHER SW | Front washer switch OFF | | Off |
| | Front washer switch ON | | On |
| FR WIPER LOW | Front wiper switch OFF | | Off |
| | Front wiper switch LO | | On |
| FR WIPER HI | Front wiper switch OFF | | Off |
| | Front wiper switch HI | | On |
| FR WIPER INT | Front wiper switch OFF | | Off |
| | Front wiper switch INT | | On |
| FR WIPER STOP | Any position other than front wiper stop position | | Off |
| | Front wiper stop position | | On |
| GLS BREAK SEN | The vehicle without glass break sensor | | On |
| | The vehicle with glass break sensor | | Off |
| HAZARD SW | When hazard switch is not pressed | | Off |
| | When hazard switch is pressed | | On |
| HD LIGHT TIME | — | | Displays a setting time of the follow me home function set by the work support |

| Monitor Item | Condition | Value/Status |
|---|---|---|
| HEAD LAMP SW 1 | Lighting switch OFF | Off |
| | Lighting switch 2ND | On |
| HEAD LAMP SW 2 | Lighting switch OFF | Off |
| | Lighting switch 2ND | On |
| HI BEAM SW | Lighting switch OFF | Off |
| | Lighting switch HI | On |
| HOOD SW | Close the hood<br>**NOTE:**<br>Vehicles without theft warning system are OFF-fixed | Off |
| | Open the hood | On |
| H/L WASH SW | **NOTE:**<br>The item is indicated, but not monitored | Off |
| IGN ON SW | Ignition switch OFF or ACC | Off |
| | Ignition switch ON | On |
| IGN SW CAN | Ignition switch OFF or ACC | Off |
| | Ignition switch ON | On |
| INT VOLUME | Wiper intermittent dial is in a dial position 1 - 7 | 1 - 7 |
| I-KEY LOCK | LOCK button of Intelligent Key is not pressed | Off |
| | LOCK button of Intelligent Key is pressed | On |
| I-KEY UNLOCK | UNLOCK button of Intelligent Key is not pressed | Off |
| | UNLOCK button of Intelligent Key is pressed | On |
| KEY ON SW | Mechanical key is removed from key cylinder | Off |
| | Mechanical key is inserted to key cylinder | On |
| KEYLESS LOCK | LOCK button of key fob is not pressed | Off |
| | LOCK button of key fob is pressed | On |
| KEY LESS PANIC | **NOTE:**<br>The item is indicated, but not monitored | Off |
| KEYLESS UNLOCK | UNLOCK button of key fob is not pressed | Off |
| | UNLOCK button of key fob is pressed | On |
| LIT-SEN FAIL | Light & rain sensor is in normal condition | OK |
| | Light & rain sensor is with internal error | NOT OK |
| MEMORY 1 | Key fob ID code is not registered in “Memory 1” | Off |
| | Key fob ID code is registered in “Memory 1” | On |
| MEMORY 2 | Key fob ID code is not registered in “Memory 2” | Off |
| | Key fob ID code is registered in “Memory 2” | On |
| MEMORY 3 | Key fob ID code is not registered in “Memory 3” | Off |
| | Key fob ID code is registered in “Memory 3” | On |
| MEMORY 4 | Key fob ID code is not registered in “Memory 4” | Off |
| | Key fob ID code is registered in “Memory 4” | On |
| MEMORY 5 | Key fob ID code is not registered in “Memory 5” | Off |
| | Key fob ID code is registered in “Memory 5” | On |
| OIL PRESS SW | • Ignition switch OFF or ACC<br>• Engine running | Off |
| | Ignition switch ON | On |
| OUT SIDE TEMP<br>**NOTE:**<br>Diesel engine models | Ignition switch ON | Approximately the same as outside air temperature |

| Monitor Item | Condition | Value/Status |
|---|---|---|
| PASSING SW | Other than lighting switch PASS | Off |
| | Lighting switch PASS | On |
| REVERSE SW CAN | Except selector lever R position | Off |
| | Selector lever R position | On |
| PUSH SW | Return to ignition switch to LOCK position | Off |
| | Press ignition switch | On |
| REAR DEF SW | Rear window defogger switch OFF | Off |
| | Rear window defogger switch ON | On |
| RR FOG SW | Rear fog lamp switch OFF | Off |
| | Rear fog lamp switch ON | On |
| RR WASHER SW | Rear washer switch OFF | Off |
| | Rear washer switch ON | On |
| RR WIPER INT | Rear wiper switch OFF | Off |
| | Rear wiper switch INT | On |
| RR WIPER ON | Rear wiper switch OFF | Off |
| | Rear wiper switch ON | On |
| RR WIPER STOP | Rear wiper stop position | Off |
| | Other than rear wiper stop position | On |
| SHOCK SENSOR | Ignition switch ON | NOMAL |
| | After the reception of air bag deployment signal from air bag diagnosis sensor unit | Off |
| | During the reception of air bag deployment signal from air bag diagnosis sensor unit | On |
| TAIL LAMP SW | Lighting switch OFF | Off |
| | Lighting switch 1ST | On |
| TRNK OPNR SW | When back door opener switch is not pressed | Off |
| | When back door opener switch is pressed | On |
| TURN SIGNAL L | Turn signal switch OFF | Off |
| | Turn signal switch LH | On |
| TURN SIGNAL R | Turn signal switch OFF | Off |
| | Turn signal switch RH | On |
| UNLOCK SHOCK | Other than the following | Off |
| | During the unlock operation interlocked with air bag | On |
| VEHICLE SPEED | While driving | Equivalent to speedometer reading |

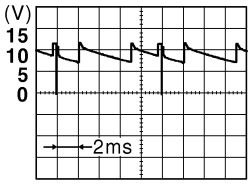
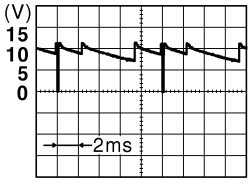
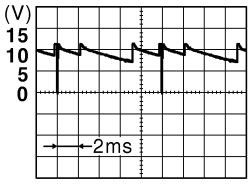
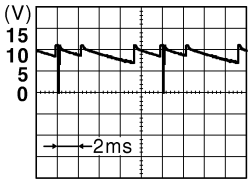
TERMINAL LAYOUT

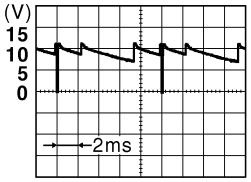
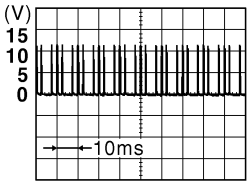
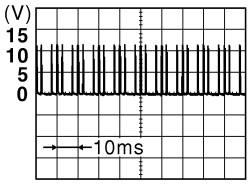
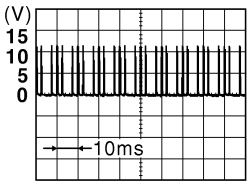
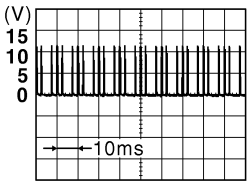


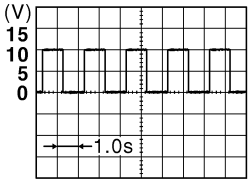
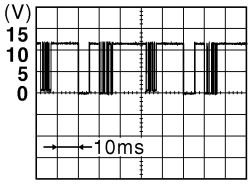
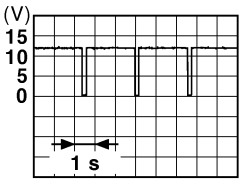
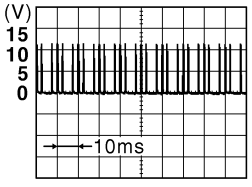

PHYSICAL VALUES

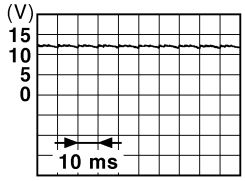
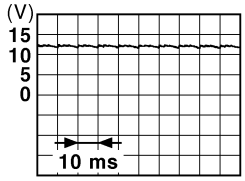
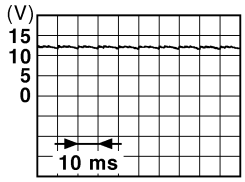
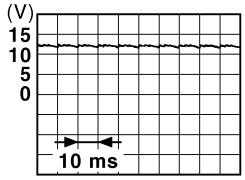
**CAUTION:**

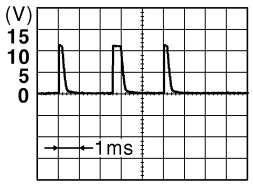
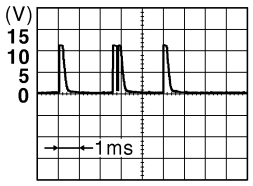
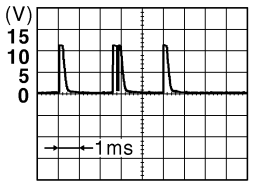
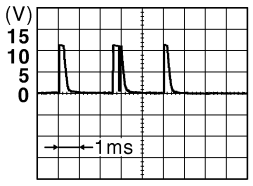
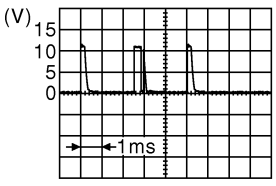
- **Check combination switch system terminal waveform under the loaded condition with lighting switch, turn signal switch and wiper switch OFF is not to be fluctuated by being overloaded.**
- **Turn wiper intermittent dial position to 4 except when checking waveform or voltage of wiper intermittent dial position. Wiper intermittent dial position can be confirmed on CONSULT-III. Refer to BCS-27, "COMB SW : CONSULT-III Function (BCM - COMB SW)".**
- **BCM reads the status of the combination switch at 10 ms internal normally. Refer to BCS-10, "System Description".**

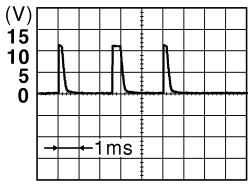
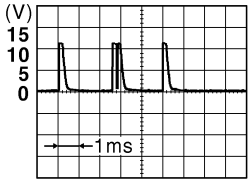
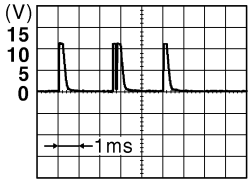
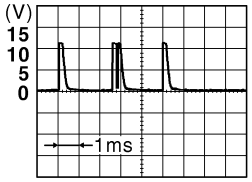
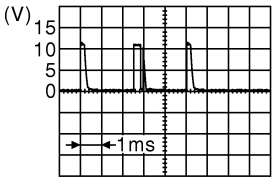
| Terminal No. (Wire color) | | Description | | Condition | | Value (Approx.) |
|---|---|---|---|---|---|---|
| + | – | Signal name | Input/ Output | | | |
| 1 (P) | Ground | Combination switch OUTPUT 1 | Output | Combination switch | All switch OFF (Wiper intermittent dial 4) | 0 V |
| | | | | | Front wiper switch HI (Wiper intermittent dial 4) |  JPMIA0160GB 9.1 V |
| | | | | | Rear wiper switch INT (Wiper intermittent dial 4) | |
| | | | | | Any of the condition below with all switch OFF<br>• Wiper intermittent dial 1<br>• Wiper intermittent dial 2<br>• Wiper intermittent dial 3<br>• Wiper intermittent dial 6<br>• Wiper intermittent dial 7 | |
| 2 (Y) | Ground | Combination switch OUTPUT 4 | Output | Combination switch (Wiper intermittent dial 4) | All switch OFF | 0 V |
| | | | | | Lighting switch 2ND |  JPMIA0163GB 9.3 V |
| | | | | | Lighting switch PASS | |
| | | | | | Front fog lamp switch ON | |
| | | | | | Turn signal switch LH | |
| 3 (LG) | Ground | Combination switch OUTPUT 3 | Output | Combination switch (Wiper intermittent dial 4) | All switch OFF | 0 V |
| | | | | | Lighting switch AUTO |  JPMIA0162GB 9.3 V |
| | | | | | Rear fog lamp switch OFF | |
| | | | | | Front wiper switch MIST | |
| | | | | | Front wiper switch INT | |
| | | | | | Front wiper switch LO | |
| 4 (R) | Ground | Combination switch OUTPUT 2 | Output | Combination switch | All switch OFF (Wiper intermittent dial 4) | 0 V |
| | | | | | Front washer switch ON (Wiper intermittent dial 4) |  JPMIA0161GB 9.1 V |
| | | | | | Rear wiper switch ON (Wiper intermittent dial 4) | |
| | | | | | Rear washer switch ON (Wiper intermittent dial 4) | |
| | | | | | Any of the condition below with all switch OFF<br>• Wiper intermittent dial 1<br>• Wiper intermittent dial 5<br>• Wiper intermittent dial 6 | |

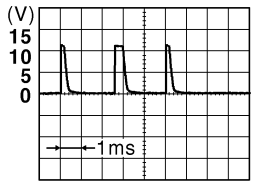
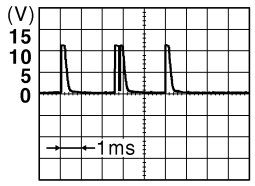
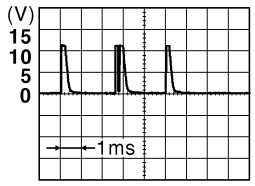
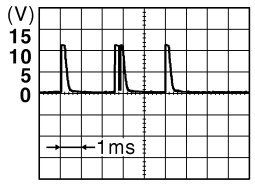
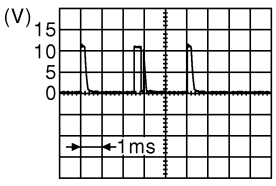
| Terminal No. (Wire color) | | Description | | Condition | | Value (Approx.) |
|---|---|---|---|---|---|---|
| + | – | Signal name | Input/ Output | | | |
| 5 (W) | Ground | Combination switch OUTPUT 5 | Output | Combination switch (Wiper intermittent dial 4) | All switch OFF | 0 V |
| | | | | | Lighting switch 1ST |  JPMIA0164GB 9.1 V |
| | | | | | Lighting switch 2ND | |
| | | | | | Lighting switch HI | |
| | | | | | Turn signal switch RH | |
| 7 (P) | Ground | Door lock/unlock switch (Lock) | Input | Door lock/unlock switch | Not pressed |  JPMIA0154GB 1.2 V |
| | | | | | Pressed to the lock side | 0 V |
| 8 (LG) | Ground | Hazard switch | Input | Hazard switch | Not pressed |  JPMIA0154GB 1.3 V |
| | | | | | Pressed | 0 V |
| 9 (BR) | Ground | Door lock/unlock switch (Unlock) | Input | Door lock/unlock switch | Not pressed |  JPMIA0154GB 1.2 V |
| | | | | | Pressed to the unlock side | 0 V |
| 12 (P) | Ground | Back door opener switch | Input | Back door opener switch | Not pressed |  JPMIA0154GB 1.2 V |
| | | | | | Pressed | 0 V |

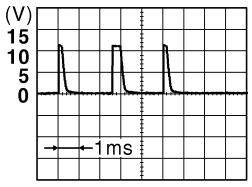
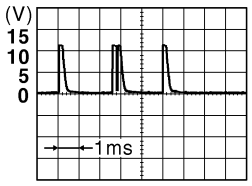
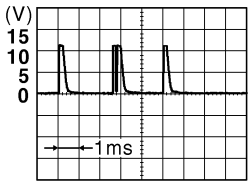
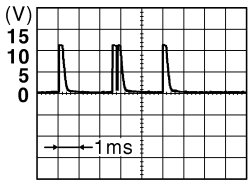
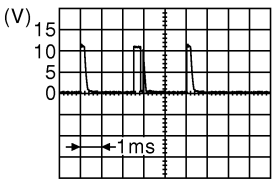
| Terminal No. (Wire color) | | Description | | Condition | | Value (Approx.) |
|---|---|---|---|---|---|---|
| + | – | Signal name | Input/ Output | | | |
| 13 (R) | Ground | Shock detect sensor | Input | Ignition switch OFF or ACC | | 0 V |
| | | | | Ignition switch ON | |  JPMIA0155GB 6.0 V |
| 14 (L/R) | Ground | A/C switch | Input | A/C switch | Not pressed | Battery voltage |
| | | | | | Pressed | 0 V |
| 15 (LG/B) | Ground | Fan switch | Input | Fan switch | Not pressed | Battery voltage |
| | | | | | Pressed | 0 V |
| 16 (GR) | Ground | Alarm link | Output | — | | — |
| 17 (BR) | Ground | Light & rain sensor serial link | Input/ Output | Ignition switch OFF or ACC | | Battery voltage |
| | | | | Ignition switch ON | |  JPMIA0156GB 8.7 V |
| 18 (SB) | Ground | Security indicator | Output | Security indicator | ON | 0 V |
| | | | | | Blinking |  JPMIA0014GB 10.3 V |
| | | | | | OFF | Battery voltage |
| 19 (L) | — | CAN-H | Input/ Output | — | | — |
| 20 (P) | — | CAN-L | Input/ Output | — | | — |
| 21 (SB) | Ground | Rear window defogger switch | Input | Rear window defogger switch | Not pressed |  JPMIA0154GB 1.1 V |
| | | | | | While pressing | 0 V |

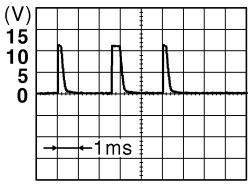
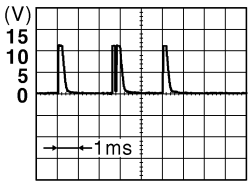
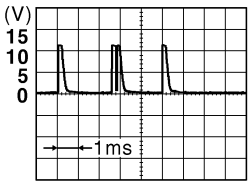
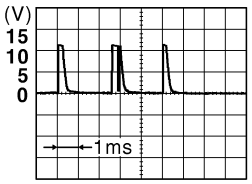
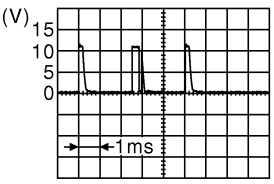
| Terminal No. (Wire color) | | Description | | Condition | | Value (Approx.) |
|---|---|---|---|---|---|---|
| + | – | Signal name | Input/ Output | | | |
| 24 (GR) | Ground | Door lock status indicator | Output | Door lock status indicator | ON | Battery voltage |
| | | | | | OFF | 0 V |
| 25 (GR) | Ground | Rear door switch LH | Input | Rear door switch LH | OFF (When rear door LH closed) |  PKID0924E 11.2 V |
| | | | | | ON (When rear door LH opened) | 0 V |
| 26 (R) | Ground | Driver door switch | Input | Driver door switch | OFF (When driver door closed) |  PKID0924E 11.2 V |
| | | | | | ON (When driver door opened) | 0 V |
| 27 (BR) | Ground | Passenger door switch | Input | Passenger door switch | OFF (When passenger door closed) |  PKID0924E 11.2 V |
| | | | | | ON (When passenger door opened) | 0 V |
| 28 (G) | Ground | Back door switch | Input | Back door switch | OFF (When back door closed) | Battery voltage |
| | | | | | ON (When back door opened) | 0 V |
| 29 (LG) | Ground | Rear door switch RH | Input | Rear door switch RH | OFF (When rear door RH closed) |  PKID0924E 11.2 V |
| | | | | | ON (When rear door RH opened) | 0 V |
| 30 (SB) | Ground | Audio link | Input/ Output | — | — | — |

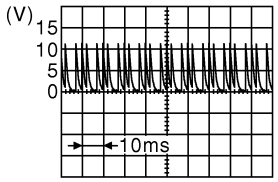
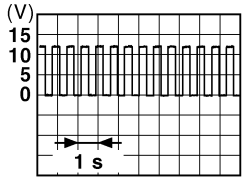
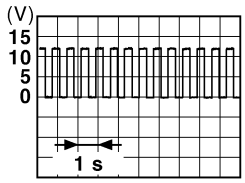
| Terminal No. (Wire color) | | Description | | Condition | | Value (Approx.) |
|---|---|---|---|---|---|---|
| + | – | Signal name | Input/ Output | | | |
| 31 (BR) | Ground | Combination switch INPUT 5 | Input | Combination switch | All switch OFF (Wiper intermittent dial 4) |  JPMIA0165GB 1.3 V |
| | | | | | Front fog lamp switch ON (Wiper intermittent dial 4) |  JPMIA0167GB 1.3 V |
| | | | | | Rear fog lamp switch ON (Wiper intermittent dial 4) |  JPMIA0168GB 1.3 V |
| | | | | | Rear wiper switch ON (Wiper intermittent dial 4) |  JPMIA0169GB 1.3 V |
| | | | | | Any of the condition below with all switch OFF<br>• Wiper intermittent dial 1<br>• Wiper intermittent dial 2<br>• Wiper intermittent dial 6<br>• Wiper intermittent dial 7 |  JPMIA0196GB 1.3 V |

| Terminal No. (Wire color) | | Description | | Condition | | Value (Approx.) |
|---|---|---|---|---|---|---|
| + | – | Signal name | Input/ Output | | | |
| 32 (G) | Ground | Combination switch INPUT 2 | Input | Combination switch (Wiper intermittent dial 4) | All switch OFF |  JPMIA0165GB 1.4 V |
| | | | | | Lighting switch PASS |  JPMIA0167GB 1.3 V |
| | | | | | Lighting switch 2ND |  JPMIA0166GB 1.3 V |
| | | | | | Front wiper switch INT |  JPMIA0168GB 1.3 V |
| | | | | | Front wiper switch HI |  JPMIA0196GB 1.3 V |

| Terminal No. (Wire color) | | Description | | Condition | | Value (Approx.) |
|---|---|---|---|---|---|---|
| + | – | Signal name | Input/ Output | | | |
| 33 (V) | Ground | Combination switch INPUT 1 | Input | Combination switch (Wiper intermittent dial 4) | All switch OFF |  JPMIA0165GB 1.4 V |
| | | | | | Turn signal switch LH |  JPMIA0167GB 1.3 V |
| | | | | | Turn signal switch RH |  JPMIA0166GB 1.3 V |
| | | | | | Front wiper switch LO |  JPMIA0168GB 1.3 V |
| | | | | | Front washer switch ON |  JPMIA0196GB 1.3 V |

| Terminal No. (Wire color) | | Description | | Condition | | Value (Approx.) |
|---|---|---|---|---|---|---|
| + | – | Signal name | Input/ Output | | | |
| 34 (GR) | Ground | Combination switch INPUT 4 | Input | Combination switch | All switch OFF (Wiper intermittent dial 4) |  JPMIA0165GB 1.4 V |
| | | | | | Lighting switch AUTO (Wiper intermittent dial 4) |  JPMIA0167GB 1.3 V |
| | | | | | Lighting switch 1ST (Wiper intermittent dial 4) |  JPMIA0166GB 1.3 V |
| | | | | | Rear wiper INT (Wiper intermittent dial 4) |  JPMIA0167GB 1.3 V |
| | | | | | Any of the condition below with all switch OFF<br>• Wiper intermittent dial 1<br>• Wiper intermittent dial 6 |  JPMIA0196GB 1.3 V |

| Terminal No. (Wire color) + | Terminal No. (Wire color) – | Description Signal name | Description Input/ Output | Condition | | Value (Approx.) |
|---|---|---|---|---|---|---|
| 35 (L) | Ground | Combination switch INPUT 3 | Input | Combination switch | All switch OFF (Wiper intermittent dial 4) |  JPMIA0165GB 1.4 V |
| | | | | | Lighting switch HI (Wiper intermittent dial 4) |  JPMIA0166GB 1.3 V |
| | | | | | Lighting switch 2ND (Wiper intermittent dial 4) |  JPMIA0167GB 1.3 V |
| | | | | | Rear wiper switch ON |  JPMIA0169GB 1.3 V |
| | | | | | Any of the condition below with all switch OFF<br>• Wiper intermittent dial 1<br>• Wiper intermittent dial 2<br>• Wiper intermittent dial 3 |  JPMIA0196GB 1.3 V |
| 36 (V) | Ground | Key switch | Input | Insert mechanical key into ignition key cylinder | | Battery voltage |
| | | | | Remove mechanical key from ignition key cylinder | | 0 V |
| 37 (R) | Ground | ACC power supply | Input | Ignition switch OFF | | 0 V |
| | | | | Ignition switch ACC or ON | | Battery voltage |
| 38 (W) | Ground | Ignition power supply | Input | Ignition switch OFF or ACC | | 0 V |
| | | | | Ignition switch ON | | Battery voltage |

| Terminal No. (Wire color) | | Description | | Condition | | Value (Approx.) |
|---|---|---|---|---|---|---|
| + | – | Signal name | Input/ Output | | | |
| 39 (P) | Ground | NATS antenna amp. | Input/ Output | Insert mechanical key into ignition key cylinder | | Just after Insert mechanical key into ignition key cylinder. Pointer of tester should move |
| 40 (LG) | Ground | NATS antenna amp. | Input/ Output | Insert mechanical key into ignition key cylinder | | Just after Insert mechanical key into ignition key cylinder. Pointer of tester should move |
| 41 (V) | Ground | Battery power supply | Input | Ignition switch OFF | | Battery voltage |
| 42 (V) | Ground | Interior room lamp power supply | Output | After passing the interior room lamp battery saver operation time | | 0 V |
| | | | | Any other time after passing the interior room lamp battery saver operation time | | Battery voltage |
| 43 (L) | Ground | Rear wiper motor | Output | Rear wiper switch OFF | | 0 V |
| | | | | Rear wiper switch ON | | Battery voltage |
| 44 (L/W) | Ground | Rear wiper auto stop | Input | Ignition switch ON | Rear wiper stop position | 0 V |
| | | | | | Any position other than rear wiper stop position |  JPMIA0197GB |
| 45 (GR) | Ground | Back door lock actuator | Output | Back door opener switch | Pressed | Battery voltage (300ms) |
| | | | | | Not pressed | 0 V |
| 47 (G/Y) | Ground | Turn signal LH | Output | Ignition switch ON | Turn signal switch OFF | 0 V |
| | | | | | Turn signal switch LH |  PKID0926E<br>6.5 V |
| 48 (G/B) | Ground | Turn signal RH | Output | Ignition switch ON | Turn signal switch OFF | 0 V |
| | | | | | Turn signal switch RH |  PKID0926E<br>6.5 V |
| 49 (Y) | Ground | Rear fog lamp | Output | Lighting switch 1ST and front fog lamp switch ON | Rear fog lamp switch OFF | 0 V |
| | | | | | Rear fog lamp switch ON | Battery voltage |
| 51 (R/W)*1 (R)*2 | Ground | Stop lamp switch | Input | Depress the brake pedal | | Battery voltage |
| | | | | Release the brake pedal | | 0 V |

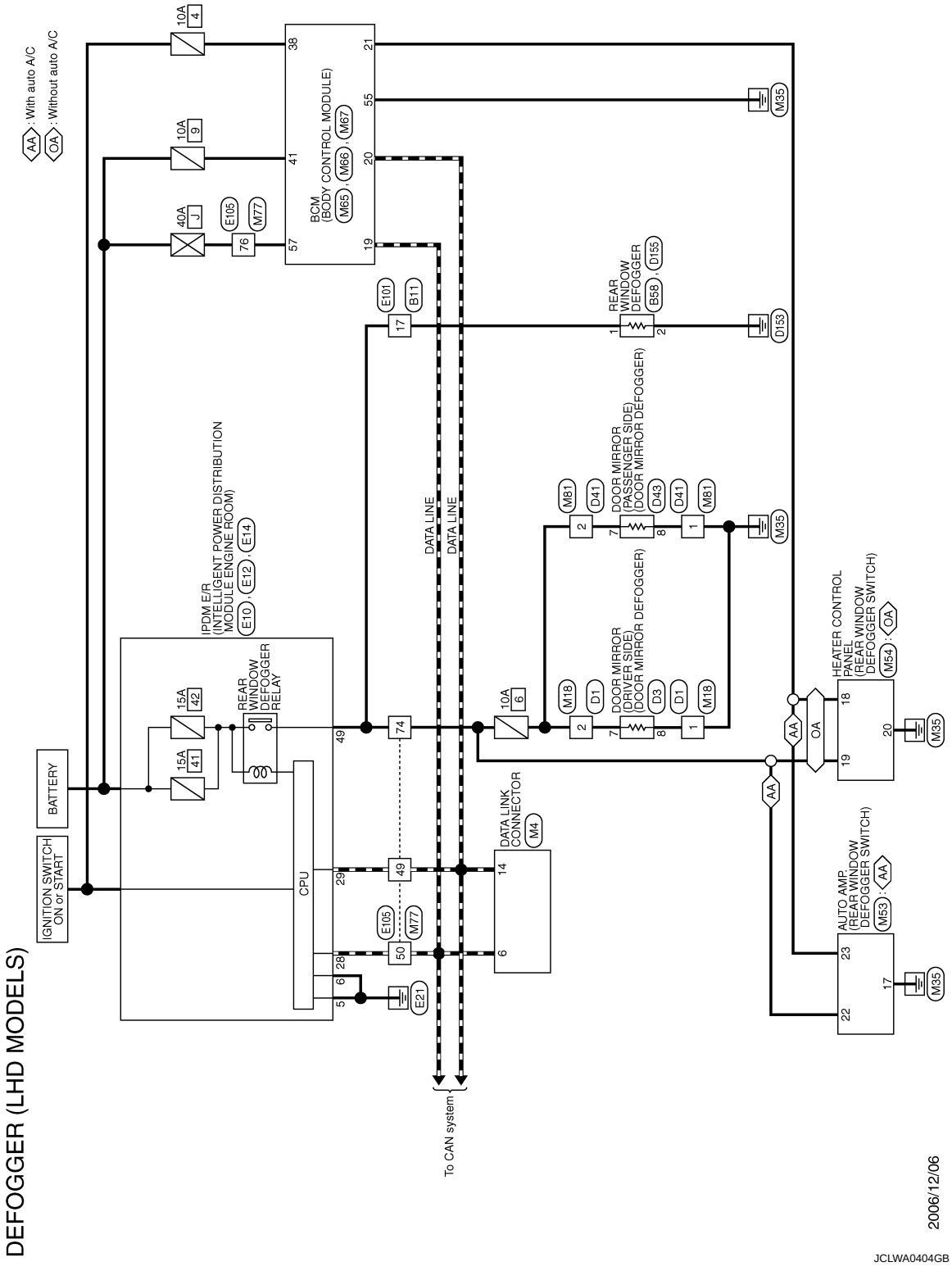
| Terminal No. (Wire color) | | Description | | Condition | | Value (Approx.) |
|---|---|---|---|---|---|---|
| + | – | Signal name | Input/ Output | | | |
| 52 (R) | Ground | Room lamp timer control | Output | Interior room lamp | OFF | Battery voltage |
| | | | | | ON | 0 V |
| 53 (L) | Ground | Power window power supply | Output | Ignition switch | OFF or ACC | 0 V |
| | | | | | ON | Battery voltage |
| 54 (O) | Ground | Door unlock (All) | Output | Door lock/unlock switch | Pressed to the unlock side | Battery voltage |
| | | | | | Pressed to the lock side | 0 V |
| 55 (B) | Ground | Ground | — | Ignition switch ON | | 0 V |
| 56 (Y)*1 (SB)*2 | Ground | Door lock (All) | Output | Door lock/unlock switch | Pressed to the unlock side | 0 V |
| | | | | | Pressed to the lock side | Battery voltage |
| 57 (Y) | Ground | Battery power supply | Input | Ignition switch OFF | | Battery voltage |
| 58 (P) | Ground | Power window power supply | Output | Ignition switch OFF | | Battery voltage |
| 59 (BR) | Ground | Super lock | Output | When lock button of key fob or Intelligent Key is not pressed | | 0 V |
| | | | | When lock button of key fob or Intelligent Key is pressed | | Battery voltage |
| 60 (GR) | Ground | Driver door unlock | Output | Door lock/unlock switch | Pressed to the unlock side | Battery voltage |
| | | | | | Pressed to the lock side | 0 V |

*1: With Intelligent Key system

*2: Without Intelligent Key system

## Wiring Diagram - DEFOGGER CONTROL SYSTEM (LHD MODELS) -

INFOID:0000000001189080



DEFOGGER (LHD MODELS)

| Connector No. | B11 |
|---|---|
| Connector Name | WIRE TO WIRE |
| Connector Type | TK10MW-NS8 |

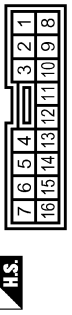


| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 17 | B | – |

| Connector No. | B58 |
|---|---|
| Connector Name | REAR WINDOW DEFOGGER |
| Connector Type | P01FB-A |

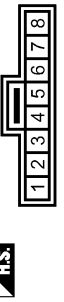
| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 1 | B | – |

| Connector No. | D1 |
|---|---|
| Connector Name | WIRE TO WIRE |
| Connector Type | TK16FW |



| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 1 | B | – |
| 2 | G | – |

| Connector No. | D3 |
|---|---|
| Connector Name | DOOR MIRROR (DRIVER SIDE) |
| Connector Type | TK08MGY |



| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 7 | G | – |
| 8 | B | – |

| Connector No. | D41 |
|---|---|
| Connector Name | WIRE TO WIRE |
| Connector Type | TK16FW |

| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 1 | B | – |
| 2 | P | – |

| Connector No. | D43 |
|---|---|
| Connector Name | DOOR MIRROR (PASSENGER SIDE) |
| Connector Type | TK08MGY |



| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 7 | G | – |
| 8 | B | – |

| Connector No. | D155 |
|---|---|
| Connector Name | REAR WINDOW DEFOGGER |
| Connector Type | P01FB-A |



| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 2 | B | – |

| Connector No. | E10 |
|---|---|
| Connector Name | IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM) |
| Connector Type | M06FB-LC |



| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 5 | B | – |
| 6 | B | – |

JCLWA0649GB

DEFOGGER (LHD MODELS)

| Connector No. | E12 |
|---|---|
| Connector Name | IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM) |
| Connector Type | NS12FW-CS |




| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 28 | L | – |
| 29 | P | – |

| Connector No. | E14 |
|---|---|
| Connector Name | IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM) |
| Connector Type | YZK 7283-5591-40-F |




| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 49 | B | –[Except M9R engine] |
| 49 | G | –[With M9R engine] |

| Connector No. | E101 |
|---|---|
| Connector Name | WIRE TO WIRE |
| Connector Type | TK10FW-NS8 |




| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 17 | G | – |

| Connector No. | E105 |
|---|---|
| Connector Name | WIRE TO WIRE |
| Connector Type | TH60MW-NS16-TM4 |



| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 49 | P | – |
| 50 | L | – |
| 74 | G | – |
| 76 | Y | – |

| Connector No. | M4 |
|---|---|
| Connector Name | DATA LINK CONNECTOR |
| Connector Type | BD16FW |




| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 6 | L | – |
| 14 | P | – |

| Connector No. | M18 |
|---|---|
| Connector Name | WIRE TO WIRE |
| Connector Type | TK16MW |




| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 1 | B | – |
| 2 | G | – |

| Connector No. | M53 |
|---|---|
| Connector Name | A/C AUTO AMP. |
| Connector Type | SAB40FW |




| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 17 | B | GND |
| 22 | R | RR DEF F/B |
| 23 | SB | RR DEF ON |

| Connector No. | M54 |
|---|---|
| Connector Name | HEATER CONTROL PANEL |
| Connector Type | TK20FGY |




| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 18 | SB | RR DEF |
| 19 | R | RR DEF F/B |
| 20 | B | GND |

JCLWA0650GB

DEFOGGER (LHD MODELS)

| Connector No. | M65 |
|---|---|
| Connector Name | BCM (BODY CONTROL MODULE) |
| Connector Type | AAB40FB |



| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 19 | L | CAN-H |
| 20 | P | CAN-L |
| 21 | SB | REAR DEFFOGER SW |
| 38 | W | IGN SW |

| Connector No. | M66 |
|---|---|
| Connector Name | BCM (BODY CONTROL MODULE) |
| Connector Type | FCI 211PG122S1017 |



| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 41 | V | BAT(FUSE) |

| Connector No. | M67 |
|---|---|
| Connector Name | BCM (BODY CONTROL MODULE) |
| Connector Type | FCI 211PC083S0017 |



| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 55 | B | GND(POWER) |
| 57 | Y | BAT(F/L) |

| Connector No. | M77 |
|---|---|
| Connector Name | WIRE TO WIRE |
| Connector Type | TH60FW-NS16-TM4 |



| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 49 | P | – |
| 50 | L | – |
| 74 | R | – |
| 76 | Y | – |

| Connector No. | M81 |
|---|---|
| Connector Name | WIRE TO WIRE |
| Connector Type | TK16MW |

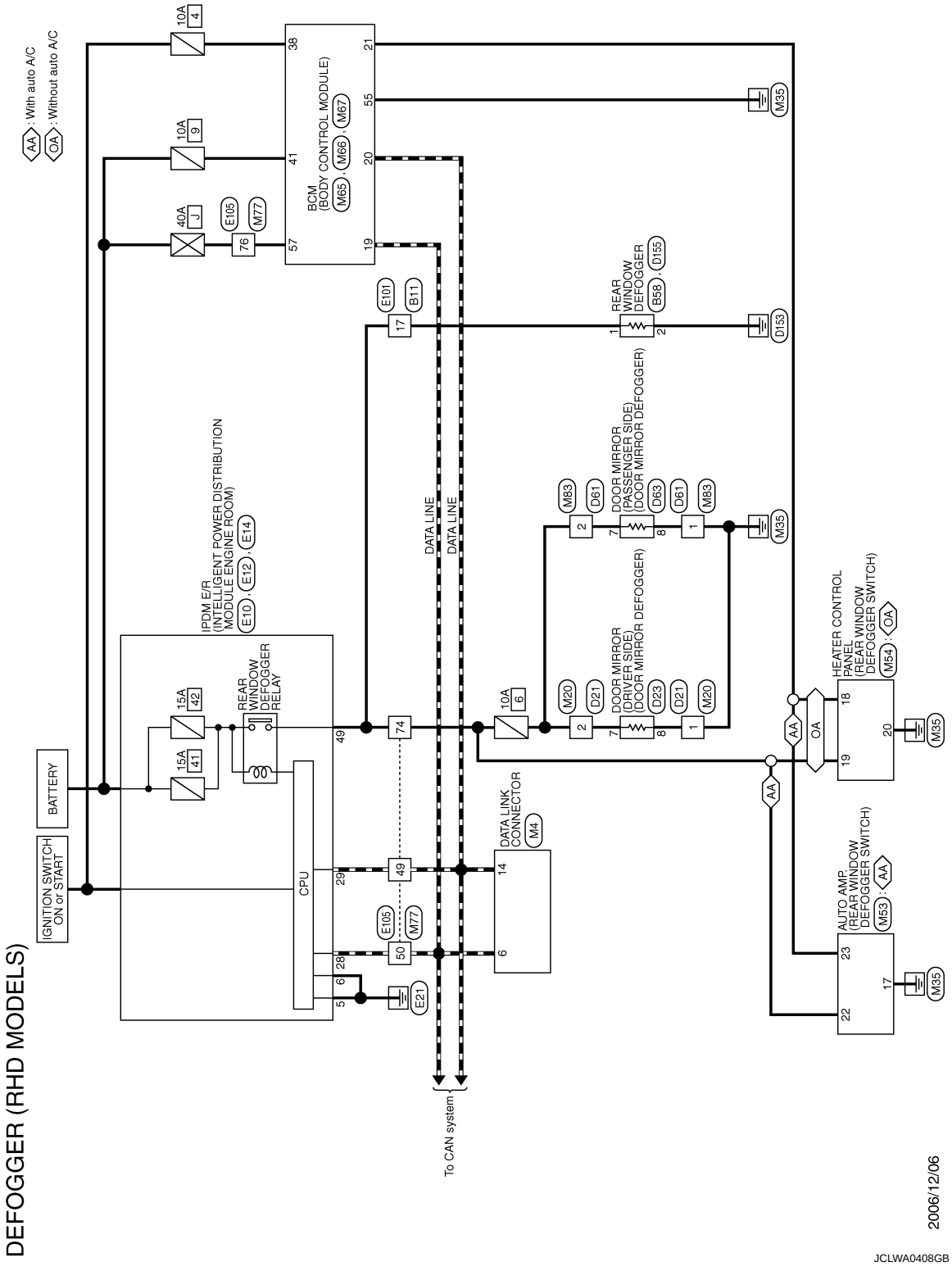


| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 1 | B | – |
| 2 | G | – |

JCLWA0651GB

## Wiring Diagram - DEFOGGER CONTROL SYSTEM (RHD MODELS) -

INFOID:0000000001189081



DEFOGGER (RHD MODELS)

| Connector No. | B11 |
|---|---|
| Connector Name | WIRE TO WIRE |
| Connector Type | TK10MW-NS8 |

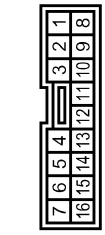


| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 17 | B | – |

| Connector No. | B58 |
|---|---|
| Connector Name | REAR WINDOW DEFOGGER |
| Connector Type | P01FB-A |

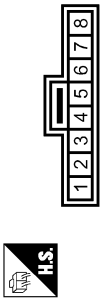
| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 1 | B | – |

| Connector No. | D21 |
|---|---|
| Connector Name | WIRE TO WIRE |
| Connector Type | TK16FW |



| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 1 | B | – |
| 2 | P | – |

| Connector No. | D23 |
|---|---|
| Connector Name | DOOR MIRROR (DRIVER SIDE) |
| Connector Type | TK08MGY |



| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 7 | G | – |
| 8 | B | – |

| Connector No. | D61 |
|---|---|
| Connector Name | WIRE TO WIRE |
| Connector Type | TK16FW |



| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 1 | B | – |
| 2 | G | – |

| Connector No. | D83 |
|---|---|
| Connector Name | DOOR MIRROR (PASSENGER SIDE) |
| Connector Type | TK08MGY |



| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 7 | G | – |
| 8 | B | – |

| Connector No. | D155 |
|---|---|
| Connector Name | REAR WINDOW DEFOGGER |
| Connector Type | P01FB-A |



| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 2 | B | – |

| Connector No. | E10 |
|---|---|
| Connector Name | IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM) |
| Connector Type | M06FB-LC |

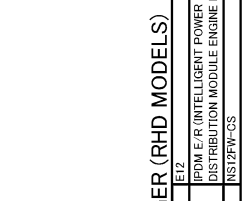


| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 5 | B | – |
| 6 | B | – |

JCLWA0652GB

DEFOGGER (RHD MODELS)

| Connector No. | E12 |
|---|---|
| Connector Name | IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM) |
| Connector Type | NS12FW-CS |

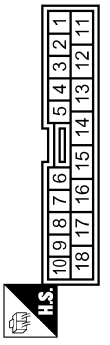



| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 28 | L | – |
| 29 | P | – |

| Connector No. | E14 |
|---|---|
| Connector Name | IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM) |
| Connector Type | YZK 7283-5591-40-F |

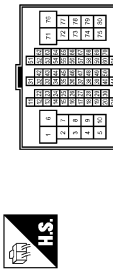

| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 49 | B | –[Except M9R engine] |
| 49 | G | –[With M9R engine] |

| Connector No. | E101 |
|---|---|
| Connector Name | WIRE TO WIRE |
| Connector Type | TK10FW-NS8 |




| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 17 | G | – |

| Connector No. | E105 |
|---|---|
| Connector Name | WIRE TO WIRE |
| Connector Type | TH60MW-NS16-TM4 |



| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 49 | P | – |
| 50 | L | – |
| 74 | G | – |
| 76 | Y | – |

| Connector No. | M4 |
|---|---|
| Connector Name | DATA LINK CONNECTOR |
| Connector Type | BD16FW |




| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 6 | L | – |
| 14 | P | – |

| Connector No. | M20 |
|---|---|
| Connector Name | WIRE TO WIRE |
| Connector Type | TK16MW |




| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 1 | B | – |
| 2 | G | – |

| Connector No. | M53 |
|---|---|
| Connector Name | AUTO AMP. |
| Connector Type | SAB40FW |



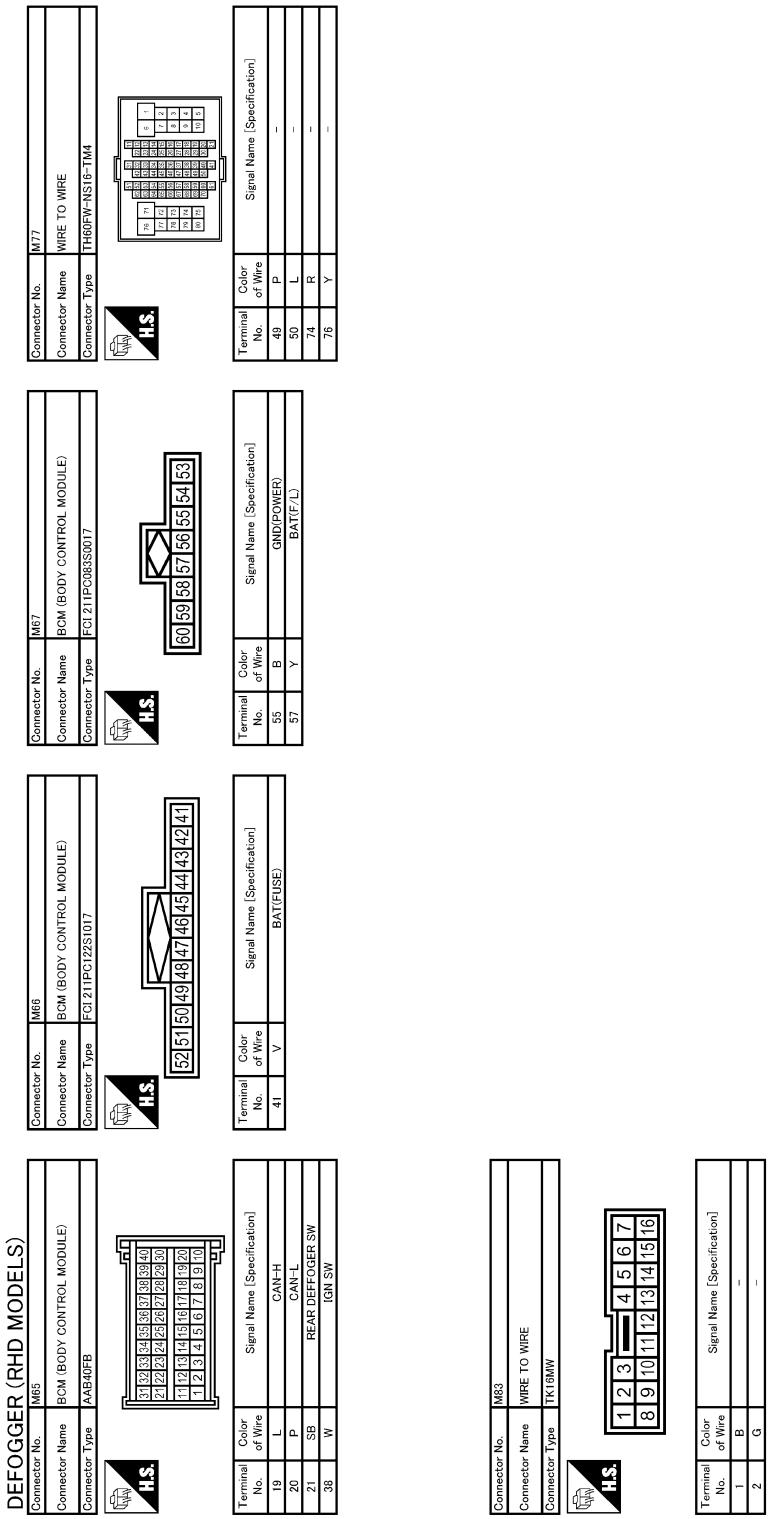

| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 17 | B | GND |
| 22 | R | RR DEF F/B |
| 23 | SB | RR DEF ON |

| Connector No. | M54 |
|---|---|
| Connector Name | HEATER CONTROL PANEL |
| Connector Type | TK20FGY |




| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 18 | SB | RR DEF |
| 19 | R | RR DEF F/B |
| 20 | B | GND |

JCLWA0653GB




JCLWA0654GB

## Fail Safe

*INFOID:0000000001555087*

Fail-safe index

BCM performs fail-safe control when any DTC listed below is detected.

| Display contents of CONSULT | Fail-safe | Cancellation |
|---|---|---|
| B2190: NATS ANTENNA AMP | • Inhibits engine cranking<br>• Inhibits steering lock unlocking (Intelligent Key unit)<br>• Fuel cut (ECM) | Erase DTC |
| B2191: DIFFERENCE OF KEY | • Inhibits engine cranking<br>• Inhibits steering lock unlocking (Intelligent Key unit)<br>• Fuel cut (ECM) | Erase DTC |
| B2192: ID DISCORD BCM-ECM | Fuel cut (ECM) | Erase DTC |
| B2193: CHAIN OF BCM-ECM | Fuel cut (ECM) | Erase DTC |
| B2194: DISCORD BCM-I-KEY | • Inhibits engine cranking<br>• Inhibits steering lock unlocking (Intelligent Key unit)<br>• Fuel cut (ECM) | Erase DTC |
| B2195: ANTI SCANNING | • Inhibits engine cranking<br>• Inhibits steering lock unlocking (Intelligent Key unit)<br>• Fuel cut (ECM) | Erase DTC |
| B2196: DONGLE NG | • Inhibits engine cranking<br>• Inhibits steering lock unlocking (Intelligent Key unit)<br>• Fuel cut (ECM) | Erase DTC |

## REAR WIPER CONTROL

BCM detects a rear wiper stopping position according to a rear wiper auto stop signal.
When a rear wiper auto stop signal is in the condition listed below, BCM stops power supply to rear wiper after rear wiper is activated for five seconds.

| Ignition switch | Rear wiper switch | Rear wiper auto stop signal |
|---|---|---|
| ON | OFF | The rear wiper auto stop signal (stop position) cannot be input for 5 seconds. |
| | ON | The rear wiper auto stop signal does not change for 5 seconds. |

**NOTE:**
The above operation is repeated when operating the rear wiper switch one minute after the stop of the rear wiper caused by Fail-safe.

## TURN SIGNAL LAMP CONTROL

BCM detects the turn signal lamp circuit status from the terminal voltage.
BCM increases the turn signal lamp blinking speed if the bulb or harness open is detected with the turn signal lamp operating.

**NOTE:**
The blinking speed is normal while activating the hazard warning lamp.

## LIGHT & RAIN SENSOR MALFUNCTION DETECTION FUNCTION

BCM controls the following items when LIGHT & RAIN sensor has a malfunction.

Auto Light Control
Headlamp is turned ON.

Front Wiper Control
The condition just before the activation of Fail-safe is maintained until the front wiper switch is turned OFF.

## DTC Inspection Priority Chart

INFOID:0000000001555088

| Priority | DTC |
|---|---|
| 1 | • U1000: CAN COMM CIRCUIT<br>• U1010: CONTROL UNIT (CAN) |
| 2 | • B2190: NATS ANTENNA AMP<br>• B2191: DIFFERNCE OF KEY<br>• B2192: ID DISCORD BCM-ECM<br>• B2193: CHAIN OF BCM-ECM<br>• B2194: DISCORD BCM-I-KEY<br>• B2195: ANTI SCANNING<br>• B2196: DONGLE NG |

## DTC Index

INFOID:0000000001555089

**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.
- PAST: Displays when there is a malfunction that is detected in the past and stored.
- 1 - 39: Displayed if any previous malfunction is present when current condition is normal. It increases like 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 | TIME | | Fail-safe | Refer to |
|---|---|---|---|---|
| No DTC is detected. further testing may be required. | — | — | — | — |
| U1000: CAN COMM CIRCUIT | 0 | 1 - 39 | — | BCS-33 |
| U1010: CONTROL UNIT (CAN) | 0 | 1 - 39 | — | BCS-34 |
| B2190: NATS ANTENNA AMP | CRNT | PAST | × | • With Intelligent Key system SEC-45<br>• Without Intelligent Key system SEC-194 |
| B2191: DIFFERENCE OF KEY | CRNT | PAST | × | • With Intelligent Key system SEC-47<br>• Without Intelligent Key system SEC-196 |
| B2192: ID DISCORD BCM-ECM | CRNT | PAST | × | • With Intelligent Key system SEC-48<br>• Without Intelligent Key system SEC-197 |
| B2193: CHAIN OF BCM-ECM | CRNT | PAST | × | • With Intelligent Key system SEC-50<br>• Without Intelligent Key system SEC-199 |
| B2194: DISCORD BCM-I-KEY | CRNT | PAST | × | SEC-51 |
| B2195: ANTI SCANNING | CRNT | PAST | × | • With Intelligent Key system SEC-52<br>• Without Intelligent Key system SEC-200 |
| B2196: DONGLE NG | CRNT | PAST | × | • With Intelligent Key system SEC-53<br>• Without Intelligent Key system SEC-201 |

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

## Reference Value

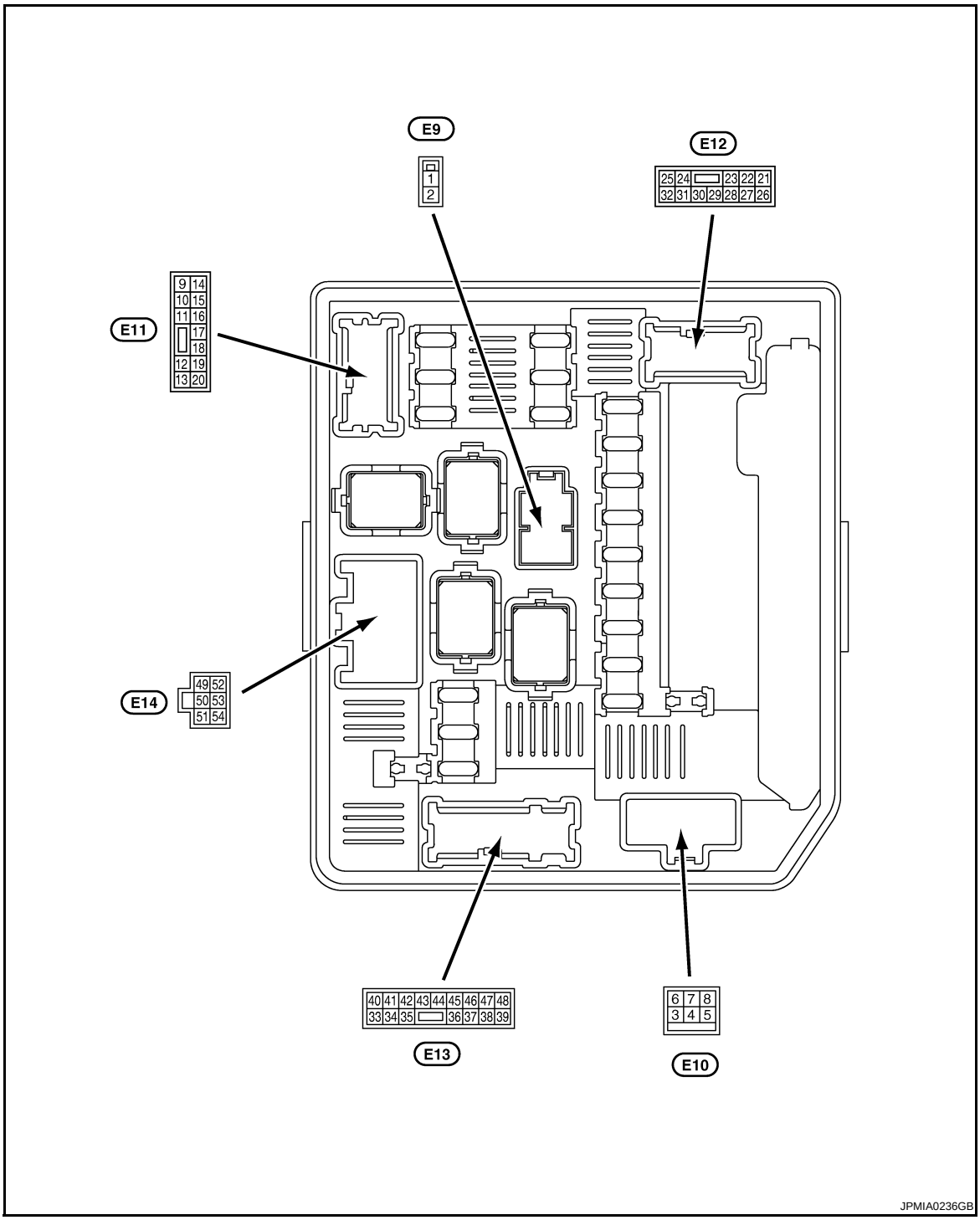
INFOID:0000000001555125

### 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 - 3 |
| 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 or AUTO (Light is illuminated) | | On |
| HL LO REQ | Lighting switch OFF | | Off |
| | Lighting switch 2ND or AUTO (Light is illuminated) | | On |
| HL HI REQ | Lighting switch OFF | | Off |
| | Lighting switch HI (Light is illuminated) | | On |
| FR FOG REQ | Lighting switch 2ND or AUTO (Light is illuminated) | Front fog lamp switch OFF | Off |
| | | Front fog lamp switch ON | On |
| HL WASHER REQ | Ignition switch ON, and low beam headlamp is ON | Front washer switch OFF | Off |
| | | Front washer switch ON (When headlamp washer is operating) | 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 due to fail-safe operation (cut-out operation) | BLOCK |
| ST RLY REQ<br>**NOTE:**<br>Vehicle without Intelligent Key system indicates only “ON”, and it does not change. | When Intelligent Key is outside the vehicle, and the push switch is pushed | | Off |
| | When Intelligent Key is inside the vehicle, and the push switch is pushed | | On |
| IGN RLY | Ignition switch OFF or ACC | | Off |
| | Ignition switch ON | | On |
| RR DEF REQ | Ignition switch ON | Rear window defogger switch OFF | Off |
| | | Rear window defogger switch ON (Rear window defogger is operating) | On |
| OIL P SW | Ignition switch OFF, ACC or engine running | | Open |
| | Ignition switch ON | | Close |

| Monitor Item | Condition | Value/Status |
|---|---|---|
| REV SW | Except selector lever R position | Off |
| | Selector lever R position | On |
| HOOD SW<br>**NOTE:**<br>This item is monitored only on the vehicle with the Vehicle Security (Theft Warning) system. | Close the hood | Off |
| | Open the hood | On |
| THFT HRN REQ<br>**NOTE:**<br>This item is monitored only on the vehicle with the Vehicle Security (Theft Warning) system. | Not operation | Off |
| | Horn is activated with Vehicle Security (Theft Warning) system. | On |
| HORN CHIRP | **NOTE:**<br>This item is indicated, but not monitored. | Off |
| IGN ON SW | Ignition switch OFF or ACC | Off |
| | Ignition switch ON | On |

TERMINAL LAYOUT




PHYSICAL VALUES

| Terminal No. (Wire color) | | Description | | Condition | Value (Approx.) |
|---|---|---|---|---|---|
| | | Signal name | Input/ Output | | |
| + | – | | | | |
| 1 (G) | Ground | Battery power supply | Input | Ignition switch OFF | Battery voltage |
| 2 (R) | Ground | Battery power supply | Input | Ignition switch OFF | Battery voltage |
| 5 (B) | Ground | Ground | — | Ignition switch ON | 0 V |

| Terminal No. (Wire color) | | Description | | Condition | | Value (Approx.) |
|---|---|---|---|---|---|---|
| + | – | Signal name | Input/ Output | | | |
| 6 (B) | Ground | Ground | — | Ignition switch ON | | 0 V |
| 7 (Y) | Ground | Front wiper LO | Output | Ignition switch ON | Front wiper switch OFF | 0 V |
| | | | | | Front wiper switch LO | Battery voltage |
| 8 (Y/R) | Ground | Front wiper HI | Output | Ignition switch ON | Front wiper switch OFF | 0 V |
| | | | | | Front wiper switch HI | Battery voltage |
| 9 (G) | Ground | ECM relay power supply | Output | Ignition switch ON | | Battery voltage |
| 10*1 (L/R) | Ground | ECM relay power supply | Output | Ignition switch ON | | Battery voltage |
| 11*2 (O) | Ground | PTC heater 1 relay control | Output | PTC heater OFF | | Battery voltage |
| | | | | PTC heater ON | | 0 V |
| 12*2 (G/Y) | Ground | PTC heater 2 relay control | Output | PTC heater OFF | | Battery voltage |
| | | | | PTC heater ON | | 0 V |
| 14 (R/B) | Ground | Ignition power supply | Output | Ignition switch OFF or ACC | | 0 V |
| | | | | Ignition switch ON | | Battery voltage |
| 15 (Y/L)*1 (B/R)*2 | Ground | ECM relay control | Input | • Engine running<br>• Ignition switch OFF<br>(For a few seconds after turning ignition switch OFF) | | 0 - 1.0 V*1 |
| | | | | | | 0.6 V*2 |
| | | | | Ignition switch OFF or ACC<br>(More than a few seconds after turning ignition switch OFF) | | Battery voltage |
| 16*3 (Y/R) | Ground | Ignition relay power supply | Output | Ignition switch ON | | Battery voltage |
| | | | | Ignition switch OFF or ACC | | 0 V |
| 19*1 (R/O) | Ground | Ignition relay power supply | Output | Ignition switch ON | | Battery voltage |
| | | | | Ignition switch OFF or ACC | | 0 V |
| 21*4 (GR) | Ground | Hood switch | Input | Close the hood | | 0 V → Battery voltage → 0 V |
| | | | | Open the hood | | 0 V |
| 22 (Y/G) | Ground | Reverse switch | Input | Ignition switch OFF or ACC | | 0 V |
| | | | | Ignition switch ON | • Selector lever “R” (Except M/T models)<br>• M/T control lever “R” (M/T models) | Battery voltage |
| | | | | | • Selector lever in any position other than “R” (Except M/T models)<br>• M/T control lever in any position other than “R” (M/T models) | 0 V |
| 23 (Y/B) | Ground | A/C relay power supply | Output | Engine stopped | | 0 V |
| | | | | Engine running | A/C switch OFF | 0 V |
| | | | | | A/C switch ON<br>(A/C compressor is operating) | Battery voltage |
| 24 (R/Y) | Ground | Headlamp LO (RH) | Output | Lighting switch OFF | | 0 V |
| | | | | Lighting switch 2ND | | Battery voltage |

| Terminal No. (Wire color) | | Description | | Condition | | Value (Approx.) |
|---|---|---|---|---|---|---|
| + | – | Signal name | Input/ Output | | | |
| 25*1 (G/L) | Ground | ETC relay control | Input | Ignition switch OFF or ACC | | Battery voltage |
| | | | | Ignition switch ON | | 0 - 1.0 V |
| 26 (O) | 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 |
| 27 (W) | Ground | Oil pressure switch | Input | Engine stopped | | 0 V |
| | | | | Engine running | | Battery voltage |
| 28 (L) | — | CAN-H | Input/ Output | — | | — |
| 29 (P) | — | CAN-L | Input/ Output | — | | — |
| 30*4 (L) | Ground | Horn relay control | Output | The horn is not activated | | Battery voltage |
| | | | | The horn is activated | | 0 V |
| 31 (R) | Ground | Headlamp LO (sensor) | Output | Lighting switch OFF | | 0 V |
| | | | | Lighting switch 2ND | | Battery voltage |
| 32*1 (R/Y) | Ground | ETC relay power supply | Output | Ignition switch ON | | Battery voltage |
| 33*1 (B/O) | Ground | Fuel pump relay control | Input | • Engine running<br>• Ignition switch ON<br>(For 1 second after turning ignition switch ON) | | 0 - 1.0 V |
| | | | | Ignition switch ON<br>(More than 1 second after turning ignition switch ON) | | Battery voltage |
| 34 (R/B) | Ground | Starter relay power supply | Input | Ignition switch ON (Except M/T models) | Selector lever “P” or “N” | Battery voltage |
| | | | | | Selector lever in any position other than “P” or “N” | 0 V |
| | | | | Ignition switch ON (M/T models) | | Battery voltage |
| 35 (W/L) | Ground | Ignition switch ON | Input | Ignition switch OFF or ACC | | 0 V |
| | | | | Ignition switch ON | | Battery voltage |
| 36 (W) | Ground | Front fog lamp (RH) | Output | Lighting switch 1ST | Front fog lamp switch ON | Battery voltage |
| | | | | | Front fog lamp switch OFF | 0 V |
| 37 (R/W) | Ground | Parking lamp (RH) | Output | Lighting switch 1ST | | Battery voltage |
| | | | | Lighting switch OFF | | 0 V |
| 38 (R/L) | Ground | Tail, license plate lamps and illuminations | Output | Lighting switch 1ST | | Battery voltage |
| | | | | Lighting switch OFF | | 0 V |
| 39 (GR) | Ground | Headlamp washer relay control | Output | Ignition switch ON | When headlamp washer is operating | 0 V |
| | | | | | When headlamp washer is not operating | Battery voltage |
| 40*1 (BR/Y)*5 (SB)*6 | Ground | Ignition relay power supply | Output | Ignition switch OFF or ACC | | 0 V |
| | | | | Ignition switch ON | | Battery voltage |
| 41 (P) | Ground | Ignition relay power supply | Output | Ignition switch OFF or ACC | | 0 V |
| | | | | Ignition switch ON | | Battery voltage |

| Terminal No. (Wire color) | | Description | | Condition | | Value (Approx.) |
|---|---|---|---|---|---|---|
| + | – | Signal name | Input/ Output | | | |
| 42*1 (B/Y) | Ground | Fuel pump relay power supply | Output | • Ignition switch OFF or ACC<br>• Approximately 1 second or more after turning the ignition switch ON | | 0 V |
| | | | | • Approximately 1 second after turning the ignition switch ON<br>• Engine running | | Battery voltage |
| 43 (W/B) | Ground | Front fog lamp (LH) | Output | Lighting switch 1ST | Front fog lamp switch ON | Battery voltage |
| | | | | | Front fog lamp switch OFF | 0 V |
| 44 (L) | Ground | Headlamp LO (LH) | Output | Lighting switch OFF | | 0 V |
| | | | | Lighting switch 2ND | | Battery voltage |
| 45 (L/W) | Ground | Headlamp HI (RH) | Output | • Lighting switch 2ND and HI<br>• lighting switch PASS | | Battery voltage |
| | | | | Lighting switch OFF | | 0 V |
| 46 (G) | Ground | Headlamp HI (LH) | Output | • Lighting switch 2ND and HI<br>• Lighting switch PASS | | Battery voltage |
| | | | | Lighting switch OFF | | 0 V |
| 47 (R/L) | Ground | Parking lamp (LH) | Output | Lighting switch 1ST | | Battery voltage |
| | | | | Lighting switch OFF | | 0 V |
| 48*7 (Y) | Ground | Cooling fan relay-3 control | Output | When cooling fan does HI operation | | 0 V |
| | | | | When cooling fan does OFF or LO operation | | Battery voltage |
| 49 (B) | Ground | Rear window defogger relay power supply | Output | Ignition switch ON | Rear window defogger switch ON | Battery voltage |
| | | | | | Rear window defogger switch OFF | 0 V |
| 50 (B/R) | Ground | Starter relay power supply | Output | When engine is cranking | | Battery voltage |
| | | | | When engine is not cranking | | 0 V |
| 51 (P) | Ground | Ignition switch START | Input | Ignition switch START | | Battery voltage |
| | | | | Ignition switch OFF, ACC or ON | | 0 V |
| 52 (W) | Ground | Cooling fan relay-1 power supply | Output | When cooling fan does LO or HI operation | | Battery voltage |
| | | | | When cooling fan does OFF operation | | 0 V |
| 53 (W/B) | Ground | Battery power supply (Cooling fan relay) | Input | Ignition switch OFF | | Battery voltage |
| 54*5 (R) | Ground | Cooling fan relay-2 power supply | Input | When cooling fan does HI operation | | Battery voltage |
| | | | | When cooling fan does OFF or LO operation | | 0 V |

*1: HR engine and MR engine models

*2: K9K engine and M9R engine models

*3: Except M/T models only

*4: With vehicle security (theft warning) system

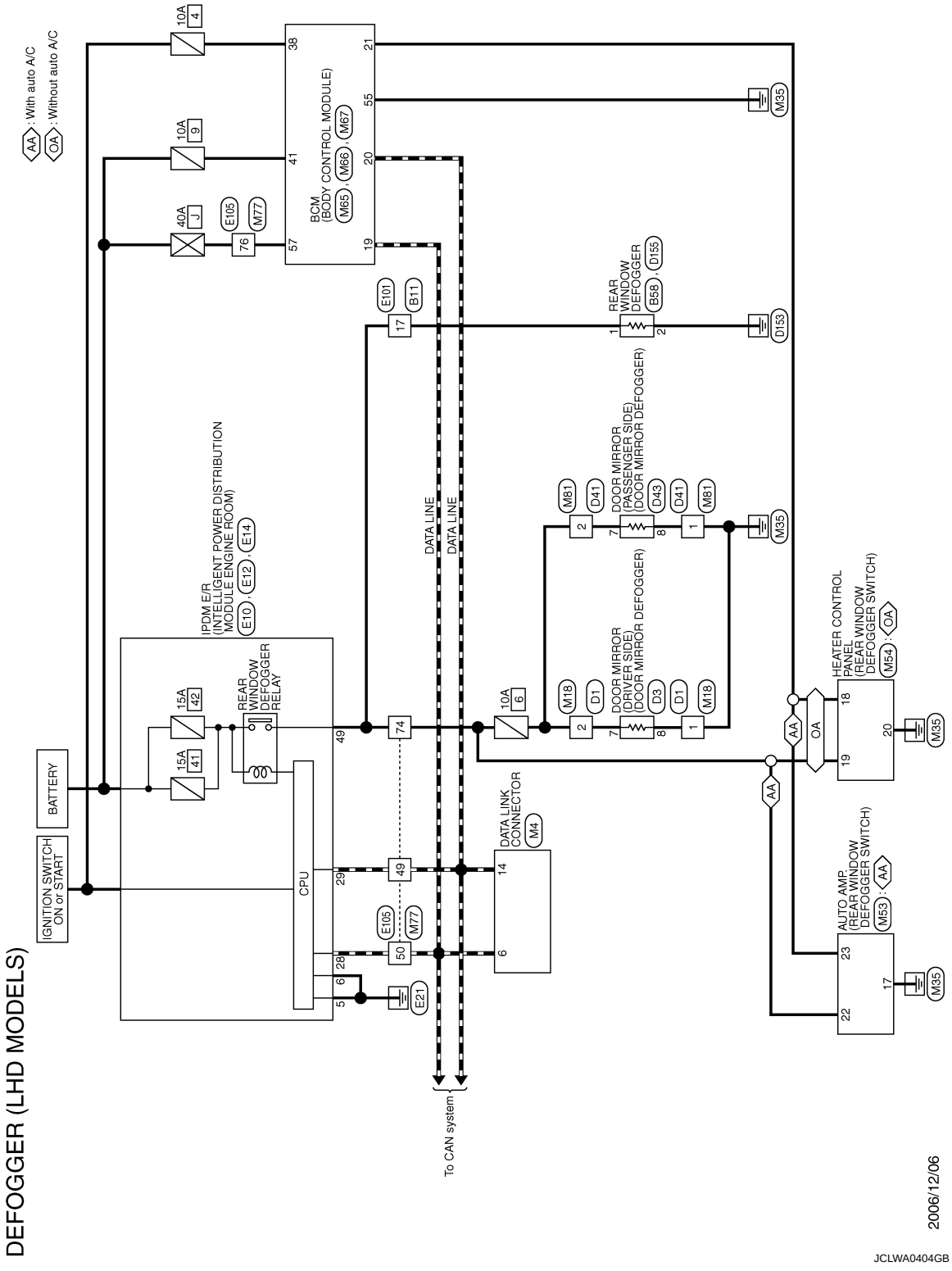
*5: HR engine models

*6: MR engine models

*7: MR engine, K9K engine and M9R engine models

# Wiring Diagram - DEFOGGER CONTROL SYSTEM (LHD MODELS) -

INFOID:0000000001189086



DEFOGGER (LHD MODELS)

| Connector No. | B11 |
|---|---|
| Connector Name | WIRE TO WIRE |
| Connector Type | TK10MW-NS8 |

H.S.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|
| 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | | |

| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 17 | B | – |

| Connector No. | B58 |
|---|---|
| Connector Name | REAR WINDOW DEFOGGER |
| Connector Type | P01FB-A |

H.S.

| 1 |
|---|

| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 1 | B | – |

| Connector No. | D1 |
|---|---|
| Connector Name | WIRE TO WIRE |
| Connector Type | TK16FW |

H.S.

| 7 | 6 | 5 | 4 | 3 | 2 | 1 |
|---|---|---|---|---|---|---|
| 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 |

| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 1 | B | – |
| 2 | G | – |

| Connector No. | D3 |
|---|---|
| Connector Name | DOOR MIRROR (DRIVER SIDE) |
| Connector Type | TK08MGY |

H.S.

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

| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 7 | G | – |
| 8 | B | – |

| Connector No. | D41 |
|---|---|
| Connector Name | WIRE TO WIRE |
| Connector Type | TK16FW |

H.S.

| 7 | 6 | 5 | 4 | 3 | 2 | 1 |
|---|---|---|---|---|---|---|
| 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 |

| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 1 | B | – |
| 2 | P | – |

| Connector No. | D43 |
|---|---|
| Connector Name | DOOR MIRROR (PASSENGER SIDE) |
| Connector Type | TK08MGY |

H.S.

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

| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 7 | G | – |
| 8 | B | – |

| Connector No. | D155 |
|---|---|
| Connector Name | REAR WINDOW DEFOGGER |
| Connector Type | P01FB-A |

H.S.

| 2 |
|---|

| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 2 | B | – |

| Connector No. | E10 |
|---|---|
| Connector Name | IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM) |
| Connector Type | M06FB-LC |

H.S.

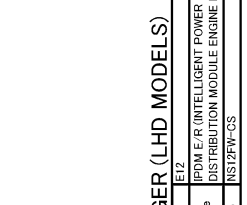
| 5 | 4 | 3 |
|---|---|---|
| 8 | 7 | 6 |

| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 5 | B | – |
| 6 | B | – |

JCLWA0649GB

DEFOGGER (LHD MODELS)

| Connector No. | E12 |
|---|---|
| Connector Name | IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM) |
| Connector Type | NS12FW-CS |

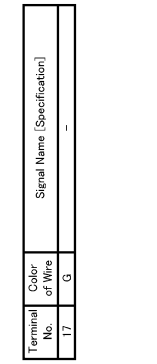



| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 28 | L | – |
| 29 | P | – |

| Connector No. | E14 |
|---|---|
| Connector Name | IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM) |
| Connector Type | YZK 7283-5591-40-F |

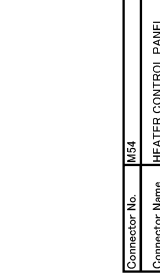

| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 49 | B | –[Except M9R engine] |
| 49 | G | –[With M9R engine] |

| Connector No. | E101 |
|---|---|
| Connector Name | WIRE TO WIRE |
| Connector Type | TK10FW-NS8 |




| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 17 | G | – |

| Connector No. | E105 |
|---|---|
| Connector Name | WIRE TO WIRE |
| Connector Type | TH60MW-NS16-TM4 |



| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 49 | P | – |
| 50 | L | – |
| 74 | G | – |
| 76 | Y | – |

| Connector No. | M4 |
|---|---|
| Connector Name | DATA LINK CONNECTOR |
| Connector Type | BD16FW |




| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 6 | L | – |
| 14 | P | – |

| Connector No. | M18 |
|---|---|
| Connector Name | WIRE TO WIRE |
| Connector Type | TK16MW |




| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 1 | B | – |
| 2 | G | – |

| Connector No. | M53 |
|---|---|
| Connector Name | A/C AUTO AMP. |
| Connector Type | SAB40FW |




| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 17 | B | GND |
| 22 | R | RR DEF F/B |
| 23 | SB | RR DEF ON |

| Connector No. | M54 |
|---|---|
| Connector Name | HEATER CONTROL PANEL |
| Connector Type | TK20FGY |

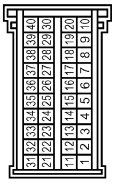



| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 18 | SB | RR DEF |
| 19 | R | RR DEF F/B |
| 20 | B | GND |

JCLWA0650GB

DEFOGGER (LHD MODELS)

| Connector No. | M65 |
|---|---|
| Connector Name | BCM (BODY CONTROL MODULE) |
| Connector Type | AAB40FB |



| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 19 | L | CAN-H |
| 20 | P | CAN-L |
| 21 | SB | REAR DEFFOGER SW |
| 38 | W | IGN SW |

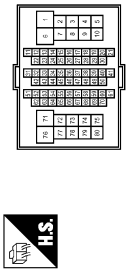
| Connector No. | M66 |
|---|---|
| Connector Name | BCM (BODY CONTROL MODULE) |
| Connector Type | FCI 211PG122S1017 |

| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 41 | V | BAT(FUSE) |

| Connector No. | M67 |
|---|---|
| Connector Name | BCM (BODY CONTROL MODULE) |
| Connector Type | FCI 211PC083S0017 |

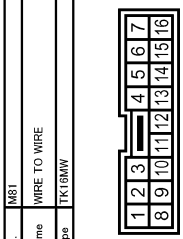
| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 55 | B | GND(POWER) |
| 57 | Y | BAT(F/L) |

| Connector No. | M77 |
|---|---|
| Connector Name | WIRE TO WIRE |
| Connector Type | TH60FW-NS16-TM4 |



| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 49 | P | – |
| 50 | L | – |
| 74 | R | – |
| 76 | Y | – |

| Connector No. | M81 |
|---|---|
| Connector Name | WIRE TO WIRE |
| Connector Type | TK16MW |

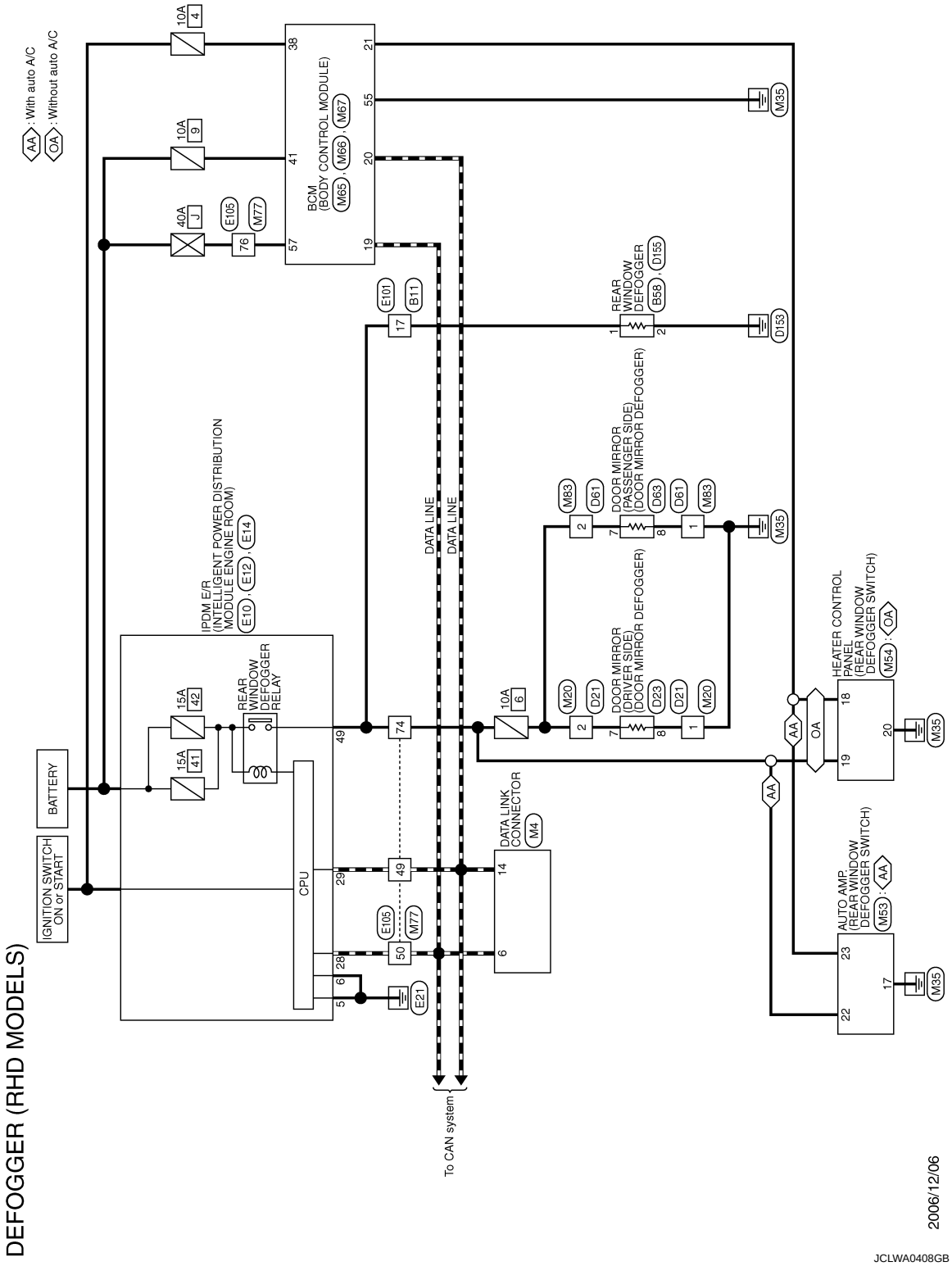


| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 1 | B | – |
| 2 | G | – |

JCLWA0651GB

## Wiring Diagram - DEFOGGER CONTROL SYSTEM (RHD MODELS) -

INFOID:0000000001189087



DEFOGGER (RHD MODELS)

| Connector No. | B11 |
|---|---|
| Connector Name | WIRE TO WIRE |
| Connector Type | TK10MW-NS8 |

H.S.

| 1 | 2 | 3 | 4 | 5 | | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| 11 | 12 | 13 | 14 | 15 | | 16 | 17 | 18 | | |

| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 17 | B | – |

| Connector No. | B58 |
|---|---|
| Connector Name | REAR WINDOW DEFOGGER |
| Connector Type | P01FB-A |

H.S.

| 1 |
|---|
| 2 |

| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 1 | B | – |

| Connector No. | D21 |
|---|---|
| Connector Name | WIRE TO WIRE |
| Connector Type | TK16FW |

H.S.

| 7 | 6 | 5 | 4 | | 3 | 2 | 1 |
|---|---|---|---|---|---|---|---|
| 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 |

| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 1 | B | – |
| 2 | P | – |

| Connector No. | D23 |
|---|---|
| Connector Name | DOOR MIRROR (DRIVER SIDE) |
| Connector Type | TK08MGY |

H.S.

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

| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 7 | G | – |
| 8 | B | – |

| Connector No. | D61 |
|---|---|
| Connector Name | WIRE TO WIRE |
| Connector Type | TK16FW |

H.S.

| 7 | 6 | 5 | 4 | | 3 | 2 | 1 |
|---|---|---|---|---|---|---|---|
| 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 |

| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 1 | B | – |
| 2 | G | – |

| Connector No. | D83 |
|---|---|
| Connector Name | DOOR MIRROR (PASSENGER SIDE) |
| Connector Type | TK08MGY |

H.S.

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

| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 7 | G | – |
| 8 | B | – |

| Connector No. | D155 |
|---|---|
| Connector Name | REAR WINDOW DEFOGGER |
| Connector Type | P01FB-A |

H.S.

| 2 |
|---|
| 1 |

| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 2 | B | – |

| Connector No. | E10 |
|---|---|
| Connector Name | IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM) |
| Connector Type | M06FB-LC |

H.S.

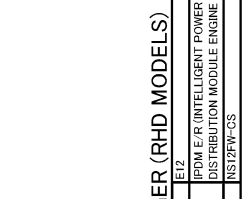
| 5 | 4 | 3 |
|---|---|---|
| 8 | 7 | 6 |

| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 5 | B | – |
| 6 | B | – |

JCLWA0652GB

DEFOGGER (RHD MODELS)

| Connector No. | E12 |
|---|---|
| Connector Name | IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM) |
| Connector Type | NS12FW-CS |

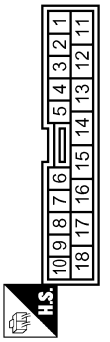



| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 28 | L | – |
| 29 | P | – |

| Connector No. | E14 |
|---|---|
| Connector Name | IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM) |
| Connector Type | YZK 7283-5591-40-F |

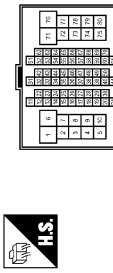

| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 49 | B | –[Except M9R engine] |
| 49 | G | –[With M9R engine] |

| Connector No. | E101 |
|---|---|
| Connector Name | WIRE TO WIRE |
| Connector Type | TK10FW-NS8 |




| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 17 | G | – |

| Connector No. | E105 |
|---|---|
| Connector Name | WIRE TO WIRE |
| Connector Type | TH60MW-NS16-TM4 |



| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 49 | P | – |
| 50 | L | – |
| 74 | G | – |
| 76 | Y | – |

| Connector No. | M4 |
|---|---|
| Connector Name | DATA LINK CONNECTOR |
| Connector Type | BD16FW |




| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 6 | L | – |
| 14 | P | – |

| Connector No. | M20 |
|---|---|
| Connector Name | WIRE TO WIRE |
| Connector Type | TK16MW |




| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 1 | B | – |
| 2 | G | – |

| Connector No. | M53 |
|---|---|
| Connector Name | AUTO AMP. |
| Connector Type | SAB40FW |



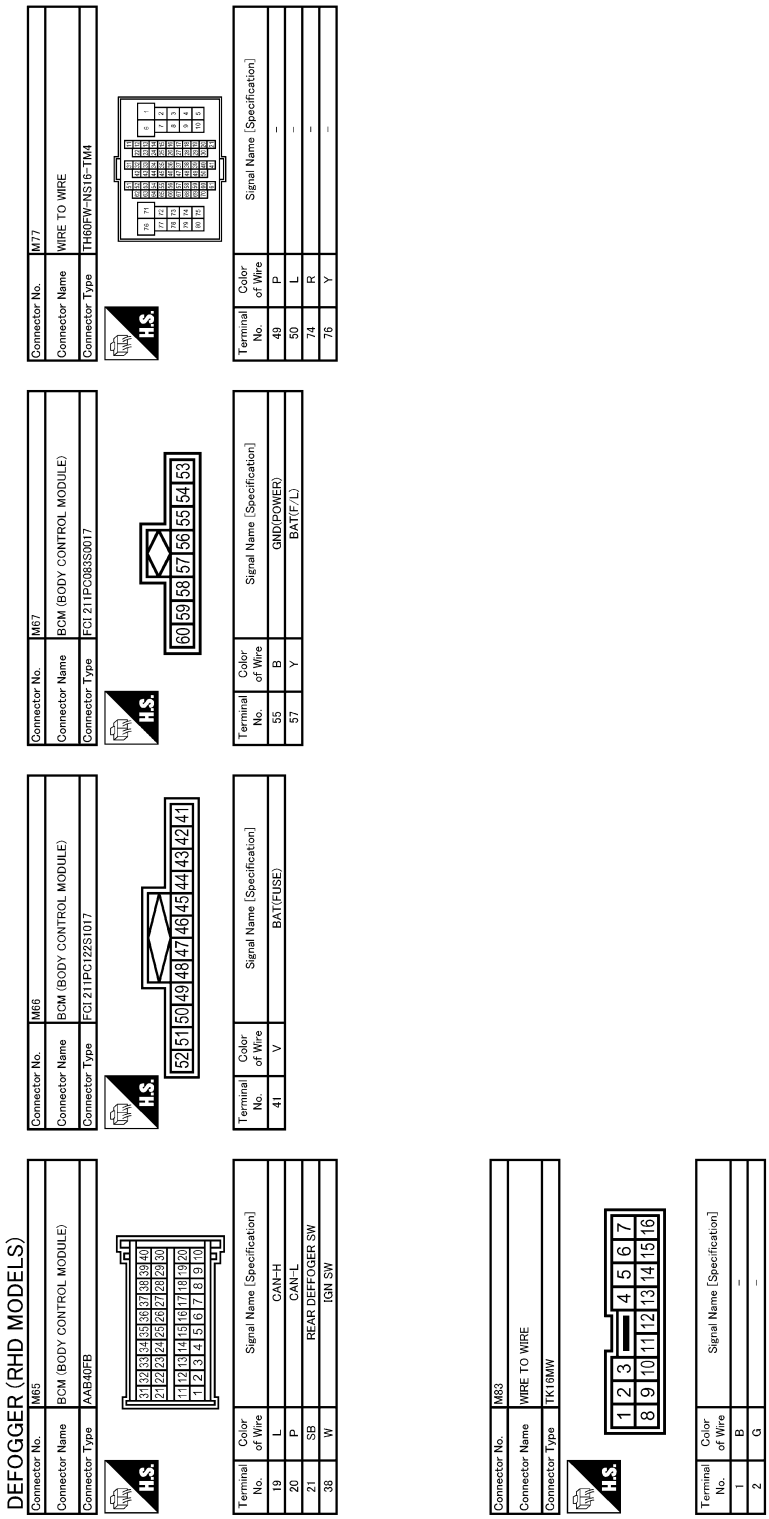

| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 17 | B | GND |
| 22 | R | RR DEF F/B |
| 23 | SB | RR DEF ON |

| Connector No. | M54 |
|---|---|
| Connector Name | HEATER CONTROL PANEL |
| Connector Type | TK20FGY |




| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 18 | SB | RR DEF |
| 19 | R | RR DEF F/B |
| 20 | B | GND |

JCLWA0653GB




JCLWA0654GB

## Fail Safe

*INFOID:0000000001555126*

### 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 | • The cooling fan relay-2*1 or the cooling fan relay-3*2 turns ON when the ignition switch is turned ON<br>• Turns off the fan motor low relay when the ignition switch is turned OFF |
| A/C compressor | A/C relay OFF |

*1: HR engine models

*2: MR engine, K9K engine and M9R engine models

If no CAN communication is available with BCM

| Control part | Fail-safe in operation |
|---|---|
| Headlamp | • The headlamp low relay turns ON when the ignition switch is turned ON<br>• The headlamp low relay turns OFF when the ignition switch is turned OFF<br>• Headlamp high relay OFF |
| • Parking lamps<br>• License plate lamps<br>• Tail lamps<br>• Illuminations | • The tail lamp relay turns ON when the ignition switch is turned ON<br>• The tail lamp relay turns OFF when the ignition switch is turned OFF |
| Front wiper | • 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.<br>• The front 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 | Front fog lamp relay OFF |
| Starter motor | Starter relay OFF |
| Rear window defogger | Rear window defogger relay OFF |
| Headlamp washer | Headlamp washer relay OFF |
| PTC heater | PTC heater relay OFF |

## Ignition relay malfunction detection function

- The CPU integrated IPDM E/R monitors the voltage at the contact circuit of the ignition relay inside it.
- IPDM E/R judges the ignition relay error if the ignition relay condition is different from the ignition switch ON signal.
- If the ignition relay cannot turn OFF due to contact seizure, it activates the tail lamp relay for 10 minutes to alert the user to the ignition relay malfunction when the ignition switch is turned OFF.

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

**NOTE:**

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

## Front wiper control

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

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

## DTC Index

INFOID:0000000001555127

| CONSULT display | Fail-safe | Timing[NOTE] | | Reference page |
|---|---|---|---|---|
| No DTC is detected. further testing may be required. | — | — | — | — |
| U1000: CAN COMM CIRCUIT | × | CRNT | PAST | PCS-14 |
| B2099: IGN RELAY OFF | — | CRNT | PAST | PCS-15 |
| B209A: RAM ERROR | — | CRNT | PAST | PCS-16 |
| B209B: ROM ERROR | — | CRNT | PAST | PCS-17 |
| B2100: EEPROM | — | CRNT | PAST | PCS-18 |

**NOTE:**

The details of time display are as follows.

- CRNT: The malfunctions that are detected now.
- PAST: The number is indicated when it is normal at present and a malfunction was detected in the past.

# SYMPTOM DIAGNOSIS

## REAR WINDOW DEFOGGER DOES NOT OPERATE

### Diagnosis Procedure

INFOID:0000000001189090

### 1.IPDM E/R AUTO ACTIVE TEST

Perform IPDM E/R active test.
Refer to PCS-9, "Diagnosis Description".

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace the malfunctioning parts.

### 2.CHECK REAR WINDOW DEFOGGER SWITCH

Check rear window defogger switch.
With auto A/C. Refer to DEF-13, "WITH AUTO A/C : Component Function Check".
Without auto A/C. Refer to DEF-15, "WITHOUT AUTO A/C : Component Function Check"

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair or replace the malfunctioning parts.

### 3.CHECK REAR WINDOW DEFOGGER RELAY

Check rear window defogger relay.
Refer to DEF-17, "Component Function Check".

Is the inspection result normal?

YES >> GO TO 4.
NO >> Repair or replace the malfunctioning parts.

### 4.CHECK REAR WINDOW DEFOGGER

Check rear window defogger.
Refer to DEF-18, "Component Function Check".

Is the inspection result normal?

YES >> GO TO 5.
NO >> Repair or replace the malfunctioning parts.

### 5.CONFIRM THE OPERATION

Confirm the operation again.

Is the result normal?

YES >> Check intermittent incident.Refer to GI-39, "Intermittent Incident"
NO >> GO TO 1.

# REAR WINDOW DEFOGGER AND DOOR MIRROR DEFOGGER DO NOT OPERATE.

## Diagnosis Procedure

INFOID:0000000001189091

### 1. IPDM E/R AUTO ACTIVE TEST

Perform IPDM E/R active test.
Refer to PCS-9, "Diagnosis Description".

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace the malfunctioning parts.

### 2. CHECK REAR WINDOW DEFOGGER SWITCH

Check rear window defogger switch.
With auto A/C. Refer to DEF-13, "WITH AUTO A/C : Component Function Check".
Without auto A/C. Refer to DEF-15, "WITHOUT AUTO A/C : Component Function Check".

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair or replace the malfunctioning parts.

### 3. CHECK REAR WINDOW DEFOGGER RELAY

Check rear window defogger relay.
Refer toDEF-17, "Component Function Check"

Is the inspection result normal?

YES >> GO TO 4.
NO >> Repair or replace the malfunctioning parts.

### 4. CHECK REAR WINDOW DEFOGGER

Check rear window defogger.
Refer to DEF-18, "Component Function Check".

Is the inspection result normal?

YES >> GO TO 5.
NO >> Repair or replace the malfunctioning parts.

### 5. CONFIRM THE OPERATION

Confirm the operation again.

Is the result normal?

YES >> Check intermittent incident. Refer to GI-39, "Intermittent Incident"
NO >> GO TO 1.

# REAR WINDOW DEFOGGER DOES NOT OPERATE BUT BOTH OF DOOR MIRROR DEFOGGER OPERATE.

## Diagnosis Procedure

INFOID:0000000001524244

### 1. CHECK REAR WINDOW DEFOGGER

Check rear window defogger.
Refer to DEF-18, "Component Function Check".

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace the malfunctioning parts.

### 2. CONFIRM THE OPERATION

Confirm the operation again.

Is the result normal?

YES >> Check intermittent incident. Refer to GI-39, "Intermittent Incident"
NO >> GO TO 1.

# DOOR MIRROR DEFOGGER DOES NOT OPERATE

## BOTH SIDE

### BOTH SIDE : Diagnosis Procedure

INFOID:0000000001524333

#### 1.CHECK DOOR MIRROR DEFOGGER

Check door mirror defogger circuit.
Refer to DEF-20, "DRIVER SIDE : Component Function Check"

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace the malfunctioning parts.

#### 2.CONFIRM THE OPERATION

Confirm the operation again.

Is the result normal?

YES >> Check intermittent incident. Refer to GI-39, "Intermittent Incident"
NO >> GO TO 1.

## DRIVER SIDE

### DRIVER SIDE : Diagnosis Procedure

INFOID:0000000001524334

#### 1.CHECK DRIVER SIDE DOOR MIRROR DEFOGGER

Check driver side door mirror defogger.
Refer to DEF-21, "DRIVER SIDE : Component Inspection".

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace the malfunctioning parts.

#### 2.CONFIRM THE OPERATION

Confirm the operation again.

Is the result normal?

YES >> Check intermittent incident. Refer to GI-39, "Intermittent Incident"
NO >> GO TO 1.

## PASSENGER SIDE

### PASSENGER SIDE : Diagnosis Procedure

INFOID:0000000001524335

#### 1.CHECK PASSENGER SIDE DOOR MIRROR DEFOGGER.

Check passenger side door mirror defogger.
Refer to DEF-23, "PASSENGER SIDE : Component Inspection"

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace the malfunctioning parts.

#### 2.CONFIRM THE OPERATION

Confirm the operation again.

Is the result normal?

YES >> Check intermittent incident. Refer to GI-39, "Intermittent Incident"
NO >> GO TO 1.

# REAR WINDOW DEFOGGER INDICATOR

## Diagnosis Procedure

INFOID:0000000001524338

### 1.CHECK REAR WINDOW DEFOGGER INDICATOR

Check rear window defogger ON signal.
With auto A/R. Refer to DEF-24, "WITH AUTO A/C : Component Function Check".
Without auto A/R. Refer to DEF-25, "WITHOUT AUTO A/C : Component Function Check".

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace the malfunctioning parts.

### 2.CONFIRM THE OPERATION

Confirm the operation again.

Is the result normal?

YES >> Check intermittent incident. Refer to GI-39, "Intermittent Incident"
NO >> GO TO 1.

# PRECAUTION

## PRECAUTIONS

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

INFOID:0000000001571916

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted. Information necessary to service the system safely is included in the “SRS AIRBAG” and “SEAT BELT” of this Service Manual.

**WARNING:**

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the “SRS AIRBAG”.**
- **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.**

# ON-VEHICLE REPAIR

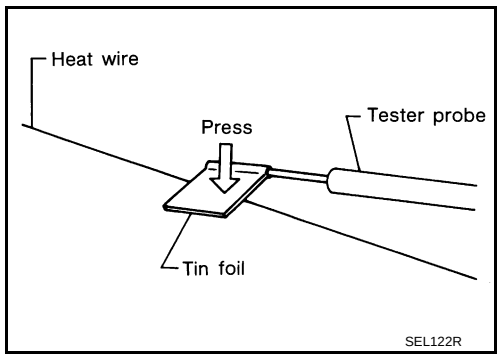
## FILAMENT

### Inspection and Repair

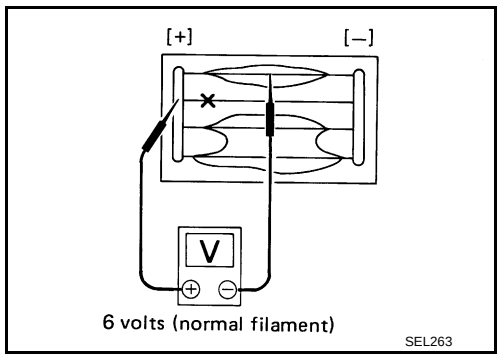
INFOID:0000000001189098

#### INSPECTION

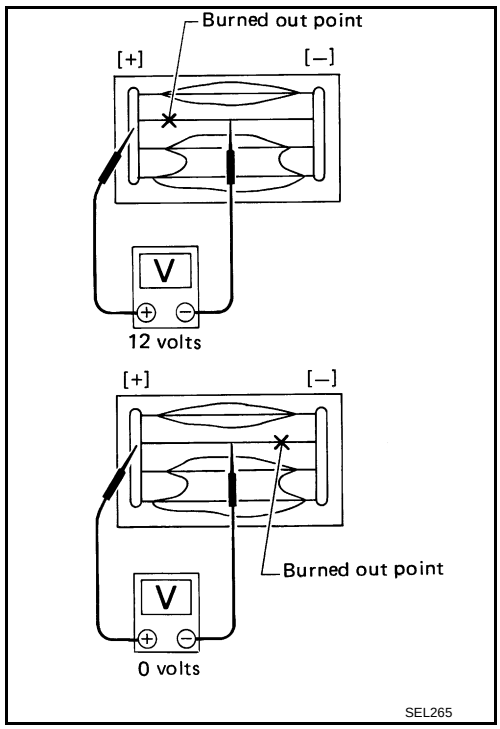
1. When measuring voltage, wrap tin foil around the top of the negative probe. Then press the foil against the wire with your finger.




2. Attach probe circuit tester (in Volt range) to middle portion of each filament.




3. If a filament is burned out, circuit tester registers 0 or battery voltage.
4. To locate burned out point, move probe to left and right along filament. Test needle will swing abruptly when probe passes the point.




#### REPAIR

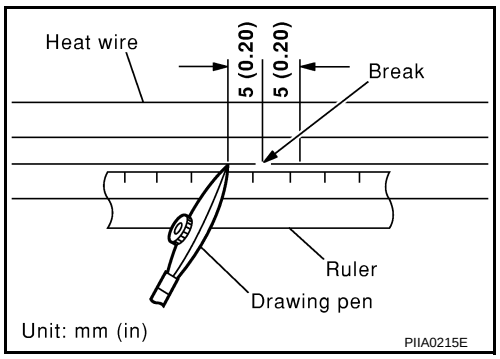
REPAIR EQUIPMENT

- Conductive silver composition (Dupont No. 4817 or equivalent)

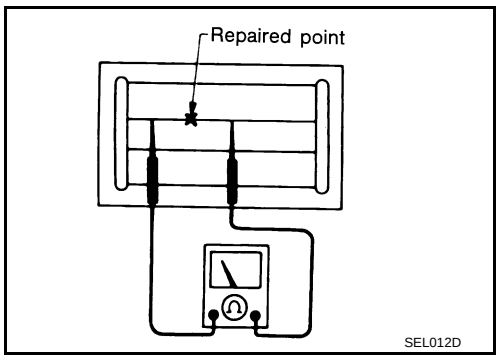
- Ruler 30 cm (11.8 in) long
- Drawing pen
- Heat gun
- Alcohol
- Cloth

REPAIRING PROCEDURE

1. Wipe broken heat wire and its surrounding area clean with a cloth dampened in alcohol.
2. Apply a small amount of conductive silver composition to tip of drawing pen.
   Shake silver composition container before use.
3. Place ruler on glass along broken line. Deposit conductive silver composition on break with drawing pen. Slightly overlap existing heat wire on both sides [preferably 5 mm (0.20 in)] of the break.




4. After repair has been completed, check repaired wire for continuity. This check should be conducted 10 minutes after silver composition is deposited.
   Do not touch repaired area while test is being conducted.




5. Apply a constant stream of hot air directly to the repaired area for approximately 20 minutes with a heat gun. A minimum distance of 3 cm (1.2 in) should be kept between repaired area and hot air outlet.
   If a heat gun is not available, let the repaired area dry for 24 hours.