# SECTION HAC

# HEATER & AIR CONDITIONING CONTROL SYSTEM

## CONTENTS

### WITHOUT 7 INCH DISPLAY

## WITH 7 INCH DISPLAY

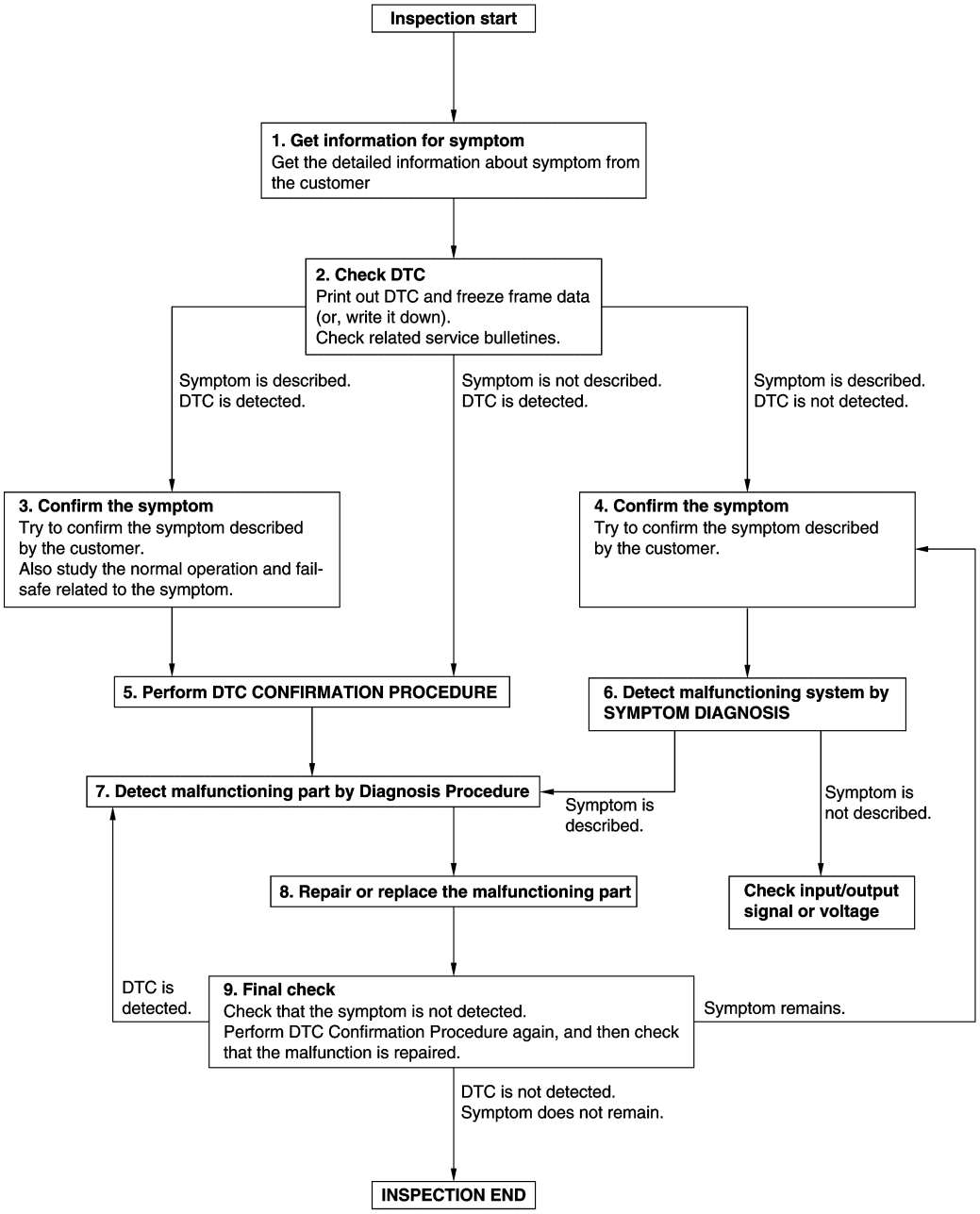
# BASIC INSPECTION

## DIAGNOSIS AND REPAIR WORKFLOW

### Work Flow

INFOID:0000000009722024

#### OVERALL SEQUENCE

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#### DETAILED FLOW

## 1.GET INFORMATION FOR SYMPTOM

1. Get detailed information from the customer about the symptom (the condition and the environment when the incident/malfunction occurs).
2. Check operation condition of the function that is malfunctioning.

>> GO TO 2.

## 2.CHECK DTC

1. Check DTC.
2. Perform the following procedure if DTC is detected.

- Record DTC and freeze frame data (Print them out using CONSULT.)
- Erase DTC.
- Study the relationship between the cause detected by DTC and the symptom described by the customer.

3. Check related service bulletins for information.

Are any symptoms described and any DTC detected?

Symptom is described, DTC is detected>>GO TO 3.
Symptom is described, DTC is not detected>>GO TO 4.
Symptom is not described, DTC is detected>>GO TO 5.

## 3.CONFIRM THE SYMPTOM

Try to confirm the symptom described by the customer.
Also study the normal operation and fail-safe related to the symptom.
Verify relation between the symptom and the condition when the symptom is detected.

>> GO TO 5.

## 4.CONFIRM THE SYMPTOM

Try to confirm the symptom described by the customer.
Verify relation between the symptom and the condition when the symptom is detected.

>> GO TO 6.

## 5.PERFORM DTC CONFIRMATION PROCEDURE

Perform DTC CONFIRMATION PROCEDURE for the detected DTC, and then check that DTC is detected again. At this time, always connect CONSULT to the vehicle, and check self diagnostic results in real time.
If two or more DTCs are detected, refer to DTC INSPECTION PRIORITY CHART, and determine trouble diagnosis order.

**NOTE:**

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

Is DTC detected?

YES >> GO TO 7.
NO >> Check according to GI-44, "Intermittent Incident".

## 6.DETECT MALFUNCTIONING SYSTEM BY SYMPTOM DIAGNOSIS

Detect malfunctioning system according to SYMPTOM DIAGNOSIS based on the confirmed symptom in step 4, and determine the trouble diagnosis order based on possible causes and symptom.

Is the symptom described?

YES >> GO TO 7.
NO >> Monitor input data from related sensors or check voltage of related module terminals using CONSULT.

## 7.DETECT MALFUNCTIONING PART BY DIAGNOSIS PROCEDURE

Inspect according to Diagnosis Procedure of the system.

Is malfunctioning part detected?

YES >> GO TO 8.
NO >> Check according to GI-44, "Intermittent Incident".

## 8. REPAIR OR REPLACE THE MALFUNCTIONING PART

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

>> GO TO 9.

## 9. FINAL CHECK

When DTC is detected in step 2, perform DTC CONFIRMATION PROCEDURE again, and then check that the malfunction is repaired securely.
When symptom is described by the customer, refer to confirmed symptom in step 3 or 4, and check that the symptom is not detected.

Is DTC detected and does symptom remain?

YES-1 >> DTC is detected: GO TO 7.
YES-2 >> Symptom remains: GO TO 4.
NO >> Before returning the vehicle to the customer, always erase DTC.

# INSPECTION AND ADJUSTMENT

## Description & Inspection

INFOID:0000000009722025

### DESCRIPTION

The purpose of the operational check is to check that the individual system operates normally.

**Conditions : Engine running at normal operating temperature**

### INSPECTION PROCEDURE

#### 1. CHECK MEMORY FUNCTION

1. Start the engine.
2. Operate the temperature control switch (driver side) and raise the temperature setting to 32°C (90°F).
3. Press the ON/OFF switch.
4. Turn the ignition switch OFF.
5. Turn the ignition switch ON.
6. Press the AUTO switch.
7. Check that the temperature setting before turning the ignition switch OFF is stored.

Is the inspection result normal?

YES >> GO TO 2.
NO >> Memory function malfunction: HAC-117, "Inspection procedure".

#### 2. CHECK BLOWER MOTOR SPEED

1. Start the engine.
2. Operate the fan control dial. Check that the fan speed changes. Check the operation for all fan speeds.
3. Set the fan speed to speed 7.

Is the inspection result normal?

YES >> GO TO 3.
NO >> Blower motor system malfunction: HAC-70, "Diagnosis Procedure".

#### 3. CHECK DISCHARGE AIR (MODE SWITCH AND DEF SWITCH)

1. Press the MODE switch and the DEF switch.
2. Check that the air outlets change according to each indicated air outlet by placing a hand in front of the outlets. Refer to HAC-16, "System Description".

**NOTE:**
Confirm that the compressor clutch is engaged (sound or visual inspection) and the intake door position is at the FRE when the D/F or DEF is selected.

Is the inspection result normal?

YES >> GO TO 4.
NO >> Mode door system malfunction: HAC-63, "Diagnosis Procedure".

#### 4. CHECK DISCHARGE AIR (UPPER VENT SWITCH)

1. Press the UPPER VENT switch.
2. The UPPER VENT switch indicator is turned ON.

3. Check that the air blown from the UPPER VENT does not greatly deviate from the air mix ratio.

| Discharge air flow | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Mode position indication | Condition | Air outlet/distribution | | | | | | |
| | | VENT | | | FOOT | | DEF | |
| | | Front | Upper | Rear | Front | Rear | | |
|  | DUAL switch: OFF<br>UPPER VENT switch : ON | 81% | 8% | 11% | — | — | — | |
|  | | 41% | 10% | 17% | 24% | 8% | — | |
|  | | 12% | 12% | 16% | 27% | 10% | 23% | |
|  | | 11% | 11% | 14% | 25% | 10% | 29% | |
|  | | 11% | 11% | 12% | — | — | 66% | |

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4. Press the UPPER VENT switch again.
5. The UPPER VENT switch indicator is turned OFF.
6. The air blown from the UPPER VENT stops.

Does it operate normally?

YES >> GO TO 5.
NO >> Upper ventilator door system malfunction: HAC-68, "Diagnosis Procedure".

## 5. CHECK INTAKE AIR

1. Press the intake switch. Indicator is turned ON (REC).
2. Press the intake switch again. Indicator is turned OFF (FRE).
3. Listen for the intake door position change. (Slight change of blower sound can be heard.)

**NOTE:**
Confirm that the compressor clutch is engaged (sound or visual inspection) and the intake door position is at the FRE when the D/F or DEF is selected.

Is the inspection result normal?

YES >> GO TO 6.
NO >> Intake door system malfunction: HAC-66, "Diagnosis Procedure".

## 6. CHECK A/C SWITCH

1. Press the A/C switch.
2. The A/C switch indicator is turned ON.
   Confirm that the compressor clutch engages (sound or visual inspection).

Is the inspection result normal?

YES >> GO TO 7.
NO >> Magnet clutch system malfunction: HAC-74, "Diagnosis Procedure".

## 7. CHECK WITH TEMPERATURE SETTING LOWERED

1. Operate the compressor.
2. Operate the temperature control switch (driver side) and lower the temperature setting to 18°C (60°F).
3. Check that the cool air blows from the outlets.

Is the inspection result normal?

YES >> GO TO 8.
NO >> Insufficient cooling: HAC-109, "Inspection procedure".

## 8. CHECK WITH TEMPERATURE SETTING RAISED

1. Operate the temperature control switch (driver side) and raise the temperature setting to 32°C (90°F) after warming up the engine.
2. Check that the warm air blows from the outlets.

Is the inspection result normal?

YES >> GO TO 9.
NO >> Insufficient heating: HAC-112, "Inspection procedure".

## 9. CHECK LH/RH INDEPENDENT TEMPERATURE ADJUSTMENT FUNCTION

1. Press the DUAL switch, and then check that “DUAL” is shown on the display.
2. Operate the temperature control switch (driver side). Check that the discharge air temperature (driver side) changes.
3. Operate the temperature control switch (passenger side). Check that the discharge air temperature (passenger side) changes.
4. Press the DUAL switch, and then check that the temperature setting (LH/RH) is unified to the driver side temperature setting.

Is the inspection result normal?

YES >> GO TO 10.
NO >> Refer to HAC-108, "Diagnosis Chart By Symptom" and perform the appropriate diagnosis.

## 10. CHECK AUTO MODE

1. Press the AUTO switch, and then check that “AUTO” is shown on the display.
2. Operate the temperature control switch (driver side). Check that the fan speed or outlet changes (the discharge air temperature or fan speed varies depending on the ambient temperature, in-vehicle temperature, and temperature setting).

Is the inspection result normal?

YES >> INSPECTION END
NO >> Refer to HAC-108, "Diagnosis Chart By Symptom" and perform the appropriate diagnosis.

# Temperature Setting Trimmer

INFOID:0000000009722026

## Description

If the temperature felt by the customer is different than the air flow temperature controlled by the temperature setting, the auto amplifier control temperature can be adjusted to compensate for the temperature setting.

## How to set

Using CONSULT, perform “TEMP SET CORRECT” on “WORK SUPPORT” of HVAC.

| Work support items | Display (°F) | Display (°C) |
|---|---|---|
| TEMP SET CORRECT | 6 | 3.0 |
| | 5 | 2.5 |
| | 4 | 2.0 |
| | 3 | 1.5 |
| | 2 | 1.0 |
| | 1 | 0.5 |
| | 0 (initial status) | 0 (initial status) |
| | –1 | –0.5 |
| | –2 | –1.0 |
| | –3 | –1.5 |
| | –4 | –2.0 |
| | –5 | –2.5 |
| | –6 | –3.0 |

**NOTE:**

- When the temperature setting is set to 25.0°C (77°F) and –3.0°C (–6°F), the temperature controlled by auto amp is 25.0°C (77°F) – 3.0°C (6°F) = 22.0°C (71°F) and the temperature becomes lower than the temperature setting.
- When the battery cable is disconnected from the negative terminal or when the battery voltage becomes 10V or less, the setting of the difference between the temperature setting and control temperature may be cancelled.

# Foot Position Setting Trimmer

INFOID:0000000009722027

## Description

In the FOOT mode, the air blowing to the DEF can be turned ON/OFF.

How to set

Using CONSULT, perform “BLOW SET” on “WORK SUPPORT” of HVAC.

| Work support items | Display | DEF door position | |
|---|---|---|---|
| | | Auto control | Manual control |
| BLOW SET | Mode 1 | OPEN | CLOSE |
| | Mode 2 (initial status) | OPEN | OPEN |
| | Mode 3 | CLOSE | OPEN |
| | Mode 4 | CLOSE | CLOSE |

**NOTE:**

When the battery cable is disconnected from the negative terminal or when the battery voltage becomes 10V or less, the setting of the discharge air mix ratio in FOOT mode may be cancelled.

## Inlet Port Memory Function (FRE)

INFOID:0000000009722028

Description

- If the ignition switch is turned to the OFF position while the FRE switch is set to ON (fresh air intake), “Perform the memory” or “Do not perform the memory” of the FRE switch ON (fresh air intake) condition can be selected.
- If “Perform the memory” was set, the FRE switch will be ON (fresh air intake) when turning the ignition switch to the ON position again.
- If “Do not perform the memory” was set, the air inlets will be controlled automatically when turning the ignition switch to the ON position again.

How to set

Using CONSULT, perform “FRE MEMORY SET” on “WORK SUPPORT” of HVAC.

| Work support items | Display | Setting |
|---|---|---|
| FRE MEMORY SET | WITHOUT | Perform the memory of manual FRE |
| | WITH (initial status) | Do not perform the memory of manual FRE (auto control) |

**NOTE:**

When the battery cable is disconnected from the negative terminal or when the battery voltage becomes 10 V or less, the setting of the FRE switch memory function may be cancelled.

## Inlet Port Memory Function (REC)

INFOID:0000000009722029

Description

- If the ignition switch is turned to the OFF position while the REC switch is set to ON (recirculation), “Perform the memory” or “Do not perform the memory” of the REC switch ON (recirculation) condition can be selected.
- If “Perform the memory” was set, the REC switch will be ON (recirculation) when turning the ignition switch to the ON position again.
- If “Do not perform the memory” was set, the air inlets will be controlled automatically when turning the ignition switch to the ON position again.

How to set

Using CONSULT, perform “REC MEMORY SET” on “WORK SUPPORT” of HVAC.

| Work support items | Display | Setting |
|---|---|---|
| REC MEMORY SET | WITHOUT (initial status) | Perform the memory of manual REC |
| | WITH | Do not perform the memory of manual REC (auto control) |

**NOTE:**

When the battery cable is disconnected from the negative terminal or when the battery voltage becomes 10 or less, the setting of the REC switch memory function may be cancelled.

# SYSTEM DESCRIPTION

## COMPRESSOR CONTROL FUNCTION

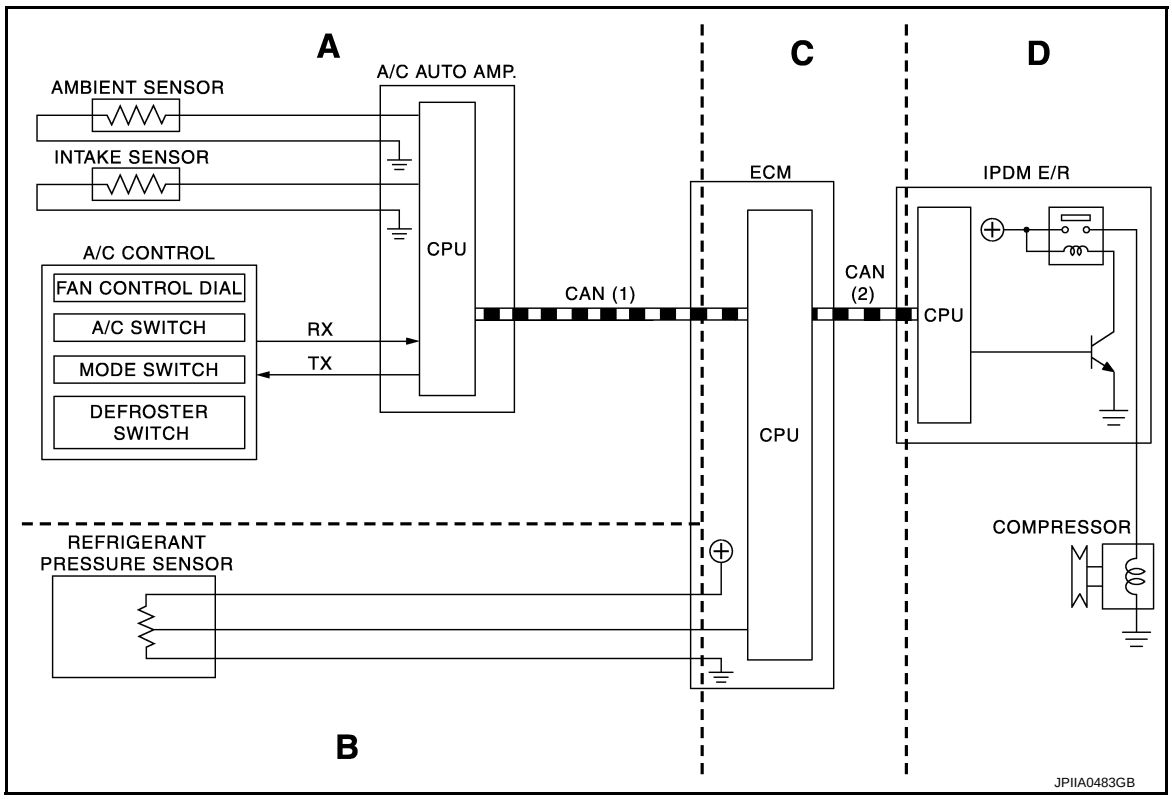
### Description

INFOID:0000000009722030

PRINCIPLE OF OPERATION

Compressor is not activated.

Functional circuit diagram




CAN (1) : A/C switch signal
: Blower fan motor switch signal

RX, TX : A/C switch signal
: Fan ON signal
: Defroster signal

CAN (2) : A/C Compressor request signal

Functional initial inspection chart

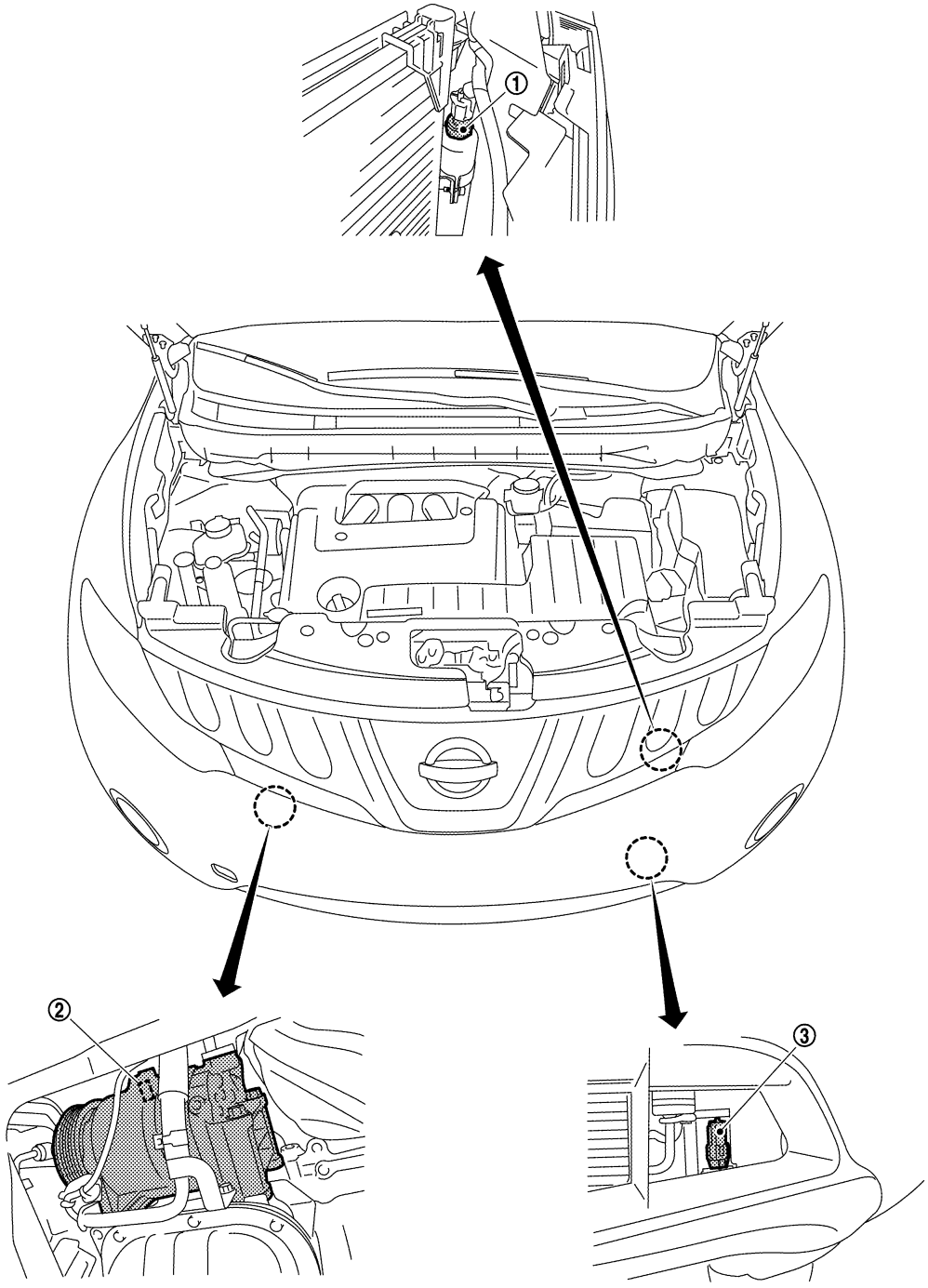
×: Applicable

| Control unit | Diagnosis item | | Location | | | |
|---|---|---|---|---|---|---|
| | | | A | B | C | D |
| A/C auto amp. | "HVAC" | Self-diagnosis | × | — | — | — |
| | | Data monitor | × | — | — | — |
| | | Active test | × | — | — | × |
| ECM | "ENGINE" | Self-diagnosis function (CAN system diagnosis) | — | — | × | — |
| | | Data monitor | — | × | × | — |
| IPDM E/R | "IPDM E/R" | Self-diagnosis function (CAN system diagnosis) | — | — | — | × |
| | | Data monitor | — | — | × | — |
| | Auto active test | | — | — | — | × |

## Component Part Location

INFOID:0000000009722031

ENGINE COMPARTMENT

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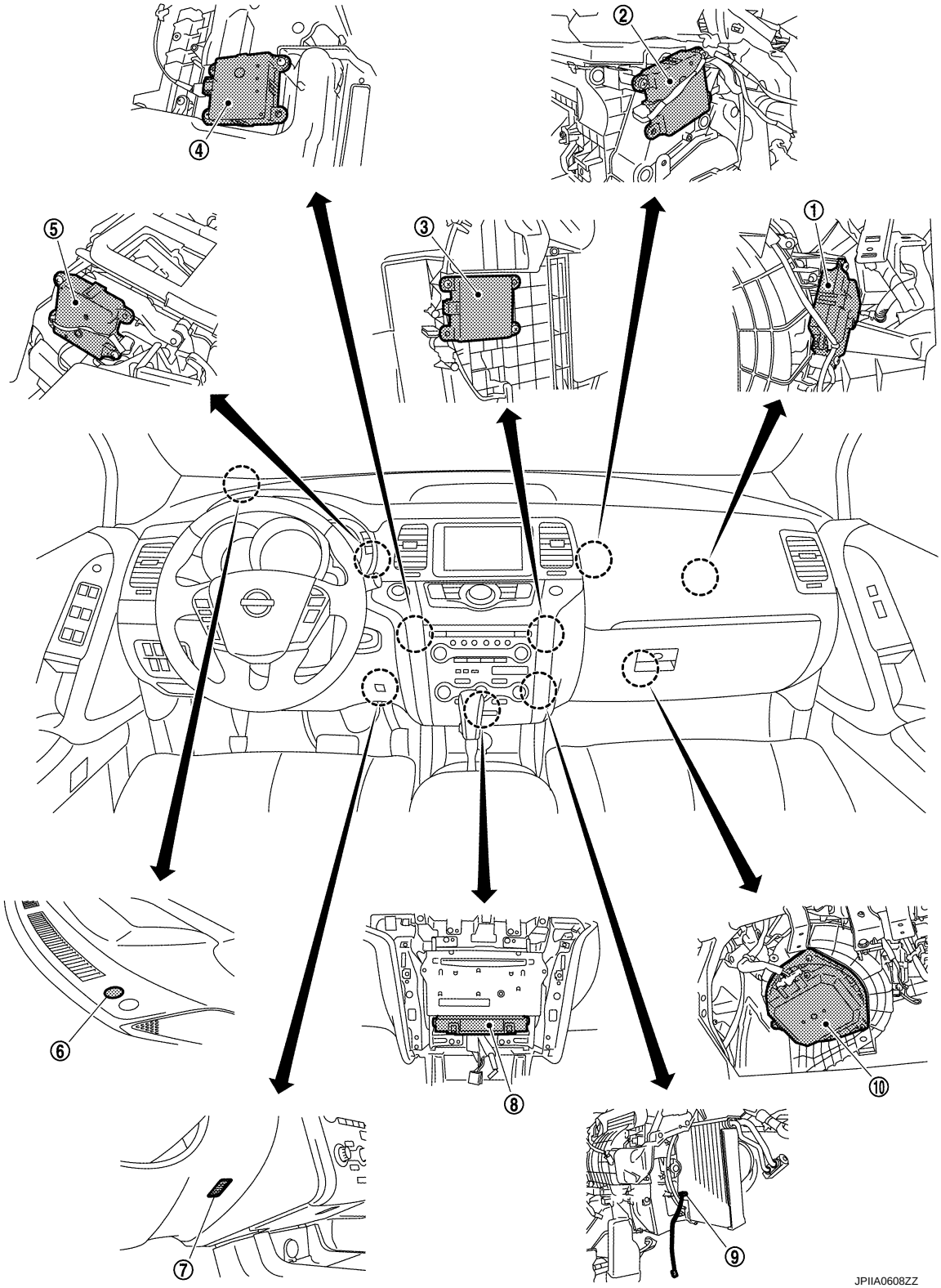
1. Refrigerant pressure sensor
2. Compressor (magnet clutch)
3. Ambient sensor

PASSENGER COMPARTMENT




1. Intake door motor
2. Upper ventilator door motor
3. Air mix door motor (passenger side)
4. Air mix door motor (driver side)
5. Mode door motor
6. Sunload sensor
7. In-vehicle sensor
8. A/C auto amp.
9. Intake sensor
10. Blower motor

## Component's Role

INFOID:0000000009722032

| Component | Reference |
|---|---|
| Refrigerant pressure sensor | EC-465, "Description" |
| Compressor | HAC-74, "Description" |
| Ambient sensor | HAC-46, "Description" |
| Intake door motor | HAC-65, "Description" |
| Upper ventilator door motor | HAC-67, "Description" |
| Air mix door motor (driver side) | HAC-58, "Description" |
| Air mix door motor (passenger side) | HAC-60, "Description" |
| Mode door motor | HAC-62, "Description" |
| Sunload sensor | HAC-55, "Description" |
| In-vehicle sensor | HAC-49, "Description" |
| A/C auto amp. | HAC-77, "A/C AUTO AMP. : Description" |
| Intake sensor | HAC-52, "Description" |
| Blower motor | HAC-70, "Description" |

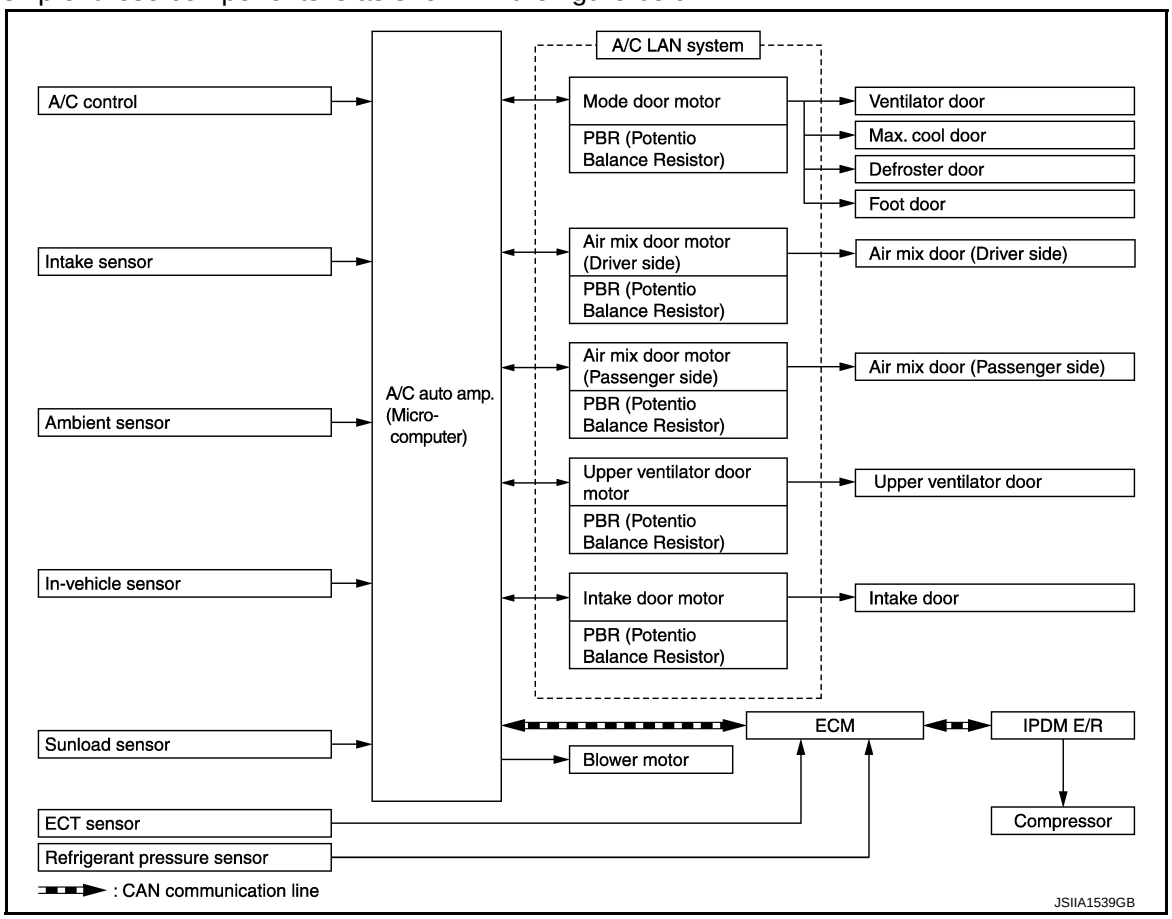
# AUTOMATIC AIR CONDITIONER SYSTEM

## System Diagram

INFOID:0000000009722033

### CONTROL SYSTEM

The control system consists of input sensors, switches, the A/C auto amp. (microcomputer) and outputs. The relationship of these components is as shown in the figure below:



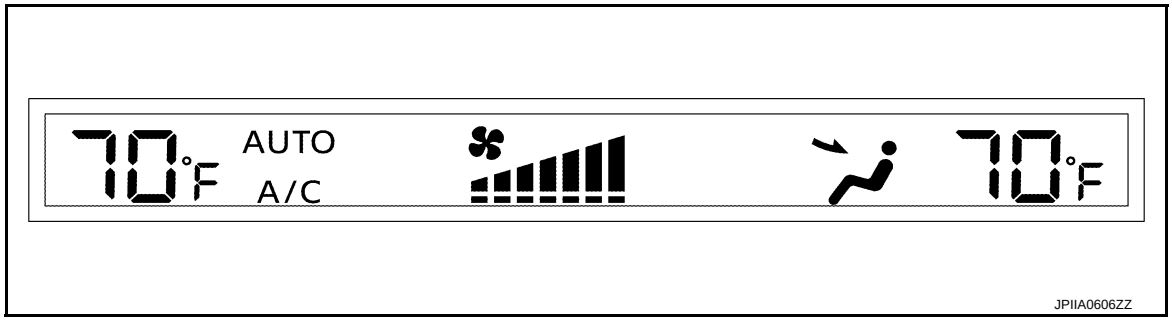

## System Description

INFOID:0000000009722034

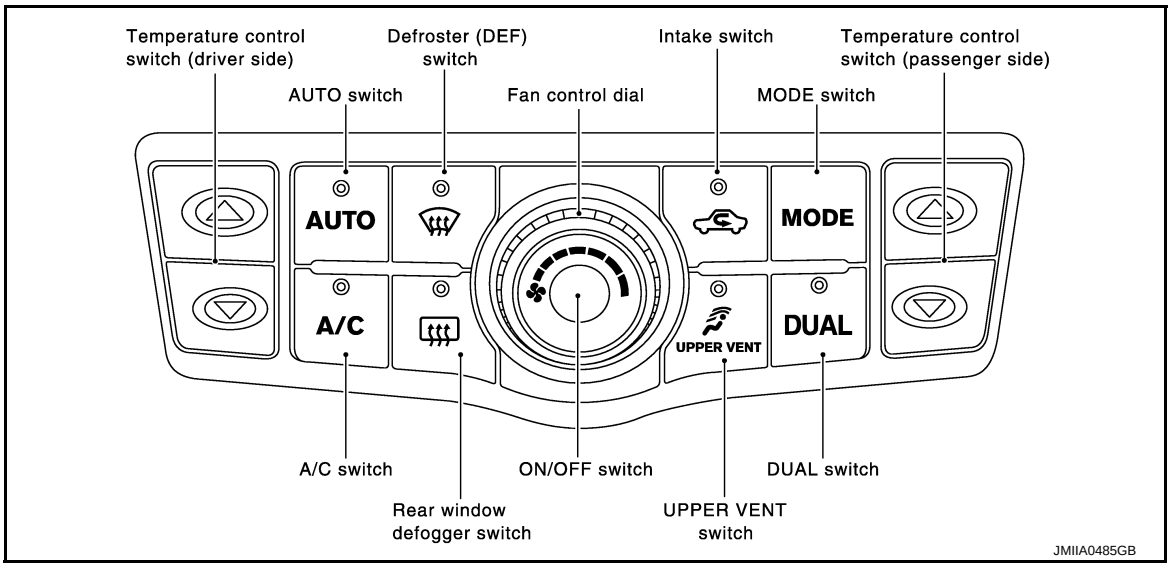
### CONTROL OPERATION

Display

The operation status of the system is displayed on the screen.



A/C Control




MODE Switch

The air discharge outlets are controlled with this switch.

Temperature Control Switch (Driver Side)

The set temperature is increased or decreased with this switch.

Temperature Control Switch (Passenger Side)

- The set temperature is increased or decreased with this switch.
- When this switch is pressed, DUAL switch indicator is turned ON.

AUTO Switch

- The compressor, intake doors, air mix doors, mode doors and blower speed are automatically controlled so that the in-vehicle temperature will reach, and be maintained at the set temperature selected by the operator.
- When pressing the AUTO switch, air inlet, air outlet, fan speed, and discharge air temperature are automatically controlled.

Defroster (DEF) Switch

Mode doors are set to the defrost position with this switch. Also, intake doors are set to the outside air position, and compressor turns ON.

UPPER VENT Switch

- When the UPPER VENT switch is pressed, the UPPER VENT switch indicator is turned ON.
- When the UPPER VENT switch indicator is turned ON, the UPPER VENT switch indicator is turned OFF by pressing the defroster (DEF) switch (after the above operation, the UPPER VENT switch indicator is turned ON by pressing the UPPER VENT switch).

A/C Switch

Compressor turns ON or OFF with this switch.
(Pressing the A/C switch when the A/C switch is ON turns OFF the A/C switch and compressor.)

Fan Control Dial

The blower speed is manually controlled with this dial. Seven speeds are available for manual control (as shown on the display screen).

ON/OFF Switch

Compressor and blower turn OFF, air inlet sets to FRE, and mode the position is set to foot position.

Rear Window Defogger Switch

When indicator is ON, rear window is defogged.

Intake Switch

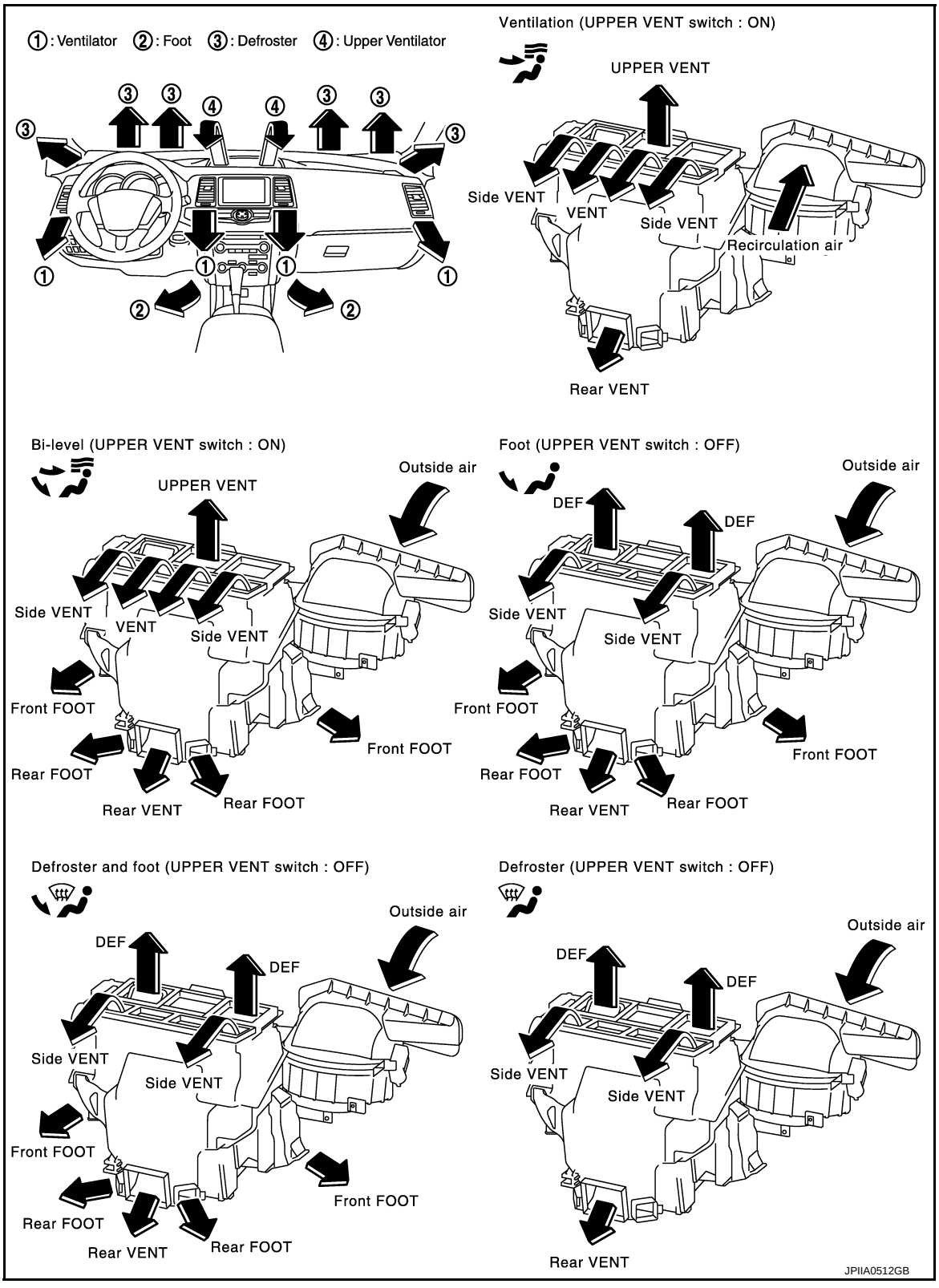
- When the intake switch is ON, the intake switch indicator is turned ON, and air inlet is set to REC.
- When the intake switch is pressed again, the intake switch indicator is turned OFF, and air inlet is set to FRE.
- When the intake switch is pressed for approximately 1.5 seconds or longer, the intake switch indicator blink twice. Then, automatic control mode is entered. Inlet status is displayed by indicator even when automatically controlled.

- When the intake switch indicator is turned OFF, shifting mode position to D/F or DEF, or when compressor is turned from ON to OFF, intake switch is automatically turned OFF (set to FRE mode). REC mode can be re-entered by pressing intake switch again, and then compressor is turned ON. (Except D/F or DEF position)

DUAL Switch

- When the DUAL switch indicator is ON, the driver side and passenger side, temperature can each be set independently.
- When the DUAL switch indicator is OFF, the driver side outlet and setting temperature are applied to both sides.

## DISCHARGE AIR FLOW



AIR DISTRIBUTION

| Discharge air flow | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Mode position indication | Condition | Air outlet/distribution | | | | | | |
| | | VENT | | | FOOT | | DEF | |
| | | Front | Upper | Rear | Front | Rear | |
|  | DUAL switch: OFF<br>UPPER VENT switch : ON | 81% | 8% | 11% | — | — | — |
|  | | 41% | 10% | 17% | 24% | 8% | — |
|  | | 12% | 12% | 16% | 27% | 10% | 23% |
|  | | 11% | 11% | 14% | 25% | 10% | 29% |
|  | | 11% | 11% | 12% | — | — | 66% |

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| Discharge air flow | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Mode position indication | Condition | Air outlet/distribution | | | | | | |
| | | VENT | | | FOOT | | DEF | |
| | | Front | Upper | Rear | Front | Rear | |
|  | DUAL switch: OFF<br>UPPER VENT switch : OFF | 88% | — | 12% | — | — | — |
|  | | 47% | — | 18% | 26% | 9% | — |
|  | | 13% | — | 17% | 33% | 12% | 25% |
|  | | 12% | — | 16% | 28% | 12% | 32% |
|  | | 11% | — | 15% | — | — | 74% |

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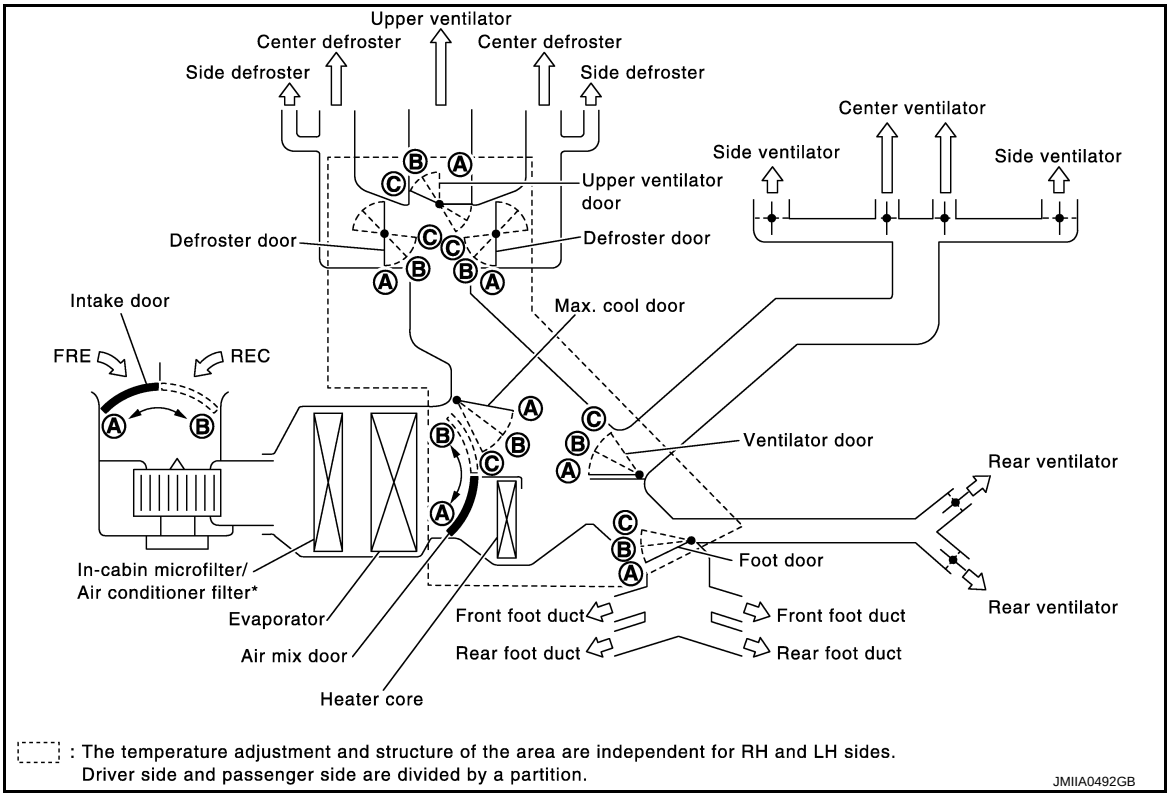
SWITCHES AND THEIR CONTROL FUNCTION



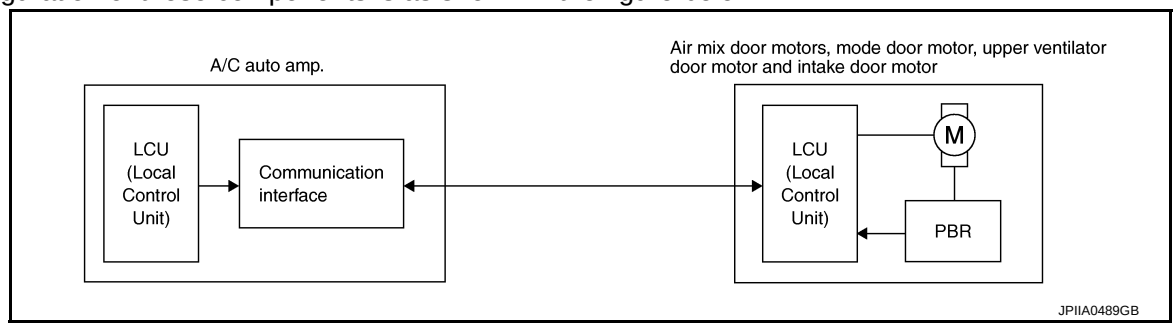

* : Models for Mexico.

| Switch position | | | Door position | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Ventilator door | Max. cool door | Defroster door | Foot door | Upper ventilator door | Intake door | Air mix door (Driver side) | Air mix door (Passenger side) |
| AUTO switch | ☀ | | AUTO | | | | | | AUTO | |
| MODE switch | VENT | | A | A | A | A | | | | |
| | B/L | | B | B | A | B | | — | | |
| | FOOT | | C | B | B | C | — | | | |
| | D/F | | C | B | B | B | | B | | |
| DEF switch | | ☀ | C | C | C | A | | B | — | — |
| UPPER VENT switch | ON | ☀ | — | | | | A-B | — | | |
| | OFF | ○ | | | | | C | | | |
| Intake switch | ON | ☀ | — | — | — | — | — | A* | | |
| | OFF | ○ | | | | | | B* | | |
| Temperature control switch (Driver side) | DUAL switch: OFF | 18.0°C (60°F) | | | | | | — | A | |
| | | 18.5°C ⇔ 31.5°C (61°F ⇔ 89°F) | | | | | | | AUTO | |
| | | 32.0°C (90°F) | | | | | | | B | |
| Temperature control switch (Driver side) | DUAL switch: ON | 18.0°C (60°F) | | | | | | | A | |
| | | 18.5°C ⇔ 31.5°C (61°F ⇔ 89°F) | | | | | | | AUTO | — |
| | | 32.0°C (90°F) | | | | | | | B | |
| Temperature control switch (Passenger side) | | 18.0°C (60°F) | | | | | | | — | A |
| | | 18.5°C ⇔ 31.5°C (61°F ⇔ 89°F) | | | | | | | | AUTO |
| | | 32.0°C (90°F) | | | | | | | | B |
| ON/OFF switch | | | C | C | B | C | — | B | — | — |

*: Inlet status is displayed by indicator when activating automatic control.

## AIR CONDITIONER LAN CONTROL SYSTEM

The LAN (Local Area Network) system consists of the A/C auto amp., the mode door motor, the air mix door motors, the upper ventilator door motor and the intake door motor.
A configuration of these components is as shown in the figure below.



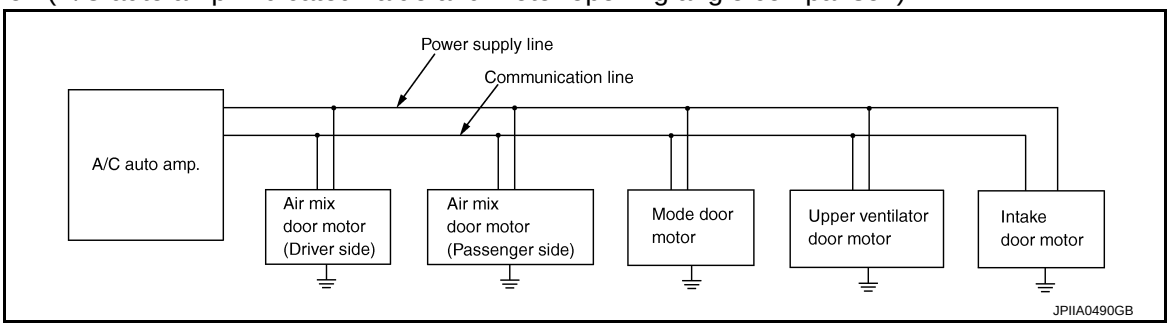
## SYSTEM CONSTRUCTION

A small network exists between the A/C auto amp., the mode door motor, the air mix door motors, the upper ventilator door motor and the intake door motor. The A/C auto amp. and motors are connected by data transmission lines and motor power supply lines. The LAN network is built through the ground circuits of each door motor.

Addresses, motor opening angle signals, motor stop signals and error checking messages are all transmitted through the data transmission lines connecting the A/C auto amp. and each door motor.

The following functions are contained in LCUs built into the mode door motor, the air mix door motors, the upper ventilator door motor and the intake door motor.

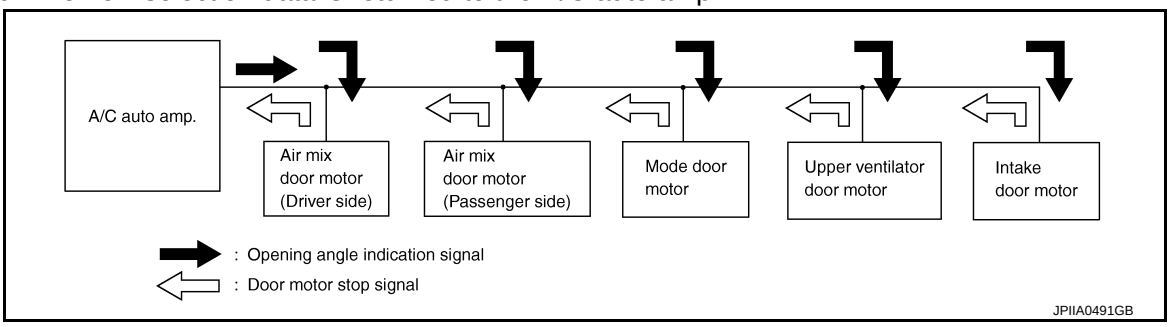
- Address
- Motor opening angle signals
- Data transmission
- Motor stop and drive decision
- Opening angle sensor (PBR function)
- Comparison
- Decision (A/C auto amp. indicated value and motor opening angle comparison)




Operation

The A/C auto amp. receives data from each of the sensors. The A/C auto amp. sends mode door, the air mix door and the intake door opening angle data to the mode door motor LCU, the air mix door motor LCUs, the upper ventilator door motor LCU and the intake door motor LCU.

The mode door motor, the air mix door motors, the upper ventilator door motor and the intake door motor read their respective signals according to the address signal. Opening angle indication signals received from the A/C auto amp. and each of the motor position sensors is compared by the LCUs in each door motor with the existing decision and opening angles. Next, HOT/COLD, DEF/VENT, OPEN/SHUT or FRE/REC operation is selected. The new selection data is returned to the A/C auto amp.




Transmission Data and Transmission Order

A/C auto amp. data is transmitted consecutively to each of the door motors following the form as shown in the figure below.

START:

- Initial compulsory signal is sent to each of the door motors.

ADDRESS:

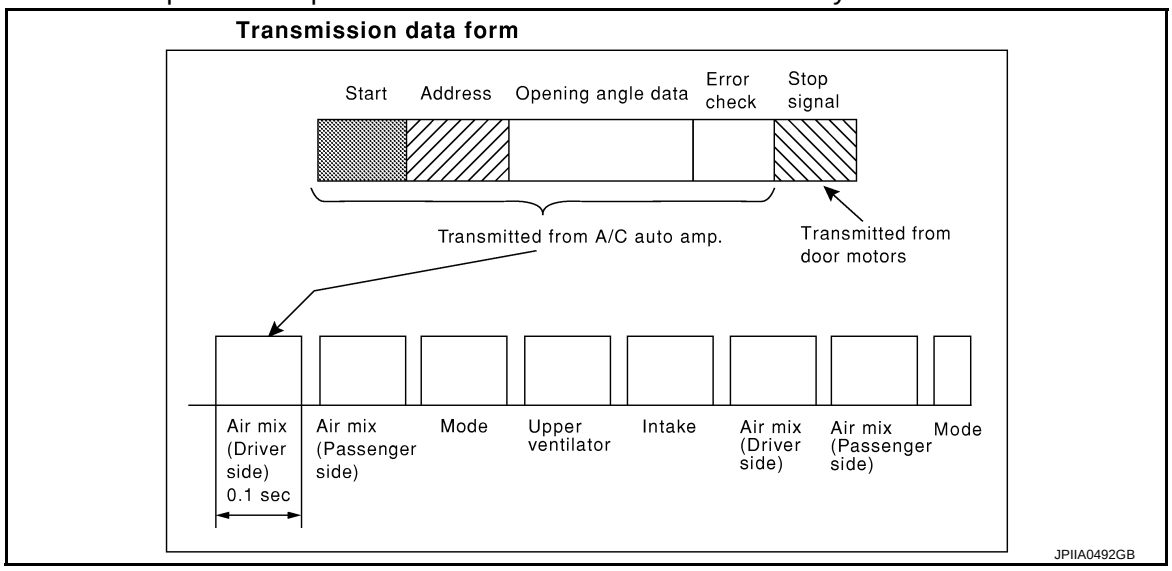
- Data sent from the A/C auto amp. is selected according to data-based decisions made by the mode door motor, the air mix door motors, the upper ventilator door motor and the intake door motor.
- If the addresses are identical, the opening angle data and error check signals are received by the door motor LCUs. The LCUs then make the appropriate error decision. If the opening angle data has no error, door control begins.
- If an error exists, the received data is rejected and the corrected data received. Finally, door control is based upon the corrected opening angle data.

OPENING ANGLE:
- Data that shows the indicated door opening angle of each door motor.

ERROR CHECK:
- In this procedure, transmitted and received data is checked for errors. Error data is then compiled. The error check prevents corrupted data from being used by the mode door motor, the air mix door motors, the upper ventilator door motor and the intake door motor. Error data can be related to the following symptoms.

- Malfunction of electrical frequency
- Poor electrical connections
- Signal leakage from transmission lines
- Signal level fluctuation

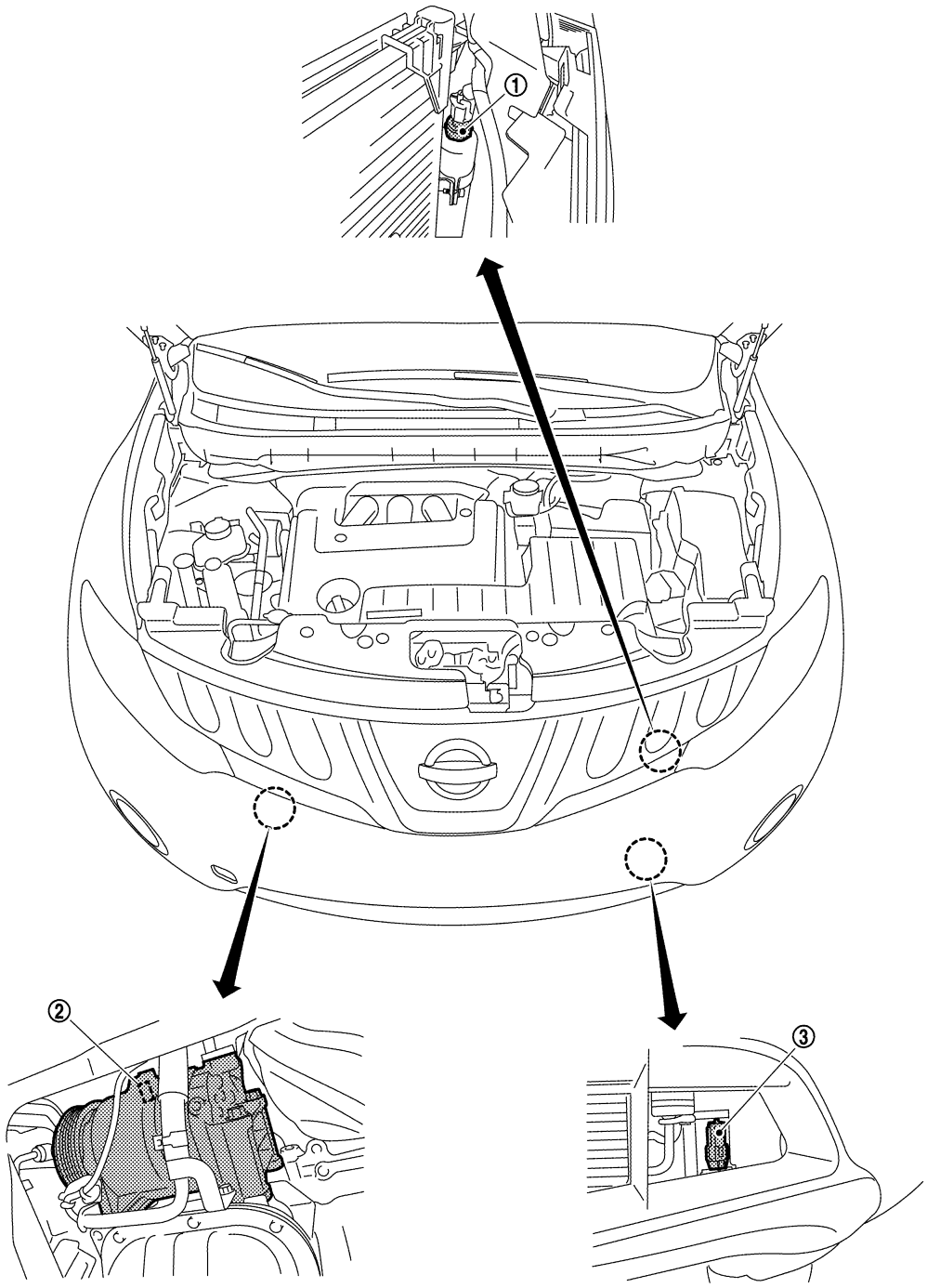
STOP SIGNAL:
- At the end of each transmission, a stop operation, in-operation, or internal malfunction message is delivered to the A/C auto amp. This completes one data transmission and control cycle.




## Component Part Location

INFOID:0000000009722035

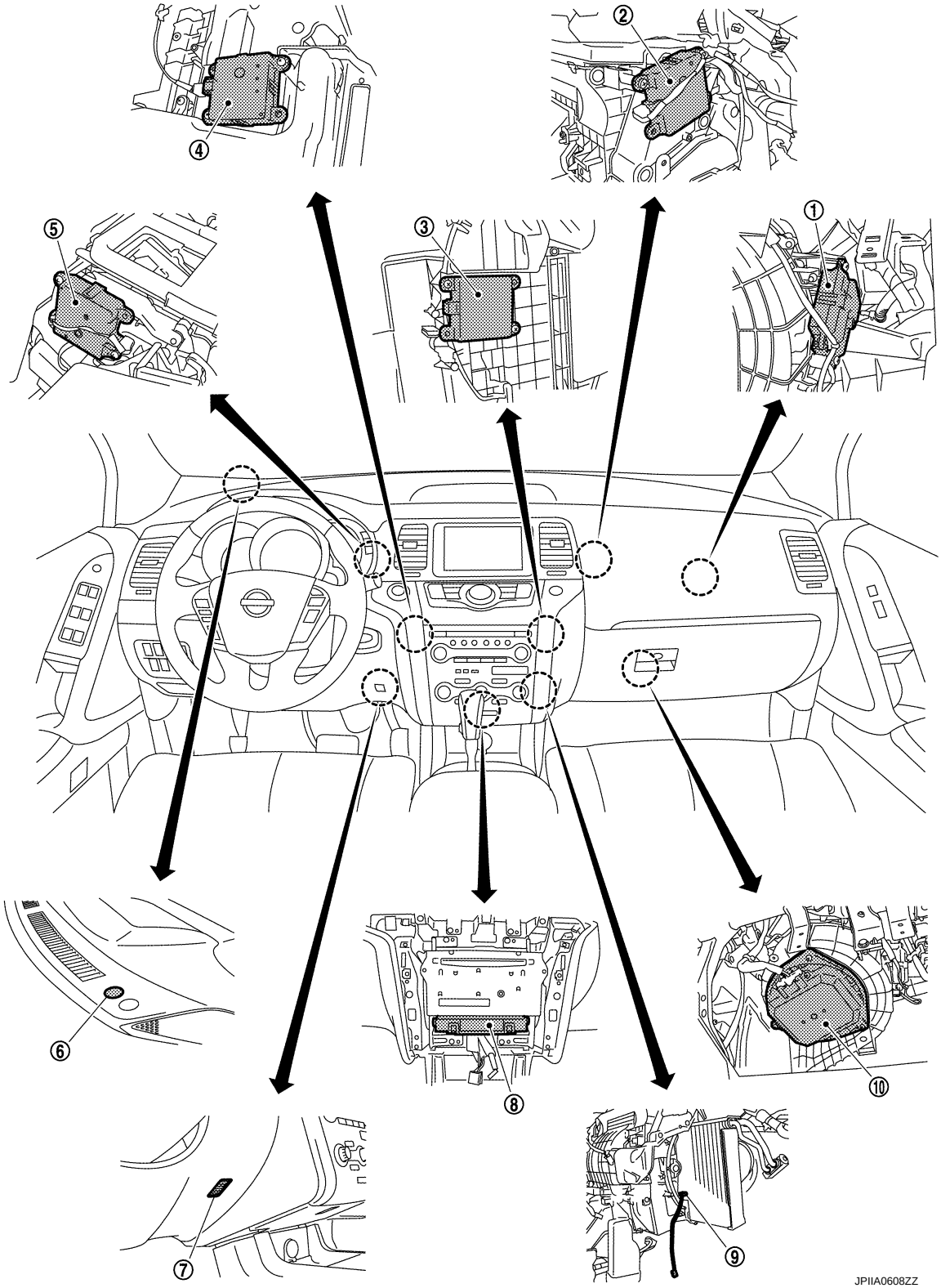
ENGINE COMPARTMENT




JPIIA0607ZZ

1. Refrigerant pressure sensor 2. Compressor (magnet clutch) 3. Ambient sensor

PASSENGER COMPARTMENT




1. Intake door motor
2. Upper ventilator door motor
3. Air mix door motor (passenger side)
4. Air mix door motor (driver side)
5. Mode door motor
6. Sunload sensor
7. In-vehicle sensor
8. A/C auto amp.
9. Intake sensor
10. Blower motor

## Component Description

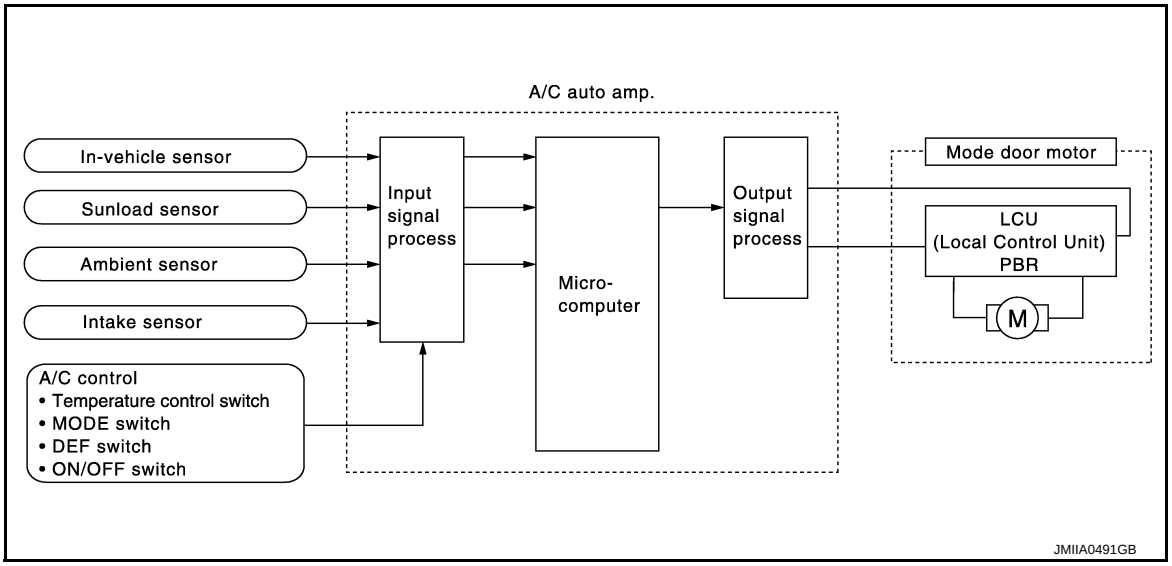
INFOID:0000000009722036

| Component | Reference |
|---|---|
| Refrigerant pressure sensor | EC-465, "Description" |
| Compressor | HAC-74, "Description" |
| Ambient sensor | HAC-46, "Description" |
| Intake door motor | HAC-65, "Description" |
| Upper ventilator door motor | HAC-67, "Description" |
| Air mix door motor (driver side) | HAC-58, "Description" |
| Air mix door motor (passenger side) | HAC-60, "Description" |
| Mode door motor | HAC-62, "Description" |
| Sunload sensor | HAC-55, "Description" |
| In-vehicle sensor | HAC-49, "Description" |
| A/C auto amp. | HAC-77, "A/C AUTO AMP. : Description" |
| Intake sensor | HAC-52, "Description" |
| Blower motor | HAC-70, "Description" |

# MODE DOOR CONTROL SYSTEM

## System Diagram

INFOID:0000000009722037




## System Description

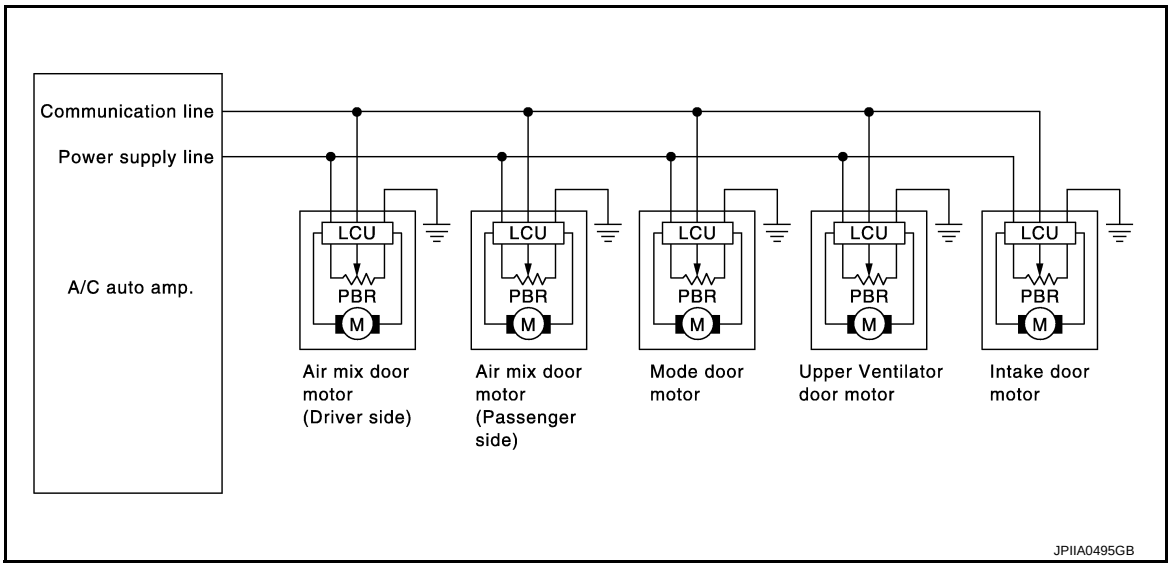
INFOID:0000000009722038

The mode door is automatically controlled by the temperature setting, ambient temperature, in-vehicle temperature, intake temperature and amount of sunload.

SYSTEM OPERATION

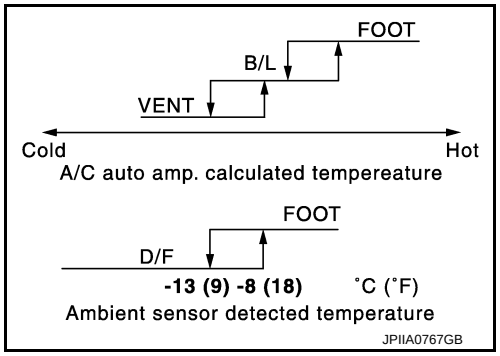
- The A/C auto amp. receives data from each of the sensors.
- The A/C auto amp. sends the air mix door, the mode door, the upper ventilator door and the intake door opening angle data to the air mix door motor LCU(s), the mode door motor LCU, the upper ventilator door motor LCU and the intake door motor LCU.
- The air mix door motor(s), the mode door motor, the upper ventilator door motor and the intake door motor read their respective signals according to the address signal. Opening angle indication signals received from the A/C auto amp. and each of the motor position sensors are compared by the LCUs in each door motor with the existing decision and opening angles.
- Next, HOT/COLD, DEF/VENT, OPEN/SHUT or FRE/REC operations is selected. The newly selected data is returned to the A/C auto amp.

Door Motor Circuit




Mode Door Control Specification

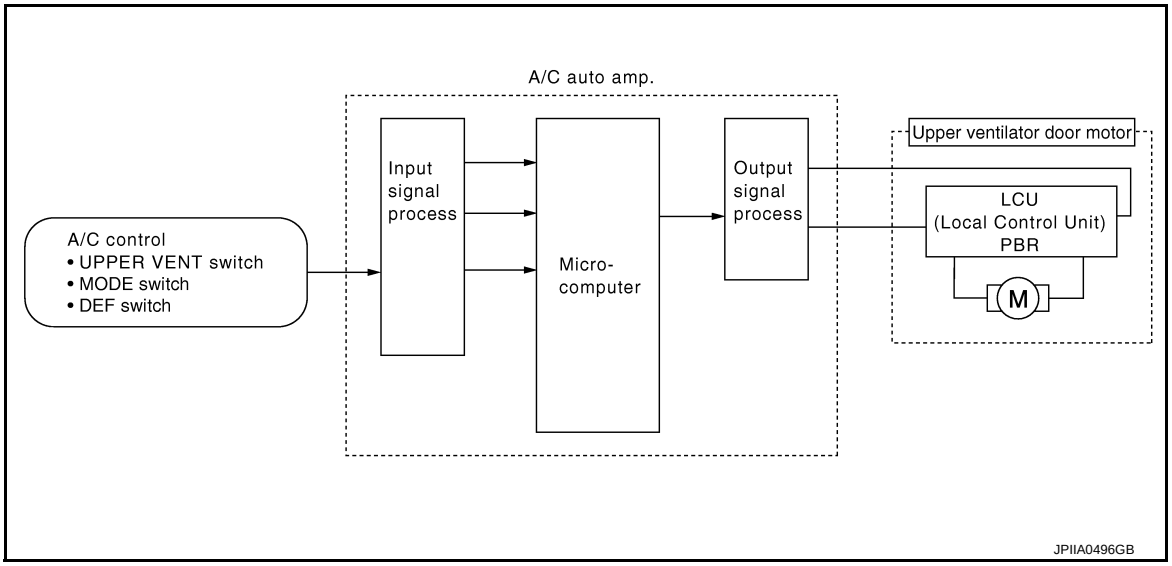
Mode position can be selected manually by pressing the MODE switch or the DEF switch on the A/C control. This enables to fix a mode position. Pressing the AUTO switch allows automatic control by the A/C auto amp. During the automatic control of a mode position, a mode door position (VENT, B/L, FOOT, or D/F) is selected based on a target the air mix door opening angle and sunload depending on the temperature calculated by the A/C auto amp. In addition, the D/F is selected to prevent windshield fogging only when ambient temperature is extremely low with mode position the FOOT.



# UPPER VENTILATOR DOOR CONTROL SYSTEM

## System Diagram

INFOID:0000000009722039




## System Description

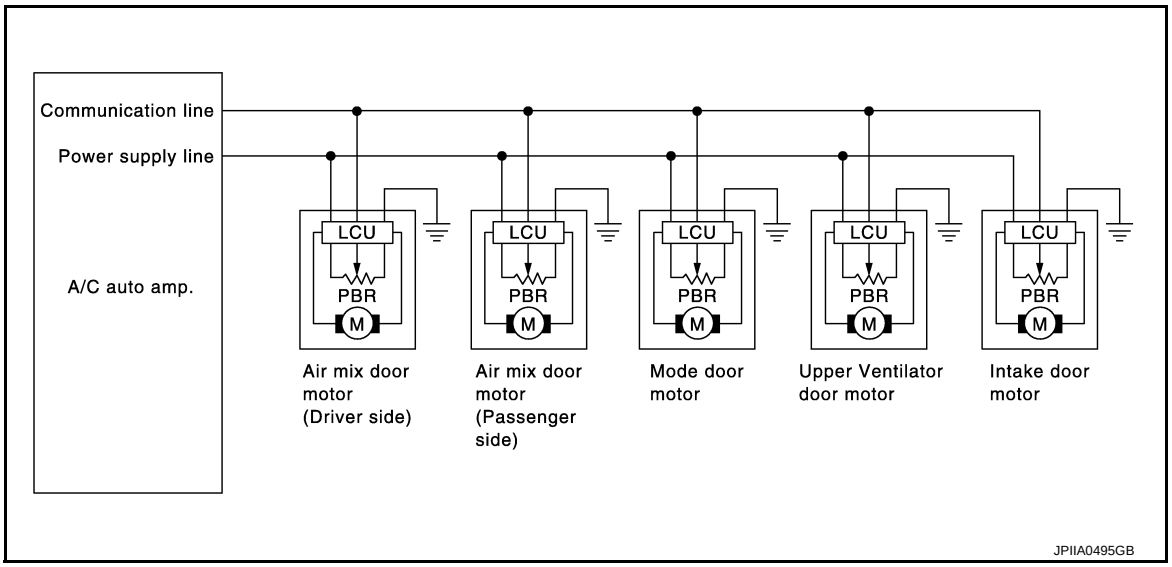
INFOID:0000000009722040

The upper ventilator door motor is attached to the heater & cooling unit assembly. The upper ventilator door motor operates by the UPPER VENT switch ON/OFF. Motor rotation is conveyed to a rod which activates the upper ventilator door.

### SYSTEM OPERATION

- The A/C auto amp. receives data from each of the sensors.
- The A/C auto amp. sends air mix door, the mode door, the upper ventilator door and the intake door opening angle data to the air mix door motor LCU(s), the mode door motor LCU, the upper ventilator door motor LCU and the intake door motor LCU.
- The air mix door motor(s), the mode door motor, the upper ventilator door motor and the intake door motor read their respective signals according to the address signal. Opening angle indication signals received from the A/C auto amp. and each of the motor position sensors are compared by the LCUs in each door motor with the existing decision and opening angles.
- Next, HOT/COLD, DEF/VENT, OPEN/SHUT or FRE/REC operations is selected. The newly selected data is returned to the A/C auto amp.

Door Motor Circuit



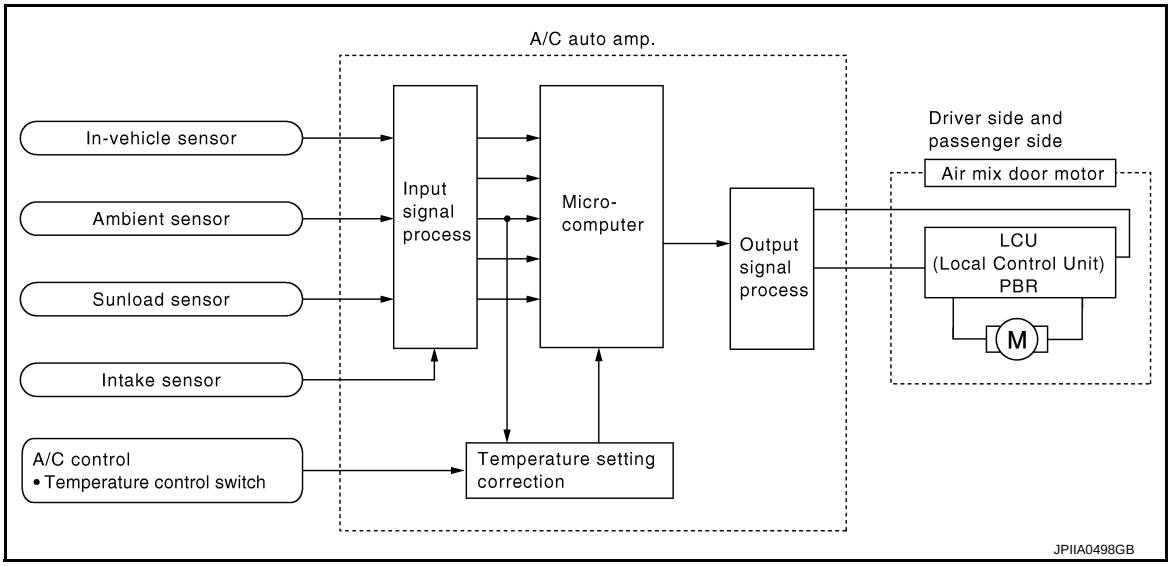

Upper Ventilator Specification

| UPPER VENT switch | MODE position | Upper ventilator door position |
|---|---|---|
| OFF | — | Close |
| ON | VENT or B/L | Open (Fully-open) |
| ON | FOOT or D/F | Open (Intermediate) |
| ON | DEF | Close |

# AIR MIX DOOR CONTROL SYSTEM

## System Diagram

INFOID:0000000009722041




## System Description

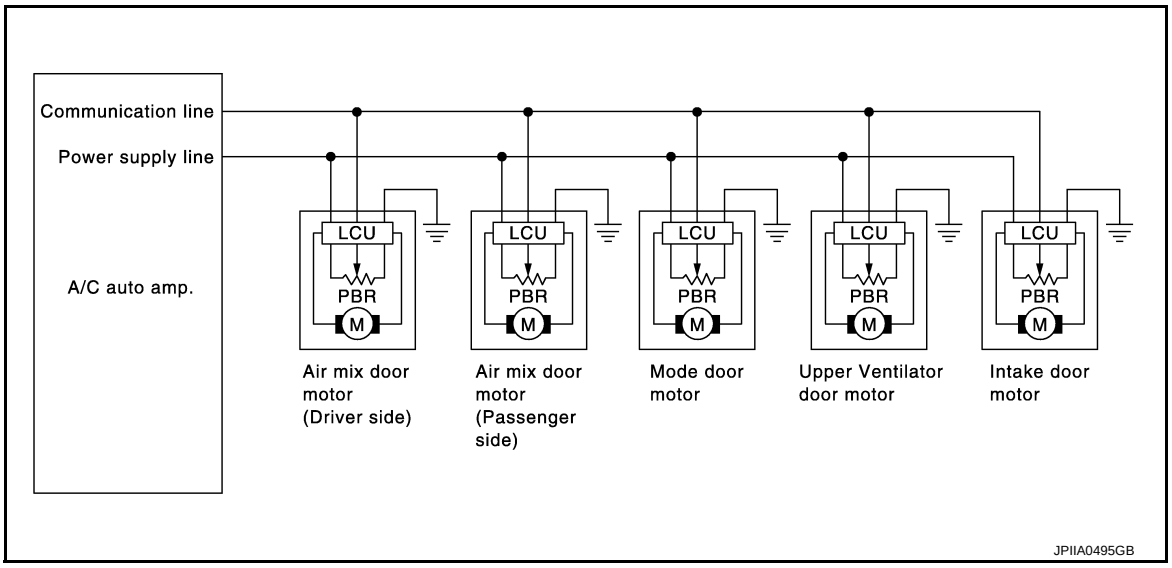
INFOID:0000000009722042

The air mix doors are automatically controlled so that in-vehicle temperature is maintained at a predetermined value by the temperature setting, ambient temperature, intake temperature and amount of sunload.

SYSTEM OPERATION

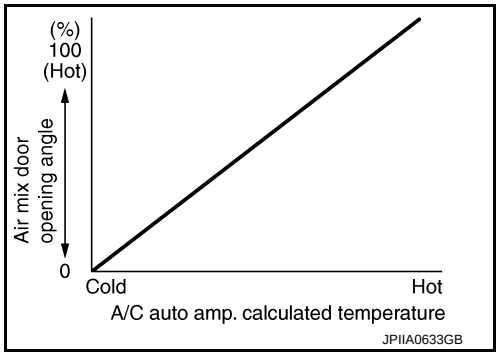
- The A/C auto amp. receives data from each of the sensors.
- The A/C auto amp. sends air mix door, the mode door, the upper ventilator door and the intake door opening angle data to the air mix door motor LCU(s), the mode door motor LCU, the upper ventilator door motor LCU and the intake door motor LCU.
- The air mix door motor(s), the mode door motor, the upper ventilator door motor and the intake door motor read their respective signals according to the address signal. Opening angle indication signals received from the A/C auto amp. and each of the motor position sensors are compared by the LCUs in each door motor with the existing decision and opening angles.
- Next, HOT/COLD, DEF/VENT, OPEN/SHUT or FRE/REC operation is selected. The newly selected data is returned to the A/C auto amp.

Door Motor Circuit




Air Mix Door Control Specification

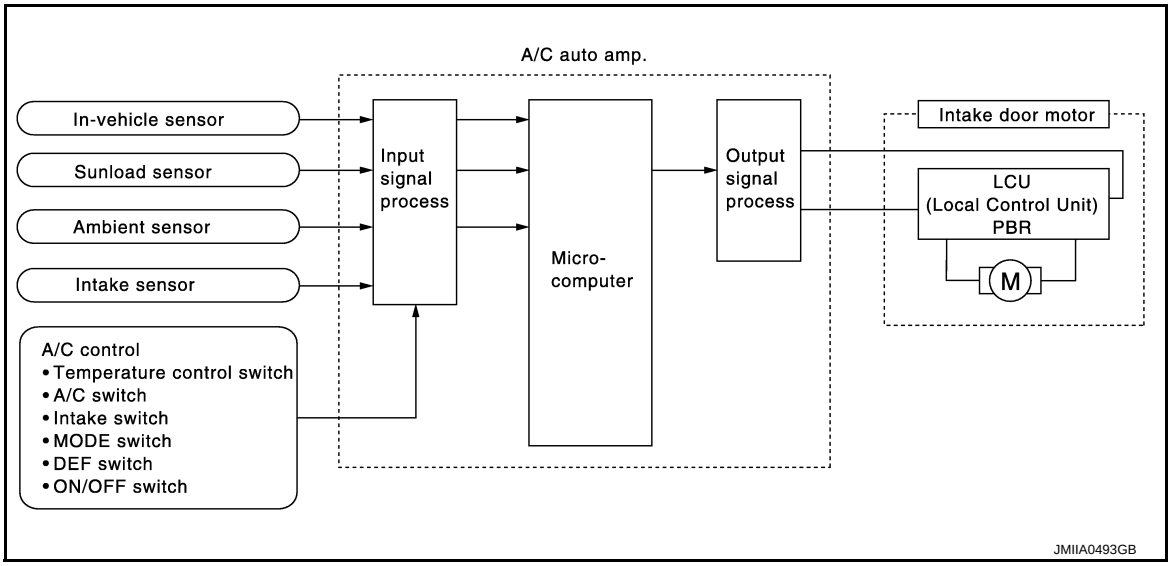
When ignition switch is ON, the A/C auto amp. continuously and automatically controls temperatures regardless of air conditioner operational condition. When setting a target temperature with the temperature control switch, the A/C auto amp. corrects the set temperature and decides a target air mix door opening angle. The A/C auto amp. controls air mix door according to the target air mix door opening angle and current air mix door opening angle, keeping an optimum air mix door opening angle. When the temperature is set at 18°C (60°F), air mix door is set on full cold, and when the temperature is set at 32°C (90°F), it is set to full hot.



# INTAKE DOOR CONTROL SYSTEM

## System Diagram

INFOID:0000000009722043




## System Description

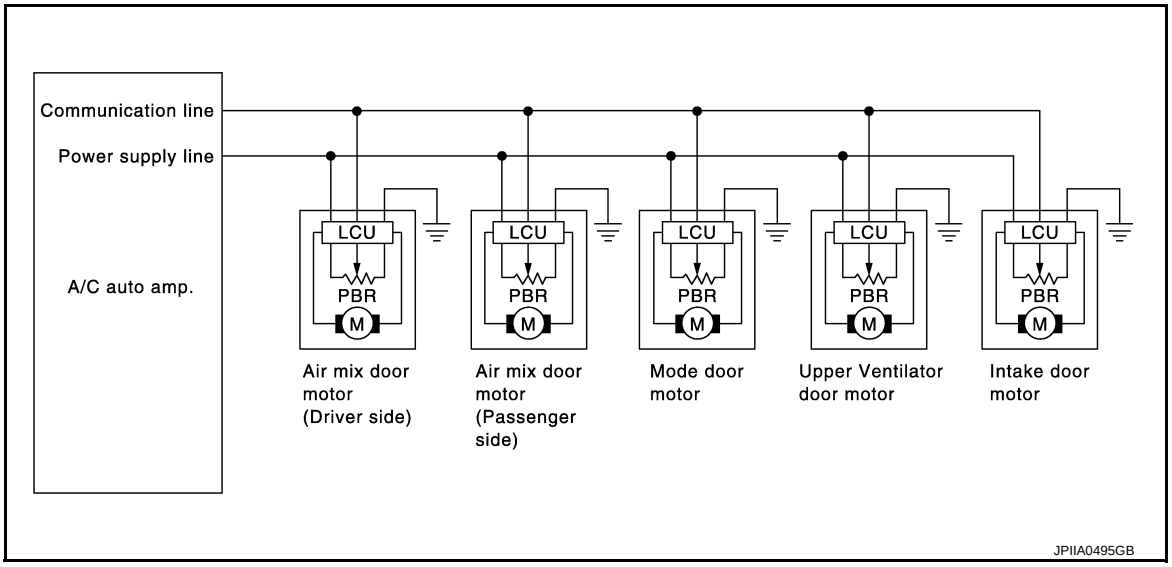
INFOID:0000000009722044

The intake doors are automatically controlled by the temperature setting, ambient temperature, in-vehicle temperature, intake temperature, amount of sunload and ON/OFF operation of the compressor.

### SYSTEM OPERATION

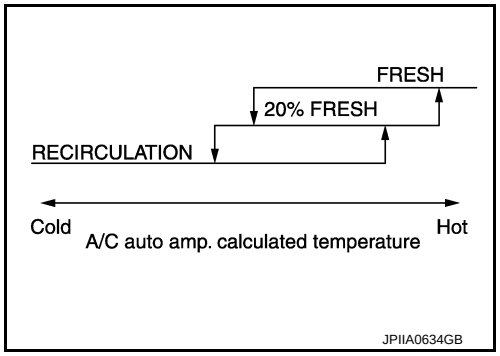
The intake door control judges intake door position based on the ambient temperature, the intake air temperature and the in-vehicle temperature. When in shifting mode position D/F, if the DEF or ON/OFF switches are pressed, or when the A/C switch is OFF, the A/C auto amp. sets the intake door to the FRE position.

Door Motor Circuit




Intake Door Control Specification

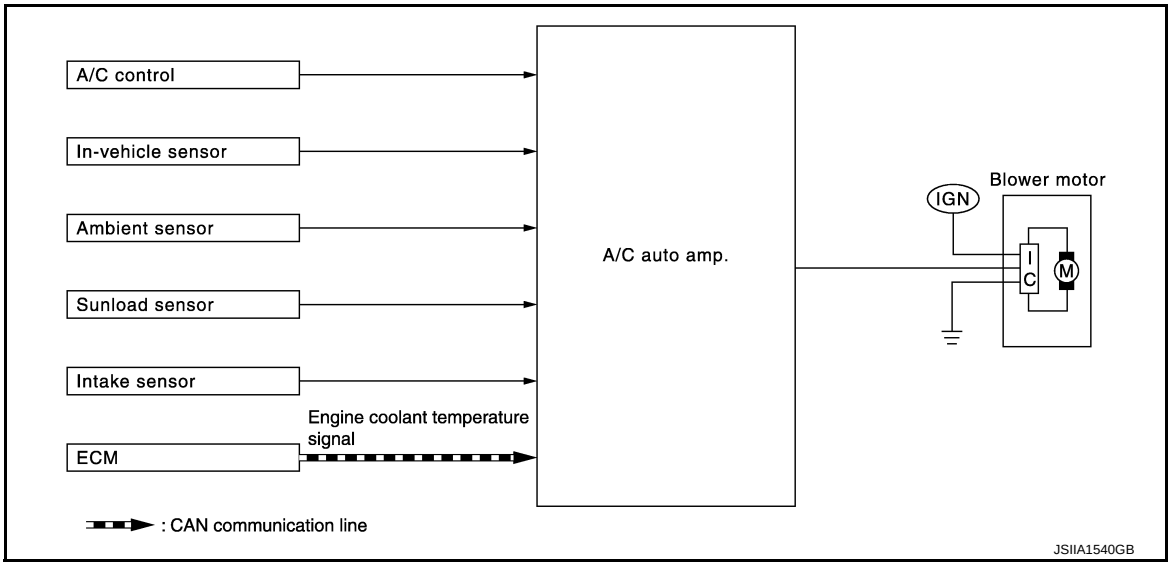
Intake door position is basically set to the FRE when the FRE indicator of the DEF switch and the intake switch turn ON, and set on the REC when the REC indicator of intake switch turns ON.
The intake door automatic control selects the FRE, the 20%FRE, or the REC depending on the target air mix door opening angle, based on in-vehicle temperature, ambient temperature, and sunload.



# BLOWER MOTOR CONTROL SYSTEM

## System Diagram

INFOID:0000000009722045




## System Description

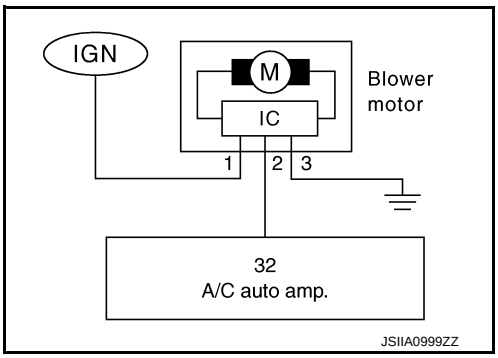
INFOID:0000000009722046

Blower speed is automatically controlled by the temperature setting, ambient temperature, in-vehicle temperature, intake temperature, amount of sunload and air mix door position.
By pressing the AUTO switch, the blower motor starts to gradually increase air flow volume.
When engine coolant temperature is low, the blower motor operation is delayed to prevent cool air from flowing.

### SYSTEM OPERATION

System operation

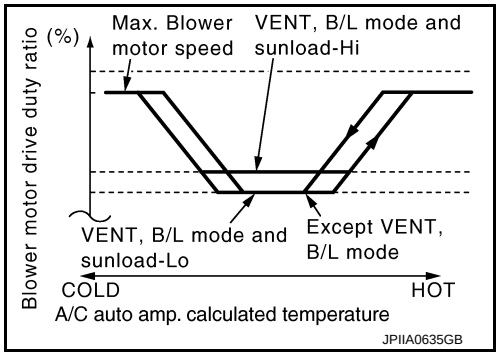
- For air flow, the manual selection (1-7) with the fan control dial has priority.
- If the AUTO switch is pressed or if the DEF switch is pressed while in the OFF condition, it changes to the automatic control by A/C auto amp.
- When increasing the air flow, it changes the duty ratio of the blower motor drive signal to prevent the air flow from suddenly increasing.
- There are the following types of air flow control: starting air flow control, starting air flow control at low coolant temperature, starting air flow control at high in-vehicle temperature, and air flow control at actuator operation in addition to manual control, normal automatic air flow control.




Normal automatic air flow control

- When the target temperature is set by the temperature control switch of A/C control, the A/C auto amp. performs the calculation and decides the target according to the signal from each sensor.
- The A/C auto amp. changes the duty ratio of blower motor drive signal and controls the air flow continuously so that the air flow becomes the target air flow.
- The minimum air flow will change according to the sunload when the air discharge outlet is VENT or B/L.

Fan Speed Control Specification




Starting air flow control

- When starting the automatic control of air flow, the system gradually increases the duty ratio of the blower motor drive signal to prevent too much air from blowing.
- The time period from when the air flow changes from LO to HI is approximately 8 seconds.
- It becomes the starting air flow control at low coolant temperature according to the calculation result of the A/C auto amp. and engine coolant temperature [approximately 58°C (136°F) or less] during the automatic air flow control.
- Do not perform the starting air flow control when the air discharge outlet is set to DEF.

Starting Fan Speed Control

Start up from COLD SOAK Condition (Automatic mode)

In cold start up condition where the engine coolant temperature is below 58°C (136°F), the blower does not operate for a short period of time (up to 150 seconds). The exact start delay time varies depending on the ambient temperature and engine coolant temperature.

In the most extreme case (very low ambient temperature) the blower start delay is 150 seconds as described above. After this delay, the blower will operate at low speed until the engine coolant temperature rises above 58°C (136°F), and then the blower speed increases to the objective speed.

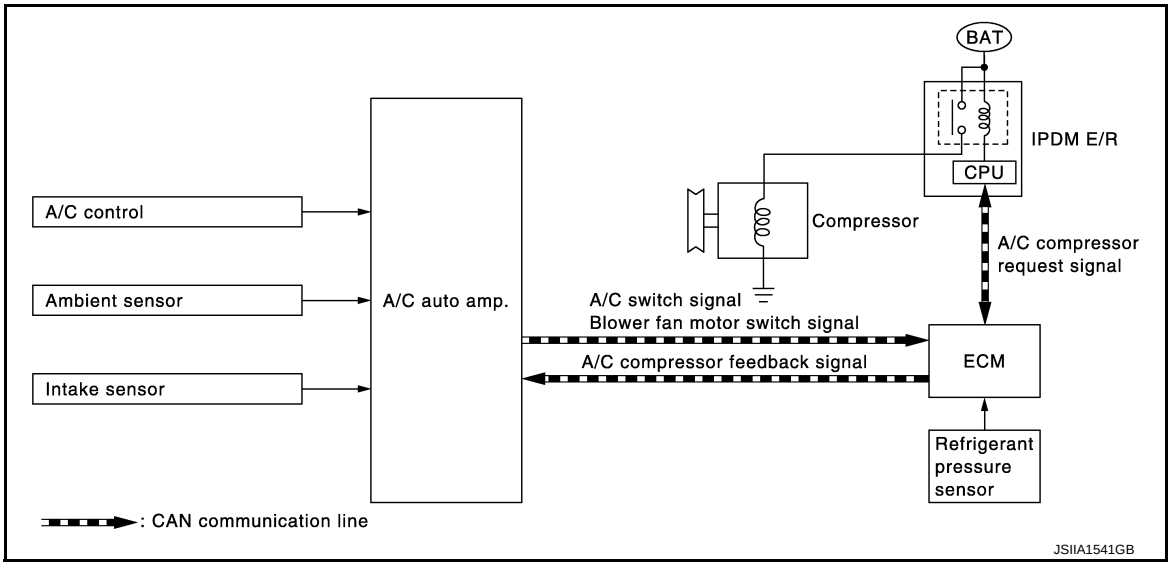
Start up from usual or HOT SOAK Condition (Automatic mode)

The blower will begin operation momentarily after the AUTO switch is pressed. The blower speed rises gradually to the objective speed over a time period of 3 seconds or less (actual time depends on the objective blower speed).

# MAGNET CLUTCH CONTROL SYSTEM

## System Diagram

INFOID:0000000009722047




## System Description

INFOID:0000000009722048

The A/C auto amp. controls compressor operation by ambient temperature, intake air temperature and signal from ECM.

### SYSTEM OPERATION

When the A/C switch, the AUTO switch, or the DEF switch is pressed, or when shifting mode position D/F, A/C auto amp. transmit the A/C switch signal and blower fan motor switch signal to the ECM, via CAN communication.

ECM judges whether compressor can be turned ON, based on each sensor status (refrigerant-pressure sensor signal, throttle angle, etc.). If the ECM judges that the compressor can be turned ON, it sends A/C compressor request signal to the IPDM E/R, via CAN communication.

Upon receipt of A/C compressor request signal from the ECM, the IPDM E/R turns the A/C relay ON to operate the compressor.

When sending A/C compressor request signal to the IPDM E/R via CAN communication line, the ECM simultaneously sends A/C compressor feedback signal to A/C auto amp. via CAN communication line.

The ECM sends A/C compressor feedback signal to A/C auto amp., then, uses input A/C compressor feedback signal to control air inlet.

#### Compressor Protection Control

The ECM makes the A/C relay turn OFF and stops the compressor when pressure on the high-pressure side detected by the refrigerant pressure sensor is over approximately 3,119 kPa (31.8 kg/cm$^2$, 452 psi), or below approximately 118 kPa (1.2 kg/cm$^2$, 17 psi).

#### Low Temperature Protection Control

Turn the A/C relay to OFF and stop the compressor by the signal from the A/C auto amp according to the evaporator passing air temperature detected by the intake sensor and the ambient temperature detected by the ambient sensor.

# CAN COMMUNICATION SYSTEM

## System Description

INFOID:0000000009722049

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto each vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN-H line, CAN-L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only. For details, refer to LAN-28, "CAN System Specification Chart".

# DIAGNOSIS SYSTEM (HVAC)

## CONSULT Function

INFOID:0000000009722050

CONSULT can display each diagnosis item using the diagnosis test modes shown as per the following.

CONSULT application items

| Diagnosis mode | Description |
|---|---|
| ECU Identification | Displays the A/C auto amp. number. |
| Self Diagnostic Result | Displays the diagnosis results judged by A/C auto amp. |
| Data Monitor | Displays A/C auto amp. input/output data in real time. |
| Active Test | The signals used to activate each device are forcibly supplied from A/C auto amp. |
| Work Support | Changes the setting for each system function.<br>• Temperature setting trimmer<br>• Inlet port memory function (FRE)<br>• Inlet port memory function (REC)<br>• Foot position setting trimmer |

## SELF DIAGNOSTIC RESULT

Refer to HAC-106, "DTC Index".

Display Item List

| DTC | Items (CONSULT screen terms) | Diagnostic item is detected when... | Possible cause |
|---|---|---|---|
| U1000 | CAN COMM CIRCUIT | When A/C auto amp. is not transmitting or receiving CAN communication signal for 2 or more seconds. | CAN communication system |
| U1010 | CONTROL UNIT (CAN) | When detecting error during the initial diagnosis of CAN controller of A/C auto amp. | A/C auto amp. |
| B257B | AMB TEMP SEN SHORT | Detected temperature at ambient sensor –44°C (–47°F) or less | • Ambient sensor<br>• A/C auto amp.<br>• Harness and connector (Ambient sensor circuit is open, or there is a short in the circuit) |
| B257C | AMB TEMP SEN OPEN | Detected temperature at ambient sensor 100°C (212°F) or more | |
| B2578 | IN CAR SEN SHORT | Detected temperature at in-vehicle sensor –44°C (–47°F) or less | • In-vehicle sensor<br>• A/C auto amp.<br>• Harness and connector (In-vehicle sensor circuit is open, or there is a short in the circuit) |
| B2579 | IN CAR SEN OPEN | Detected temperature at in-vehicle sensor 100°C (212°F) or more | |
| B2581 | EVAP TEMP SEN SHORT | Detected temperature at intake sensor –33°C (–27°F) or less | • Intake sensor<br>• A/C auto amp.<br>• Harness and connector (Intake sensor circuit is open, or there is a short in the circuit) |
| B2582 | EVAP TEMP SEN OPEN | Detected temperature at intake sensor 69°C (156°F) or more | |
| B2630* | SUNLOAD SEN SHORT | Detected calorie at sunload sensor 64.7 w/m$^2$ (56 kcal/m$^2$·h) or less | • Sunload sensor<br>• A/C auto amp.<br>• Harness and connector (Sunload sensor circuit is open, or there is a short in the circuit) |
| B2631* | SUNLOAD SEN OPEN | Detected calorie at sunload sensor 2832 w/m$^2$ (2436 kcal/m$^2$·h) or more | |
| B2632 | DR AIRMIX ACTR SHORT | Air mix door PBR (driver side) position 5% or less | • Air mix door motor (driver side)<br>• A/C auto amp.<br>• Harness and connector (CAN communication line is open or shorted)<br>(Air mix door motor is open or shorted) |
| B2633 | DR AIRMIX ACTR OPEN | Air mix door PBR (driver side) position 95% or more | |

| DTC | Items (CONSULT screen terms) | Diagnostic item is detected when... | Possible cause |
|---|---|---|---|
| B2634 | PASS AIRMIX ACTR SHORT | Air mix door PBR (passenger side) position 5% or less | • Air mix door motor (passenger side)<br>• A/C auto amp.<br>• Harness and connector (CAN communication line is open or shorted) (Air mix door motor is open or shorted) |
| B2635 | PASS AIRMIX ACTR OPEN | Air mix door PBR (passenger side) position 95% or more | |
| B2636 | DR VENT DOOR FAIL | When the malfunctioning door position is detected at VENT position | • Mode door motor<br>• A/C auto amp.<br>• Harness and connector (CAN communication line is open or shorted) (Mode door motor is open or shorted) |
| B2637 | DR B/L DOOR FAIL | When the malfunctioning door position is detected at B/L position | |
| B2638 | DR D/F1 DOOR FAIL | When the malfunctioning door position is detected at FOOT position | |
| B2639 | DR DEF DOOR FAIL | When the malfunctioning door position is detected at DEF position | |
| B263D | FRE DOOR FAIL | When the malfunctioning intake door position is detected at FRE position | • Intake door motor<br>• A/C auto amp.<br>• Harness and connector (CAN communication line is open or shorted) (Intake door motor is open or shorted) |
| B263E | 20P FRE DOOR FAIL | When the malfunctioning intake door position is detected at 20%FRE position | |
| B263F | REC DOOR FAIL | When the malfunctioning intake door position is detected at REC position | |
| B2654 | D/F2 DOOR FAIL | When the malfunctioning door position is detected at D/F position | • Mode door motor<br>• A/C auto amp.<br>• Harness and connector (CAN communication line is open or shorted) (Mode door motor is open or shorted) |
| B2655 | B/L2 DOOR FAIL | When the malfunctioning door position is detected at B/L2 position | |
| B2661 | UPPER VENT DOOR OPEN POSI FAIL | When the malfunctioning upper ventilator door position is detected at open position. | • Upper ventilator door motor<br>• A/C auto amp.<br>• Harness and connector (CAN communication line is open or shorted) (Upper ventilator door motor is open or shorted) |
| B2662 | UPPER VENT DOOR MID POSI FAIL | When the malfunctioning upper ventilator door position is detected at middle position. | |
| B2663 | UPPER VENT DOOR SHUT POSI FAIL | When the malfunctioning upper ventilator door position is detected at shut position. | |

*: Perform self-diagnosis under sunshine. When performing indoors, aim a light (more than 60 W) at sunload sensor, otherwise self-diagnosis indicates even though the sunload sensor is functioning normally.

## DATA MONITOR

**NOTE:**

The following table includes information (items) inapplicable to this vehicle. For information (items) applicable to this vehicle, refer to CONSULT display items.

Display item list

| Monitor item [Unit] | | Description |
|---|---|---|
| COMP REQ SIG | [On/Off] | Displays A/C switch ON/OFF status transmitted to other units via CAN communication |
| FAN REQ SIG | [On/Off] | Displays blower switch ON/OFF status transmitted to other units via CAN communication |
| AMB TEMP SEN | [°C] | Ambient sensor value converted from ambient sensor signal received from ambient sensor |
| IN-VEH TEMP | [°C] | In-vehicle sensor value converted from in-vehicle sensor signal received from in-vehicle sensor |

| Monitor item [Unit] | | Description |
|---|---|---|
| INT TEMP SEN | [°C] | Intake sensor value converted from intake sensor signal received from intake sensor |
| SUNLOAD SEN | [w/m$^2$] | Sunload sensor value converted from sunload sensor signal received from sunload sensor |
| AMB SEN CAL | [°C] | Ambient sensor value calculated by A/C auto amp. |
| IN-VEH CAL | [°C] | In-vehicle sensor value calculated by A/C auto amp. |
| INT TEMP CAL | [°C] | Intake sensor value calculated by A/C auto amp. |
| SUNL SEN CAL | [w/m$^2$] | Sunload sensor value calculated by A/C auto amp. |
| FAN DUTY | | Duty ratio of blower motor judged by A/C auto amp. |
| XM | | Target discharge air temperature judged by A/C auto amp. according to the temperature setting and the value from each sensor |
| ENG COOL TEMP | [°C] | Water temperature signal value received from ECM via CAN communication |
| VEHICLE SPEED | [Mph (km/h)] | Vehicle speed signal value received from meter via CAN communication |

## ACTIVE TEST

| Test item | Description |
|---|---|
| ALL SEG | **NOTE:**<br>• Item can be displayed but cannot be tested.<br>• When choosing to turn “ALL SEG” on, error message is displayed but it is not malfunction. |
| HVAC TEST | The operation check of A/C system can be performed by selecting the mode. Refer to the following table for the conditions of each mode. |

### HVAC TEST

| | Test item | | | | | | |
|---|---|---|---|---|---|---|---|
| | MODE 1 | MODE 2 | MODE 3 | MODE 4 | MODE 5 | MODE 6 | MODE 7 |
| Mode door position | VENT1 | VENT2 | B/L1 | B/L2 | FOOT | D/F | DEF |
| Intake door position | REC | REC | 20%FRE | 20%FRE | FRE | FRE | FRE |
| Air mix door position (driver & passenger side) | FULL COLD | FULL HOT | FULL COLD | FULL HOT | FULL HOT | FULL HOT | FULL HOT |
| Blower motor duty ratio | 35% | 35% | 61% | 61% | 81% | 81% | 35% |
| Compressor (Magnet clutch) | ON | ON | ON | ON | OFF | OFF | ON |
| Upper ventilator door | OPEN | SHUT | OPEN | SHUT | SHUT | SHUT | SHUT |

**NOTE:**

Perform the inspection of each output device after starting the engine because the compressor is operated.

## WORK SUPPORT

| Work item | Description | Reference |
|---|---|---|
| TEMP SET CORRECT<br>(Setting of difference between temperature setting and control temperature) | If the temperature felt by the customer is different than the air flow temperature controlled by the temperature setting, the auto amplifier control temperature can be adjusted to compensate for the temperature setting. | HAC-10, "Temperature Setting Trimmer" |
| BLOW SET<br>(Blow setting to DEF in FOOT mode) | In the FOOT mode, the air blowing to the DEF can change ON/OFF. | HAC-10, "Foot Position Setting Trimmer" |

| Work item | Description | Reference |
|---|---|---|
| FRE MEMORY SET<br>(FRE memory function setting) | • If the ignition switch is turned to the OFF position while the FRE switch is set to ON (fresh air intake), “Perform the memory” or “Do not perform the memory” of the FRE switch ON (fresh air intake) condition can be selected.<br>• If “Perform the memory” was set, the FRE switch will be ON (fresh air intake) when turning the ignition switch to the ON position again.<br>• If “Do not perform the memory” was set, the air inlets will be controlled automatically when turning the ignition switch to the ON position again. | HAC-11, "Inlet Port Memory Function (FRE)" |
| REC MEMORY SET<br>(REC memory function setting) | • If the ignition switch is turned to the OFF position while the REC switch is set to ON (recirculation), “Perform the memory” or “Do not perform the memory” of the REC switch ON (recirculation) condition can be selected.<br>• If “Perform the memory” was set, the REC switch will be ON (recirculation) when turning the ignition switch to the ON position again.<br>• If “Do not perform the memory” was set, the air inlets will be controlled automatically when turning the ignition switch to the ON position again. | HAC-11, "Inlet Port Memory Function (REC)" |

**NOTE:**

When the battery cable is disconnected from the negative terminal or when the battery voltage becomes 10 V or less, the setting of WORK SUPPORT may be cancelled.

# DTC/CIRCUIT DIAGNOSIS

## U1000 CAN COMM CIRCUIT

### Description

INFOID:0000000009722051

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with two communication lines (CAN-H line, CAN-L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.
CAN Communication Signal Chart. Refer to LAN-17, "How to Use CAN Communication Signal Chart".

### DTC Logic

INFOID:0000000009722052

#### DTC DETECTION LOGIC

| DTC | Items (CONSULT screen terms) | Diagnostic item is detected when... | Possible cause |
|---|---|---|---|
| U1000 | CAN COMM CIRCUIT | When A/C auto amp. is not transmitting or receiving CAN communication signal for 2 or more seconds. | CAN communication system |

### Diagnosis Procedure

INFOID:0000000009722053

#### 1. CHECK WITH SELF-DIAGNOSIS FUNCTION OF CONSULT

1. Turn ignition switch ON and wait for 2 or more seconds.
2. Using CONSULT, perform “SELF-DIAGNOSIS RESULTS” of HVAC.

Is “CAN COMM CIRCUIT” displayed?

YES >> Perform trouble diagnosis for the CAN communication system. Refer to LAN-18, "Trouble Diagnosis Flow Chart".
NO >> Perform the intermittent malfunction diagnosis. Refer to GI-44, "Intermittent Incident".

# U1010 CONTROL UNIT (CAN)

## Description

INFOID:0000000009722054

Initial diagnosis of A/C auto amp.

## DTC Logic

INFOID:0000000009722055

### DTC DETECTION LOGIC

| DTC | Items (CONSULT screen terms) | Diagnostic item is detected when... | Possible cause |
|---|---|---|---|
| U1010 | CONTROL UNIT (CAN) | When detecting error during the initial diagnosis of CAN controller of A/C auto amp. | A/C auto amp. |

## Diagnosis Procedure

INFOID:0000000009722056

### 1.CHECK WITH SELF-DIAGNOSIS FUNCTION OF CONSULT

Using CONSULT, perform “SELF-DIAGNOSIS RESULTS” of HVAC.

Is DTC No.“U1010” displayed?

YES >> Replace A/C auto amp.
NO >> INSPECTION END

# B257B, B257C AMBIENT SENSOR

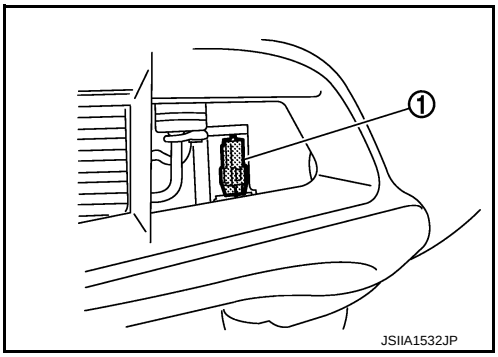
## Description

INFOID:0000000009722057

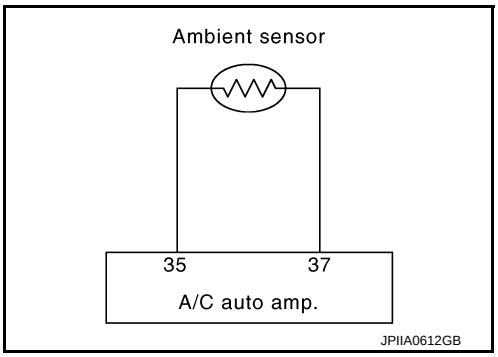
### COMPONENT DESCRIPTION

Ambient Sensor

- The ambient sensor (1) is installed to the front bumper (left back).
- It detects ambient temperature and converts it into a resistance value which is then input into the A/C auto amp.




Ambient Sensor Circuit




### AMBIENT TEMPERATURE INPUT PROCESS

The A/C auto amp. equips a processing circuit for the ambient sensor input. However, when the temperature detected by the ambient sensor increases quickly, the processing circuit retards the A/C auto amp. function. It only allows the A/C auto amp. to recognize an ambient temperature increase of 0.33°C (0.6°F) per 100 seconds.

As an example, consider stopping for a few minutes after high speed driving. Although the actual ambient temperature has not changed, the temperature detected by the ambient sensor increases. This is because the heat from the engine compartment can radiate to the front bumper area, the location of the ambient sensor.

## DTC Logic

INFOID:0000000009722058

### DTC DETECTION LOGIC

**NOTE:**

- If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to HAC-44, "DTC Logic" or HAC-45, "DTC Logic".
- If there is an open circuit in the ambient sensor, A/C auto amp. registers extreme cold [–44°C (–47°F)] and adjusts the temperature control warmer.

| DTC | Items (CONSULT screen terms) | Diagnostic item is detected when... | Possible cause |
|---|---|---|---|
| B257B | AMBIENT SENSOR | Detected temperature at ambient sensor –44°C (–47°F) or less | • Ambient sensor<br>• A/C auto amp.<br>• Harness and connector (Ambient sensor circuit is open, or there is a short in the circuit) |
| B257C | | Detected temperature at ambient sensor 100°C (212°F) or more | |

### DTC CONFIRMATION PROCEDURE

1. CHECK WITH SELF-DIAGNOSIS FUNCTION OF CONSULT

1. Using CONSULT, perform “SELF-DIAGNOSIS RESULTS” of HVAC.
2. Check if any DTC No. is displayed in the self-diagnosis results.

**NOTE:**

- If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to HAC-44, "DTC Logic" or HAC-45, "DTC Logic".
- If there is an open circuit in the ambient sensor, A/C auto amp. registers extreme cold [–44°C (–47°F)] and adjusts the temperature control warmer.

Is DTC No.“B257B” or “B257C” displayed?

YES >> Perform trouble diagnosis for the ambient sensor. Refer to HAC-47, "Diagnosis Procedure".
NO >> INSPECTION END

## Diagnosis Procedure

INFOID:0000000009722059

### 1.CHECK VOLTAGE BETWEEN AMBIENT SENSOR AND GROUND

1. Disconnect ambient sensor connector.
2. Turn ignition switch ON.
3. Check voltage between ambient sensor harness connector and ground.

| (+) | | (–) | Voltage |
|---|---|---|---|
| Ambient sensor | | — | |
| Connector | Terminal | | |
| E337 | 1 | Ground | Approx. 5 V |

Is the inspection result normal?

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

### 2.CHECK CIRCUIT CONTINUITY BETWEEN AMBIENT SENSOR AND A/C AUTO AMP.

1. Turn ignition switch OFF.
2. Disconnect A/C auto amp. connector.
3. Check continuity between ambient sensor harness connector and A/C auto amp. harness connector.

| Ambient sensor | | A/C auto amp. | | Continuity |
|---|---|---|---|---|
| Connector | Terminal | Connector | Terminal | |
| E337 | 2 | M50 | 37 | Existed |

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair harness or connector.

### 3.CHECK AMBIENT SENSOR

Check ambient sensor. Refer to HAC-48, "Component Inspection".

Is the inspection result normal?

YES >> Replace A/C auto amp.
NO >> Replace ambient sensor.

### 4.CHECK CIRCUIT CONTINUITY BETWEEN AMBIENT SENSOR AND A/C AUTO AMP.

1. Turn ignition switch OFF.
2. Disconnect A/C auto amp. connector.
3. Check continuity between ambient sensor harness connector and A/C auto amp. harness connector.

| Ambient sensor | | A/C auto amp. | | Continuity |
|---|---|---|---|---|
| Connector | Terminal | Connector | Terminal | |
| E337 | 1 | M50 | 35 | Existed |

4. Check continuity between ambient sensor harness connector and ground.

| Ambient sensor | | — | Continuity |
|---|---|---|---|
| Connector | Terminal | | |
| E337 | 1 | Ground | Not existed |

Is the inspection result normal?

YES >> Replace A/C auto amp.
NO >> Repair harness or connector.

## Component Inspection

INFOID:0000000009722060

### 1. CHECK AMBIENT SENSOR

1. Turn ignition switch OFF.
2. Disconnect ambient sensor connector. Refer to VTL-26, "Exploded View".
3. Check resistance between ambient sensor terminals.

| Terminal | | Condition | Resistance kΩ |
|---|---|---|---|
| | | Temperature °C (°F) | |
| 1 | 2 | –15 (5) | 12.73 |
| | | –10 (14) | 9.92 |
| | | –5 (23) | 7.80 |
| | | 0 (32) | 6.19 |
| | | 5 (41) | 4.95 |
| | | 10 (50) | 3.99 |
| | | 15 (59) | 3.24 |
| | | 20 (68) | 2.65 |
| | | 25 (77) | 2.19 |
| | | 30 (86) | 1.81 |
| | | 35 (95) | 1.51 |
| | | 40 (104) | 1.27 |
| | | 45 (113) | 1.07 |

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace ambient sensor.

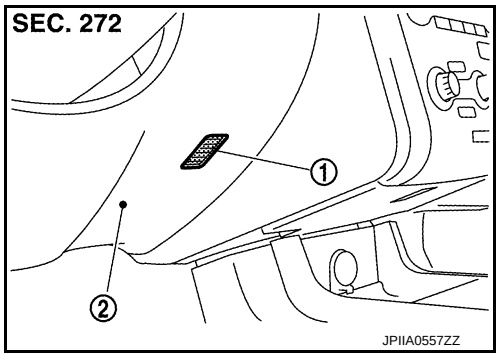
# B2578, B2579 IN-VEHICLE SENSOR

## Description

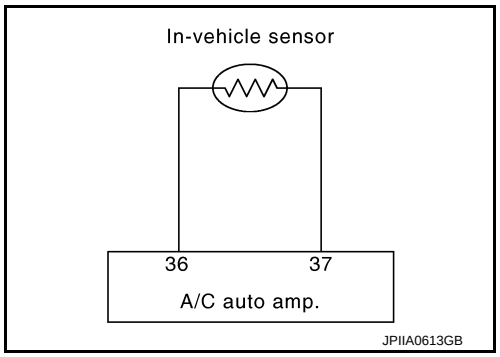
INFOID:0000000009722061

In-vehicle Sensor

- The in-vehicle sensor (1) is located on instrument driver lower panel (2).
- It converts variations in compartment air temperature drawn from the aspirator into a resistance value. It is then input into the A/C auto amp.

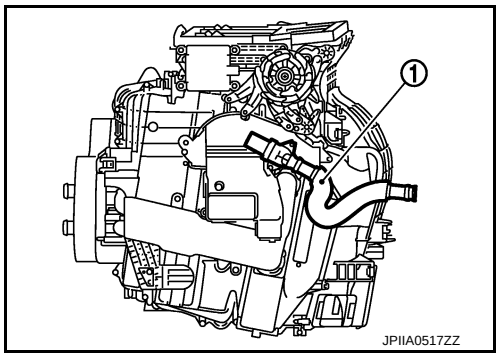


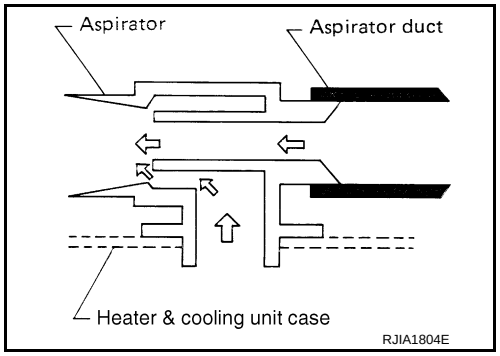

In-vehicle Sensor Circuit




Aspirator

The aspirator (1) is located on driver side of heater & cooling unit assembly. It produces vacuum pressure due to air discharged from the heater & cooling unit assembly, continuously taking compartment air in the aspirator.




## DTC Logic

INFOID:0000000009722062

DTC DETECTION LOGIC

**NOTE:**
If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to HAC-44, "DTC Logic" or HAC-45, "DTC Logic".

| DTC | Items (CONSULT screen terms) | Diagnostic item is detected when... | Possible cause |
|---|---|---|---|
| B2578 | IN-VEHICLE SENSOR | Detected temperature at in-vehicle sensor –44°C (–47°F) or less | • In-vehicle sensor<br>• A/C auto amp.<br>• Harness and connector (In-vehicle sensor circuit is open, or there is a short in the circuit) |
| B2579 | | Detected temperature at in-vehicle sensor 100°C (212°F) or more | |

## DTC CONFIRMATION PROCEDURE

### 1.CHECK WITH SELF-DIAGNOSIS FUNCTION OF CONSULT

1. Using CONSULT, perform “SELF-DIAGNOSIS RESULTS” of HVAC.
2. Check if any DTC No. is displayed in the self-diagnosis results.

**NOTE:**
If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to HAC-44, "DTC Logic" or HAC-45, "DTC Logic".

Is DTC No.“B2578” or “B2579” displayed?

YES >> Perform trouble diagnosis for the in-vehicle sensor. Refer to HAC-50, "Diagnosis Procedure".
NO >> INSPECTION END

## Diagnosis Procedure

INFOID:0000000009722063

### 1.CHECK VOLTAGE BETWEEN IN-VEHICLE SENSOR AND GROUND

1. Disconnect in-vehicle sensor connector.
2. Turn ignition switch ON.
3. Check voltage between in-vehicle sensor harness connector and ground.

| (+) | | (–) | Voltage |
|---|---|---|---|
| In-vehicle sensor | | — | |
| Connector | Terminal | | |
| M41 | 1 | Ground | Approx. 5 V |

Is the inspection result normal?

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

### 2.CHECK CIRCUIT CONTINUITY BETWEEN IN-VEHICLE SENSOR AND A/C AUTO AMP.

1. Turn ignition switch OFF.
2. Disconnect A/C auto amp. connector.
3. Check continuity between in-vehicle sensor harness connector and A/C auto amp. harness connector.

| In-vehicle sensor | | A/C auto amp. | | Continuity |
|---|---|---|---|---|
| Connector | Terminal | Connector | Terminal | |
| M41 | 2 | M50 | 37 | Existed |

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair harness or connector.

### 3.CHECK IN-VEHICLE SENSOR

Check in-vehicle sensor. Refer to HAC-51, "Component Inspection".

Is the inspection result normal?

YES >> Replace A/C auto amp.

NO >> Replace in-vehicle sensor.

## 4. CHECK CIRCUIT CONTINUITY BETWEEN IN-VEHICLE SENSOR AND A/C AUTO AMP.

1. Turn ignition switch OFF.
2. Disconnect A/C auto amp. connector.
3. Check continuity between in-vehicle sensor harness connector and A/C auto amp. harness connector.

| In-vehicle sensor | | A/C auto amp. | | Continuity |
|---|---|---|---|---|
| Connector | Terminal | Connector | Terminal | |
| M41 | 1 | M50 | 36 | Existed |

4. Check continuity between in-vehicle sensor harness connector and ground.

| In-vehicle sensor | | — | Continuity |
|---|---|---|---|
| Connector | Terminal | | |
| M41 | 1 | Ground | Not existed |

Is the inspection result normal?

YES >> Replace A/C auto amp.
NO >> Repair harness or connector.

# Component Inspection

INFOID:0000000009722064

## 1. CHECK IN-VEHICLE SENSOR

1. Turn ignition switch OFF.
2. Disconnect in-vehicle sensor connector. Refer to VTL-27, "Exploded View".
3. Check resistance between in-vehicle sensor terminals.

| Terminal | | Condition | Resistance kΩ |
|---|---|---|---|
| | | Temperature °C (°F) | |
| 1 | 2 | –15 (5) | 12.73 |
| | | –10 (14) | 9.92 |
| | | –5 (23) | 7.80 |
| | | 0 (32) | 6.19 |
| | | 5 (41) | 4.95 |
| | | 10 (50) | 3.99 |
| | | 15 (59) | 3.24 |
| | | 20 (68) | 2.65 |
| | | 25 (77) | 2.19 |
| | | 30 (86) | 1.81 |
| | | 35 (95) | 1.51 |
| | | 40 (104) | 1.27 |
| | | 45 (113) | 1.07 |

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace in-vehicle sensor.

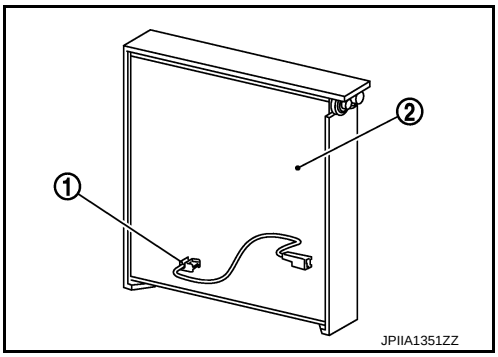
# B2581, B2582 INTAKE SENSOR

## Description

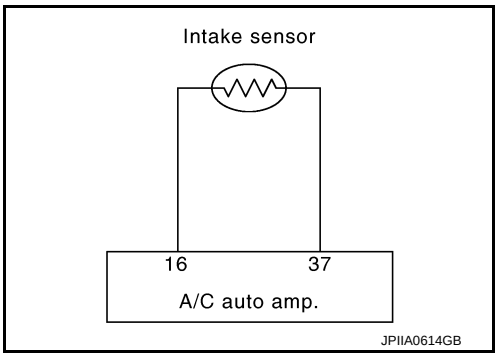
INFOID:0000000009722065

Intake Sensor

- The intake sensor (1) is located on the evaporator (2).
- It converts air temperature after it passes through the evaporator into a resistance value which is then input to the A/C auto amp.




Intake Sensor Circuit




## DTC Logic

INFOID:0000000009722066

### DTC DETECTION LOGIC

**NOTE:**

If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to HAC-44, "DTC Logic" or HAC-45, "DTC Logic".

| DTC | Items (CONSULT screen terms) | Diagnostic item is detected when... | Possible cause |
|---|---|---|---|
| B2581 | INTAKE SENSOR | Detected temperature at intake sensor –33°C (–27°F) or less | • Intake sensor<br>• A/C auto amp.<br>• Harness and connector (Intake sensor circuit is open, or there is a short in the circuit) |
| B2582 | | Detected temperature at intake sensor 69°C (156°F) or more | |

### DTC CONFIRMATION PROCEDURE

#### 1. CHECK WITH SELF-DIAGNOSIS FUNCTION OF CONSULT

1. Using CONSULT, perform “SELF-DIAGNOSIS RESULTS” of HVAC.
2. Check if any DTC No. is displayed in the self-diagnosis results.

**NOTE:**

If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to HAC-44, "DTC Logic" or HAC-45, "DTC Logic".

Is DTC No.“B2581” or “B2582” displayed?

YES >> Perform trouble diagnosis for the intake sensor. Refer to HAC-52, "Diagnosis Procedure".
NO >> INSPECTION END

## Diagnosis Procedure

INFOID:0000000009722067

#### 1. CHECK VOLTAGE BETWEEN INTAKE SENSOR AND GROUND

1. Disconnect intake sensor connector.
2. Turn ignition switch ON.
3. Check voltage between intake sensor harness connector and ground.

| (+) | | (–) | Voltage |
|---|---|---|---|
| Intake sensor | | — | |
| Connector | Terminal | | |
| M42 | 1 | Ground | Approx. 5 V |

Is the inspection result normal?

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

## 2.CHECK CIRCUIT CONTINUITY BETWEEN INTAKE SENSOR AND A/C AUTO AMP.

1. Turn ignition switch OFF.
2. Disconnect A/C auto amp. connector.
3. Check continuity between intake sensor harness connector and A/C auto amp. harness connector.

| Intake sensor | | A/C auto amp. | | Continuity |
|---|---|---|---|---|
| Connector | Terminal | Connector | Terminal | |
| M42 | 2 | M50 | 37 | Existed |

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair harness or connector.

## 3.CHECK INTAKE SENSOR

Check intake sensor. Refer to HAC-53, "Component Inspection".

Is the inspection result normal?

YES >> Replace A/C auto amp.
NO >> Replace intake sensor.

## 4.CHECK CIRCUIT CONTINUITY BETWEEN INTAKE SENSOR AND A/C AUTO AMP.

1. Turn ignition switch OFF.
2. Disconnect A/C auto amp. connector.
3. Check continuity between intake sensor harness connector and A/C auto amp. harness connector.

| Intake sensor | | A/C auto amp. | | Continuity |
|---|---|---|---|---|
| Connector | Terminal | Connector | Terminal | |
| M42 | 1 | M50 | 16 | Existed |

4. Check continuity between intake sensor harness connector and ground.

| Intake sensor | | — | Continuity |
|---|---|---|---|
| Connector | Terminal | | |
| M42 | 1 | Ground | Not existed |

Is the inspection result normal?

YES >> Replace A/C auto amp.
NO >> Repair harness or connector.

# Component Inspection

INFOID:0000000009722068

## 1.CHECK INTAKE SENSOR

1. Turn ignition switch OFF.
2. Disconnect intake sensor connector.
3. Check resistance between intake sensor terminals.

| Terminal | | Condition | Resistance kΩ |
|---|---|---|---|
| | | Temperature °C (°F) | |
| 1 | 2 | –15 (5) | 18.63 |
| | | –10 (14) | 14.15 |
| | | –5 (23) | 10.86 |
| | | 0 (32) | 8.41 |
| | | 5 (41) | 6.58 |
| | | 10 (50) | 5.19 |
| | | 15 (59) | 4.12 |
| | | 20 (68) | 3.30 |
| | | 25 (77) | 2.67 |
| | | 30 (86) | 2.17 |
| | | 35 (95) | 1.78 |
| | | 40 (104) | 1.46 |
| | | 45 (113) | 1.21 |

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace intake sensor.

# B2630, B2631 SUNLOAD SENSOR

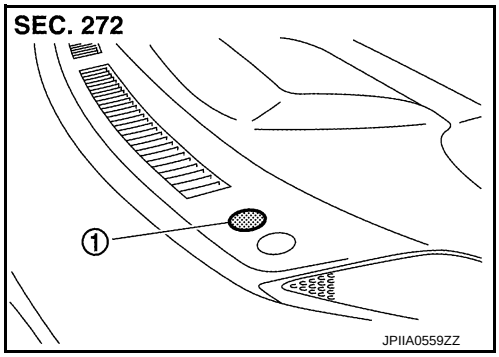
## Description

INFOID:0000000009722069

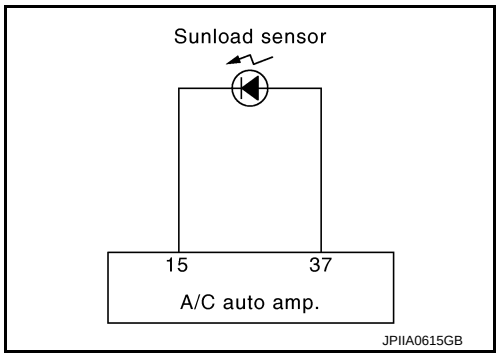
### COMPONENT DESCRIPTION

Sunload Sensor

- The sunload sensor (1) is located on the driver's side instrument panel & pad.
- It detects sunload entering through windshield by means of a photo diode. The sensor converts the sunload into a current value which is then input into the A/C auto amp.




Sunload Sensor Circuit




### SUNLOAD INPUT PROCESS

The A/C auto amp. also equips a processing circuit which averages the variations in detected sunload over a period of time. This prevents drastic swings in the air temperature control system operation due to small or quick variations in detected sunload.

For example, consider driving along a road bordered by an occasional group of large trees. The sunload detected by the sunload sensor varies whenever the trees obstruct the sunlight. The processing circuit averages the detected sunload over a period of time, so that the (insignificant) effect of the trees momentarily obstructing the sunlight does not cause any change in the air temperature control system operation. On the other hand, shortly after entering a long tunnel, the system recognizes the change in sunload, and the system reacts accordingly.

## DTC Logic

INFOID:0000000009722070

### DTC DETECTION LOGIC

**NOTE:**

- If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to HAC-44, "DTC Logic" or HAC-45, "DTC Logic".
- Sunload sensor may register a malfunction when indoors, at dusk, or at other times when light is insufficient. When performing the diagnosis indoors, light the sunload sensor with a lamp (60W or more).

| DTC | Items (CONSULT screen terms) | Diagnostic item is detected when... | Possible cause |
|---|---|---|---|
| B2630 | SUNLOAD SENSOR | Detected calorie at sunload sensor 64.7 w/$m^2$ (56 kcal/$m^2$·h) or less | • Sunload sensor<br>• A/C auto amp.<br>• Harness and connector (Sunload sensor circuit is open, or there is a short in the circuit) |
| B2631 | | Detected calorie at sunload sensor 2832 w/$m^2$ (2436 kcal/$m^2$·h) or more | |

DTC CONFIRMATION PROCEDURE

1. CHECK WITH SELF-DIAGNOSIS FUNCTION OF CONSULT

1. Using CONSULT, perform “SELF-DIAGNOSIS RESULTS” of HVAC.
2. Check if any DTC No. is displayed in the self-diagnosis results.

**NOTE:**

- If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to HAC-44, "DTC Logic" or HAC-45, "DTC Logic".
- Sunload sensor may register a malfunction when indoors, at dusk, or at other times when light is insufficient. When performing the diagnosis indoors, light the sunload sensor with a lamp (60W or more).

Is DTC No.“B2630” or “B2631” displayed?

YES >> Perform trouble diagnosis for the sunload sensor. Refer to HAC-56, "Diagnosis Procedure".
NO >> INSPECTION END

## Diagnosis Procedure

INFOID:0000000009722071

1. CHECK VOLTAGE BETWEEN SUNLOAD SENSOR AND GROUND

1. Disconnect sunload sensor connector.
2. Turn ignition switch ON.
3. Check voltage between sunload sensor harness connector and ground.

| (+) | | (–) | Voltage |
|---|---|---|---|
| Sunload sensor | | — | |
| Connector | Terminal | | |
| M74 | 1 | Ground | Approx. 5 V |

Is the inspection result normal?

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

2. CHECK CIRCUIT CONTINUITY BETWEEN SUNLOAD SENSOR AND A/C AUTO AMP.

1. Turn ignition switch OFF.
2. Disconnect A/C auto amp. connector.
3. Check continuity between sunload sensor harness connector and A/C auto amp. harness connector.

| Sunload sensor | | A/C auto amp. | | Continuity |
|---|---|---|---|---|
| Connector | Terminal | Connector | Terminal | |
| M74 | 2 | M50 | 37 | Existed |

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair harness or connector.

3. CHECK SUNLOAD SENSOR

1. Reconnect sunload sensor connector and A/C auto amp. connector.
2. Check sunload sensor. Refer to HAC-57, "Component Inspection".

Is the inspection result normal?

YES >> Replace A/C auto amp.
NO >> Replace sunload sensor.

4. CHECK CIRCUIT CONTINUITY BETWEEN SUNLOAD SENSOR AND A/C AUTO AMP.

1. Turn ignition switch OFF.
2. Disconnect A/C auto amp. connector.
3. Check continuity between sunload sensor harness connector and A/C auto amp. harness connector.

| Sunload sensor | | A/C auto amp. | | Continuity |
|---|---|---|---|---|
| Connector | Terminal | Connector | Terminal | |
| M74 | 1 | M50 | 15 | Existed |

4. Check continuity between sunload sensor harness connector and ground.

| Sunload sensor | | — | Continuity |
|---|---|---|---|
| Connector | Terminal | | |
| M74 | 1 | Ground | Not existed |

Is the inspection result normal?

YES >> Replace A/C auto amp.
NO >> Repair harness or connector.

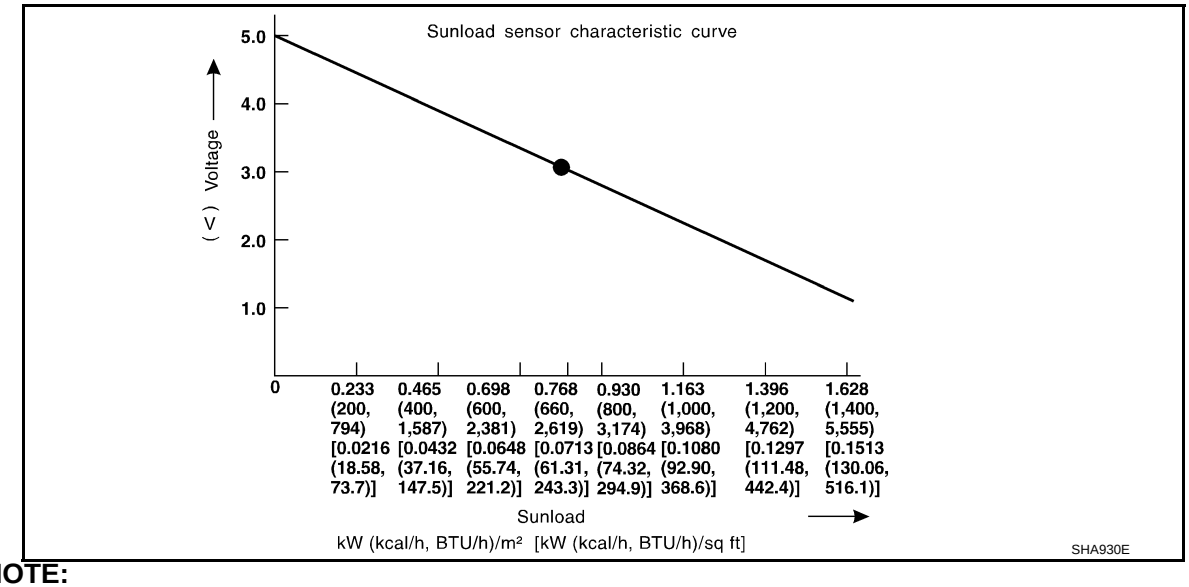
## Component Inspection

INFOID:0000000009722072

### 1. CHECK SUNLOAD SENSOR

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

| (+) | | (–) |
|---|---|---|
| A/C auto amp. | | — |
| Connector | Terminal | |
| M50 | 15 | Ground |




**NOTE:**
Select a place where sunshine directly on it when checking sunload sensor.

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace sunload sensor.

# B2632, B2633 AIR MIX DOOR MOTOR (DRIVER SIDE)

## Description

INFOID:0000000009722073

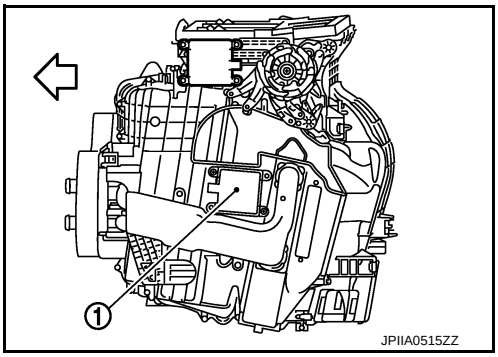
### COMPONENT DESCRIPTION

Air Mix Door Motor (Driver Side)

- The air mix door motor (driver side) (1) are attached to the heater & cooling unit assembly.

⇦: Vehicle front

- It rotates so that the air mix door is opened or closed to a position set by the A/C auto amp.
- Motor rotation is then conveyed through a shaft and the air mix door position feedback is then sent to the A/C auto amp. by PBR built-in air mix door motor.




## DTC Logic

INFOID:0000000009722074

### DTC DETECTION LOGIC

**NOTE:**

If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to HAC-44, "DTC Logic" or HAC-45, "DTC Logic".

| DTC | Items (CONSULT screen terms) | Diagnostic item is detected when... | Possible cause |
|---|---|---|---|
| B2632 | DR AIR MIX DOOR MOT | Air mix door PBR (driver side) position 95% or less | • Air mix door motor (PBR internal circuit is open or shorted)<br>• A/C auto amp.<br>• Harness and connector (LAN communication line is open or shorted) |
| B2633 | | Air mix door PBR (driver side) position 5% or more | |

### DTC CONFIRMATION PROCEDURE

#### 1. CHECK WITH SELF-DIAGNOSIS FUNCTION OF CONSULT

1. Using CONSULT, perform “SELF-DIAGNOSIS RESULTS” of HVAC.
2. Check if any DTC No. is displayed in the self-diagnosis results.

**NOTE:**

If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to HAC-44, "DTC Logic" or HAC-45, "DTC Logic".

Is DTC No.“B2632” or “B2633” displayed?

YES >> Perform trouble diagnosis for the air mix door motor (driver side). Refer to HAC-59, "Diagnosis Procedure".

NO >> GO TO 2.

#### 2. FUNCTION INSPECTION

1. Press temperature control “UP” switch (driver side) until 32°C (90°F) is displayed.
2. Check for warm air at discharge air outlets.
3. Operate the compressor.
4. Press temperature control “DOWN” switch (driver side) until 18°C (60°F) is displayed.
5. Check for cool air at air discharge outlets.

Does it operate normally?

YES >> INSPECTION END

NO >> Check air mix door motor (driver side) installation, and repair or replace the malfunctioning parts.

## Diagnosis Procedure

INFOID:0000000009722075

### 1. CHECK POWER SUPPLY FOR AIR MIX DOOR MOTOR (DRIVER SIDE)

Check voltage between air mix door motor (driver side) harness connector and ground.

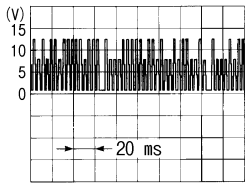
| (+) | | (–) | Voltage |
|---|---|---|---|
| Air mix door motor (driver side) | | — | |
| Connector | Terminal | | |
| M306 | 1 | Ground | Battery voltage |

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair the harnesses or connectors.

### 2. CHECK SIGNAL FOR AIR MIX DOOR MOTOR (DRIVER SIDE)

Check the output waveform (LAN signal) between air mix door motor (driver side) harness connector and ground using an oscilloscope.

| (+) | | (–) | Voltage |
|---|---|---|---|
| Air mix door motor (driver side) | | — | |
| Connector | Terminal | | |
| M306 | 3 | Ground |  SJIA1453J |

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair the harnesses or connectors.

### 3. CHECK AIR MIX DOOR MOTOR (DRIVER SIDE) GROUND CIRCUIT

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

| Air mix door motor (driver side) | | — | Continuity |
|---|---|---|---|
| Connector | Terminal | | |
| M306 | 2 | Ground | Existed |

Is the inspection result normal?

YES >> Replace air mix door motor (driver side).
NO >> Repair harness or connector.

# B2634, B2635 AIR MIX DOOR MOTOR (PASSENGER SIDE)

## Description

INFOID:0000000009722076

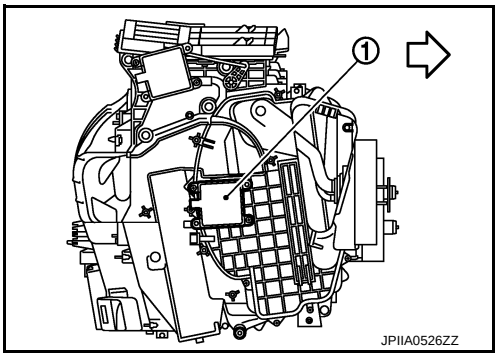
### COMPONENT DESCRIPTION

Air Mix Door Motor (Passenger Side)

- The air mix door motor (passenger side) (1) are attached to the heater & cooling unit assembly.

⇦: Vehicle front

- It rotates so that the air mix door is opened or closed to a position set by the A/C auto amp.
- Motor rotation is then conveyed through a shaft and the air mix door position feedback is then sent to the A/C auto amp. by PBR built-in air mix door motor.




## DTC Logic

INFOID:0000000009722077

### DTC DETECTION LOGIC

**NOTE:**

If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to HAC-44, "DTC Logic" or HAC-45, "DTC Logic".

| DTC | Items (CONSULT screen terms) | Diagnostic item is detected when... | Possible cause |
|---|---|---|---|
| B2634 | PASS AIR MIX DOOR MOT | Air mix door PBR (passenger side) position 95% or less | • Air mix door motor (PBR internal circuit is open or shorted)<br>• A/C auto amp.<br>• Harness and connector (LAN communication line is open or shorted) |
| B2635 | | Air mix door PBR (passenger side) position 5% or more | |

### DTC CONFIRMATION PROCEDURE

#### 1. CHECK WITH SELF-DIAGNOSIS FUNCTION OF CONSULT

1. Using CONSULT, perform “SELF-DIAGNOSIS RESULTS” of HVAC.
2. Check if any DTC No. is displayed in the self-diagnosis results.

**NOTE:**

If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to HAC-44, "DTC Logic" or HAC-45, "DTC Logic".

Is DTC No.“B2634” or “B2635” displayed?

YES >> Perform trouble diagnosis for the air mix door motor (passenger side). Refer to HAC-61, "Diagnosis Procedure".

NO >> GO TO 2.

#### 2. FUNCTION INSPECTION

1. Press temperature control “UP” switch (passenger side) until 32°C (90°F) is displayed.
2. Check for warm air at discharge air outlets.
3. Operate the compressor.
4. Press temperature control “DOWN” switch (passenger side) until 18°C (60°F) is displayed.
5. Check for cool air at air discharge outlets.

Does it operate normally?

YES >> INSPECTION END

NO >> Check air mix door motor (passenger side) installation, and repair or replace the malfunctioning parts.

## Diagnosis Procedure

INFOID:0000000009722078

### 1. CHECK POWER SUPPLY FOR AIR MIX DOOR MOTOR (PASSENGER SIDE)

Check voltage between air mix door motor (passenger side) harness connector and ground.

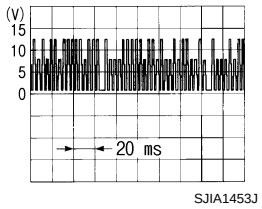
| (+) | | (–) | Voltage |
|---|---|---|---|
| Air mix door motor (passenger side) | | — | |
| Connector | Terminal | | |
| M307 | 1 | Ground | Battery voltage |

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair the harnesses or connectors.

### 2. CHECK SIGNAL FOR AIR MIX DOOR MOTOR (PASSENGER SIDE)

Check the output waveform (LAN signal) between air mix door motor (passenger side) harness connector and ground using an oscilloscope.

| (+) | | (–) | Voltage |
|---|---|---|---|
| Air mix door motor (passenger side) | | — | |
| Connector | Terminal | | |
| M307 | 3 | Ground |  SJIA1453J |

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair the harnesses or connectors.

### 3. CHECK AIR MIX DOOR MOTOR (PASSENGER SIDE) GROUND CIRCUIT

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

| Air mix door motor (passenger side) | | — | Continuity |
|---|---|---|---|
| Connector | Terminal | | |
| M307 | 2 | Ground | Existed |

Is the inspection result normal?

YES >> Replace air mix door motor (passenger side).
NO >> Repair harness or connector.

# B2636, B2637, B2638, B2639, B2654, B2655 MODE DOOR MOTOR

## Description

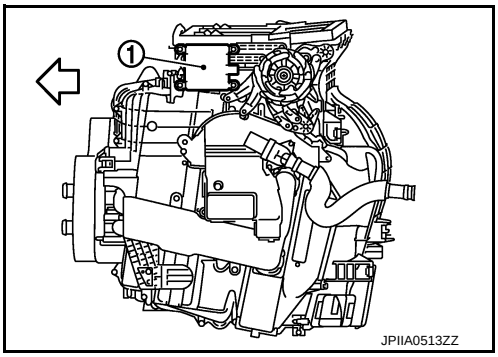
INFOID:0000000009722079

### COMPONENT DESCRIPTION

Mode Door Motor

- The mode door motor (1) are attached to the heater & cooling unit assembly.
- It rotates so that air is discharged from the outlet set by the A/C auto amp. Motor rotation is conveyed to a link which activates the mode door.

⇦: Vehicle front




## DTC Logic

INFOID:0000000009722080

### DTC DETECTION LOGIC

**NOTE:**

If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to HAC-44, "DTC Logic" or HAC-45, "DTC Logic".

| DTC | Items (CONSULT screen terms) | Diagnostic item is detected when... | Possible cause |
|---|---|---|---|
| B2636 | DR VENT DOOR FAIL | When the malfunctioning door position is detected at VENT position | • Mode door motor (PBR internal circuit is open or shorted)<br>• A/C auto amp.<br>• Harness and connector (LAN communication line is open or shorted) |
| B2637 | DR B/L DOOR FAIL | When the malfunctioning door position is detected at B/L position | |
| B2638 | DR D/F1 DOOR FAIL | When the malfunctioning door position is detected at FOOT position | |
| B2639 | DR DEF DOOR FAIL | When the malfunctioning door position is detected at DEF position | |
| B2654 | D/F2 DOOR FAIL | When the malfunctioning door position is detected at D/F position | |
| B2655 | B/L2 DOOR FAIL | When the malfunctioning door position is detected at B/L2 position | |

### DTC CONFIRMATION PROCEDURE

#### 1.CHECK WITH SELF-DIAGNOSIS FUNCTION OF CONSULT

1. Using CONSULT, perform “SELF-DIAGNOSIS RESULTS” of HVAC.
2. Check if any DTC No. is displayed in the self-diagnosis results.

**NOTE:**

If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to HAC-44, "DTC Logic" or HAC-45, "DTC Logic".

Is DTC No.“ B2636 ”, “ B2637 ”, “B2638 ”, “B2639 ”, “B2654 ” or “B2655 ” displayed?

YES >> Perform trouble diagnosis for the mode door motor. Refer to HAC-63, "Diagnosis Procedure".
NO >> GO TO 2.

#### 2.FUNCTION INSPECTION

1. Press MODE switch and DEF switch.
2. Each position indicator should change shape.

3. Confirm that air discharge comes out according to the air distribution table at below. Refer to HAC-16, "System Description".

| Discharge air flow | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Mode position indication | Condition | Air outlet/distribution | | | | | | |
| | | VENT | | | FOOT | | DEF | |
| | | Front | Upper | Rear | Front | Rear | | |
|  | DUAL switch: OFF<br>UPPER VENT switch : ON | 81% | 8% | 11% | — | — | — | |
|  | | 41% | 10% | 17% | 24% | 8% | — | |
|  | | 12% | 12% | 16% | 27% | 10% | 23% | |
|  | | 11% | 11% | 14% | 25% | 10% | 29% | |
|  | | 11% | 11% | 12% | — | — | 66% | |

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| Discharge air flow | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Mode position indication | Condition | Air outlet/distribution | | | | | | |
| | | VENT | | | FOOT | | DEF | |
| | | Front | Upper | Rear | Front | Rear | | |
|  | DUAL switch: OFF<br>UPPER VENT switch : OFF | 88% | — | 12% | — | — | — | |
|  | | 47% | — | 18% | 26% | 9% | — | |
|  | | 13% | — | 17% | 33% | 12% | 25% | |
|  | | 12% | — | 16% | 28% | 12% | 32% | |
|  | | 11% | — | 15% | — | — | 74% | |

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**NOTE:**
Confirm that the compressor clutch is engaged (Sound or visual inspection) and intake door position is at FRE when DEF (  ) or D/F (  ) is selected.

Does it operate normally?

YES >> INSPECTION END
NO >> Check mode door motor installation, and repair or replace the malfunctioning parts.

## Diagnosis Procedure

INFOID:0000000009722081

### 1. CHECK POWER SUPPLY FOR MODE DOOR MOTOR

Check voltage between mode door motor harness connector and ground.

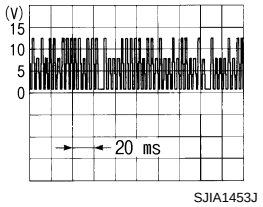
| (+) | | (–) | Voltage |
|---|---|---|---|
| Mode door motor | | — | |
| Connector | Terminal | | |
| M310 | 1 | Ground | Battery voltage |

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair harness or connector.

### 2. CHECK SIGNAL FOR MODE DOOR MOTOR

Confirm A/C LAN signal between mode door motor harness connector and ground using an oscilloscope.

| (+) | | (–) | Voltage |
|---|---|---|---|
| Mode door motor | | — | |
| Connector | Terminal | | |
| M310 | 3 | Ground |  SJIA1453J |



Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair harness or connector.

## 3. CHECK MODE DOOR MOTOR GROUND CIRCUIT

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

| Mode door motor | | — | Continuity |
|---|---|---|---|
| Connector | Terminal | | |
| M310 | 2 | Ground | Existed |

Is the inspection result normal?

YES >> Replace mode door motor.
NO >> Repair harness or connector.

# B263D, B263E, B263F INTAKE DOOR MOTOR

## Description

INFOID:0000000009722082

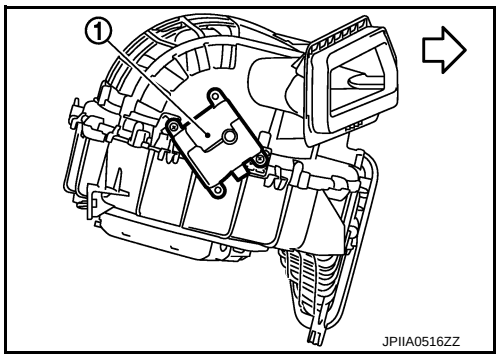
### COMPONENT DESCRIPTION

Intake Door Motor

- The intake door motor (1) is attached to the blower unit.

⇦: Vehicle front

- It rotates so that air is drawn from inlets set by the A/C auto amp. Motor rotation is conveyed to a lever which activates the intake door.




## DTC Logic

INFOID:0000000009722083

### DTC DETECTION LOGIC

**NOTE:**
If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to HAC-44, "DTC Logic" or HAC-45, "DTC Logic".

| DTC | Items (CONSULT screen terms) | Diagnostic item is detected when... | Possible cause |
|---|---|---|---|
| B263D | FRE DOOR FAIL | When the malfunctioning intake door position is detected at FRE position | • Intake door motor (PBR internal circuit is open or shorted)<br>• A/C auto amp.<br>• Harness and connector (LAN communication line is open or shorted) |
| B263E | 20P FRE DOOR FAIL | When the malfunctioning intake door position is detected at 20%FRE position | |
| B263F | REC DOOR FAIL | When the malfunctioning intake door position is detected at REC position | |

### DTC CONFIRMATION PROCEDURE

#### 1.CHECK WITH SELF-DIAGNOSIS FUNCTION OF CONSULT

1. Using CONSULT, perform “SELF-DIAGNOSIS RESULTS” of HVAC.
2. Check if any DTC No. is displayed in the self-diagnosis results.

**NOTE:**
If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to HAC-44, "DTC Logic" or HAC-45, "DTC Logic".

Is DTC No.“B263D”, “B263E” or “B263F” displayed?

YES >> Perform trouble diagnosis for the intake door motor. Refer to HAC-66, "Diagnosis Procedure".
NO >> GO TO 2.

#### 2.FUNCTION INSPECTION

1. Press intake switch.
2. The intake switch indicator is turned ON. (REC position)
3. Listen for intake door position change (Slight change of blower sound can be heard.).
4. Press intake switch again.
5. The intake switch indicator is turned OFF. (FRE position)
6. Listen for intake door position change (Slight change of blower sound can be heard.).

Does it operate normally?

YES >> INSPECTION END
NO >> Check intake door motor installation, and repair or replace the malfunctioning parts.

## Diagnosis Procedure

INFOID:0000000009722084

### 1.CHECK POWER SUPPLY FOR INTAKE DOOR MOTOR

Check voltage between intake door motor harness connector and ground.

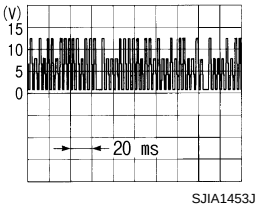
| (+) | | (–) | Voltage |
|---|---|---|---|
| Intake door motor | | — | |
| Connector | Terminal | | |
| M304 | 1 | Ground | Battery voltage |

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair harness or connector.

### 2.CHECK SIGNAL FOR INTAKE DOOR MOTOR

Confirm A/C LAN signal between intake door motor harness connector and ground using an oscilloscope.

| (+) | | (–) | Voltage |
|---|---|---|---|
| Intake door motor | | — | |
| Connector | Terminal | | |
| M304 | 3 | Ground |  SJIA1453J |

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair harness or connector.

### 3.CHECK INTAKE DOOR MOTOR GROUND CIRCUIT

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

| Intake door motor | | — | Continuity |
|---|---|---|---|
| Connector | Terminal | | |
| M304 | 2 | Ground | Existed |

Is the inspection result normal?

YES >> Replace intake door motor.
NO >> Repair harness or connector.

# B2661, B2662, B2663 UPPER VENTILATOR DOOR MOTOR

## Description

INFOID:0000000009722085

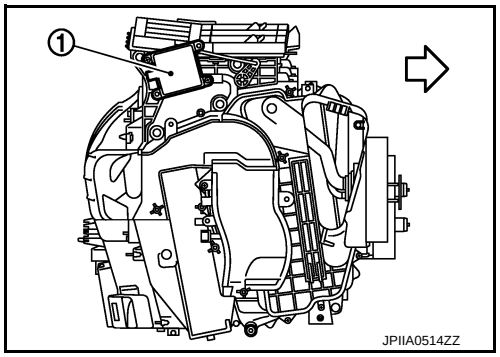
### COMPONENT DESCRIPTION

Upper Ventilator Door Motor

- The upper ventilator door motor (1) are attached to the heater & cooling unit assembly.

⇦: Vehicle front

- Upper ventilator door motor operates by UPPER VENT switch ON/OFF when the DEF switch is OFF.
- Motor rotation is conveyed to a link which activates the upper ventilator door.




## DTC Logic

INFOID:0000000009722086

### DTC DETECTION LOGIC

**NOTE:**
If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to HAC-44, "DTC Logic" or HAC-45, "DTC Logic".

| DTC | Items (CONSULT screen terms) | Diagnostic item is detected when... | Possible cause |
|---|---|---|---|
| B2661 | UPPER VENT DOOR MOT | When the malfunctioning upper ventilator door position is detected at open position. | • Upper ventilator door motor (PBR internal circuit is open or shorted)<br>• A/C auto amp.<br>• Harness and connector (LAN communication line is open or shorted) |
| B2662 | | When the malfunctioning upper ventilator door position is detected at middle position. | |
| B2663 | | When the malfunctioning upper ventilator door position is detected at shut position. | |

### DTC CONFIRMATION PROCEDURE

#### 1.CHECK WITH SELF-DIAGNOSIS FUNCTION OF CONSULT

1. Using CONSULT perform “SELF-DIAGNOSIS RESULTS” of HVAC.
2. Check if any DTC No. is displayed in the self-diagnosis results.

**NOTE:**
If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to HAC-44, "DTC Logic" or HAC-45, "DTC Logic".

Is DTC No.“B2661”, “B2662” or “B2663” displayed?

YES >> Perform trouble diagnosis for the upper ventilator door motor. Refer to HAC-68, "Diagnosis Procedure".
NO >> GO TO 2.

#### 2.FUNCTION INSPECTION

1. Press the UPPER VENT switch.
2. The UPPER VENT switch indicator is turned ON.

3. Check that the air blown from UPPER VENT does not greatly deviate from the air mix ratio.

| Discharge air flow | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Mode position indication | Condition | Air outlet/distribution | | | | | | |
| | | VENT | | | FOOT | | DEF | |
| | | Front | Upper | Rear | Front | Rear | | |
|  | DUAL switch: OFF<br>UPPER VENT switch : ON | 81% | 8% | 11% | — | — | — | |
|  | | 41% | 10% | 17% | 24% | 8% | — | |
|  | | 12% | 12% | 16% | 27% | 10% | 23% | |
|  | | 11% | 11% | 14% | 25% | 10% | 29% | |
|  | | 11% | 11% | 12% | — | — | 66% | |

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4. Press the UPPER VENT switch again.
5. The UPPER VENT switch indicator is turned OFF.
6. The air blown from UPPER VENT stops.

Does it operate normally?

YES >> INSPECTION END
NO >> Check upper ventilator door motor installation, and repair or replace the malfunctioning parts.

## Diagnosis Procedure

INFOID:0000000009722087

### 1.CHECK POWER SUPPLY FOR UPPER VENTILATOR DOOR MOTOR

Check voltage between upper ventilator door motor harness connector and ground.

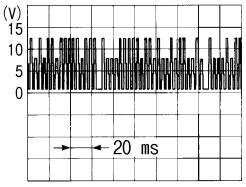
| (+) | | (–) | Voltage |
|---|---|---|---|
| Upper ventilator door motor | | — | |
| Connector | Terminal | | |
| M308 | 1 | Ground | Battery voltage |

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair harness or connector.

### 2.CHECK SIGNAL FOR UPPER VENTILATOR DOOR MOTOR

Confirm A/C LAN signal between upper ventilator door motor harness connector and ground using an oscilloscope.

| (+) | | (–) | Voltage |
|---|---|---|---|
| Upper ventilator door motor | | — | |
| Connector | Terminal | | |
| M308 | 3 | Ground |  SJIA1453J |

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair harness or connector.

## 3. CHECK UPPER VENTILATOR DOOR MOTOR GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect upper ventilator door motor connector.
3. Check continuity between upper ventilator door motor harness connector and ground.

| Upper ventilator door motor | | — | Continuity |
|---|---|---|---|
| Connector | Terminal | | |
| M308 | 2 | Ground | Existed |

Is the inspection result normal?

YES >> Replace upper ventilator door motor.
NO >> Repair harness or connector.

# BLOWER MOTOR

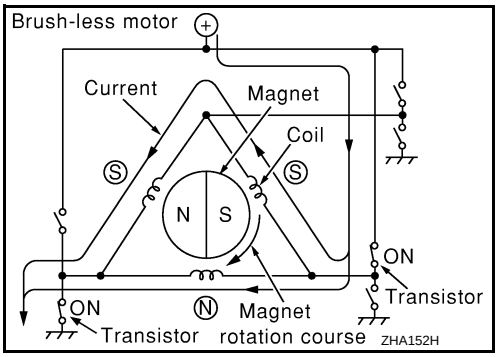
## Description

INFOID:0000000009722088

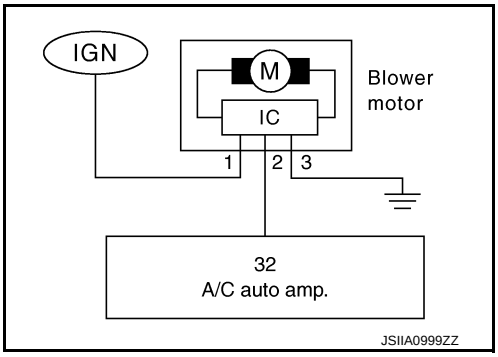
### COMPONENT DESCRIPTION

Brush-less Motor

The blower motor utilizes a brush-less motor with a rotating magnet. Quietness is improved over previous motors where the brush was the point of contact and the coil rotated.




Blower Motor Circuit




## Component Function Check

INFOID:0000000009722089

### 1.CHECK OPERATION

1. Warm up the engine.
2. Operate the fan control dial. Check that the fan speed and indicator are switched for all fan speeds.

Does it operate normally?

YES >> INSPECTION END
NO >> Perform trouble diagnosis for the blower motor. Refer to HAC-70, "Diagnosis Procedure".

## Diagnosis Procedure

INFOID:0000000009722090

### 1.CHECK WITH SELF-DIAGNOSIS FUNCTION OF CONSULT

1. Using CONSULT, perform “SELF-DIAGNOSIS RESULTS” of HVAC.
2. Check if any DTC No. is displayed in the self-diagnosis results.

**NOTE:**
If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to HAC-44, "DTC Logic" or HAC-45, "DTC Logic".

Is any DTC No. displayed?

YES >> Perform the diagnosis that is applicable to the sensor and actuator. Refer to HAC-106, "DTC Index".
NO >> GO TO 2.

### 2.CHECK WITH ACTIVE TEST OF CONSULT

1. Using CONSULT, perform “HVAC TEST” “ACTIVE TEST” of HVAC to check each output device. Refer to HAC-40, "CONSULT Function".
   **NOTE:**
   Perform the ACTIVE TEST after starting the engine because the compressor is operated.

2. Check that the blower motor control signal changes according to each indicator signal.

| | Test item | | | | | | |
|---|---|---|---|---|---|---|---|
| | MODE 1 | MODE 2 | MODE 3 | MODE 4 | MODE 5 | MODE 6 | MODE 7 |
| Mode door position | VENT1 | VENT2 | B/L1 | B/L2 | FOOT | D/F | DEF |
| Intake door position | REC | REC | 20%FRE | 20%FRE | FRE | FRE | FRE |
| Air mix door position (driver & passenger side) | FULL COLD | FULL HOT | FULL COLD | FULL HOT | FULL HOT | FULL HOT | FULL HOT |
| Blower motor duty ratio | 35% | 35% | 61% | 61% | 81% | 81% | 35% |
| Compressor (Magnet clutch) | ON | ON | ON | ON | OFF | OFF | ON |
| Upper ventilator door | OPEN | SHUT | OPEN | SHUT | SHUT | SHUT | SHUT |

**NOTE:**

Perform the inspection of each output device after starting the engine because the compressor is operated.

Does it operate normally?

YES >> INSPECTION END
NO >> GO TO 3.

## 3.CHECK POWER SUPPLY FOR BLOWER MOTOR

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

| (+) | | (–) | Voltage |
|---|---|---|---|
| Blower motor | | — | |
| Connector | Terminal | | |
| M98 | 1 | Ground | Battery voltage |

Is the inspection result normal?

YES >> GO TO 4.
NO >> GO TO 7.

## 4.CHECK BLOWER MOTOR GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Check continuity between blower motor harness connector and ground.

| Blower motor | | — | Continuity |
|---|---|---|---|
| Connector | Terminal | | |
| M98 | 3 | Ground | Existed |

Is the inspection result normal?

YES >> GO TO 5.
NO >> Repair harness or connector.

## 5.CHECK BLOWER MOTOR CIRCUIT CONTINUITY

1. Disconnect A/C auto amp. connector.
2. Check continuity between blower motor harness connector and A/C auto amp. harness connector.

| Blower motor | | A/C auto amp. | | Continuity |
|---|---|---|---|---|
| Connector | Terminal | Connector | Terminal | |
| M98 | 2 | M50 | 32 | Existed |

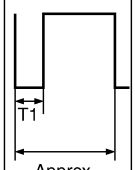
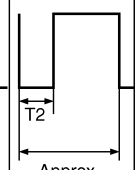
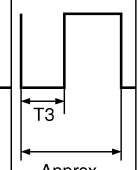
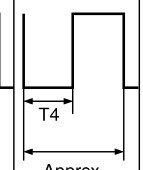
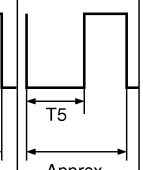
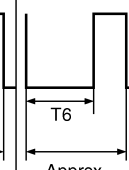
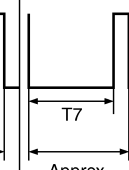
Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair harness or connector.

## 6.CHECK A/C AUTO AMP. OUTPUT SIGNAL

1. Reconnect blower motor connector and A/C auto amp. connector.
2. Turn ignition switch ON.
3. Set MODE switch to the VENT position.
4. Check the output waveform between blower motor harness connector and ground using an oscilloscope, while varying the fan speed from 1 to 7.

| Blower fan speed (Manual) VENT mode | 1st | 2nd | 3rd | 4th | 5th | 6th | 7th |
|---|---|---|---|---|---|---|---|
| Blower motor connector M 98 terminal No. 2 (Oscilloscope) |  |  |  |  |  |  |  |
| Duty ratio | Approx. 25% | Approx. 33% | Approx. 41% | Approx. 51% | Approx. 61% | Approx. 71% | Approx. 81% |

NOTE: Duty ratio = $\frac{Tx}{\text{Approx. } 1.6 \text{ ms}}$ x 100 (%)

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Is the inspection result normal?

YES >> Replace the blower motor.
NO >> Replace the A/C auto amp.

## 7.CHECK POWER VOLTAGE OF BLOWER RELAY

1. Turn the ignition switch OFF.
2. Remove the blower relay. Refer to PG-91, "Fuse, Connector and Terminal Arrangement".
3. Turn the ignition switch ON.
4. Check the voltage between blower relay fuse block side terminal and ground. Refer to PG-91, "Fuse, Connector and Terminal Arrangement" for relay terminal assignment.

| (+) | (–) | Voltage |
|---|---|---|
| Blower relay | — | |
| 1 | Ground | Battery voltage |
| 3 | | |

Is the inspection result normal?

YES >> GO TO 8.
NO >> Inspection the power supply circuit. Refer to PG-47, "Wiring Diagram - IGNITION POWER SUPPLY -".

## 8.CHECK BLOWER RELAY

1. Turn the ignition switch OFF.
2. Install the blower relay. Refer to PG-91, "Fuse, Connector and Terminal Arrangement".
3. Turn the ignition switch ON.
4. Check the operating sound of blower relay.

Is the inspection result normal?

YES >> GO TO 9.
NO >> Replace the blower relay.

## 9.CHECK FUSE

Check 15A fuses (Nos. 21 and 22).
**NOTE:**

Refer to PG-91, "Fuse, Connector and Terminal Arrangement" for fuse location.

Is the inspection result normal?

YES >> Repair the harnesses or connectors.
NO >> Replace the fuse after repairing the applicable circuit.

## Component Inspection

INFOID:0000000009722091

### 1. CHECK BLOWER MOTOR

1. Remove the blower motor. Refer to VTL-33, "Exploded View".
2. Check that the blower motor rotates smoothly.

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace blower motor.

# MAGNET CLUTCH

## Description

INFOID:0000000009722092

The magnet clutch drives the compressor, by an IPDM E/R signal.

## Component Function Check

INFOID:0000000009722093

### 1.FUNCTION INSPECTION

1. Press AUTO switch.
2. “AUTO” is indicated on the display.
3. Press the A/C switch.
4. Check that the indicator of the A/C switch turns on. Check visually and by sound that the compressor is operating (the discharge air temperature or fan speed varies depending on the ambient temperature, in-vehicle temperature, and temperature setting).
5. Press the A/C switch again.
6. Check that the indicator of the A/C switch turns OFF. Check visually and by sound that the compressor stops.

Does it operate normally?

YES >> INSPECTION END
NO >> Perform trouble diagnosis for the compressor. Refer to HAC-74, "Diagnosis Procedure".

## Diagnosis Procedure

INFOID:0000000009722094

### 1.INSPECTION IN AUTO ACTIVE TEST MODE

Perform “AUTO ACTIVE TEST”. Refer to PCS-10, "Diagnosis Description".

Does it operate normally?

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

### 2.CHECK MAGNET CLUTCH POWER SUPPLY

1. Turn ignition switch OFF.
2. Disconnect compressor connector.
3. Perform auto active test of IPDM E/R. Refer to PCS-10, "Diagnosis Description".
4. When auto active test operation sequence is compressor (magnet clutch) operation, check voltage between compressor harness connector and ground.

| + | | – | Voltage |
|---|---|---|---|
| Compressor | | | |
| Connector | Terminal | | |
| F18 | 1 | Ground | 0 V ⇔ Battery voltage |

Is the inspection result normal?

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

### 3.CHECK FUSE

Check 10 A fuse (No. 49, located in IPDM E/R).

**NOTE:**
Refer to PG-93, "Fuse, Connector and Terminal Arrangement".

Is the inspection result normal?

YES >> GO TO 4.
NO >> Replace the blown fuse after repairing the affected circuit if a fuse is blown.

### 4.CHECK MAGNET CLUTCH POWER SUPPLY CIRCUIT FOR OPEN

1. Disconnect IPDM E/R connector.
2. Check continuity between IPDM E/R harness connector and compressor harness connector.

| IPDM E/R | | Compressor | | Continuity |
|---|---|---|---|---|
| Connector | Terminal | Connector | Terminal | |
| F12 | 48 | F18 | 1 | Existed |

Is the inspection result normal?

YES >> Replace IPDM E/R. Refer to PCS-37, "Removal and Installation".
NO >> Repair harness or connector.

## 5. CHECK MAGNET CLUTCH GROUND CIRCUIT FOR OPEN

Check continuity between compressor harness connector and ground.

| Compressor | | — | Continuity |
|---|---|---|---|
| Connector | Terminal | | |
| F18 | 2 | Ground | Existed |

Is the inspection result normal?

YES >> Replace magnet clutch. Refer to HA-38, "MAGNET CLUTCH : Removal and Installation".
NO >> Repair harness or connector.

## 6. CHECK WITH SELF-DIAGNOSIS FUNCTION OF CONSULT

1. Using CONSULT, perform “SELF-DIAGNOSIS RESULTS” of HVAC.
2. Check if any DTC No. is displayed in the self-diagnosis results.

**NOTE:**
If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to HAC-44, "DTC Logic" or HAC-45, "DTC Logic".

Is any DTC No. displayed?

YES >> Perform the diagnosis that is applicable to the sensor and actuator. Refer to HAC-106, "DTC Index".
NO >> GO TO 7.

## 7. CHECK A/C AUTO AMP. INPUT SIGNAL

Using CONSULT, check “On/Off” of “COMP REQ SIG” and “FAN REQ SIG” in “DATA MONITOR” of HVAC. Refer to HAC-40, "CONSULT Function".

**A/C SWITCH ON : COMP REQ SIG On**
**A/C SWITCH OFF : COMP REQ SIG Off**
**FAN CONTROL DIAL ON : FAN REQ SIG On**
**FAN CONTROL DIAL OFF : FAN REQ SIG Off**

Is the inspection result normal?

YES >> GO TO 8.
NO >> Replace A/C auto amp.

## 8. CHECK REFRIGERANT PRESSURE SENSOR

Check refrigerant pressure sensor. Refer to EC-465, "Diagnosis Procedure".

Is the inspection result normal?

YES >> INSPECTION END
NO >> Repair or replace malfunctioning parts.

# A/C CONTROL SIGNAL CIRCUIT

## Diagnosis Procedure

INFOID:0000000009722095

### 1.CHECK WITH SELF-DIAGNOSIS FUNCTION OF CONSULT

1. Using CONSULT, perform “SELF-DIAGNOSIS RESULTS” of HVAC.
2. Check if any DTC No. is displayed in the self-diagnosis results.

**NOTE:**
If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to HAC-44, "DTC Logic" or HAC-45, "DTC Logic".

Is any DTC No. displayed?

YES >> Perform the diagnosis that is applicable to the sensor and actuator. Refer to HAC-106, "DTC Index".
NO >> GO TO 2.

### 2.CHECK TX (A/C CONTROL → A/C AUTO AMP.) CIRCUIT CONTINUITY

1. Disconnect the A/C control and the A/C auto amp. connector.
2. Check continuity between A/C control harness connector and A/C auto amp. harness connector.

| A/C control | | A/C auto amp. | | Continuity |
|---|---|---|---|---|
| Connector | Terminal | Connector | Terminal | |
| M95 | 4 | M50 | 7 | Existed |

3. Check continuity between A/C control harness connector and ground.

| A/C control | | — | Continuity |
|---|---|---|---|
| Connector | Terminal | | |
| M95 | 4 | Ground | Not existed |

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair harness or connector.

### 3.CHECK RX (A/C AUTO AMP. → A/C CONTROL) CIRCUIT CONTINUITY

1. Disconnect the A/C control and the A/C auto amp. connector.
2. Check continuity between A/C control harness connector and A/C auto amp. harness connector.

| A/C control | | A/C auto amp. | | Continuity |
|---|---|---|---|---|
| Connector | Terminal | Connector | Terminal | |
| M95 | 3 | M50 | 6 | Existed |

3. Check continuity between A/C control harness connector and ground.

| A/C control | | — | Continuity |
|---|---|---|---|
| Connector | Terminal | | |
| M95 | 3 | Ground | Not existed |

Is the inspection result normal?

YES >> Perform trouble diagnosis for the A/C control. Refer to HAC-78, "A/C CONTROL : Diagnosis Procedure".
NO >> Repair harness or connector.

# POWER SUPPLY AND GROUND CIRCUIT
## A/C AUTO AMP.

### A/C AUTO AMP. : Description

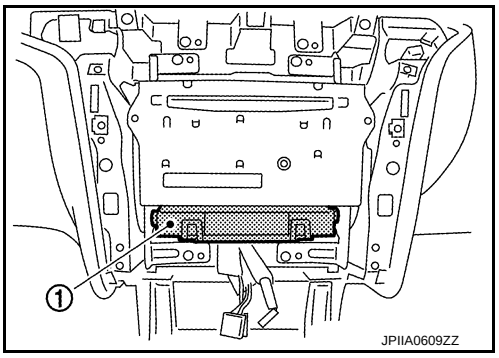
INFOID:0000000009722096

#### COMPONENT DESCRIPTION

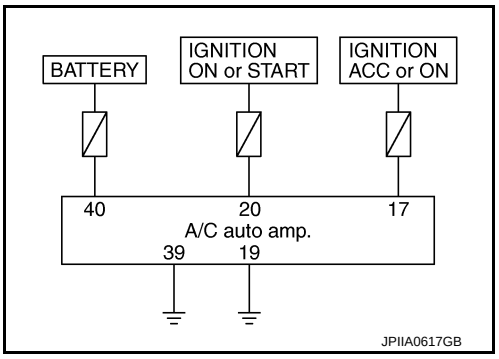
A/C Auto Amp. (Air Conditioner Automatic Amplifier)

The A/C auto amp. (1) has a built-in microcomputer that processes information sent from various sensors needed for air conditioner operation. The air mix door motor(s), the mode door motor, the intake door motor, the upper ventilator door motor, the blower motor and the compressor are then controlled.

When the various switches and temperature control switch are operated, data is input to the A/C auto amp. from the A/C control.




Power Supply and Ground Circuit for A/C Auto Amp.




### A/C AUTO AMP. : Component Function Check

INFOID:0000000009722097

#### 1. CHECK OPERATION

1. Press the AUTO switch, and then check that “AUTO” is shown on the display.
2. Operate the temperature control switch (driver side). Check that the fan speed or outlet changes. (The discharge air temperature or fan speed varies depending on the ambient temperature, in-vehicle temperature, and temperature setting.)

Does it operate normally?

YES >> INSPECTION END

NO >> Perform trouble diagnosis for the A/C system. Refer to HAC-77, "A/C AUTO AMP. : Diagnosis Procedure".

### A/C AUTO AMP. : Diagnosis Procedure

INFOID:0000000009722098

#### 1. CHECK A/C AUTO AMP. POWER SUPPLY CIRCUIT

1. Disconnect the A/C auto amp. connector.
2. Check voltage between A/C auto amp. harness connector and ground.

| (+) | | (–) | Voltage | | |
|---|---|---|---|---|---|
| A/C auto amp. | | — | Ignition switch position | | |
| Connector | Terminal | | OFF | ACC | ON |
| M50 | 17 | Ground | Approx. 0 V | Battery voltage | Battery voltage |
| | 20 | | Approx. 0 V | Approx. 0 V | Battery voltage |
| | 40 | | Battery voltage | Battery voltage | Battery voltage |

Is the inspection result normal?

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

## 2.CHECK FUSE

Check 10A fuses [Nos. 3, 6 and 19, located in the fuse block (J/B)].

**NOTE:**
Refer to PG-91, "Fuse, Connector and Terminal Arrangement".

Is the inspection result normal?

YES >> Repair the harnesses or connectors.
NO >> Replace the fuse after repairing the applicable circuit.

## 3.CHECK A/C AUTO AMP. CIRCUIT CONTINUITY

1. Turn ignition switch OFF.
2. Check continuity between A/C auto amp. harness connector and ground.

| A/C auto amp. | | — | Continuity |
|---|---|---|---|
| Connector | Terminal | | |
| M50 | 19 | Ground | Existed |
| | 39 | | |

Is the inspection result normal?

YES >> Replace the A/C auto amp.
NO >> Repair the harnesses or connectors.

# A/C CONTROL

## A/C CONTROL : Diagnosis Procedure

INFOID:0000000009722099

## 1.CHECK A/C CONTROL POWER SUPPLY CIRCUIT

1. Disconnect the A/C control connector.
2. Turn ignition switch ON.
3. Check voltage between A/C control harness connector and ground.

| (+) | | (–) | Voltage |
|---|---|---|---|
| A/C control | | — | |
| Connector | Terminal | | |
| M95 | 1 | Ground | Battery voltage |

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair the harnesses or connectors.

## 2.CHECK A/C CONTROL CIRCUIT CONTINUITY

1. Turn ignition switch OFF.
2. Check continuity between A/C control harness connector and ground.

| A/C control | | — | Continuity |
|---|---|---|---|
| Connector | Terminal | | |
| M95 | 2 | Ground | Existed |

Is the inspection result normal?

YES >> Replace the A/C control.
NO >> Repair the harnesses or connectors.

# A/C DISPLAY

## A/C DISPLAY : Diagnosis Procedure

INFOID:0000000009722100

### 1.CHECK A/C DISPLAY POWER SUPPLY CIRCUIT

1. Disconnect the A/C display connector.
2. Turn ignition switch ON.
3. Check voltage between A/C display harness connector and ground.

| (+) | | (–) | Voltage |
|---|---|---|---|
| A/C display | | — | |
| Connector | Terminal | | |
| M16 | 6 | Ground | Battery voltage |

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair the harnesses or connectors.

### 2.CHECK A/C DISPLAY CIRCUIT CONTINUITY

1. Turn ignition switch OFF.
2. Check continuity between A/C display harness connector and ground.

| A/C display | | — | Continuity |
|---|---|---|---|
| Connector | Terminal | | |
| M16 | 1 | Ground | Existed |

Is the inspection result normal?

YES >> Replace the A/C display.
NO >> Repair the harnesses or connectors.

# ECU DIAGNOSIS INFORMATION

## ECM

### Reference Value

INFOID:0000000009722101

VALUES ON THE DIAGNOSIS TOOL

**NOTE:**

- The following table includes information (items) inapplicable to this vehicle. For information (items) applicable to this vehicle, refer to CONSULT display items.
- Numerical values in the following table are reference values.
- These values are input/output values that ECM receives/transmits and may differ from actual operations.
  Example:
  The ignition timing shown by the timing light may differ from the ignition timing displayed on the data monitor. This occurs because the timing light shows a value calculated by ECM according to signals received from the cam shaft position sensor and other sensors related to ignition timing.

For outlines of following items, refer to EC-129, "CONSULT Function".

| Monitor Item | Condition | | Values/Status |
|---|---|---|---|
| ENG SPEED | Run engine and compare CONSULT value with the tachometer indication. | | Almost the same speed as the tachometer indication. |
| MAS A/F SE-B1 | See EC-140, "Description". | | |
| B/FUEL SCHDL | See EC-140, "Description". | | |
| A/F ALPHA-B1 | See EC-140, "Description". | | |
| A/F ALPHA-B2 | See EC-140, "Description". | | |
| COOLANT TEMP/S | • Engine: After warming up | | More than 70°C (158°F) |
| A/F SEN1 (B1) | • Engine: After warming up | Maintaining engine speed at 2,000 rpm | Fluctuates around 2.2 V |
| A/F SEN1 (B2) | • Engine: After warming up | Maintaining engine speed at 2,000 rpm | Fluctuates around 2.2 V |
| HO2S2 (B1) | • Revving engine from idle to 3,000 rpm quickly after the following conditions are met.<br>- Engine: After warming up<br>- After keeping engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load | | 0 - 0.3 V ←→ Approx. 0.6 - 1.0 V |
| HO2S2 (B2) | • Revving engine from idle to 3,000 rpm quickly after the following conditions are met.<br>- Engine: After warming up<br>- After keeping engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load | | 0 - 0.3 V ←→ Approx. 0.6 - 1.0 V |
| HO2S2 MNTR (B1) | • Revving engine from idle to 3,000 rpm quickly after the following conditions are met.<br>- Engine: After warming up<br>- After keeping engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load | | LEAN ←→ RICH |
| HO2S2 MNTR (B2) | • Revving engine from idle to 3,000 rpm quickly after the following conditions are met.<br>- Engine: After warming up<br>- After keeping engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load | | LEAN ←→ RICH |
| VHCL SPEED SE | • Turn drive wheels and compare CONSULT value with the speedometer indication. | | Almost the same speed as speedometer indication |
| BATTERY VOLT | • Ignition switch: ON (Engine stopped) | | 11 - 14 V |
| ACCEL SEN 1 | • Ignition switch: ON (Engine stopped) | Accelerator pedal: Fully released | 0.5 - 1.0 V |
| | | Accelerator pedal: Fully depressed | 4.2 - 4.8 V |
| ACCEL SEN 2*1 | • Ignition switch: ON (Engine stopped) | Accelerator pedal: Fully released | 0.5 - 1.0 V |
| | | Accelerator pedal: Fully depressed | 4.2 - 4.8 V |

| Monitor Item | Condition | | Values/Status |
|---|---|---|---|
| TP SEN 1-B1 | • Ignition switch: ON (Engine stopped)<br>• Selector lever: D position | Accelerator pedal: Fully released | More than 0.36 V |
| | | Accelerator pedal: Fully depressed | Less than 4.75 V |
| TP SEN 2-B1*1 | • Ignition switch: ON (Engine stopped)<br>• Selector lever: D position | Accelerator pedal: Fully released | More than 0.36 V |
| | | Accelerator pedal: Fully depressed | Less than 4.75 V |
| FUEL T/TMP SE | • Ignition switch: ON | | Indicates fuel tank temperature |
| INT/A TEMP SE | • Ignition switch: ON | | Indicates intake air temperature |
| EVAP SYS PRES | • Ignition switch: ON | | Approx. 1.8 - 4.8 V |
| FUEL LEVEL SE | • Ignition switch: ON | | Depending on fuel level of fuel tank |
| START SIGNAL | • Ignition switch: ON → START → ON | | OFF → ON → OFF |
| CLSD THL POS | • Ignition switch: ON (Engine stopped) | Accelerator pedal: Fully released | ON |
| | | Accelerator pedal: Slightly depressed | OFF |
| AIR COND SIG | • Engine: After warming up, idle the engine | Air conditioner switch: OFF | OFF |
| | | Air conditioner switch: ON (Compressor operates.) | ON |
| P/N POSI SW | • Ignition switch: ON | Selector lever: P or N position | ON |
| | | Selector lever: Except above position | OFF |
| PW/ST SIGNAL | • Engine: After warming up, idle the engine | Steering wheel: Not being turned | OFF |
| | | Steering wheel: Being turned | ON |
| LOAD SIGNAL | • Ignition switch: ON | Rear window defogger switch: ON and/or Lighting switch: 2nd position | ON |
| | | Rear window defogger switch and lighting switch: OFF | OFF |
| IGNITION SW | • Ignition switch: ON → OFF → ON | | ON → OFF → ON |
| HEATER FAN SW | • Engine: After warming up, idle the engine | Heater fan switch: ON | ON |
| | | Heater fan switch: OFF | OFF |
| BRAKE SW | • Ignition switch: ON | Brake pedal: Fully released | OFF |
| | | Brake pedal: Slightly depressed | ON |
| INJ PULSE-B1 | • Engine: After warming up<br>• Selector lever: P or N position<br>• Air conditioner switch: OFF<br>• No load | Idle | 2.0 - 3.0 msec |
| | | 2,000 rpm | 1.9 - 2.9 msec |
| INJ PULSE-B2 | • Engine: After warming up<br>• Selector lever: P or N position<br>• Air conditioner switch: OFF<br>• No load | Idle | 2.0 - 3.0 msec |
| | | 2,000 rpm | 1.9 - 2.9 msec |
| IGN TIMING | • Engine: After warming up<br>• Selector lever: P or N position<br>• Air conditioner switch: OFF<br>• No load | Idle | 7 - 17°BTDC |
| | | 2,000 rpm | 25 - 45°BTDC |
| CAL/LD VALUE | • Engine: After warming up<br>• Selector lever: P or N position<br>• Air conditioner switch: OFF<br>• No load | Idle | 5 - 35% |
| | | 2,500 rpm | 5 - 35% |
| MASS AIRFLOW | • Engine: After warming up<br>• Selector lever: P or N position<br>• Air conditioner switch: OFF<br>• No load | Idle | 2.0 - 6.0 g/s |
| | | 2,500 rpm | 7.0 - 20.0 g/s |

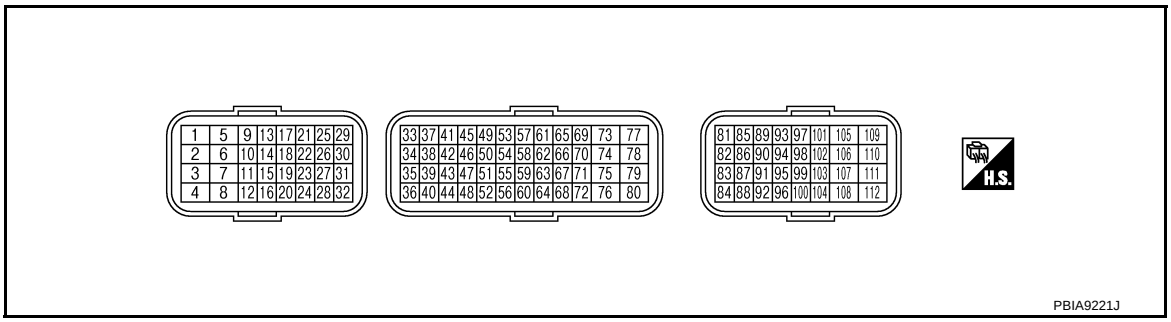
| Monitor Item | Condition | | Values/Status |
|---|---|---|---|
| PURG VOL C/V | • Engine: After warming up<br>• Selector lever: P or N position<br>• Air conditioner switch: OFF<br>• No load | Idle<br>(Accelerator pedal: Not depressed even slightly, after engine starting.) | 0% |
| | | 2,000 rpm | — |
| INT/V TIM (B1) | • Engine: After warming up<br>• Selector lever: P or N position<br>• Air conditioner switch: OFF<br>• No load | Idle | –5 - 5°CA |
| | | 2,000 rpm | Approx. 0 - 30°CA |
| INT/V TIM (B2) | • Engine: After warming up<br>• Selector lever: P or N position<br>• Air conditioner switch: OFF<br>• No load | Idle | –5 - 5°CA |
| | | 2,000 rpm | Approx. 0 - 30°CA |
| INT/V SOL (B1) | • Engine: After warming up<br>• Selector lever: P or N position<br>• Air conditioner switch: OFF<br>• No load | Idle | 0 - 2% |
| | | 2,000 rpm | Approx. 0 - 50% |
| INT/V SOL (B2) | • Engine: After warming up<br>• Selector lever: P or N position<br>• Air conditioner switch: OFF<br>• No load | Idle | 0 - 2% |
| | | 2,000 rpm | Approx. 0 - 50% |
| VIAS S/V-1 | • Engine: After warming up<br>• Selector lever: P or N position<br>• Air conditioner switch: OFF<br>• No load | When revving engine up to 5,000 rpm quickly | OFF →ON → OFF |
| VIAS S/V-2 | • Engine: After warming up<br>• Selector lever: P or N position<br>• Air conditioner switch: OFF<br>• No load | When revving engine up to 5,000 rpm quickly | OFF →ON → OFF |
| AIR COND RLY | • Engine: After warming up, idle the engine | Air conditioner switch: OFF | OFF |
| | | Air conditioner switch: ON<br>(Compressor operates) | ON |
| ENGINE MOUNT | • Engine: After warming up | Idle (With vehicle stopped) | IDLE |
| | | Except above conditions | TRVL |
| FUEL PUMP RLY | • For 1 second after turning ignition switch: ON<br>• Engine running or cranking | | ON |
| | • Except above | | OFF |
| VENT CONT/V | • Ignition switch: ON | | OFF |
| THRTL RELAY | • Ignition switch: ON | | ON |
| COOLING FAN | • Engine: After warming up, idle the engine<br>• Air conditioner switch: OFF | Engine coolant temperature: 97°C (206°F) or less | OFF |
| | | Engine coolant temperature: Between 98°C (208°F) and 99°C (210°F) | LOW |
| | | Engine coolant temperature: Between 100°C (212°F) and 104°C (219°F) | MID |
| | | Engine coolant temperature: 105°C (221°F) or more | HI |
| HO2S2 HTR (B1) | • Engine speed: Below 3,600 rpm after the following conditions are met.<br>- Engine: After warming up<br>- Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load | | ON |
| | • Engine speed: Above 3,600 rpm | | OFF |

| Monitor Item | Condition | | Values/Status |
|---|---|---|---|
| HO2S2 HTR (B2) | • Engine speed: Below 3,600 rpm after the following conditions are met.<br>- Engine: After warming up<br>- Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load | | ON |
| | • Engine speed: Above 3,600 rpm | | OFF |
| I/P PULLY SPD | • Vehicle speed: More than 20 km/h (12 MPH) | | Almost the same speed as the tachometer indication |
| VEHICLE SPEED | • Turn drive wheels and compare CONSULT value with the speedometer indication. | | Almost the same speed as the speedometer indication |
| IDL A/V LEARN | • Engine: Running | Idle air volume learning has not been performed yet. | YET |
| | | Idle air volume learning has already been performed successfully. | CMPLT |
| ENG OIL TEMP | • Engine: After warming up | | More than 70°C (158°F) |
| TRVL AFTER MIL | • Ignition switch: ON | Vehicle has traveled after MIL has illuminated. | 0 - 65,535 km<br>(0 - 40,723 miles) |
| A/F S1 HTR (B1) | • Engine: After warming up, idle the engine<br>(More than 140 seconds after starting engine) | | 4 - 100% |
| A/F S1 HTR (B2) | • Engine: After warming up, idle the engine<br>(More than 140 seconds after starting engine) | | 4 - 100% |
| AC PRESS SEN | • Engine: Idle<br>• Both A/C switch and blower fan switch: ON (Compressor operates) | | 1.0 - 4.0 V |
| VHCL SPEED SE | • Turn drive wheels and compare CONSULT value with the speedometer indication. | | Almost the same speed as the speedometer indication |
| SET VHCL SPD | • Engine: Running | ASCD: Operating | The preset vehicle speed is displayed |
| MAIN SW | • Ignition switch: ON | MAIN switch: Pressed | ON |
| | | MAIN switch: Released | OFF |
| CANCEL SW | • Ignition switch: ON | CANCEL switch: Pressed | ON |
| | | CANCEL switch: Released | OFF |
| RESUME/ACC SW | • Ignition switch: ON | RESUME/ACCELERATE switch: Pressed | ON |
| | | RESUME/ACCELERATE switch: Released | OFF |
| SET SW | • Ignition switch: ON | SET/COAST switch: Pressed | ON |
| | | SET/COAST switch: Released | OFF |
| BRAKE SW1<br>(ASCD brake switch) | • Ignition switch: ON | Brake pedal: Fully released | ON |
| | | Brake pedal: Slightly depressed | OFF |
| BRAKE SW2<br>(Stop lamp switch) | • Ignition switch: ON | Brake pedal: Fully released | OFF |
| | | Brake pedal: Slightly depressed | ON |
| VHCL SPD CUT | • Ignition switch: ON | | NON |
| LO SPEED CUT | • Ignition switch: ON | | NON |
| AT OD MONITOR | • Ignition switch: ON | | OFF |
| AT OD CANCEL | • Ignition switch: ON | | OFF |
| CRUISE LAMP | • Ignition switch: ON | MAIN switch: Pressed at the 1st time → at the 2nd time | ON → OFF |
| SET LAMP | • MAIN switch: ON<br>• When vehicle speed is between 40 km/h (25 MPH) and 144 km/h (89 MPH) | ASCD: Operating | ON |
| | | ASCD: Not operating | OFF |

| Monitor Item | Condition | Values/Status |
|---|---|---|
| ALT DUTY | • Engine: Idle | 0 - 80% |
| A/F ADJ-B1 | • Engine: Running | –0.330 - 0.330 |
| A/F ADJ-B2 | • Engine: Running | –0.330 - 0.330 |
| BAT CUR SEN | • Engine speed: Idle<br>• Battery: Fully charged*2<br>• Selector lever: P or N position<br>• Air conditioner switch: OFF<br>• No load | Approx. 2,600 - 3,500 mV |
| ALT DUTY SIG | • Power generation voltage variable control: Operating | ON |
| | • Power generation voltage variable control: Not operating | OFF |
| HO2 S2 DIAG1 (B1) | DTC P0139 self-diagnosis (delayed response) is incomplete. | INCMP |
| | DTC P0139 self-diagnosis (delayed response) is complete. | CMPLT |
| HO2 S2 DIAG1 (B2) | DTC P0159 self-diagnosis (delayed response) is incomplete. | INCMP |
| | DTC P0159 self-diagnosis (delayed response) is complete. | CMPLT |
| HO2 S2 DIAG2 (B1) | DTC P0139 self-diagnosis (slow response) is incomplete. | INCMP |
| | DTC P0139 self-diagnosis (slow response) is complete. | CMPLT |
| HO2 S2 DIAG2 (B2) | DTC P0159 self-diagnosis (slow response) is incomplete. | INCMP |
| | DTC P0159 self-diagnosis (slow response) is complete. | CMPLT |
| A/F SEN1 DIAG1 (B1) | DTC P015A and P015B self-diagnosis is incomplete. | INCMP |
| | DTC P015A and P015B self-diagnosis is complete. | CMPLT |
| A/F SEN1 DIAG1 (B2) | DTC P015C and P015D self-diagnosis is incomplete. | INCMP |
| | DTC P015C and P015D self-diagnosis is complete. | CMPLT |
| A/F SEN1 DIAG2 (B1) | DTC P014C and P014D self-diagnosis is incomplete. | INCMP |
| | DTC P014C and P014D self-diagnosis is complete. | CMPLT |
| A/F SEN1 DIAG2 (B2) | DTC P014E and P014F self-diagnosis is incomplete. | INCMP |
| | DTC P014E and P014F self-diagnosis is complete. | CMPLT |
| A/F SEN1 DIAG3 (B1) | The vehicle condition is not within the diagnosis range of DTC P014C, P014D, P015A or P015B. | ABSNT |
| | The vehicle condition is within the diagnosis range of DTC P014C, P014D, P015A or P015B. | PRSNT |
| A/F SEN1 DIAG3 (B2) | The vehicle condition is not within the diagnosis range of DTC P014E, P014F, P015C or P015D. | ABSNT |
| | The vehicle condition is within the diagnosis range of DTC P014E, P014F, P015C or P015D. | PRSNT |
| THRTL STK CNT B1*3 | — | — |
| EVAP LEAK DIAG | Ignition switch: ON | Indicates the condition of EVAP leak diagnosis. |
| EVAP DIAG READY | Ignition switch: ON | Indicates the ready condition of EVAP leak diagnosis. |

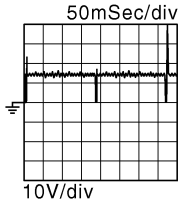
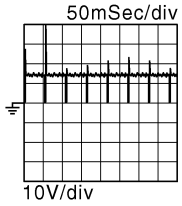
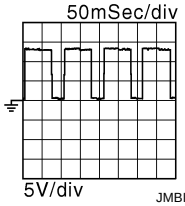
*1: Accelerator pedal position sensor 2 signal and throttle position sensor 2 signal are converted by ECM internally. Thus, they differ from ECM terminals voltage signal.
*2: Before measuring the terminal voltage, confirm that the battery is fully charged. Refer to PG-3, "How to Handle Battery".
*3: The item is indicated, but not used.

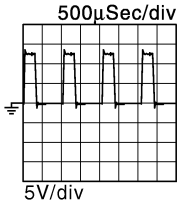
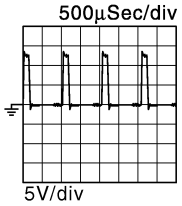
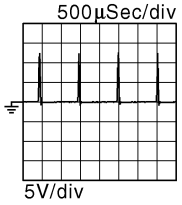
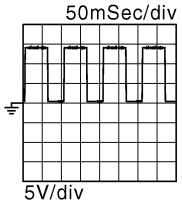
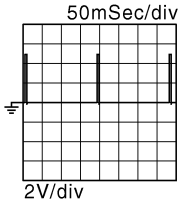
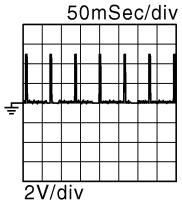
TERMINAL LAYOUT

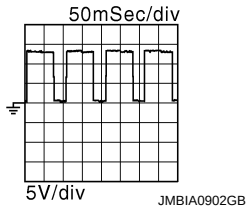
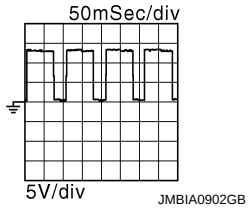


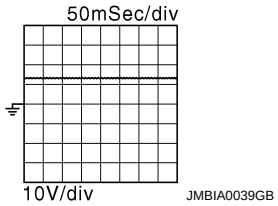
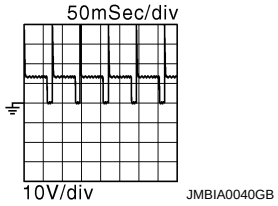

PHYSICAL VALUES

**NOTE:**
- ECM is located in the engine room left side near battery.
- Specification data are reference values.
- Pulse signal is measured by CONSULT.

| Terminal No. | | Description | | Condition | Value (Approx.) |
|---|---|---|---|---|---|
| + | – | Signal name | Input/ Output | | |
| 1 (P/B) | 112 (B) | Fuel injector No. 6 | Output | [Engine is running]<br>• Warm-up condition<br>• Idle speed<br>**NOTE:**<br>The pulse cycle changes depending on rpm at idle | BATTERY VOLTAGE (11 - 14 V)★<br>  <br><br>JMBIA0047GB |
| 3 (L/W) | | Fuel injector No. 5 | | | |
| 29 (LG/R) | | Fuel injector No. 4 | | | |
| 30 (R/Y) | | Fuel injector No. 3 | | [Engine is running]<br>• Warm-up condition<br>• Engine speed: 2,000 rpm | BATTERY VOLTAGE (11 - 14 V)★<br>  <br><br>JMBIA0048GB |
| 31 (R/W) | | Fuel injector No. 2 | | | |
| 32 (R/B) | | Fuel injector No. 1 | | | |
| 2 (G/W) | 112 (B) | Throttle control motor power supply | Input | [Ignition switch: ON] | BATTERY VOLTAGE (11 - 14 V) |
| 4 (BR/Y) | 112 (B) | A/F sensor 1 heater (bank 1) | Output | [Engine is running]<br>• Warm-up condition<br>• Idle speed<br>(More than 140 seconds after starting engine) | 2.9 - 8.8 V★<br>  <br><br>JMBIA0902GB |

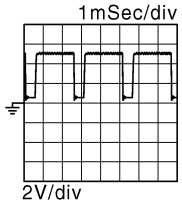
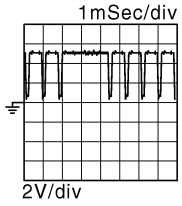
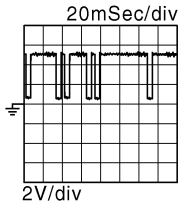
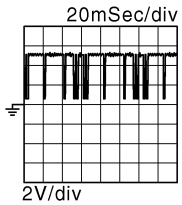
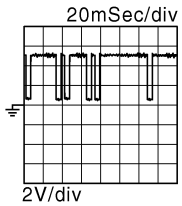
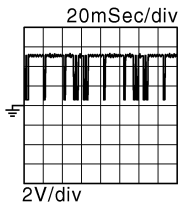
| Terminal No. | | Description | | Condition | Value (Approx.) |
|---|---|---|---|---|---|
| + | – | Signal name | Input/ Output | | |
| 5 (L) | 112 (B) | Throttle control motor (Open) | Output | [Ignition switch: ON]<br>• Engine stopped<br>• Selector lever: D position<br>• Accelerator pedal: Fully depressed | 0 - 14 V★<br>  <br><br>JMBIA0031GB |
| | | | | [Ignition switch: ON]<br>• Engine stopped<br>• Selector lever: D position<br>• Accelerator pedal: Fully released | 0 - 14 V★<br>  <br><br>JMBIA0032GB |
| 6 (P) | 112 (B) | Throttle control motor (Close) | Output | [Ignition switch: ON]<br>• Engine stopped<br>• Selector lever: D position<br>• Accelerator pedal: Fully released | 0 - 14 V★<br>  <br><br>JMBIA1125GB |
| 8 (SB) | 112 (B) | A/F sensor 1 heater (bank 2) | Output | [Engine is running]<br>• Warm-up condition<br>• Idle speed<br>(More than 140 seconds after starting engine) | 2.9 - 8.8 V★<br>  <br><br>JMBIA0030GB |
| 9 (L/B)<br>10 (G/R)<br>11 (Y/R)<br>18 (GR/R)<br>19 (P)<br>21 (W) | 112 (B) | Ignition signal No. 3<br>Ignition signal No. 2<br>Ignition signal No. 1<br>Ignition signal No. 6<br>Ignition signal No. 5<br>Ignition signal No. 4 | Output | [Engine is running]<br>• Warm-up condition<br>• Idle speed<br>**NOTE:**<br>The pulse cycle changes depending on rpm at idle | 0 - 0.2 V★<br>  <br><br>JMBIA0035GB |
| | | | | [Engine is running]<br>• Warm-up condition<br>• Engine speed: 2,000 rpm | 0.1 - 0.4 V★<br>  <br><br>JMBIA0036GB |
| 12 (B) | — | ECM ground | — | — | — |

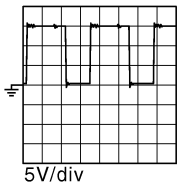
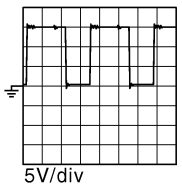
| Terminal No. | | Description | | Condition | Value (Approx.) |
|---|---|---|---|---|---|
| + | – | Signal name | Input/ Output | | |
| 13 (P/B) | 112 (B) | Heated oxygen sensor 2 heater (bank 1) | Output | [Engine is running]<br>• Engine speed: Below 3,600 rpm after the following conditions are met<br>- Engine: after warming up<br>- Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load | 10 V★<br>  <br> |
| | | | | [Ignition switch: ON]<br>• Engine stopped<br>[Engine is running]<br>• Engine speed: Above 3,600 rpm | BATTERY VOLTAGE (11 - 14 V) |
| 14 (GR) | 112 (B) | Fuel pump relay | Output | [Ignition switch: ON]<br>• For 1 second after turning ignition switch ON<br>[Engine is running] | 0 - 1.5 V |
| | | | | [Ignition switch: ON]<br>• More than 1 second after turning ignition switch ON | BATTERY VOLTAGE (11 - 14 V) |
| 15 (O) | 112 (B) | Throttle control motor relay | Output | [Ignition switch: ON → OFF] | 0 - 1.0 V → BATTERY VOLTAGE (11 - 14 V) → 0 V |
| | | | | [Ignition switch: ON] | 0 - 1.0 V |
| 16 (B/Y) | — | ECM ground | — | — | — |
| 17 (R) | 112 (B) | Heated oxygen sensor 2 heater (bank 2) | Output | [Engine is running]<br>• Engine speed: Below 3,600 rpm after the following conditions are met<br>- Engine: after warming up<br>- Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load | 10 V★<br>  <br> |
| | | | | [Ignition switch: ON]<br>• Engine stopped<br>[Engine is running]<br>• Engine speed: Above 3,600 rpm | BATTERY VOLTAGE (11 - 14 V) |
| 24 (W/B) | 112 (B) | ECM relay (Self shut-off) | Output | [Engine is running]<br>[Ignition switch: OFF]<br>• A few seconds after turning ignition switch OFF | 0 - 1.5 V |
| | | | | [Ignition switch: OFF]<br>• More than a few seconds after turning ignition switch OFF | BATTERY VOLTAGE (11 - 14 V) |

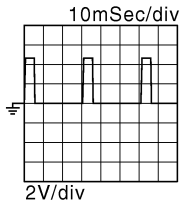
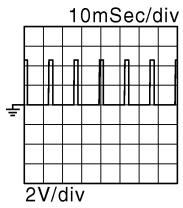
| Terminal No. | | Description | | Condition | Value (Approx.) |
|---|---|---|---|---|---|
| + | – | Signal name | Input/ Output | | |
| 25 (P/L) | 112 (B) | EVAP canister purge volume control solenoid valve | Output | [Engine is running]<br>• Idle speed<br>• Accelerator pedal: Not depressed even slightly, after engine starting | BATTERY VOLTAGE<br>(11 - 14 V)★<br>  <br> |
| | | | | [Engine is running]<br>• Engine speed: approximately 2,000 rpm (More than 100 seconds after starting engine) | BATTERY VOLTAGE<br>(11 - 14 V)★<br>  <br> |
| 26 (GR/B) | 112 (B) | VIAS control solenoid valve 2 | Output | [Engine is running]<br>• Warm-up condition<br>• Idle speed | BATTERY VOLTAGE<br>(11 - 14 V) |
| | | | | [Engine is running]<br>• Warm-up condition<br>• When revving engine up to 5,000 rpm quickly | BATTERY VOLTAGE (11 - 14 V)<br>↓<br>0 - 1.0 V<br>↓<br>BATTERY VOLTAGE (11 - 14 V) |
| 27 (V) | 112 (B) | VIAS control solenoid valve 1 | Output | [Engine is running]<br>• Warm-up condition<br>• Idle speed | BATTERY VOLTAGE<br>(11 - 14 V) |
| | | | | [Engine is running]<br>• Warm-up condition<br>• When revving engine up to 5,000 rpm quickly | BATTERY VOLTAGE (11 - 14 V)<br>↓<br>0 - 1.0 V<br>↓<br>BATTERY VOLTAGE (11 - 14 V) |
| 28 (BR/W) | 112 (B) | Electronic controlled engine mount control solenoid valve | Output | [Engine is running]<br>• Engine speed: For 2 seconds after reaching 950 rpm or less | 0 - 1.0 V |
| | | | | [Engine is running]<br>• Engine speed: After a lapse of 2 seconds after reaching 950 rpm or less | 2.0 - 3.0 V |
| | | | | [Engine is running]<br>• Engine speed: 950 rpm or more | BATTERY VOLTAGE<br>(11 - 14 V) |
| 33 (W) | 112 (B) | Heated oxygen sensor 2 (bank 1) | Input | [Engine is running]<br>• Revving engine from idle to 3,000 rpm quickly after the following conditions are met<br>- Engine: after warming up<br>- Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load | 0 - 1.0 V |

| Terminal No. | | Description | | Condition | Value (Approx.) |
|---|---|---|---|---|---|
| + | – | Signal name | Input/ Output | | |
| 34 (W/L) | 112 (B) | Heated oxygen sensor 2 (bank 2) | Input | [Engine is running]<br>• Revving engine from idle to 3,000 rpm quickly after the following conditions are met<br>- Engine: after warming up<br>- Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load | 0 - 1.0 V |
| 35 (B) | — | Sensor ground (Heated oxygen sensor 2) | — | — | — |
| 36 (B) | — | Sensor ground (Throttle position sensor) | — | — | — |
| 37 (W) | 112 (B) | Throttle position sensor 1 | Input | [Ignition switch: ON]<br>• Engine stopped<br>• Selector lever: D position<br>• Accelerator pedal: Fully released | More than 0.36 V |
| | | | | [Ignition switch: ON]<br>• Engine stopped<br>• Selector lever: D position<br>• Accelerator pedal: Fully depressed | Less than 4.75 V |
| 38 (R) | 112 (B) | Throttle position sensor 2 | Input | [Ignition switch: ON]<br>• Engine stopped<br>• Selector lever: D position<br>• Accelerator pedal: Fully released | Less than 4.75 V |
| | | | | [Ignition switch: ON]<br>• Engine stopped<br>• Selector lever: D position<br>• Accelerator pedal: Fully depressed | More than 0.36 V |
| 39 (R) | 40 (G) | Refrigerant pressure sensor | Input | [Engine is running]<br>• Warm-up condition<br>• Both A/C switch and blower fan motor switch: ON (Compressor operates) | 1.0 - 4.0 V |
| 40 (G) | — | Sensor ground (Refrigerant pressure sensor) | — | — | — |
| 41 (O/B) | 48 (B/P) | Power steering pressure sensor | Output | [Engine is running]<br>• Steering wheel: Being turned | 0.5 - 4.5 V |
| | | | | [Engine is running]<br>• Steering wheel: Not being turned | 0.4 - 0.8 V |
| 42 (BR) | 44 (G/B) | Battery current sensor | Input | [Engine is running]<br>• Battery: Fully charged*2<br>• Idle speed | 2.6 - 3.5 V |
| 44 (G/B) | — | Sensor ground (Battery current sensor) | — | — | — |
| 45 (P) | 49 (L) | A/F sensor 1 (bank 1) | Input | [Ignition switch: ON] | 2.2 V |
| 46 (Y) | 52 (B/R) | Engine coolant temperature sensor | Input | [Engine is running] | 0 - 4.8 V<br>Output voltage varies with engine coolant temperature. |

| Terminal No. | | Description | | Condition | Value (Approx.) |
|---|---|---|---|---|---|
| + | – | Signal name | Input/ Output | | |
| 47 (G) | 36 (B) | Sensor power supply (Throttle position sensor) | — | [Ignition switch: ON] | 5 V |
| 48 (B/P) | — | Sensor ground (Power steering pressure sensor) | — | — | — |
| 49 (L) | 112 (B) | A/F sensor 1 (bank 1) | Input | [Engine is running]<br>• Warm-up condition<br>• Engine speed: 2,000 rpm | 1.8 V<br>Output voltage varies with air fuel ratio. |
| 50 (L/Y) | 56 (G/B) | Intake air temperature sensor | Input | [Engine is running] | 0 - 4.8 V<br>Output voltage varies with intake air temperature. |
| 51 (R/Y) | 44 (G/B) | Sensor power supply (Battery current sensor) | — | [Ignition switch: ON] | 5 V |
| 52 (B/R) | — | Sensor ground (Engine coolant temperature sensor/Engine oil temperature sensor) | — | — | — |
| 53 (V) | 57 (LG) | A/F sensor 1 (bank 2) | Input | [Ignition switch: ON] | 2.2 V |
| 54 (G) | 52 (B/R) | Engine oil temperature sensor | Input | [Engine is running] | 0 - 4.8 V<br>Output voltage varies with engine oil temperature. |
| 55 (SB) | 48 (Y) | Sensor power supply (Power steering pressure sensor) | — | [Ignition switch: ON] | 5 V |
| 56 (G/B) | — | Sensor ground (Mass air flow sensor/Intake air temperature sensor) | — | — | — |
| 57 (LG) | 112 (B) | A/F sensor 1 (bank 2) | Input | [Engine is running]<br>• Warm-up condition<br>• Engine speed: 2,000 rpm | 1.8 V<br>Output voltage varies with air fuel ratio. |
| 58 (O) | 56 (G/B) | Mass air flow sensor | Input | [Engine is running]<br>• Warm-up condition<br>• Idle speed | 0.9 - 1.2 V |
| | | | | [Engine is running]<br>• Warm-up condition<br>• Engine speed: 2,500 rpm | 1.6 - 1.9 V |
| 59 (G/W) | 64 (B/R) | Sensor power supply [Camshaft position sensor (PHASE) (bank 1)] | — | [Ignition switch: ON] | 5 V |
| 60 (Y/B) | — | Sensor ground [Crankshaft position sensor (POS)] | — | — | — |
| 61 (B) | 67 (—) | Knock sensor (bank 1) | Input | [Engine is running]<br>• Idle speed | 2.5 V*1 |
| 62 (W) | 67 (—) | Knock sensor (bank 2) | Input | [Engine is running]<br>• Idle speed | 2.5 V*1 |
| 63 (R/W) | 68 (Y/G) | Sensor power supply [Camshaft position sensor (PHASE) (bank 2)] | — | [Ignition switch: ON] | 5 V |
| 64 (B/R) | — | Sensor ground [Camshaft position sensor (PHASE) (bank 1)] | — | — | — |

| Terminal No. | | Description | | Condition | Value (Approx.) |
|---|---|---|---|---|---|
| + | – | Signal name | Input/ Output | | |
| 65 (W/B) | 60 (Y/B) | Crankshaft position sensor (POS) | Input | [Engine is running]<br>• Warm-up condition<br>• Idle speed<br>**NOTE:**<br>The pulse cycle changes depending on rpm at idle | 4.0 - 5.0 V★<br>  <br><br>JMBIA0041GB |
| | | | | [Engine is running]<br>• Engine speed: 2,000 rpm | 4.0 - 5.0 V★<br>  <br><br>JMBIA0042GB |
| 67 (—) | — | Sensor ground (Knock sensor) | — | — | — |
| 68 (Y/G) | — | Sensor ground [Camshaft position sensor (PHASE) (bank 2)] | — | — | — |
| 69 (BR/W) | 68 (Y/G) | Camshaft position sensor (PHASE) (bank 2) | Input | [Engine is running]<br>• Warm-up condition<br>• Idle speed<br>**NOTE:**<br>The pulse cycle changes depending on rpm at idle | 3.0 - 5.0 V★<br>  <br><br>JMBIA0045GB |
| | | | | [Engine is running]<br>• Engine speed is 2,000 rpm | 3.0 - 5.0 V★<br>  <br><br>JMBIA0046GB |
| 70 (W/R) | 64 (B/R) | Camshaft position sensor (PHASE) (bank 1) | Input | [Engine is running]<br>• Warm-up condition<br>• Idle speed<br>**NOTE:**<br>The pulse cycle changes depending on rpm at idle | 3.0 - 5.0 V★<br>  <br><br>JMBIA0045GB |
| | | | | [Engine is running]<br>• Engine speed is 2,000 rpm | 3.0 - 5.0 V★<br>  <br><br>JMBIA0046GB |

| Terminal No. | | Description | | Condition | Value (Approx.) |
|---|---|---|---|---|---|
| + | – | Signal name | Input/ Output | | |
| 72 (BR/W) | 40 (G) | Sensor power supply (Refrigerant pressure sensor) | — | [Ignition switch: ON] | 5 V |
| 75 (Y) | 112 (B) | Intake valve timing control solenoid valve (bank 2) | Output | [Engine is running]<br>• Warm-up condition<br>• Idle speed | BATTERY VOLTAGE (11 - 14 V) |
| | | | | [Engine is running]<br>• Warm-up condition<br>• Engine speed: 2,000 rpm | 7 - 12 V★<br>  <br>5V/div JMBIA0038GB |
| 76 (R/G) | 60 (Y/B) | Sensor power supply [Crankshaft position sensor (POS)] | — | [Ignition switch: ON] | 5 V |
| 77 (W/L) | 112 (B) | Power supply for ECM (Back-up) | Input | [Ignition switch: OFF] | BATTERY VOLTAGE (11 - 14 V) |
| 78 (R/L) | 112 (B) | Intake valve timing control solenoid valve (bank 1) | Output | [Engine is running]<br>• Warm-up condition<br>• Idle speed | BATTERY VOLTAGE (11 - 14 V) |
| | | | | [Engine is running]<br>• Warm-up condition<br>• Engine speed: 2,000 rpm | 7 - 12 V★<br>  <br>5V/div JMBIA0038GB |
| 81 (W) | 84 (B) | Accelerator pedal position sensor 1 | Input | [Ignition switch: ON]<br>• Engine stopped<br>• Accelerator pedal: Fully released | 0.5 - 1.0 V |
| | | | | [Ignition switch: ON]<br>• Engine stopped<br>• Accelerator pedal: Fully depressed | 4.2 - 4.8 V |
| 82 (O) | 100 (G) | Accelerator pedal position sensor 2 | Input | [Ignition switch: ON]<br>• Engine stopped<br>• Accelerator pedal: Fully released | 0.25 - 0.50 V |
| | | | | [Ignition switch: ON]<br>• Engine stopped<br>• Accelerator pedal: Fully depressed | 2.0 - 2.5 V |
| 83 (BR) | 84 (B) | Sensor power supply (Accelerator pedal position sensor 1) | — | [Ignition switch: ON] | 5 V |
| 84 (B) | — | Sensor ground (Accelerator pedal position sensor 1) | — | — | — |

| Terminal No. | | Description | | Condition | Value (Approx.) |
|---|---|---|---|---|---|
| + | – | Signal name | Input/ Output | | |
| 85 (Y) | 92 (BR) | ASCD steering switch | Input | [Ignition switch: ON]<br>• ASCD steering switch: OFF | 4 V |
| | | | | [Ignition switch: ON]<br>• MAIN switch: Pressed | 0 V |
| | | | | [Ignition switch: ON]<br>• CANCEL switch: Pressed | 1 V |
| | | | | [Ignition switch: ON]<br>• RESUME/ACCELERATE switch: Pressed | 3 V |
| | | | | [Ignition switch: ON]<br>• SET/COAST switch: Pressed | 2 V |
| 86 (SB) | 96 (GR) | EVAP control system pressure sensor | Input | [Ignition switch: ON] | 1.8 - 4.8 V |
| 87 (GR) | 100 (G) | Sensor power supply (Accelerator pedal position sensor 2) | — | [Ignition switch: ON] | 5 V |
| 88 (O) | — | Data link connector | Input/ Output | — | — |
| 91 (L) | 96 (GR) | Sensor power supply (EVAP control system pressure sensor) | — | [Ignition switch: ON] | 5 V |
| 92 (BR) | — | Sensor ground (ASCD steering switch) | — | — | — |
| 93 (BR) | 112 (B) | Ignition switch | Input | [Ignition switch: OFF] | 0 V |
| | | | | [Ignition switch: ON] | BATTERY VOLTAGE (11 - 14 V) |
| 94 (GR) | 112 (B) | Engine speed output signal | Output | [Engine is running]<br>• Warm-up condition<br>• Idle speed<br>**NOTE:**<br>The pulse cycle changes depending on rpm at idle | 1 V★<br>  <br><br>JMBIA0076GB |
| | | | | [Engine is running]<br>• Engine speed: 2,000 rpm | 1 V★<br>  <br><br>JMBIA0077GB |
| 95 (Y) | 104 (SB) | Fuel tank temperature sensor | Input | [Engine is running] | 0 - 4.8 V<br>Output voltage varies with fuel tank temperature. |
| 96 (GR) | — | Sensor ground (EVAP control system pressure sensor) | — | — | — |
| 97 (P) | — | CAN communication line (CAN-L) | Input/ Output | — | — |
| 98 (L) | — | CAN communication line (CAN-H) | Input/ Output | — | — |

| Terminal No. | | Description | | Condition | Value (Approx.) |
|---|---|---|---|---|---|
| + | – | Signal name | Input/ Output | | |
| 100 (G) | — | Sensor ground (Accelerator pedal position sensor 2) | — | — | — |
| 102 (R) | 112 (B) | PNP signal | Input | [Ignition switch: ON]<br>• Selector lever: P or N position | BATTERY VOLTAGE (11 - 14 V) |
| | | | | [Ignition switch: ON]<br>• Selector lever: Except above position | 0 V |
| 104 (SB) | — | Sensor ground (Fuel tank temperature sensor) | — | — | — |
| 105 (V) | 112 (B) | Power supply for ECM | Input | [Ignition switch: ON] | BATTERY VOLTAGE (11 - 14 V) |
| 106 (SB) | 112 (B) | Stop lamp switch | Input | [Ignition switch: OFF]<br>• Brake pedal: Fully released | 0 V |
| | | | | [Ignition switch: OFF]<br>• Brake pedal: Slightly depressed | BATTERY VOLTAGE (11 - 14 V) |
| 107 (B)<br>108 (B) | — | ECM ground | — | — | — |
| 109 (W) | 112 (B) | EVAP canister vent control valve | Output | [Ignition switch: ON] | BATTERY VOLTAGE (11 - 14 V) |
| 110 (G) | 112 (B) | ASCD brake switch | Input | [Ignition switch: ON]<br>• Brake pedal: Slightly depressed | 0 V |
| | | | | [Ignition switch: ON]<br>• Brake pedal: Fully released | BATTERY VOLTAGE (11 - 14 V) |
| 111 (B)<br>112 (B) | — | ECM ground | — | — | — |

★: Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

*1: This may vary depending on internal resistance of the tester.

*2: Before measuring the terminal voltage, confirm that the battery is fully charged. Refer to PG-3, "How to Handle Battery".

# A/C AUTO AMP.

## Reference Value

INFOID:0000000009722102

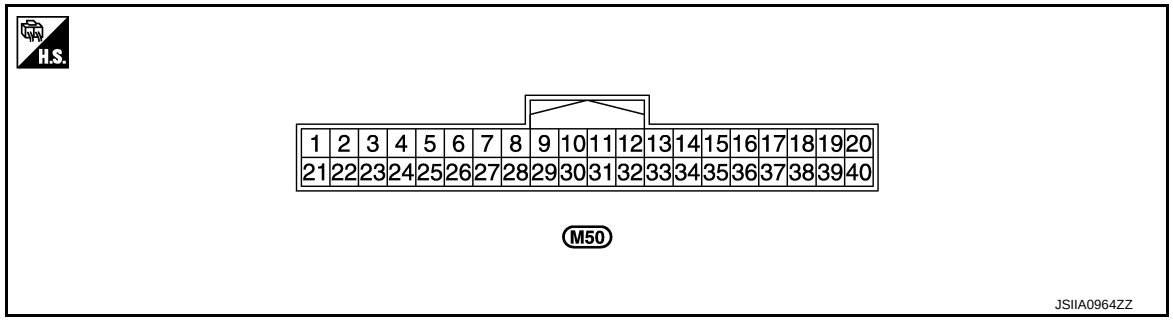
### VALUES ON THE DIAGNOSIS TOOL

**NOTE:**
The following table includes information (items) inapplicable to this vehicle. For information (items) applicable to this vehicle, refer to CONSULT display items.

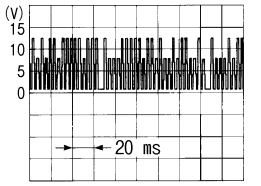
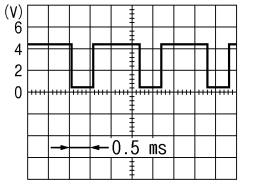
CONSULT MONITOR ITEM

| Monitor item | Condition | | Value/Status |
|---|---|---|---|
| COMP REQ SIG | Engine: Run at idle after warming up | A/C switch: ON (Compressor operation status) | On |
| | | A/C switch: OFF | Off |
| FAN REQ SIG | Engine: Run at idle after warming up | Blower fan: ON | On |
| | | Blower fan: OFF | Off |
| AMB TEMP SEN | Ignition switch ON | — | 22 - 131°F (–30 - 55°C) |
| IN-VEH TEMP | Ignition switch ON | — | 22 - 131°F (–30 - 55°C) |
| INT TEMP SEN | Ignition switch ON | — | 22 - 131°F (–30 - 55°C) |
| SUNLOAD SEN | Ignition switch ON | — | 0 - 1045 w/m$^2$ (0 - 900 kcal/m$^2$·h) |
| AMB SEN CAL | Ignition switch ON | — | 22 - 131°F (–30 - 55°C) |
| IN-VEH CAL | Ignition switch ON | — | 22 - 131°F (–30 - 55°C) |
| INT TEMP CAL | Ignition switch ON | — | 22 - 131°F (–30 - 55°C) |
| SUNL SEN CAL | Ignition switch ON | — | 0 - 1045 w/m$^2$ (0 - 900 kcal/m$^2$·h) |
| FAN DUTY | Engine: Run at idle after warming up | Blower fan: ON | 25 - 81 |
| | | Blower fan: OFF | 0 |
| XM | Ignition switch ON | — | –100 - 155 |
| ENG COOL TEMP | Ignition switch ON | — | Values according to coolant temperature |
| VEHICLE SPEED | Driving | — | Equivalent to speedometer reading |

### TERMINAL LAYOUT

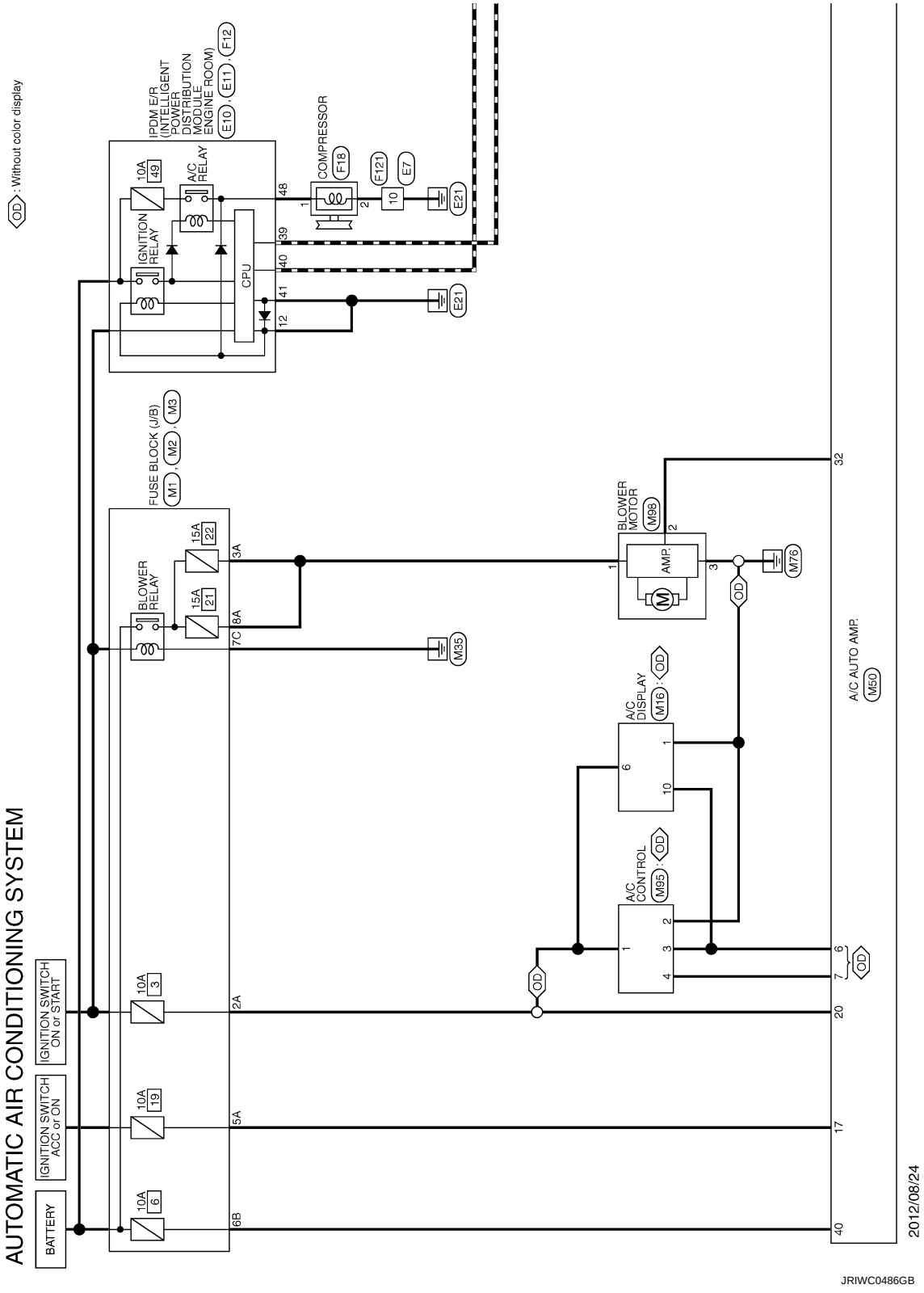


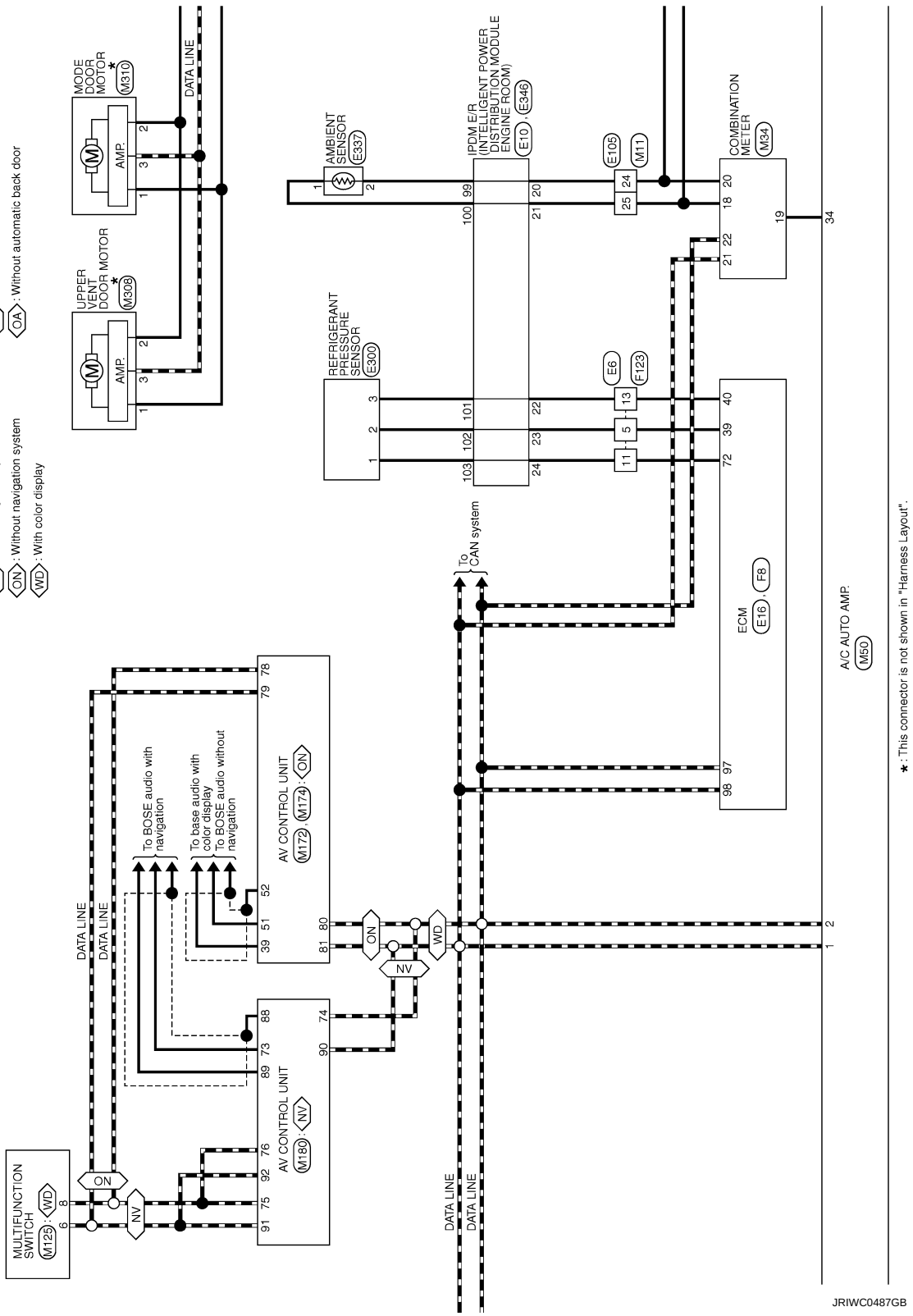

### PHYSICAL VALUES

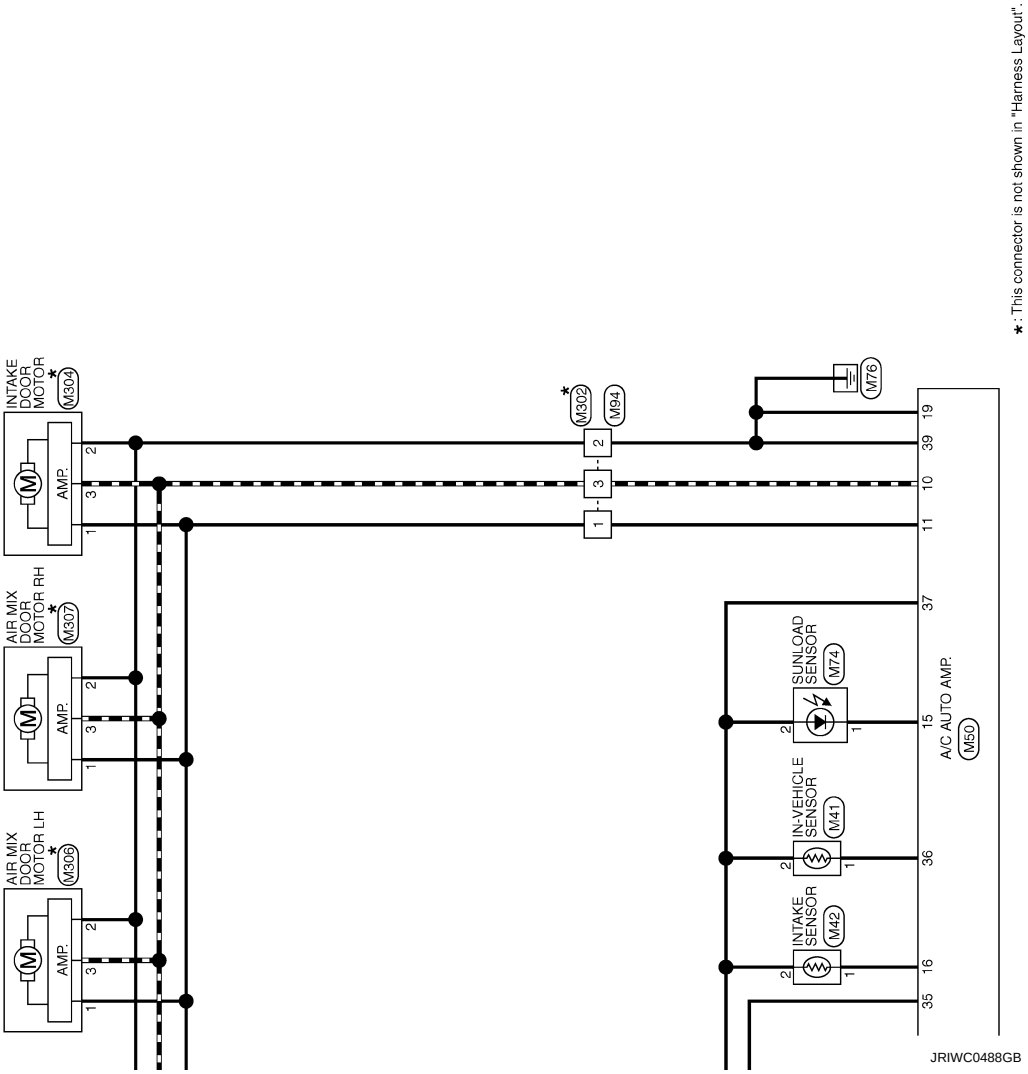
| Terminal No. (Wire color) | | Description | | Condition | Value (Approx.) |
|---|---|---|---|---|---|
| + | − | Signal name | Input/ Output | | |
| 1 (L) | — | CAN-H | Input/ Output | — | — |
| 2 (P) | — | CAN-L | Input/ Output | — | — |
| 6 (L) | Ground | TX (AMP > SW·DISP) | Input | — | — |
| 7 (P) | Ground | RX (SW > AMP) | Output | — | — |
| 10 (G) | Ground | LAN signal | Input/ Output | — |  SJIA1453J |
| 11 (R) | Ground | Power supply for each door motor | Input | Ignition switch ON | Battery voltage |
| 15 (BR) | Ground | Sunload sensor | Input | — | — |
| 16 (R) | Ground | Intake sensor | Input | — | — |
| 17 (W) | Ground | Power supply from ACC | — | Ignition switch ACC | Battery voltage |
| 19 (B) | Ground | Ground | — | Ignition switch ON | 0 V |
| 20 (G) | Ground | Power supply from IGN | — | Ignition switch ON | Battery voltage |
| 32 (L) | Ground | Blower motor control signal | Output | • Ignition switch ON<br>• Blower speed: 1st speed (manual) |  JSIIA0096ZZ |
| 34 (V) | Ground | Power supply for ambient meter | Output | Ignition switch ON | 5V |
| 35 (G) | Ground | Ambient sensor | Input | — | — |
| 36 (LG) | Ground | In-vehicle sensor | Input | — | — |
| 37 (SB) | Ground | Sensor ground | — | Ignition switch ON | 0 V |
| 39 (B) | Ground | Ground | — | Ignition switch ON | 0 V |
| 40 (Y) | Ground | Power supply from BATT | — | Ignition switch OFF | Battery voltage |

## Wiring Diagram - AIR CONDITIONER CONTROL SYSTEM -

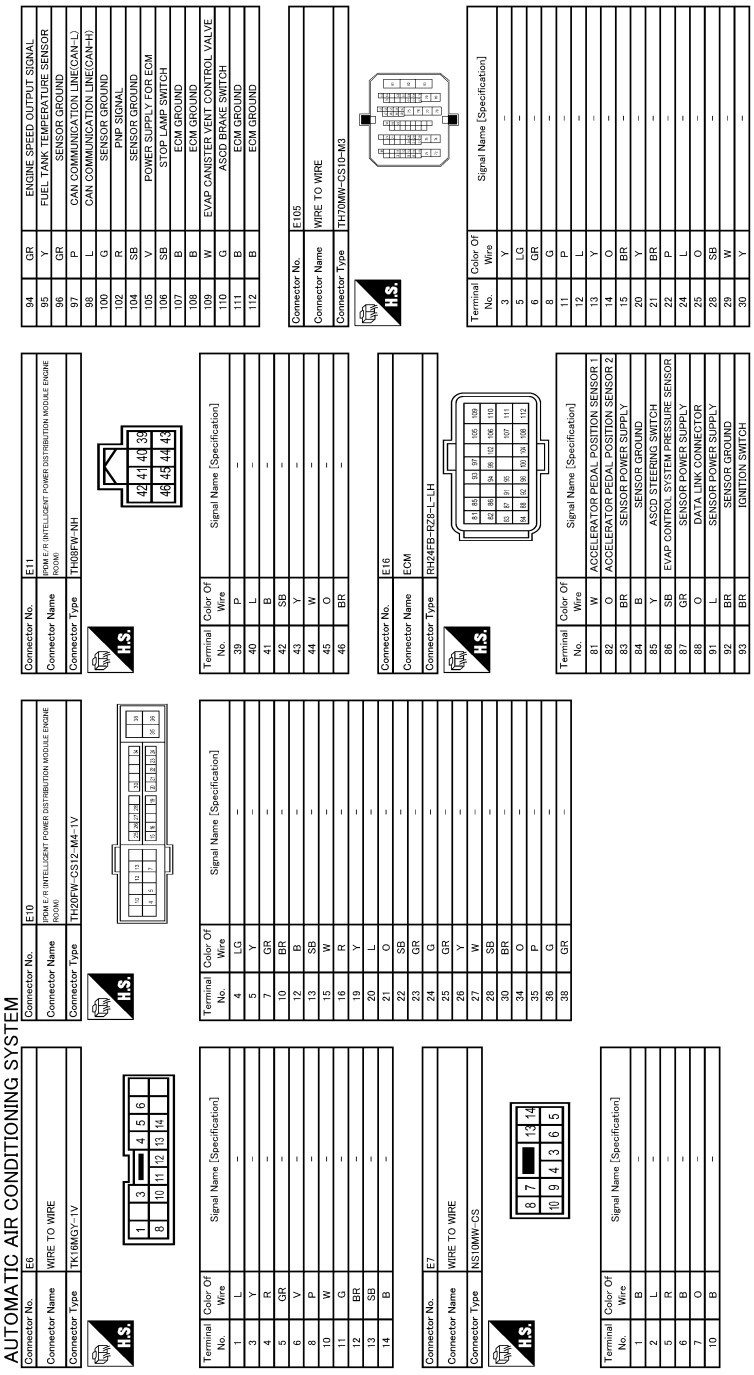
INFOID:0000000009722103




AB : With automatic back door
OA : Without automatic back door
NV : With navigation system
ON : Without navigation system
WD : With color display
MODE DOOR MOTOR * M310
UPPER VENT DOOR MOTOR * M308
AMP.
DATA LINE
AMBIENT SENSOR E337
IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM) E10, E346
COMBINATION METER M34
REFRIGERANT PRESSURE SENSOR E300
E105 M11
E6 F123
To CAN system
ECM E16, F8
A/C AUTO AMP. M50
To BOSE audio with navigation
To base audio with color display
To BOSE audio without navigation
AV CONTROL UNIT M172, M174 : ON
AV CONTROL UNIT M180 : NV
MULTIFUNCTION SWITCH M125 : WD
* : This connector is not shown in "Harness Layout".
JRIWC0487GB


✱: This connector is not shown in "Harness Layout".
INTAKE DOOR MOTOR ✱ M304
AMP.
AIR MIX DOOR MOTOR RH ✱ M307
AMP.
AIR MIX DOOR MOTOR LH ✱ M306
AMP.
✱ M302
M94
M76
SUNLOAD SENSOR M74
IN-VEHICLE SENSOR M41
INTAKE SENSOR M42
A/C AUTO AMP. M50
JRIWC0488GB

AUTOMATIC AIR CONDITIONING SYSTEM

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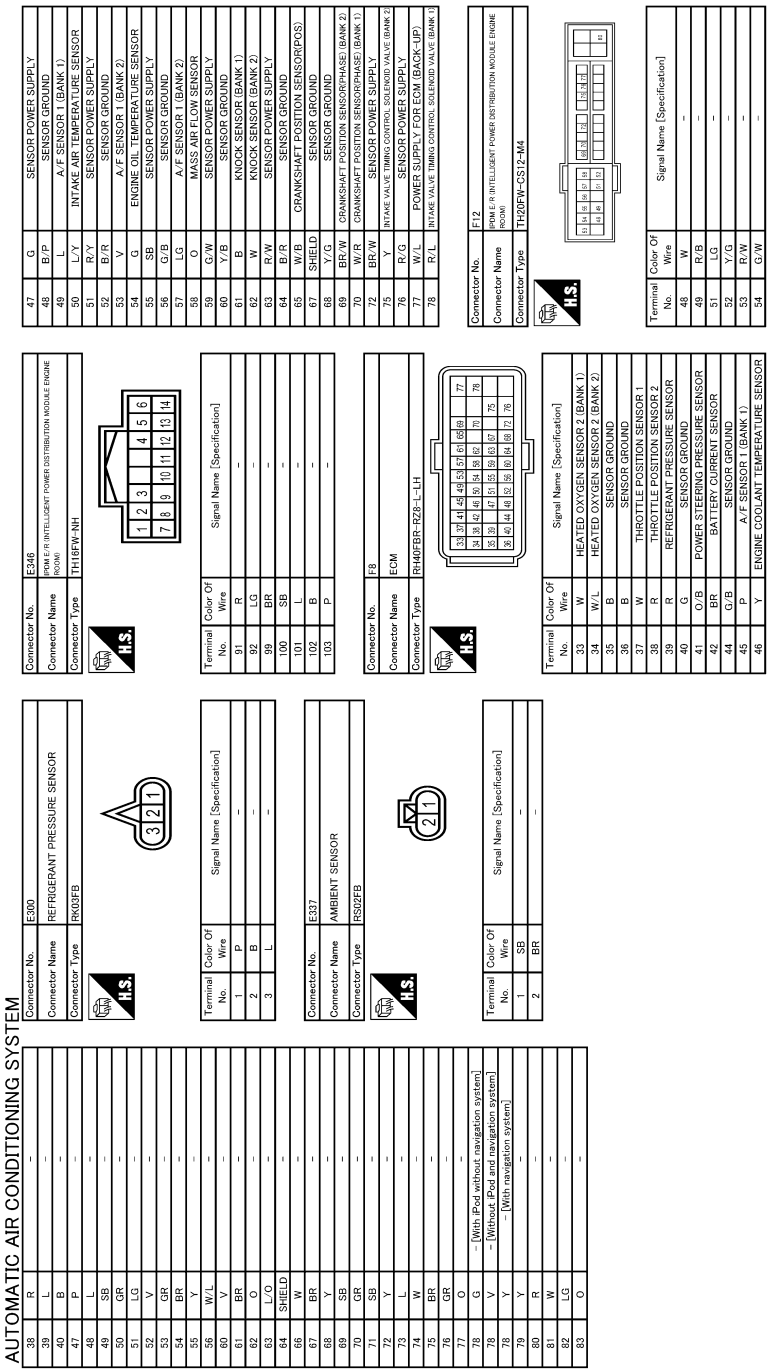


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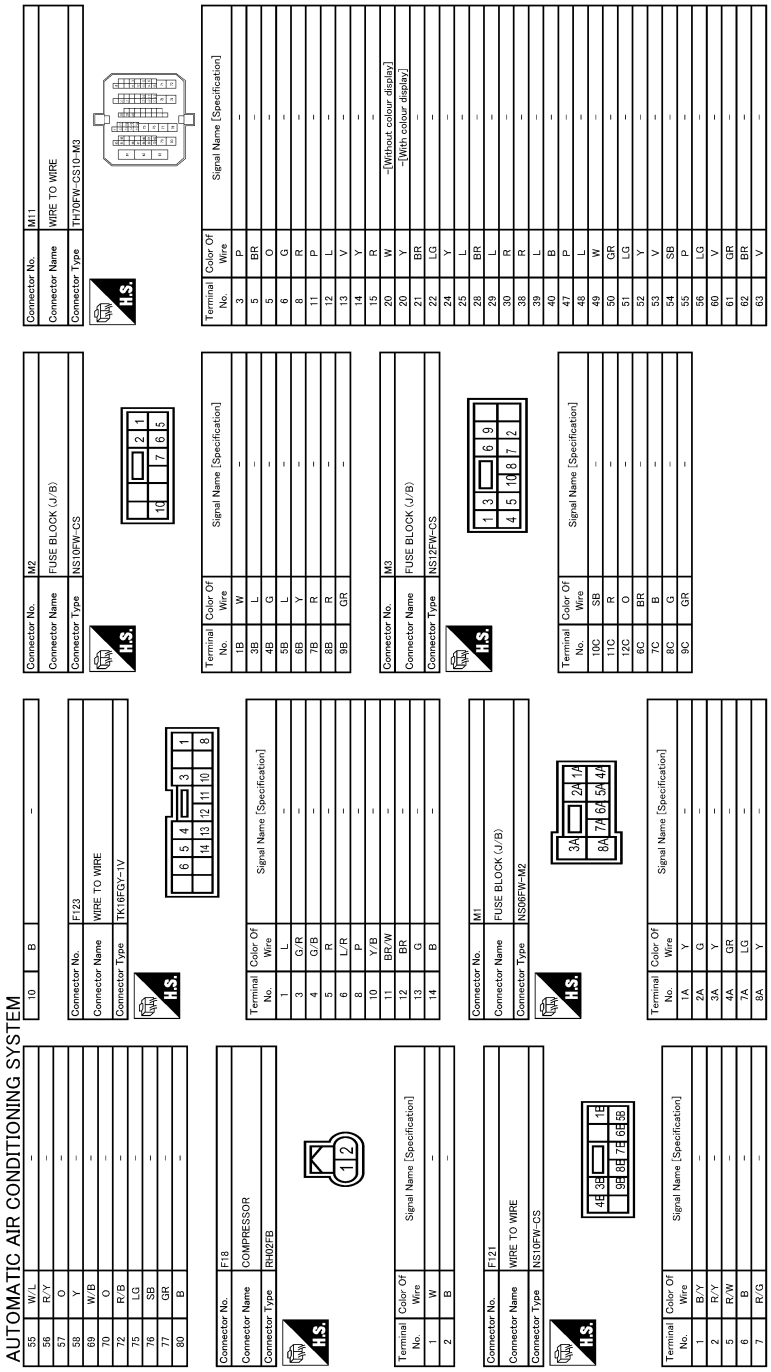


JRIWC1464GB

AUTOMATIC AIR CONDITIONING SYSTEM

| | | |
|---|---|---|
| 64 | SHIELD | – |
| 66 | W | – |
| 67 | R | – |
| 68 | W | – |
| 69 | P | – |
| 70 | G | – |
| 71 | G | – |
| 72 | BR | – |
| 73 | L | – |
| 74 | W | – |
| 75 | BR | – |
| 76 | R | – |
| 77 | G | – |
| 78 | Y | – |
| 79 | G | – |
| 80 | R | – |
| 81 | W | – |
| 82 | W | – |
| 83 | BG | – |

| Connector No. | M16 |
|---|---|
| Connector Name | A/C DISPLAY |
| Connector Type | TH10FB-NH |

H.S.

| Terminal No. | Color Of Wire | Signal Name [Specification] |
|---|---|---|
| 1 | B | GROUND |
| 6 | G | IGN |
| 8 | R | ILL+ |
| 9 | BR | ILL– |
| 10 | L | RX (AMP DISP) |

| Connector No. | M34 |
|---|---|
| Connector Name | COMBINATION METER |
| Connector Type | TH40FW-NH |

H.S.

| Terminal No. | Color Of Wire | Signal Name [Specification] |
|---|---|---|
| 1 | Y | BATTERY POWER SUPPLY |
| 2 | LG | IGN SIGNAL |
| 3 | B | GROUND |
| 4 | B | GROUND |
| 5 | SB | ILLUMINATION CONTROL SIGNAL |
| 8 | SB | TRIP RESET SIGNAL |
| 9 | W | SW ILL POWER |
| 10 | LG | METER CONTROL SWITCH GROUND |
| 11 | L | ENTER SWITCH SIGNAL |
| 12 | R | SELECT SWITCH SIGNAL |
| 13 | V | ILLUMINATION CONTROL SWITCH SIGNAL (–) (With automatic drive positioner) |
| 14 | GR | ILLUMINATION CONTROL SWITCH SIGNAL (–) |
| 15 | BR | AIR BAG SIGNAL |
| 18 | L | AMBIENT SENSOR SIGNAL |
| 19 | P | AMBIENT SENSOR POWER |
| 20 | Y | AMBIENT SENSOR GROUND |
| 21 | L | CAN-H |
| 22 | P | CAN-L |
| 23 | B | GROUND |
| 24 | W | FUEL LEVEL SENSOR GROUND |
| 25 | BR | ALTERNATOR SIGNAL |
| 26 | G | PARKING BRAKE SWITCH SIGNAL |
| 27 | V | BRAKE FLUID LEVEL SWITCH SIGNAL |
| 29 | R | WASHER LEVEL SWITCH SIGNAL |
| 30 | P | VEHICLE SPEED SIGNAL (2-PULSE) |
| 31 | V | VEHICLE SPEED SIGNAL (8-PULSE) |
| 32 | LG | OVERDRIVE CONTROL SWITCH SIGNAL |
| 34 | G | FUEL LEVEL SENSOR SIGNAL |
| 35 | SB | SEAT BELT BUCKLE SWITCH SIGNAL (DRIVER SIDE) |
| 36 | R | SEAT BELT BUCKLE SWITCH SIGNAL (PASSENGER SIDE) |

| Connector No. | M41 |
|---|---|
| Connector Name | IN-VEHICLE SENSOR |
| Connector Type | A02FW |

H.S.

| Terminal No. | Color Of Wire | Signal Name [Specification] |
|---|---|---|
| 1 | LG | – |
| 2 | SB | –[Without colour display] |
| 2 | Y | –[With colour display] |

| Connector No. | M42 |
|---|---|
| Connector Name | INTAKE SENSOR |
| Connector Type | C02FW |

H.S.

| Terminal No. | Color Of Wire | Signal Name [Specification] |
|---|---|---|
| 1 | G | –[With colour display] |
| 1 | R | –[Without colour display] |
| 2 | SB | –[Without colour display] |
| 2 | Y | –[With colour display] |

| Connector No. | M50 |
|---|---|
| Connector Name | A/C AUTO AMP |
| Connector Type | SAB40FW |

H.S.

| Terminal No. | Color Of Wire | Signal Name [Specification] |
|---|---|---|
| 1 | L | CAN–H |
| 2 | P | CAN–L |
| 6 | L | TX (AMP SW & DISP) |
| 7 | P | RX (SW AMP) |
| 10 | G | LAN SIG [Without colour display] |
| 10 | L | LAN SIG [With colour display] |
| 11 | R | VACTR |
| 15 | BR | SUN SENS |
| 16 | G | INTAKE SENS [With colour display] |
| 16 | R | INTAKE SENS [Without colour display] |
| 19 | B | GROUND |
| 20 | G | IGN |
| 26 | GR | RR DEF F/B |
| 27 | BR | RR DEF ON |
| 32 | L | FAN PWM |
| 34 | P | AMB POWER [With colour display] |
| 34 | V | AMB POWER [Without colour display] |
| 35 | G | AMB SENS [Without colour display] |
| 35 | L | AMB SENS [With colour display] |
| 36 | LG | INCAR SENS |
| 37 | SB | SENS GND [Without colour display] |
| 37 | Y | SENS GND [With colour display] |
| 39 | B | GND (POWER) |
| 40 | Y | BAT |

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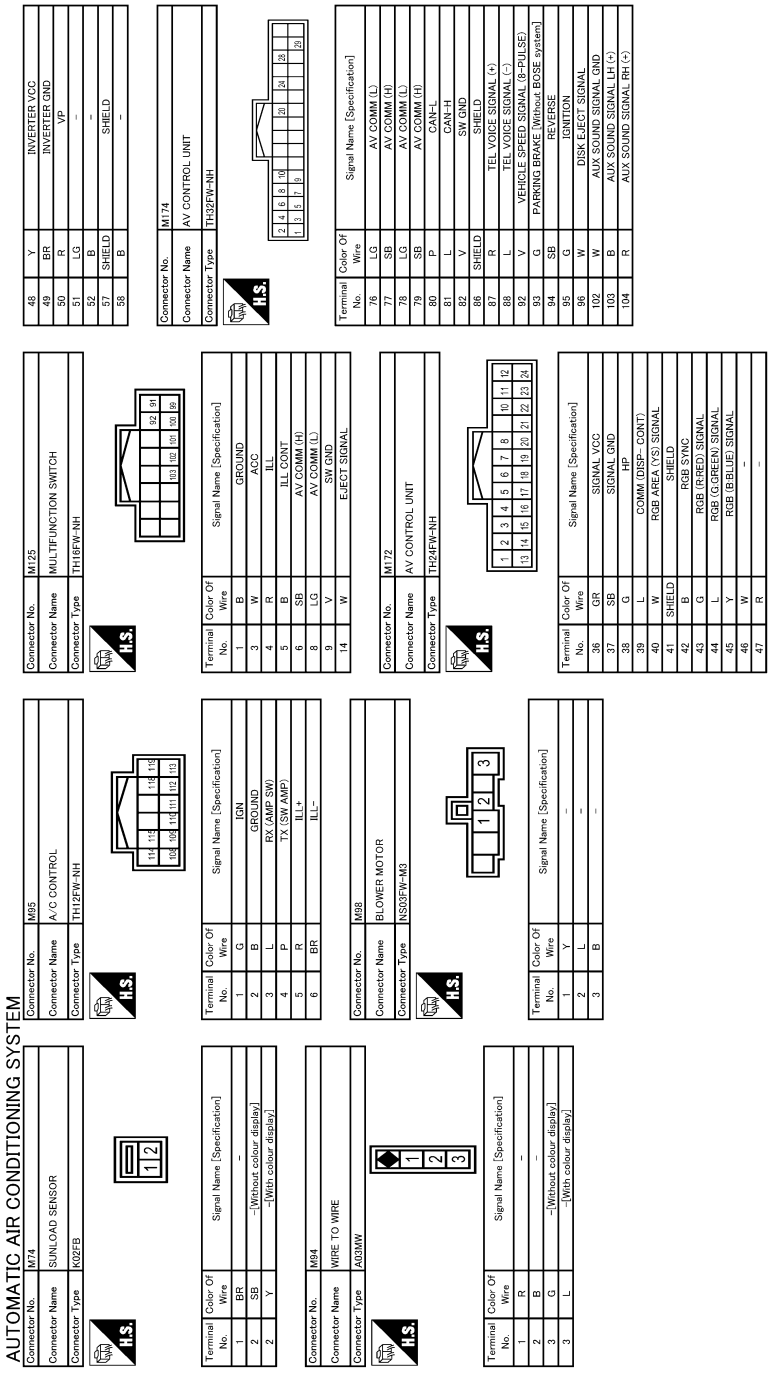


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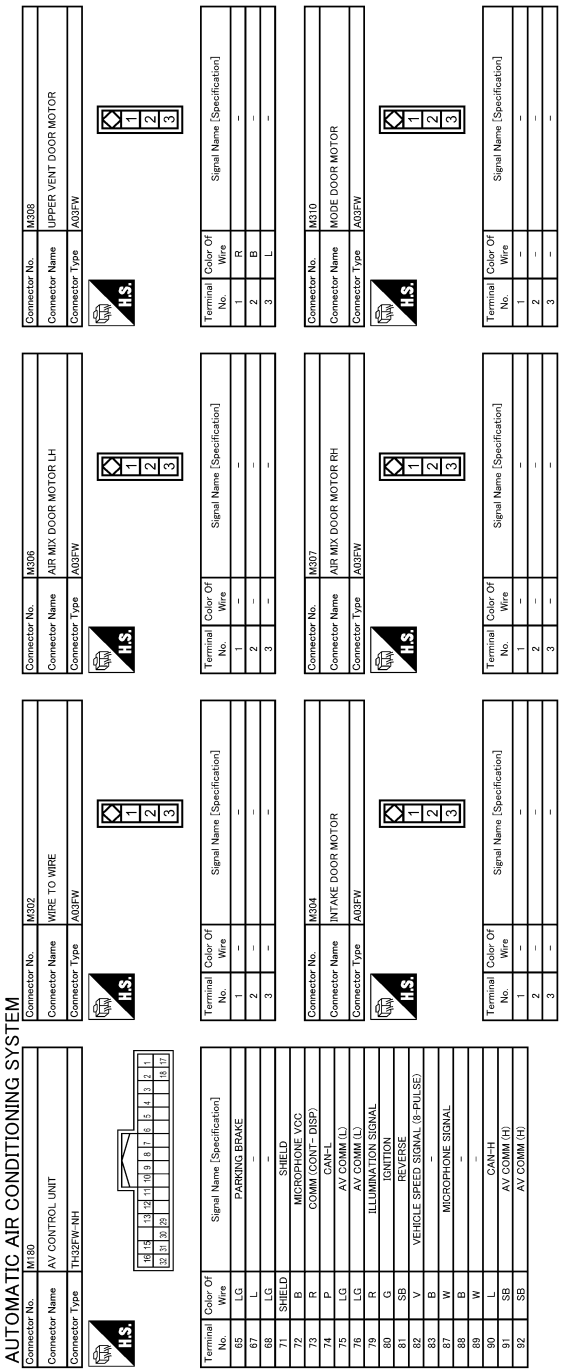


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## Fail-Safe

*INFOID:0000000009722104*

### FAIL-SAFE FUNCTION

If a communication error exists between the A/C auto amp. and A/C control for 30 seconds or longer, air conditioner is controlled under the following conditions:

**Compressor : ON**
**Air outlet : AUTO**
**Air inlet : FRE (Fresh air intake)**
**Fan speed : AUTO**
**Set temperature : Setting before communication error occurs**

## DTC Inspection Priority Chart

INFOID:0000000009722105

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

| Priority | Detected items (DTC) |
|---|---|
| 1 | • U1000: CAN COMM CIRCUIT<br>• U1010: CONTROL UNIT (CAN) |
| 2 | • B2578: IN-VEHICLE SENSOR<br>• B2579: IN-VEHICLE SENSOR<br>• B257B: AMBIENT SENSOR<br>• B257C: AMBIENT SENSOR<br>• B2581: INTAKE SENSOR<br>• B2582: INTAKE SENSOR<br>• B2630: SUNLOAD SENSOR<br>• B2631: SUNLOAD SENSOR<br>• B2632: DR AIR MIX DOOR MOT<br>• B2633: DR AIR MIX DOOR MOT<br>• B2634: PASS AIR MIX DOOR MOT<br>• B2635: PASS AIR MIX DOOR MOT<br>• B2636: DR VENT DOOR FAIL<br>• B2637: DR B/L DOOR FAIL<br>• B2638: DR D/F1 DOOR FAIL<br>• B2639: DR DEF DOOR FAIL<br>• B263D: FRE DOOR FAIL<br>• B263E: 20P FRE DOOR FAIL<br>• B263F: REC DOOR FAIL<br>• B2654: D/F2 DOOR FAIL<br>• B2655: B/L2 DOOR FAIL<br>• B2661: UPPER VENT DOOR MOT<br>• B2662: UPPER VENT DOOR MOT<br>• B2663: UPPER VENT DOOR MOT |

## DTC Index

INFOID:0000000009722106

| DTC | Items (CONSULT screen terms) | Reference |
|---|---|---|
| U1000 | CAN COMM CIRCUIT | HAC-44, "DTC Logic" |
| U1010 | CONTROL UNIT (CAN) | HAC-45, "DTC Logic" |
| B2578 | IN-VEHICLE SENSOR | HAC-49, "DTC Logic" |
| B2579 | IN-VEHICLE SENSOR | HAC-49, "DTC Logic" |
| B257B | AMBIENT SENSOR | HAC-46, "DTC Logic" |
| B257C | AMBIENT SENSOR | HAC-46, "DTC Logic" |
| B2581 | INTAKE SENSOR | HAC-52, "DTC Logic" |
| B2582 | INTAKE SENSOR | HAC-52, "DTC Logic" |
| B2630* | SUNLOAD SENSOR | HAC-55, "DTC Logic" |
| B2631* | SUNLOAD SENSOR | HAC-55, "DTC Logic" |
| B2632 | DR AIR MIX DOOR MOT | HAC-58, "DTC Logic" |
| B2633 | DR AIR MIX DOOR MOT | HAC-58, "DTC Logic" |

| DTC | Items (CONSULT screen terms) | Reference |
|---|---|---|
| B2634 | PASS AIR MIX DOOR MOT | HAC-60, "DTC Logic" |
| B2635 | PASS AIR MIX DOOR MOT | HAC-60, "DTC Logic" |
| B2636 | DR VENT DOOR FAIL | HAC-62, "DTC Logic" |
| B2637 | DR B/L DOOR FAIL | HAC-62, "DTC Logic" |
| B2638 | DR D/F1 DOOR FAIL | HAC-62, "DTC Logic" |
| B2639 | DR DEF DOOR FAIL | HAC-62, "DTC Logic" |
| B263D | FRE DOOR FAIL | HAC-65, "DTC Logic" |
| B263E | 20P FRE DOOR FAIL | HAC-65, "DTC Logic" |
| B263F | REC DOOR FAIL | HAC-65, "DTC Logic" |
| B2654 | D/F2 DOOR FAIL | HAC-62, "DTC Logic" |
| B2655 | B/L2 DOOR FAIL | HAC-62, "DTC Logic" |
| B2661 | UPPER VENT DOOR MOT | HAC-67, "DTC Logic" |
| B2662 | UPPER VENT DOOR MOT | HAC-67, "DTC Logic" |
| B2663 | UPPER VENT DOOR MOT | HAC-67, "DTC Logic" |

*: Perform self-diagnosis under sunshine. When performing indoors, aim a light (more than 60 W) at sunload sensor, otherwise self-diagnosis indicates even though the sunload sensor is functioning normally.

# SYMPTOM DIAGNOSIS

## AIR CONDITIONER CONTROL

### Diagnosis Chart By Symptom

INFOID:0000000009722107

| Symptom | Reference | |
|---|---|---|
| A/C system does not activate. | Go to Trouble Diagnosis Procedure for A/C Control Signal Circuit. | HAC-76, "Diagnosis Procedure" |
| A/C display dose not work. | Go to Trouble Diagnosis Procedure for A/C Display. | HAC-79, "A/C DISPLAY : Diagnosis Procedure" |
| Air outlet does not change. | Go to Trouble Diagnosis Procedure for Mode Door Motor. (LAN) | HAC-63, "Diagnosis Procedure" |
| Mode door motor does not operate normally. | | |
| Discharge air temperature does not change. | Go to Trouble Diagnosis Procedure for Air Mix Door Motor. (LAN) | HAC-59, "Diagnosis Procedure" (driver side) or HAC-61, "Diagnosis Procedure" (passenger side) |
| Air mix door motor does not operate normally. | | |
| Intake door does not change. | Go to Trouble Diagnosis Procedure for Intake Door Motor. (LAN) | HAC-66, "Diagnosis Procedure" |
| Intake door motor does not operate normally. | | |
| Blower motor operation is malfunctioning. | Go to Trouble Diagnosis Procedure for Blower Motor. | HAC-70, "Diagnosis Procedure" |
| Magnet clutch does not engage. | Go to Trouble Diagnosis Procedure for Magnet Clutch. | HAC-74, "Diagnosis Procedure" |
| Insufficient cooling | Go to Trouble Diagnosis Procedure for Insufficient Cooling. | HAC-109, "Inspection procedure" |
| No cool air comes out. (Air flow volume is normal.) | | |
| Insufficient heating | Go to Trouble Diagnosis Procedure for Insufficient Heating. | HAC-112, "Inspection procedure" |
| No warm air comes out. (Air flow volume is normal.) | | |
| Noise | Go to Trouble Diagnosis Procedure for Noise. | HAC-115, "Inspection procedure" |
| Memory function does not operate. | Go to Trouble Diagnosis Procedure for Memory Function. | HAC-117, "Inspection procedure" |

# INSUFFICIENT COOLING

## Description

INFOID:0000000009722108

Symptom
- Insufficient cooling
- No cool air comes out. (Air flow volume is normal.)

## Inspection procedure

INFOID:0000000009722109

### 1. CHECK WITH A GAUGE OF RECOVERY/RECYCLING RECHARGING EQUIPMENT

Connect the recovery/recycling recharging equipment to the vehicle and perform the pressure inspection with the gauge.

Is there refrigerant?

YES >> GO TO 2.
NO-1 >> Check for refrigerant leakages with the refrigerant leakage detecting fluorescent leak detector. Refer to HA-30, "Inspection".
NO-2 >> GO TO 2 after repairing or replacing the parts according to the inspection results.

### 2. CHECK CHARGED REFRIGERANT AMOUNT

1. Connect recovery/recycling recharging equipment to the vehicle and discharge the refrigerant.
2. Recharge with the proper amount of refrigerant and perform the inspection with the refrigerant leakage detecting fluorescent leak detector. Refer to HA-30, "Inspection".

Is the inspection result normal?

YES >> GO TO 3.
NO >> Refill the refrigerant and repair or replace the parts according to the inspection results.

### 3. CHECK REFRIGERANT CYCLE PRESSURE

Connect recovery/recycling recharging equipment to the vehicle and perform the performance test. Refer to HA-28, "Performance Chart".

Is the inspection result normal?

YES >> GO TO 4.
NO >> Perform the diagnosis with the gauge pressure. Refer to HA-8, "Trouble Diagnosis For Unusual Pressure".

### 4. CHECK SETTING OF TEMPERATURE SETTING TRIMMER

Using CONSULT, check the setting of “TEMP SET CORRECT” on “WORK SUPPORT” of HVAC. Refer to HAC-10, "Temperature Setting Trimmer".

1. Check that the temperature setting trimmer is set to “+ direction”.
   **NOTE:**
   The control temperature can be set with the setting of the temperature setting trimmer.
2. Set temperature control dial to “0”.

Are the malfunction solved?

YES >> Perform the setting separately if necessary. END.
NO >> GO TO 5.

### 5. CHECK WITH SELF-DIAGNOSIS FUNCTION OF CONSULT

1. Using CONSULT, perform “SELF-DIAGNOSIS RESULTS” of HVAC.
2. Check if any DTC No. is displayed in the trouble diagnosis results.
   **NOTE:**
   If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to HAC-44, "DTC Logic" or HAC-45, "DTC Logic".

Is any DTC No. displayed?

YES >> Perform the diagnosis that is applicable to the sensor and the door motor. Refer to HAC-106, "DTC Index".
NO >> GO TO 6.

### 6. CHECK WITH ACTIVE TEST OF CONSULT

1. Using CONSULT, perform “HVAC TEST” “ACTIVE TEST” of HVAC to check each output device. Refer to HAC-40, "CONSULT Function".
   **NOTE:**
   Perform the ACTIVE TEST after starting the engine because the compressor is operated.
2. Refer to the table and check the outlet, inlet, air flow temperature, blower motor control signal, magnet clutch operation, and air mix ratio. Visually check each operating condition, by listening for noise, touching air outlets with a hand, etc.

| | Test item | | | | | | |
|---|---|---|---|---|---|---|---|
| | MODE 1 | MODE 2 | MODE 3 | MODE 4 | MODE 5 | MODE 6 | MODE 7 |
| Mode door position | VENT1 | VENT2 | B/L1 | B/L2 | FOOT | D/F | DEF |
| Intake door position | REC | REC | 20%FRE | 20%FRE | FRE | FRE | FRE |
| Air mix door position (driver & passenger side) | FULL COLD | FULL HOT | FULL COLD | FULL HOT | FULL HOT | FULL HOT | FULL HOT |
| Blower motor duty ratio | 35% | 35% | 61% | 61% | 81% | 81% | 35% |
| Compressor (Magnet clutch) | ON | ON | ON | ON | OFF | OFF | ON |
| Upper ventilator door | OPEN | SHUT | OPEN | SHUT | SHUT | SHUT | SHUT |

**NOTE:**
Perform the inspection of each output device after starting the engine because the compressor is operated.

| Discharge air flow | | | | | | | |
|---|---|---|---|---|---|---|---|
| Mode position indication | Condition | Air outlet/distribution | | | | | |
| | | VENT | | | FOOT | | DEF |
| | | Front | Upper | Rear | Front | Rear | |
|  | DUAL switch: OFF<br>UPPER VENT switch : ON | 81% | 8% | 11% | — | — | — |
|  | | 41% | 10% | 17% | 24% | 8% | — |
|  | | 12% | 12% | 16% | 27% | 10% | 23% |
|  | | 11% | 11% | 14% | 25% | 10% | 29% |
|  | | 11% | 11% | 12% | — | — | 66% |

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| Discharge air flow | | | | | | | |
|---|---|---|---|---|---|---|---|
| Mode position indication | Condition | Air outlet/distribution | | | | | |
| | | VENT | | | FOOT | | DEF |
| | | Front | Upper | Rear | Front | Rear | |
|  | DUAL switch: OFF<br>UPPER VENT switch : OFF | 88% | — | 12% | — | — | — |
|  | | 47% | — | 18% | 26% | 9% | — |
|  | | 13% | — | 17% | 33% | 12% | 25% |
|  | | 12% | — | 16% | 28% | 12% | 32% |
|  | | 11% | — | 15% | — | — | 74% |

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Does it operate normally?

YES >> GO TO 7.

NO-1 >> Air outlet does not change. Refer to HAC-63, "Diagnosis Procedure".
NO-2 >> Air inlet does not change. Refer to HAC-66, "Diagnosis Procedure".
NO-3 >> Discharge air temperature does not change. Refer to HAC-59, "Diagnosis Procedure" and HAC-61, "Diagnosis Procedure".
NO-4 >> Blower motor does not operate normally. Refer to HAC-70, "Diagnosis Procedure".
NO-5 >> Magnet clutch does not operate. Refer to HAC-74, "Diagnosis Procedure".

## 7. CHECK AMBIENT TEMPERATURE DISPLAY

Check that there is not much difference between actual ambient temperature and indicated temperature on information display in combination meter.

Is the inspection result normal?

YES >> GO TO 8.
NO >> Perform the diagnosis for the A/C auto amp. connection recognition signal. Refer to MWI-56, "Diagnosis Procedure".

## 8. CHECK DRIVE BELT

Check tension of the drive belt. Refer to EM-17, "Checking".

Is the inspection result normal?

YES >> GO TO 9.
NO >> Adjust or replace drive belt.

## 9. CHECK AIR LEAKAGE FROM DUCT

Check duct and nozzle, etc, of the A/C system for air leakage.

Is the inspection result normal?

YES >> INSPECTION END
NO >> Repair or replace parts according to the inspection results.

# INSUFFICIENT HEATING

## Description

INFOID:0000000009722110

Symptom
- Insufficient heating
- No warm air comes out. (Air flow volume is normal.)

## Inspection procedure

INFOID:0000000009722111

### 1.CHECK COOLING SYSTEM

1. Check engine coolant level and check for leakage. Refer to CO-11, "Inspection".
2. Check radiator cap. Refer to CO-15, "RADIATOR CAP : Inspection".
3. Check water flow sounds of engine coolant. Refer to CO-12, "Refilling".

Is the inspection result normal?

YES >> GO TO 2.
NO >> Refill the engine coolant and repair or replace the parts according to the inspection results.

### 2.CHECK OPERATION

1. Press temperature switch (driver side) and raise temperature setting to 32°C (90°F) after warming up the engine.
2. Check that warm air blows from the outlets.

Is the inspection result normal?

YES >> INSPECTION END
NO >> GO TO 3.

### 3.CHECK SETTING OF TEMPERATURE SETTING TRIMMER

Using CONSULT, check the setting of “TEMP SET CORRECT” on “WORK SUPPORT” of HVAC. Refer to HAC-10, "Temperature Setting Trimmer".

1. Check that the temperature setting trimmer is set to “– direction”.
   **NOTE:**
   The control temperature can be set by the temperature setting trimmer.
2. Set temperature control dial to “0”.

Are the malfunction solved?

YES >> Perform the setting separately if necessary. END.
NO >> GO TO 4.

### 4.CHECK WITH SELF-DIAGNOSIS FUNCTION OF CONSULT

1. Using CONSULT, perform “SELF-DIAGNOSIS RESULTS” of HVAC.
2. Check if any DTC No. is displayed in the trouble diagnosis results.
   **NOTE:**
   If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to HAC-44, "DTC Logic" or HAC-45, "DTC Logic".

Is any DTC No. displayed?

YES >> Perform the diagnosis that is applicable to the sensor and the door motor. Refer to HAC-106, "DTC Index".
NO >> GO TO 5.

### 5.CHECK WITH ACTIVE TEST OF CONSULT

1. Using CONSULT, perform “HVAC TEST” in “ACTIVE TEST” of HVAC to check each output device. Refer to HAC-40, "CONSULT Function".
   **NOTE:**
   Perform the ACTIVE TEST after starting the engine because the compressor is operated.
2. Refer to the table and check the outlet, inlet, air flow temperature, blower motor control signal, magnet clutch operation, and air mix ratio. Visually check each operating condition, by listening for noise, touching air outlets with a hand, etc.

| | Test item | | | | | | |
|---|---|---|---|---|---|---|---|
| | MODE 1 | MODE 2 | MODE 3 | MODE 4 | MODE 5 | MODE 6 | MODE 7 |
| Mode door position | VENT1 | VENT2 | B/L1 | B/L2 | FOOT | D/F | DEF |
| Intake door position | REC | REC | 20%FRE | 20%FRE | FRE | FRE | FRE |
| Air mix door position (driver & passenger side) | FULL COLD | FULL HOT | FULL COLD | FULL HOT | FULL HOT | FULL HOT | FULL HOT |
| Blower motor duty ratio | 35% | 35% | 61% | 61% | 81% | 81% | 35% |
| Compressor (Magnet clutch) | ON | ON | ON | ON | OFF | OFF | ON |
| Upper ventilator door | OPEN | SHUT | OPEN | SHUT | SHUT | SHUT | SHUT |

**NOTE:**
Perform the inspection of each output device after starting the engine because the compressor is operated.

| Discharge air flow | | | | | | | |
|---|---|---|---|---|---|---|---|
| Mode position indication | Condition | Air outlet/distribution | | | | | |
| | | VENT | | | FOOT | | DEF |
| | | Front | Upper | Rear | Front | Rear | |
|  | DUAL switch: OFF<br>UPPER VENT switch : ON | 81% | 8% | 11% | — | — | — |
|  | | 41% | 10% | 17% | 24% | 8% | — |
|  | | 12% | 12% | 16% | 27% | 10% | 23% |
|  | | 11% | 11% | 14% | 25% | 10% | 29% |
|  | | 11% | 11% | 12% | — | — | 66% |

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| Discharge air flow | | | | | | | |
|---|---|---|---|---|---|---|---|
| Mode position indication | Condition | Air outlet/distribution | | | | | |
| | | VENT | | | FOOT | | DEF |
| | | Front | Upper | Rear | Front | Rear | |
|  | DUAL switch: OFF<br>UPPER VENT switch : OFF | 88% | — | 12% | — | — | — |
|  | | 47% | — | 18% | 26% | 9% | — |
|  | | 13% | — | 17% | 33% | 12% | 25% |
|  | | 12% | — | 16% | 28% | 12% | 32% |
|  | | 11% | — | 15% | — | — | 74% |

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Does it operate normally?

YES >> GO TO 6.
NO-1 >> Air outlet does not change. Refer to HAC-63, "Diagnosis Procedure".
NO-2 >> Air inlet does not change. Refer to HAC-66, "Diagnosis Procedure".
NO-3 >> Discharge air temperature does not change. Refer to HAC-59, "Diagnosis Procedure" and HAC-61, "Diagnosis Procedure".
NO-4 >> Blower motor does not operate normally. Refer to HAC-70, "Diagnosis Procedure".
NO-5 >> Magnet clutch does not operate. Refer to HAC-74, "Diagnosis Procedure".

## 6. CHECK AIR LEAKAGE FROM DUCT

Check duct and nozzle, etc, of the A/C system for air leakage.

Is the inspection result normal?

YES >> GO TO 7.
NO >> Repair or replace parts according to the inspection results.

## 7. CHECK HEATER HOSE INSTALLATION CONDITION

Check the heater hose installation condition visually (for twists, crushes, etc.).

Is the inspection result normal?

YES >> GO TO 8.
NO >> Repair or replace parts according to the inspection results.

## 8. CHECK TEMPERATURE OF HEATER HOSE

1. Check the temperature of inlet hose and outlet hose of heater core.
2. Check that the inlet side of heater core is hot and the outlet side is slightly lower than/almost equal to the inlet side.

**CAUTION:**
**Always perform the temperature inspection in a short period of time because the engine coolant temperature is very hot.**

Is the inspection result normal?

YES >> GO TO 9.
NO >> Replace the heater core after performing the procedures after the cooling system inspection. GO TO 1.

## 9. REPLACE HEATER CORE

Replace the heater core. Refer to VTL-47, "Exploded View".

Are the malfunction solved?

YES >> INSPECTION END
NO >> Perform the procedures again after the cooling system inspection. GO TO 1.

# NOISE

## Description

INFOID:0000000009722112

Symptom
- Noise
- Noise is heard when the A/C system operates.

## Inspection procedure

INFOID:0000000009722113

### 1.CHECK OPERATION

1. Operate the A/C system and check the operation. Refer to HAC-8, "Description & Inspection".
2. Check the parts where noise is occurring.

Can the parts where noise is occurring be checked?

YES-1 >> Noise from blower motor: GO TO 2.
YES-2 >> Noise from compressor: GO TO 3.
YES-3 >> Noise from expansion valve: GO TO 4.
YES-4 >> Noise from A/C piping (pipe, flexible hose): GO TO 6.
YES-5 >> Noise from drive belt: GO TO 7.
NO >> INSPECTION END

### 2.CHECK BLOWER MOTOR

1. Remove blower motor.
2. Remove foreign materials that are in the blower unit.
3. Check the noise from blower motor again.

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace blower motor.

### 3.CHECK COMPRESSOR

Perform trouble diagnosis for the compressor and check the compressor. Refer to HA-11, "Symptom Table".

Is the inspection result normal?

YES >> INSPECTION END
NO >> Refill the refrigerant or replace the compressor according to the inspection results.

### 4.CHECK WITH GAUGE PRESSURE

Perform the diagnosis with the gauge pressure. Refer to HA-8, "Trouble Diagnosis For Unusual Pressure".

Is the inspection result normal?

YES >> GO TO 5.
NO >> Repair or replace parts according to the inspection results.

### 5.CHECK EXPANSION VALVE

1. Correct the refrigerant with recovery/recycling recharging equipment.
2. Recharge with the proper amount of the collected refrigerant after recycling or new refrigerant.
3. Check for the noise from expansion valve again.

Are the malfunction solved?

YES >> INSPECTION END
NO >> Replace expansion valve.

### 6.CHECK A/C PIPING (PIPE, FLEXIBLE HOSE)

1. Check the A/C piping (pipes, flexible hoses) (for deformation and damage, etc.).
2. Check the installation condition of clips and brackets, etc, of the A/C piping (pipes, flexible hoses).

Is the inspection result normal?

YES >> Fix the line with rubber or come vibration absorbing material.
NO >> Repair or replace parts according to the inspection results.

### 7.CHECK DRIVE BELT

Check tension of the drive belt. Refer to EM-17, "Checking".

Is the inspection result normal?

YES >> Check the noise from compressor: GO TO 3.
NO >> Adjust or replace drive belt according to the inspection results.

# MEMORY FUNCTION DOES NOT OPERATE

## Description

INFOID:0000000009722114

Symptom
- Memory function does not operate normally.
- The setting is not maintained. (It returns to the initial condition.)

## Inspection procedure

INFOID:0000000009722115

### 1.CHECK OPERATION

1. Set temperature control switch to 32°C (90°F).
2. Press the ON/OFF switch.
3. Turn the ignition switch OFF.
4. Turn the ignition switch ON.
5. Press the AUTO switch.
6. Check that the set temperature is maintained.

Is the inspection result normal?

YES >> INSPECTION END
NO >> GO TO 2.

### 2.CHECK POWER SUPPLY AND GROUND CIRCUIT OF A/C AUTO AMP.

Check power supply and ground circuit of the A/C auto amp. Refer to HAC-77, "A/C AUTO AMP. : Diagnosis Procedure".

Is the inspection result normal?

YES >> Replace the A/C auto amp.
NO >> Repair or replace malfunctioning parts.

# PRECAUTION

## PRECAUTIONS
## FOR USA AND CANADA

### FOR USA AND CANADA : Precaution for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER"

INFOID:0000000009722116

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 AIR BAG” and “SEAT BELT” of this Service Manual.

**WARNING:**

**Always observe the following items for preventing accidental activation.**

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision that 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 “SRS AIR BAG”.**
- **Never use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

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

**WARNING:**

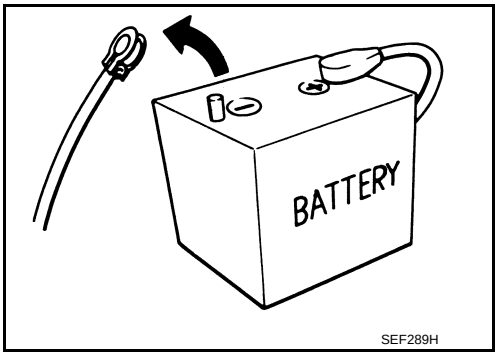
**Always observe the following items for preventing accidental activation.**

- **When working near the Air Bag Diagnosis Sensor Unit or other Air Bag System sensors with the ignition ON or engine running, never use air or electric power tools or strike near the sensor(s) with a hammer. Heavy vibration could activate the sensor(s) and deploy the air bag(s), possibly causing serious injury.**
- **When using air or electric power tools or hammers, always switch the ignition OFF, disconnect the battery, and wait at least 3 minutes before performing any service.**

### FOR USA AND CANADA : Precautions for Removing of Battery Terminal

INFOID:0000000010092838

- When removing the 12V battery terminal, turn OFF the ignition switch and wait at least 30 seconds.
  **NOTE:**
  ECU may be active for several tens of seconds after the ignition switch is turned OFF. If the battery terminal is removed before ECU stops, then a DTC detection error or ECU data corruption may occur.
- For vehicles with the 2-batteries, be sure to connect the main battery and the sub battery before turning ON the ignition switch.
  **NOTE:**
  If the ignition switch is turned ON with any one of the terminals of main battery and sub battery disconnected, then DTC may be detected.



SEF289H

- After installing the 12V battery, always check "Self Diagnosis Result" of all ECUs and erase DTC.
  **NOTE:**
  The removal of 12V battery may cause a DTC detection error.

### FOR USA AND CANADA : Working with HFC-134a (R-134a)

INFOID:0000000009722117

**CAUTION:**

- **CFC-12 (R-12) refrigerant and HFC-134a (R-134a) refrigerant are not compatible. Compressor malfunction is likely to occur if the refrigerants are mixed, refer to “CONTAMINATED REFRIGERANT”**

**below. To determine the purity of HFC-134a (R-134a) in the vehicle and recovery tank, use Refrigerant Recovery/Recycling Recharging equipment and Refrigerant Identifier.**
- **Use only specified lubricant for the HFC-134a (R-134a) A/C system and HFC-134a (R-134a) components. Compressor malfunction is likely to occur if lubricant other than that specified is used.**
- **The specified HFC-134a (R-134a) lubricant rapidly absorbs moisture from the atmosphere. The following handling precautions must be observed:**
- **Immediately cap (seal) the component to minimize the entry of moisture from the atmosphere when removing refrigerant components from a vehicle.**
- **Never remove the caps (unseal) until just before connecting the components when installing refrigerant components to a vehicle. Connect all refrigerant loop components as quickly as possible to minimize the entry of moisture into system.**
- **Use only the specified lubricant from a sealed container. Immediately reseal containers of lubricant. Lubricant becomes moisture saturated and should not be used without proper sealing.**
- **Never allow lubricant (NISSAN A/C System Oil Type S) to come in to contact with styrene foam parts. Damage may result.**

CONTAMINATED REFRIGERANT

**Take the appropriate steps shown below if a refrigerant other than pure HFC-134a (R-134a) is identified in a vehicle:**
- Explain to the customer that environmental regulations prohibit the release of contaminated refrigerant into the atmosphere.
- Explain that recovery of the contaminated refrigerant could damage service equipment and refrigerant supply.
- Suggest the customer return the vehicle to the location of previous service where the contamination may have occurred.
- If repairing, recover the refrigerant using only **dedicated equipment and containers. Never reintroduce contaminated refrigerant into the existing service equipment.** Contact a local refrigerant product retailer for available service if the facility does not have dedicated recovery equipment. This refrigerant must be disposed of in accordance with all federal and local regulations. In addition, replacement of all refrigerant system components on the vehicle is recommended.
- The air conditioner warranty is void if the vehicle is within the warranty period. Please contact Nissan Customer Affairs for further assistance.

## FOR USA AND CANADA : General Refrigerant Precaution

INFOID:0000000009722118

**WARNING:**
- **Never breath A/C refrigerant, lubricant vapor or mist. Exposure may irritate eyes, nose and throat. Remove HFC-134a (R-134a) from the A/C system, using certified service equipment meeting requirements of SAE J-2210 [HFC-134a (R-134a) recycling equipment], or J-2209 [HFC-134a (R-134a) recovery equipment]. Ventilate work area before resuming service if accidental system discharge occurs. Additional health and safety information may be obtained from refrigerant and lubricant manufacturers.**
- **Never release refrigerant into the air. Use approved recovery/recycling equipment to capture the refrigerant each time an air conditioning system is discharged.**
- **Always wear eye and hand protection (goggles and gloves) when working with any refrigerant or air conditioning system.**
- **Never store or heat refrigerant containers above 52°C (126°F).**
- **Never heat a refrigerant container with an open flame. Place the bottom of the container in a warm pail of water if container warming is required.**
- **Never intentionally drop, puncture, or incinerate refrigerant containers.**
- **Keep refrigerant away from open flames. Poisonous gas is produced if refrigerant burns.**
- **Refrigerant displaces oxygen, therefore be certain to work in well ventilated areas to prevent suffocation.**
- **Never pressure test or leakage test HFC-134a (R-134a) service equipment and/or vehicle air conditioning systems with compressed air during repair. Some mixtures of air and HFC-134a (R-134a) have been shown to be combustible at elevated pressures. These mixtures, if ignited, may cause injury or property damage. Additional health and safety information may be obtained from refrigerant manufacturers.**

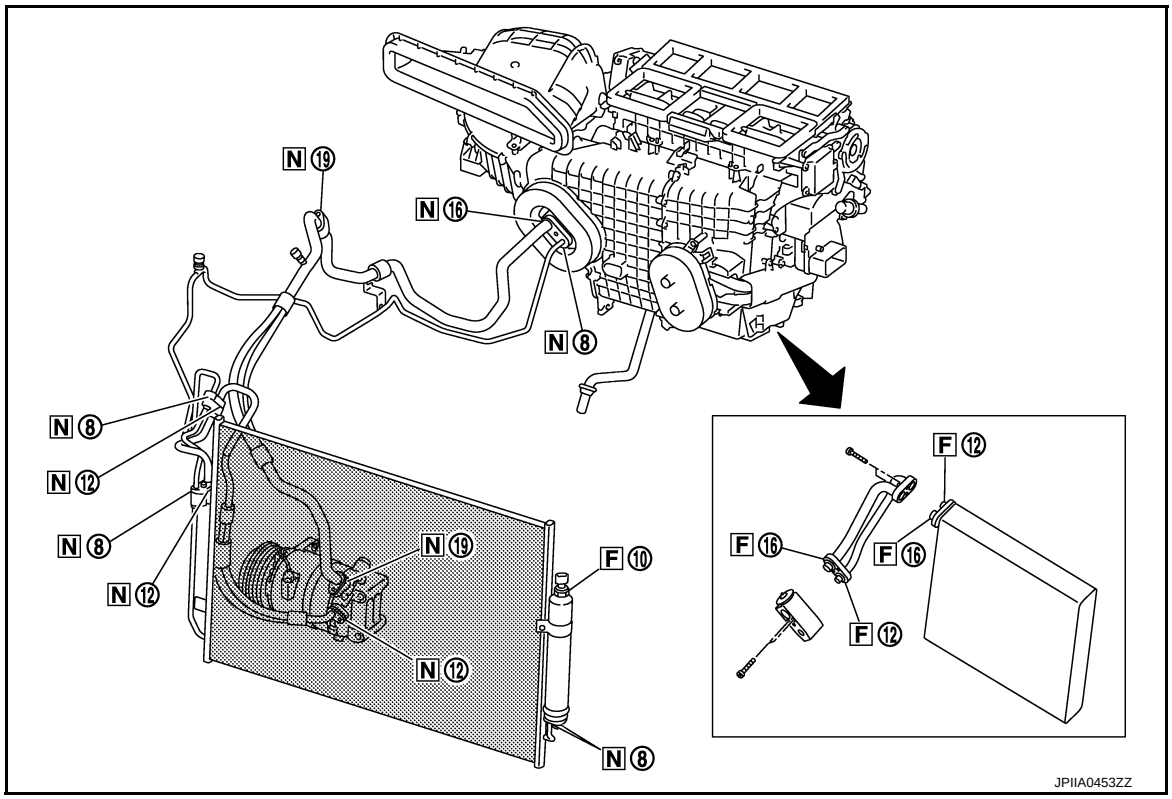
## FOR USA AND CANADA : Refrigerant Connection

INFOID:0000000009722119

A new type refrigerant connection has been introduced to all refrigerant lines except the following location.

- Expansion valve to evaporator
- Refrigerant pressure sensor to liquid tank

O-RING AND REFRIGERANT CONNECTION




F. Former type refrigerant connection N. New type refrigerant connection

O: O-ring size

**CAUTION:**

**The new and former refrigerant connections use different O-ring configurations. Never confuse O-rings since they are not interchangeable. Refrigerant may leak at the connection if a wrong O-ring is installed.**

O-Ring Part Numbers and Specifications

| Connection type | Piping connection point | | Part number | QTY | O-ring size |
|---|---|---|---|---|---|
| New | Low-pressure flexible hose to low-pressure pipe | | 92474 N8210 | 1 | ϕ19 |
| | High-pressure pipe to condenser pipe assembly (Outlet) | | 92471 N8210 | 1 | ϕ8 |
| | Condenser pipe assembly (Inlet) to high-pressure flexible hose (One-touch joint) | | 92472 N8210 | 1 | ϕ12 |
| | Condenser assembly to condenser pipe assembly | Inlet | 92472 N8210 | 1 | ϕ12 |
| | | Outlet | 92471 N8210 | 1 | ϕ8 |
| | Low-pressure pipe to expansion valve | | 92473 N8210 | 1 | ϕ16 |
| | High-pressure pipe to expansion valve | | 92471 N8210 | 1 | ϕ8 |
| | Compressor to low-pressure flexible hose | | 92474 N8210 | 1 | ϕ19 |
| | Compressor to high-pressure flexible hose | | 92472 N8210 | 1 | ϕ12 |
| | Liquid tank to condenser assembly | Inlet | 92471 N8210 | 1 | ϕ8 |
| | | Outlet | | 1 | |

| Connection type | Piping connection point | | Part number | QTY | O-ring size |
|---|---|---|---|---|---|
| Former | Refrigerant pressure sensor to liquid tank | | J2476 89956 | 1 | ϕ10 |
| | Expansion valve to evaporator pipe assembly | Inlet | 92475 71L00 | 1 | ϕ12 |
| | | Outlet | 92475 72L00 | 1 | ϕ16 |
| | Evaporator to evaporator pipe assembly | Inlet | 92475 71L00 | 1 | ϕ12 |
| | | Outlet | 92475 72L00 | 1 | ϕ16 |

**WARNING:**

**Check that all refrigerant is discharged into the recycling equipment and the pressure in the system is less than atmospheric pressure. Then gradually loosen the discharge side hose fitting and remove it.**

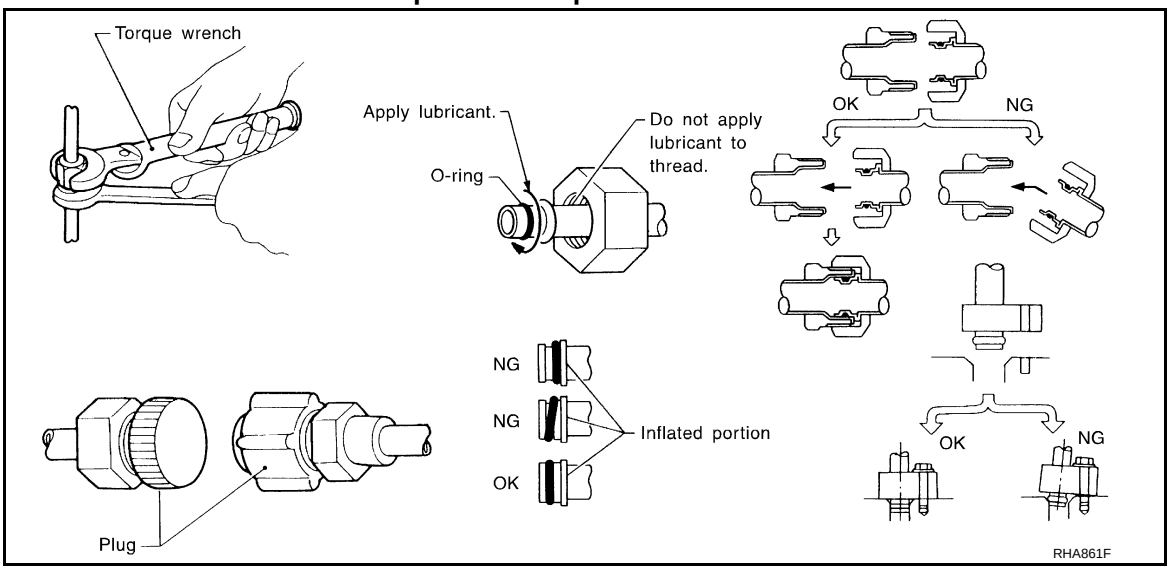
**CAUTION:**

**Observe the following when replacing or cleaning refrigerant cycle components.**

- **Store it in the same way at it is when mounted on the car when the compressor is removed. Failure to do so will cause lubricant to enter the low-pressure chamber.**
- **Always use a torque wrench and a back-up wrench when connecting tubes.**
- **Immediately plug all openings to prevent entry of dust and moisture after disconnecting tubes.**
- **Connect the pipes at the final stage of the operation when installing an air conditioner in the vehicle. Never remove the seal caps of pipes and other components until just before required for connection.**
- **Allow components stored in cool areas to warm to working area temperature before removing seal caps. This prevents condensation from forming inside A/C components.**
- **Thoroughly remove moisture from the refrigeration system before charging the refrigerant.**
- **Replace always used O-rings.**
- **Apply lubricant to circle of the O-rings shown in illustration when connecting tube. Be careful not to apply lubricant to threaded portion.**

**Name : NISSAN A/C System Oil Type S**

- **O-ring must be closely attached to the groove portion of tube.**
- **Be careful not to damage O-ring and tube when replacing the O-ring.**
- **Connect tube until a click can be heard. Then tighten the nut or bolt by hand. Check that the O-ring is installed to tube correctly.**
- **Perform leakage test and make sure that there is no leakage from connections after connecting line. Disconnect the line and replace the O-ring when the refrigerant leaking point is found. Then tighten the connections of seal seat to the specified torque.**




## FOR USA AND CANADA : Service Equipment

INFOID:0000000009722120

### RECOVERY/RECYCLING EQUIPMENT

Be certain to follow the manufacturer instructions for machine operation and machine maintenance. Never introduce any refrigerant other than that specified into the machine.

### ELECTRICAL LEAK DETECTOR

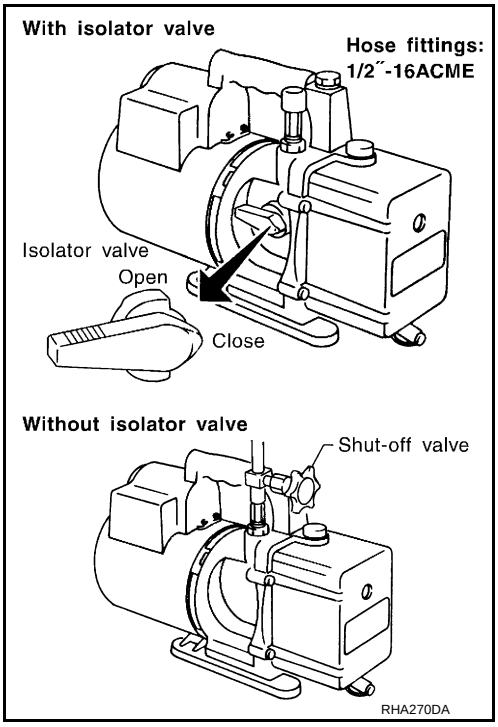
Be certain to follow the manufacturer instructions for tester operation and tester maintenance.

VACUUM PUMP

The lubricant contained inside the vacuum pump is not compatible with the specified lubricant for HFC-134a (R-134a) A/C systems. The vent side of the vacuum pump is exposed to atmospheric pressure. So the vacuum pump lubricant may migrate out of the pump into the service hose. This is possible when the pump is switched OFF after evacuation (vacuuming) and hose is connected to it.
To prevent this migration, use a manual valve placed near the hose-to-pump connection, as per the following.

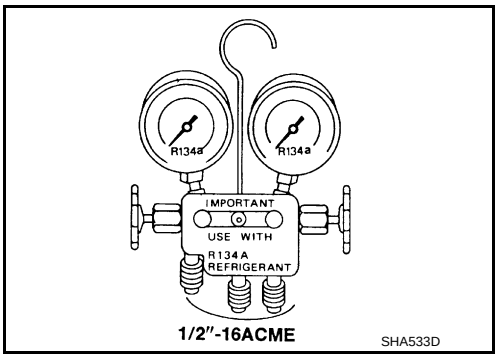
- Vacuum pumps usually have a manual isolator valve as part of the pump. Close this valve to isolate the service hose from the pump.
- Use a hose equipped with a manual shut-off valve near the pump end for pumps without an isolator. Close the valve to isolate the hose from the pump.
- Disconnect the hose from the pump if the hose has an automatic shut-off valve. As long as the hose is connected, the valve is open and lubricating oil may migrate.

Some one-way valves open when vacuum is applied and close under no vacuum condition. Such valves may restrict the ability of the pump to create a deep vacuum and are not recommended.



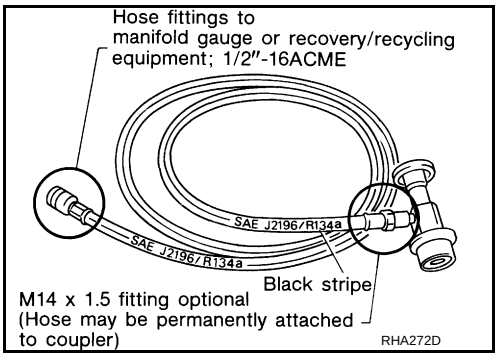

MANIFOLD GAUGE SET

Be certain that the gauge face indicates HFC-134a or R-134a. Be sure the gauge set has 1/2″-16 ACME threaded connections for service hoses. Confirm the set has been used only with refrigerant HFC-134a (R-134a) and specified lubricants.




SERVICE HOSES

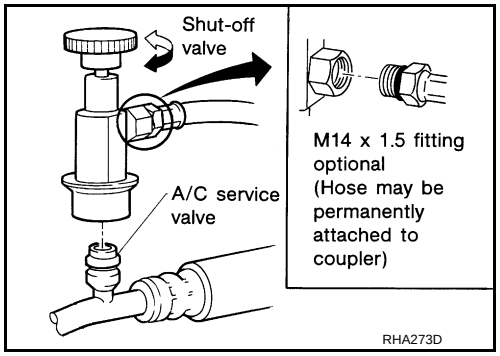
Be certain that the service hoses display the markings described (colored hose with a black stripe). All hoses must equip positive shut-off devices (either manual or automatic) near the end of the hoses opposite to the manifold gauge.




SERVICE COUPLERS

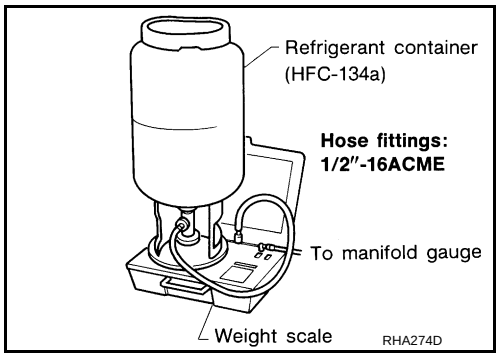
Never attempt to connect HFC-134a (R-134a) service couplers to a CFC-12 (R-12) A/C system. The HFC-134a (R-134a) couplers do not properly connect to the CFC-12 (R-12) system. However, if an improper connection is attempted, discharge and contamination may occur.

| Shut-off valve rotation | A/C service valve |
|---|---|
| Clockwise | Open |
| Counterclockwise | Close |




REFRIGERANT WEIGHT SCALE

Verify that no refrigerant other than HFC-134a (R-134a) and specified lubricants have been used with the scale. The hose fitting must be 1/2″-16 ACME if the scale controls refrigerant flow electronically.




CHARGING CYLINDER

Use of a charging cylinder is not recommended. Refrigerant may be vented into the air from the top valve of the cylinder when filling the cylinder with refrigerant. Also, the accuracy of the cylinder is generally less than that of an electronic scale or of quality recycle/recharge equipment.

## FOR MEXICO

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

INFOID:0000000009722121

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. Information necessary to service the system safely is included in the “SRS AIR BAG” and “SEAT BELT” of this Service Manual.

**WARNING:**

**Always observe the following items for preventing accidental activation.**

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision that 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 “SRS AIR BAG”.**
- **Never use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

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

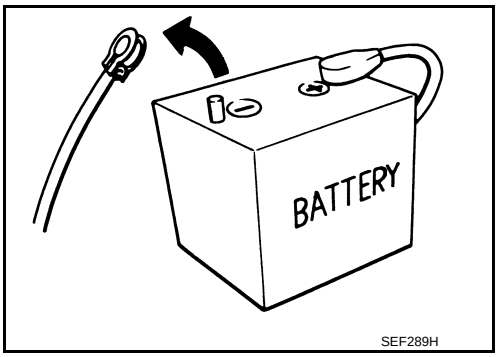
**WARNING:**

**Always observe the following items for preventing accidental activation.**

- **When working near the Air Bag Diagnosis Sensor Unit or other Air Bag System sensors with the ignition ON or engine running, never use air or electric power tools or strike near the sensor(s) with a hammer. Heavy vibration could activate the sensor(s) and deploy the air bag(s), possibly causing serious injury.**
- **When using air or electric power tools or hammers, always switch the ignition OFF, disconnect the battery, and wait at least 3 minutes before performing any service.**

## FOR MEXICO : Precautions for Removing of Battery Terminal

INFOID:0000000010092839




- When removing the 12V battery terminal, turn OFF the ignition switch and wait at least 30 seconds.
  **NOTE:**
  ECU may be active for several tens of seconds after the ignition switch is turned OFF. If the battery terminal is removed before ECU stops, then a DTC detection error or ECU data corruption may occur.
- For vehicles with the 2-batteries, be sure to connect the main battery and the sub battery before turning ON the ignition switch.
  **NOTE:**
  If the ignition switch is turned ON with any one of the terminals of main battery and sub battery disconnected, then DTC may be detected.
- After installing the 12V battery, always check "Self Diagnosis Result" of all ECUs and erase DTC.
  **NOTE:**
  The removal of 12V battery may cause a DTC detection error.

## FOR MEXICO : Working with HFC-134a (R-134a)

INFOID:0000000009722122

**CAUTION:**

- **CFC-12 (R-12) refrigerant and HFC-134a (R-134a) refrigerant are not compatible. Compressor malfunction is likely to occur if the refrigerants are mixed, refer to "CONTAMINATED REFRIGERANT" below. To determine the purity of HFC-134a (R-134a) in the vehicle and recovery tank, use Refrigerant Recovery/Recycling Recharging equipment and Refrigerant Identifier.**
- **Use only specified lubricant for the HFC-134a (R-134a) A/C system and HFC-134a (R-134a) components. Compressor malfunction is likely to occur if lubricant other than that specified is used.**
- **The specified HFC-134a (R-134a) lubricant rapidly absorbs moisture from the atmosphere. The following handling precautions must be observed:**
- **Immediately cap (seal) the component to minimize the entry of moisture from the atmosphere when removing refrigerant components from a vehicle.**
- **Never remove the caps (unseal) until just before connecting the components when installing refrigerant components to a vehicle. Connect all refrigerant loop components as quickly as possible to minimize the entry of moisture into system.**
- **Use only the specified lubricant from a sealed container. Immediately reseal containers of lubricant. Lubricant becomes moisture saturated and should not be used without proper sealing.**
- **Never allow lubricant (NISSAN A/C System Oil Type S) to come in to contact with styrene foam parts. Damage may result.**

### CONTAMINATED REFRIGERANT

**Take the appropriate steps shown below if a refrigerant other than pure HFC-134a (R-134a) is identified in a vehicle:**

- Explain to the customer that environmental regulations prohibit the release of contaminated refrigerant into the atmosphere.
- Explain that recovery of the contaminated refrigerant could damage service equipment and refrigerant supply.
- Suggest the customer return the vehicle to the location of previous service where the contamination may have occurred.
- If repairing, recover the refrigerant using only **dedicated equipment and containers. Never reintroduce contaminated refrigerant into the existing service equipment.** Contact a local refrigerant product retailer for available service if the facility does not have dedicated recovery equipment. This refrigerant must be disposed of in accordance with all federal and local regulations. In addition, replacement of all refrigerant system components on the vehicle is recommended.
- The air conditioner warranty is void if the vehicle is within the warranty period. Please contact Nissan Customer Affairs for further assistance.

## FOR MEXICO : General Refrigerant Precaution

INFOID:0000000009722123

**WARNING:**

- **Never breath A/C refrigerant, lubricant vapor or mist. Exposure may irritate eyes, nose and throat. Remove HFC-134a (R-134a) from the A/C system, using certified service equipment meeting require-**

**ments of SAE J-2210 [HFC-134a (R-134a) recycling equipment], or J-2209 [HFC-134a (R-134a) recovery equipment]. Ventilate work area before resuming service if accidental system discharge occurs. Additional health and safety information may be obtained from refrigerant and lubricant manufacturers.**

- **Never release refrigerant into the air. Use approved recovery/recycling equipment to capture the refrigerant each time an air conditioning system is discharged.**
- **Always wear eye and hand protection (goggles and gloves) when working with any refrigerant or air conditioning system.**
- **Never store or heat refrigerant containers above 52°C (126°F).**
- **Never heat a refrigerant container with an open flame. Place the bottom of the container in a warm pail of water if container warming is required.**
- **Never intentionally drop, puncture, or incinerate refrigerant containers.**
- **Keep refrigerant away from open flames. Poisonous gas is produced if refrigerant burns.**
- **Refrigerant displaces oxygen, therefore be certain to work in well ventilated areas to prevent suffocation.**
- **Never pressure test or leakage test HFC-134a (R-134a) service equipment and/or vehicle air conditioning systems with compressed air during repair. Some mixtures of air and HFC-134a (R-134a) have been shown to be combustible at elevated pressures. These mixtures, if ignited, may cause injury or property damage. Additional health and safety information may be obtained from refrigerant manufacturers.**

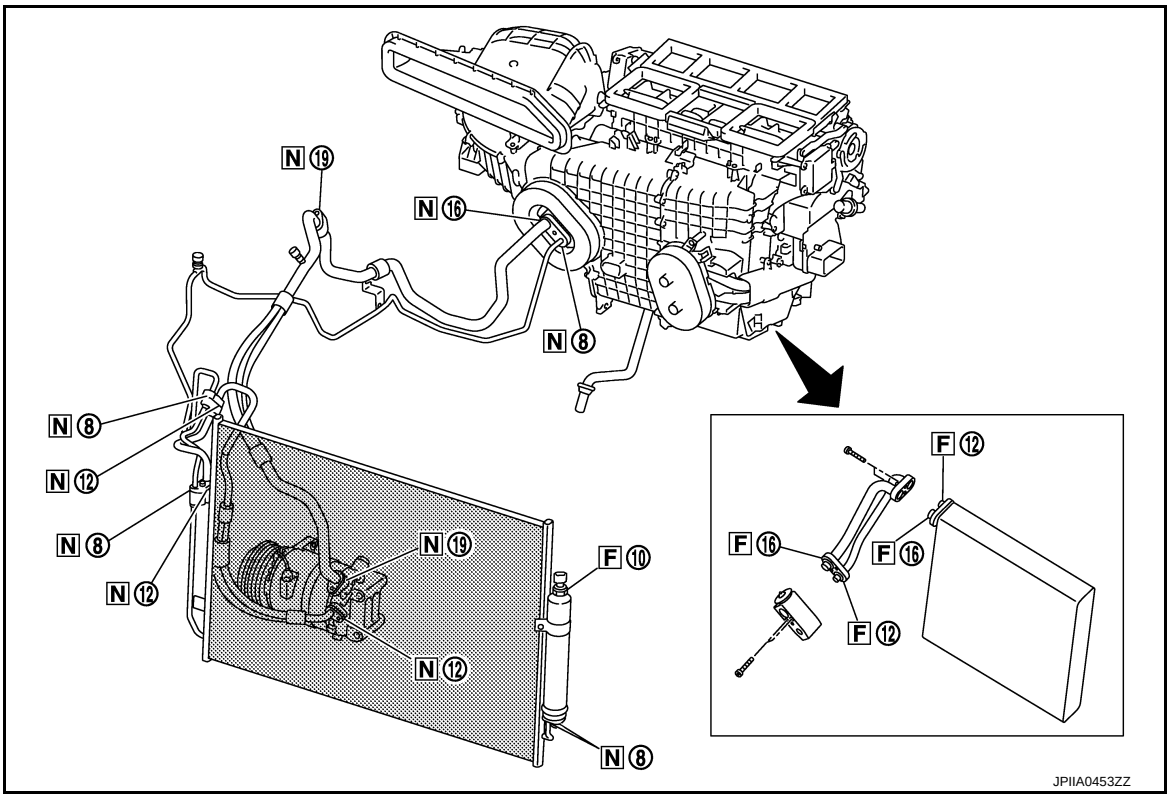
## FOR MEXICO : Refrigerant Connection

INFOID:0000000009722124

A new type refrigerant connection has been introduced to all refrigerant lines except the following location.

- Expansion valve to evaporator
- Refrigerant pressure sensor to liquid tank

### O-RING AND REFRIGERANT CONNECTION




F. Former type refrigerant connection N. New type refrigerant connection

O: O-ring size

**CAUTION:**

**The new and former refrigerant connections use different O-ring configurations. Never confuse O-rings since they are not interchangeable. Refrigerant may leak at the connection if a wrong O-ring is installed.**

O-Ring Part Numbers and Specifications

| Connection type | Piping connection point | | Part number | QTY | O-ring size |
|---|---|---|---|---|---|
| New | Low-pressure flexible hose to low-pressure pipe | | 92474 N8210 | 1 | ϕ19 |
| | High-pressure pipe to condenser pipe assembly (Outlet) | | 92471 N8210 | 1 | ϕ8 |
| | Condenser pipe assembly (Inlet) to high-pressure flexible hose (One-touch joint) | | 92472 N8210 | 1 | ϕ12 |
| | Condenser assembly to condenser pipe assembly | Inlet | 92472 N8210 | 1 | ϕ12 |
| | | Outlet | 92471 N8210 | 1 | ϕ8 |
| | Low-pressure pipe to expansion valve | | 92473 N8210 | 1 | ϕ16 |
| | High-pressure pipe to expansion valve | | 92471 N8210 | 1 | ϕ8 |
| | Compressor to low-pressure flexible hose | | 92474 N8210 | 1 | ϕ19 |
| | Compressor to high-pressure flexible hose | | 92472 N8210 | 1 | ϕ12 |
| | Liquid tank to condenser assembly | Inlet | 92471 N8210 | 1 | ϕ8 |
| | | Outlet | | 1 | |
| Former | Refrigerant pressure sensor to liquid tank | | J2476 89956 | 1 | ϕ10 |
| | Expansion valve to evaporator pipe assembly | Inlet | 92475 71L00 | 1 | ϕ12 |
| | | Outlet | 92475 72L00 | 1 | ϕ16 |
| | Evaporator to evaporator pipe assembly | Inlet | 92475 71L00 | 1 | ϕ12 |
| | | Outlet | 92475 72L00 | 1 | ϕ16 |

**WARNING:**

**Check that all refrigerant is discharged into the recycling equipment and the pressure in the system is less than atmospheric pressure. Then gradually loosen the discharge side hose fitting and remove it.**

**CAUTION:**

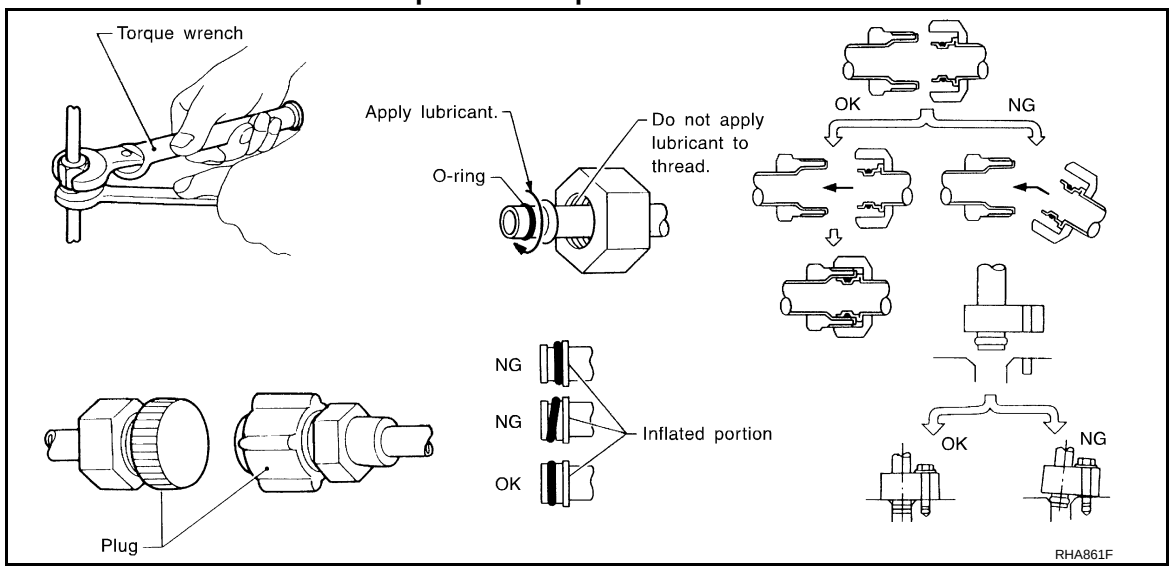
**Observe the following when replacing or cleaning refrigerant cycle components.**

- **Store it in the same way at it is when mounted on the car when the compressor is removed. Failure to do so will cause lubricant to enter the low-pressure chamber.**
- **Always use a torque wrench and a back-up wrench when connecting tubes.**
- **Immediately plug all openings to prevent entry of dust and moisture after disconnecting tubes.**
- **Connect the pipes at the final stage of the operation when installing an air conditioner in the vehicle. Never remove the seal caps of pipes and other components until just before required for connection.**
- **Allow components stored in cool areas to warm to working area temperature before removing seal caps. This prevents condensation from forming inside A/C components.**
- **Thoroughly remove moisture from the refrigeration system before charging the refrigerant.**
- **Replace always used O-rings.**
- **Apply lubricant to circle of the O-rings shown in illustration when connecting tube. Be careful not to apply lubricant to threaded portion.**

**Name : NISSAN A/C System Oil Type S**

- **O-ring must be closely attached to the groove portion of tube.**
- **Be careful not to damage O-ring and tube when replacing the O-ring.**
- **Connect tube until a click can be heard. Then tighten the nut or bolt by hand. Check that the O-ring is installed to tube correctly.**

- **Perform leakage test and make sure that there is no leakage from connections after connecting line. Disconnect the line and replace the O-ring when the refrigerant leaking point is found. Then tighten the connections of seal seat to the specified torque.**




## FOR MEXICO : Service Equipment

INFOID:0000000009722125

### RECOVERY/RECYCLING EQUIPMENT

Be certain to follow the manufacturer instructions for machine operation and machine maintenance. Never introduce any refrigerant other than that specified into the machine.

### ELECTRICAL LEAK DETECTOR

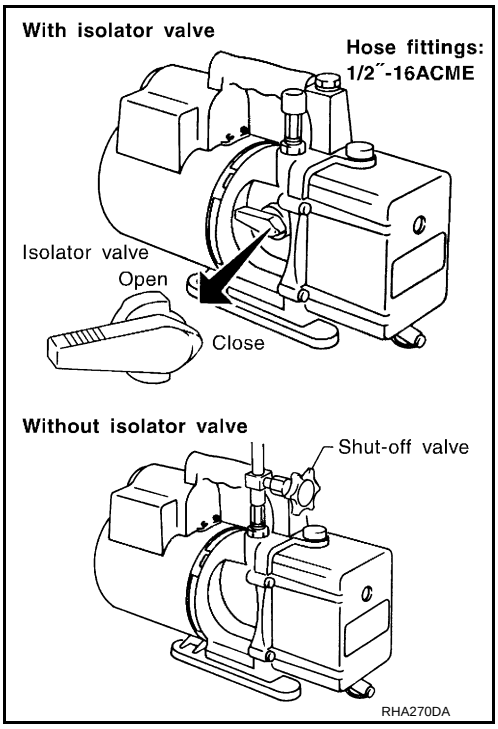
Be certain to follow the manufacturer instructions for tester operation and tester maintenance.

### VACUUM PUMP

The lubricant contained inside the vacuum pump is not compatible with the specified lubricant for HFC-134a (R-134a) A/C systems. The vent side of the vacuum pump is exposed to atmospheric pressure. So the vacuum pump lubricant may migrate out of the pump into the service hose. This is possible when the pump is switched OFF after evacuation (vacuuming) and hose is connected to it.
To prevent this migration, use a manual valve placed near the hose-to-pump connection, as per the following.

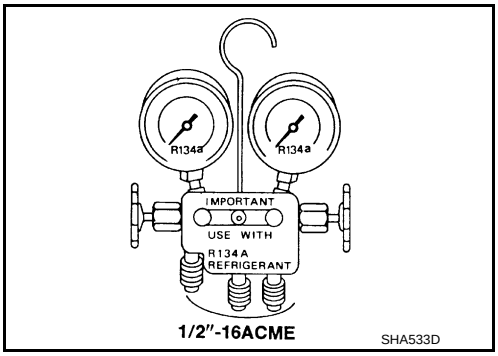
- Vacuum pumps usually have a manual isolator valve as part of the pump. Close this valve to isolate the service hose from the pump.
- Use a hose equipped with a manual shut-off valve near the pump end for pumps without an isolator. Close the valve to isolate the hose from the pump.
- Disconnect the hose from the pump if the hose has an automatic shut-off valve. As long as the hose is connected, the valve is open and lubricating oil may migrate.

Some one-way valves open when vacuum is applied and close under no vacuum condition. Such valves may restrict the ability of the pump to create a deep vacuum and are not recommended.



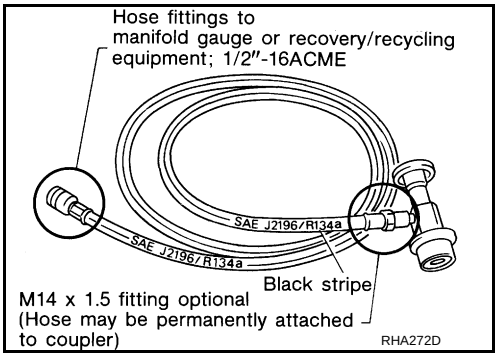

### MANIFOLD GAUGE SET

Be certain that the gauge face indicates HFC-134a or R-134a. Be sure the gauge set has 1/2″-16 ACME threaded connections for service hoses. Confirm the set has been used only with refrigerant HFC-134a (R-134a) and specified lubricants.




## SERVICE HOSES

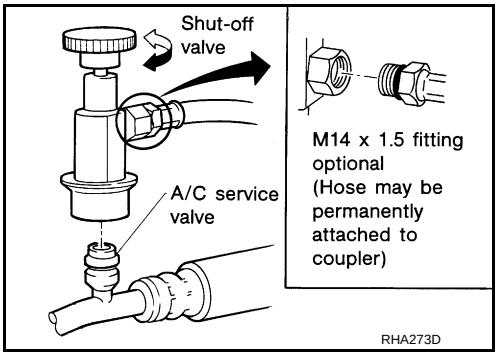
Be certain that the service hoses display the markings described (colored hose with a black stripe). All hoses must equip positive shut-off devices (either manual or automatic) near the end of the hoses opposite to the manifold gauge.




## SERVICE COUPLERS

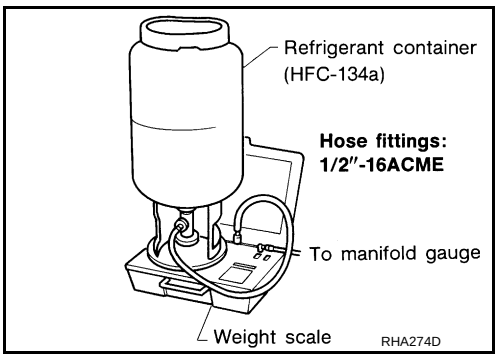
Never attempt to connect HFC-134a (R-134a) service couplers to a CFC-12 (R-12) A/C system. The HFC-134a (R-134a) couplers do not properly connect to the CFC-12 (R-12) system. However, if an improper connection is attempted, discharge and contamination may occur.

| Shut-off valve rotation | A/C service valve |
|---|---|
| Clockwise | Open |
| Counterclockwise | Close |




## REFRIGERANT WEIGHT SCALE

Verify that no refrigerant other than HFC-134a (R-134a) and specified lubricants have been used with the scale. The hose fitting must be 1/2″-16 ACME if the scale controls refrigerant flow electronically.




## CHARGING CYLINDER

Use of a charging cylinder is not recommended. Refrigerant may be vented into the air from the top valve of the cylinder when filling the cylinder with refrigerant. Also, the accuracy of the cylinder is generally less than that of an electronic scale or of quality recycle/recharge equipment.

# COMPRESSOR

## General Precautions

INFOID:0000000009722126

**CAUTION:**

- **Plug all openings to prevent moisture and foreign matter from entering.**
- **Store it in the same way at it is when mounted on the car when the compressor is removed.**
- **Follow “Maintenance of Lubricant Quantity in Compressor” exactly when replacing or repairing the compressor. Refer to HA-25, "Maintenance of Lubricant Quantity".**
- **Keep friction surfaces between clutch and pulley clean. Wipe it off by using a clean waste cloth moistened with thinner if the surface is contaminated with lubricant.**
- **Turn the compressor shaft by hand more than five turns in both directions after compressor service operation. This equally distributes lubricant inside the compressor. Let the engine idle and operate the compressor for one hour after the compressor is installed.**
- **Apply voltage to the new compressor and check for normal operation after replacing the compressor magnet clutch.**

# FLUORESCENT LEAK DETECTOR

## General Precautions

INFOID:0000000009722127

**CAUTION:**

- **The A/C system contains a fluorescent leak detection dye used for locating refrigerant leakages. An ultraviolet (UV) lamp is required to illuminate the dye when inspecting for leakages.**
- **Always wear fluorescence enhancing UV safety goggles to protect eyes and enhance the visibility of the fluorescent dye.**
- **The fluorescent dye leak detector is not a replacement for an electrical leak detector (SST: J-41995). The fluorescent dye leak detector should be used in conjunction with an electrical leak detector (SST: J-41995) to pin-point refrigerant leakages.**
- **Read and follow all manufacture operating instructions and precautions prior to performing the work for the purpose of safety and customer satisfaction.**
- **A compressor shaft seal should not necessarily be repaired because of dye seepage. The compressor shaft seal should only be repaired after confirming the leakage with an electrical leak detector (SST: J-41995).**
- **Always remove any remaining dye from the leakage area after repairs are completed to avoid a misdiagnosis during future service.**
- **Never allow dye to come into contact with painted body panels or interior components. Clean immediately with the approved dye cleaner if dye is spilled. Fluorescent dye left on a surface for an extended period of time cannot be removed.**
- **Never spray the fluorescent dye cleaning agent on hot surfaces (engine exhaust manifold, etc.).**
- **Never use more than one refrigerant dye bottle (1/4 ounce /7.4 cc) per A/C system.**
- **Leak detection dyes for HFC-134a (R-134a) and CFC-12 (R-12) A/C systems are different. Never use HFC-134a (R-134a) leak detection dye in CFC-12 (R-12) A/C system, or CFC-12 (R-12) leak detection dye in HFC-134a (R-134a) A/C system, or A/C system damage may result.**
- **The fluorescent properties of the dye remains for three or more years unless a compressor malfunction occurs.**

### IDENTIFICATION

**NOTE:**

Vehicles with factory installed fluorescent dye have a green label.
Vehicles without factory installed fluorescent dye have a blue label.

### IDENTIFICATION LABEL FOR VEHICLE

Vehicles with factory installed fluorescent dye have an identification label on the front side of hood.

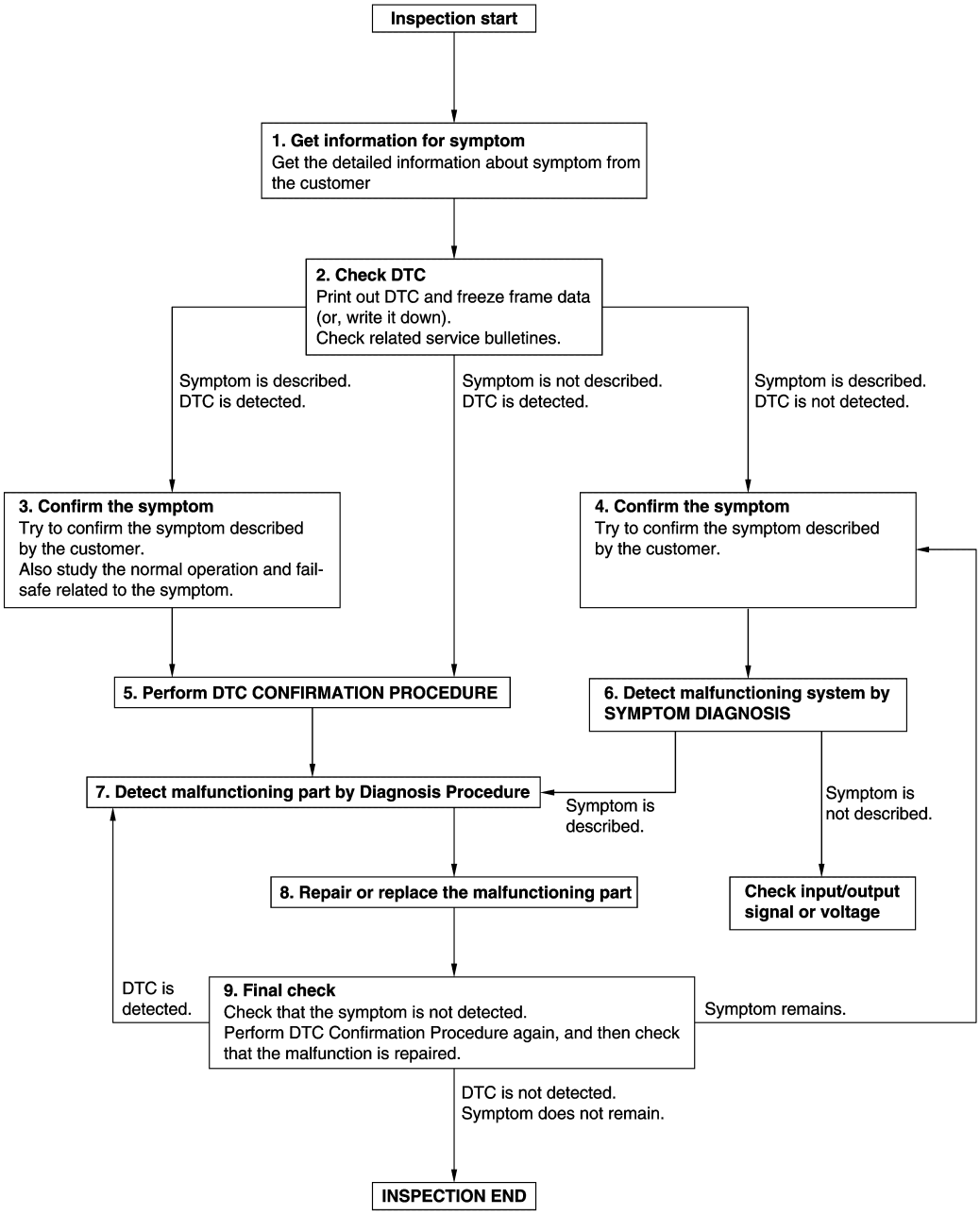
# BASIC INSPECTION

## DIAGNOSIS AND REPAIR WORKFLOW

### Work Flow

INFOID:0000000009722128

#### OVERALL SEQUENCE

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#### DETAILED FLOW

## 1.GET INFORMATION FOR SYMPTOM

1. Get detailed information from the customer about the symptom (the condition and the environment when the incident/malfunction occurs).
2. Check operation condition of the function that is malfunctioning.

>> GO TO 2.

## 2.CHECK DTC

1. Check DTC.
2. Perform the following procedure if DTC is detected.

- Record DTC and freeze frame data (Print them out using CONSULT.)
- Erase DTC.
- Study the relationship between the cause detected by DTC and the symptom described by the customer.

3. Check related service bulletins for information.

Are any symptoms described and any DTC detected?

Symptom is described, DTC is detected>>GO TO 3.
Symptom is described, DTC is not detected>>GO TO 4.
Symptom is not described, DTC is detected>>GO TO 5.

## 3.CONFIRM THE SYMPTOM

Try to confirm the symptom described by the customer.
Also study the normal operation and fail-safe related to the symptom.
Verify relation between the symptom and the condition when the symptom is detected.

>> GO TO 5.

## 4.CONFIRM THE SYMPTOM

Try to confirm the symptom described by the customer.
Verify relation between the symptom and the condition when the symptom is detected.

>> GO TO 6.

## 5.PERFORM DTC CONFIRMATION PROCEDURE

Perform DTC CONFIRMATION PROCEDURE for the detected DTC, and then check that DTC is detected again. At this time, always connect CONSULT to the vehicle, and check self diagnostic results in real time.
If two or more DTCs are detected, refer to DTC INSPECTION PRIORITY CHART, and determine trouble diagnosis order.

**NOTE:**

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

Is DTC detected?

YES >> GO TO 7.
NO >> Check according to GI-44, "Intermittent Incident".

## 6.DETECT MALFUNCTIONING SYSTEM BY SYMPTOM DIAGNOSIS

Detect malfunctioning system according to SYMPTOM DIAGNOSIS based on the confirmed symptom in step 4, and determine the trouble diagnosis order based on possible causes and symptom.

Is the symptom described?

YES >> GO TO 7.
NO >> Monitor input data from related sensors or check voltage of related module terminals using CONSULT.

## 7.DETECT MALFUNCTIONING PART BY DIAGNOSIS PROCEDURE

Inspect according to Diagnosis Procedure of the system.

Is malfunctioning part detected?

YES >> GO TO 8.
NO >> Check according to GI-44, "Intermittent Incident".

## 8. REPAIR OR REPLACE THE MALFUNCTIONING PART

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

>> GO TO 9.

## 9. FINAL CHECK

When DTC is detected in step 2, perform DTC CONFIRMATION PROCEDURE again, and then check that the malfunction is repaired securely.
When symptom is described by the customer, refer to confirmed symptom in step 3 or 4, and check that the symptom is not detected.

Is DTC detected and does symptom remain?

YES-1 >> DTC is detected: GO TO 7.
YES-2 >> Symptom remains: GO TO 4.
NO >> Before returning the vehicle to the customer, always erase DTC.

# INSPECTION AND ADJUSTMENT

## Description & Inspection

INFOID:0000000009722129

### DESCRIPTION

The purpose of the operational check is to check that the individual system operates normally.

**Conditions : Engine running at normal operating temperature**

### INSPECTION PROCEDURE

#### 1.CHECK MEMORY FUNCTION

1. Start the engine.
2. Operate the temperature control dial (driver side) and raise the temperature setting to 32°C (90°F).
3. Press the ON/OFF switch.
4. Turn the ignition switch OFF.
5. Turn the ignition switch ON.
6. Press the AUTO switch.
7. Check that the temperature setting before turning the ignition switch OFF is stored.

Is the inspection result normal?

YES >> GO TO 2.
NO >> Memory function malfunction: HAC-241, "Inspection procedure".

#### 2.CHECK BLOWER MOTOR SPEED

1. Start the engine.
2. Operate the fan control dial. Check that the fan speed changes. Check the operation for all fan speeds.
3. Set the fan speed to speed 7.

Is the inspection result normal?

YES >> GO TO 3.
NO >> Blower motor system malfunction: HAC-196, "Diagnosis Procedure".

#### 3.CHECK DISCHARGE AIR(MODE SWITCH AND DEF SWITCH)

1. Press the MODE switch and the DEF switch.
2. Check that the air outlets change according to each indicated air outlet by placing a hand in front of the outlets. Refer to HAC-143, "System Description".

**NOTE:**
Confirm that the compressor clutch is engaged (sound or visual inspection) and intake door position is at FRE when the D/F or DEF is selected.

Is the inspection result normal?

YES >> GO TO 4.
NO >> Mode door system malfunction: HAC-189, "Diagnosis Procedure".

#### 4.CHECK DISCHARGE AIR (UPPER VENT SWITCH)

1. Press the UPPER VENT switch.
2. The UPPER VENT switch indicator is turned ON.

3. Check that the air blown from UPPER VENT does not greatly deviate from the air mix ratio.

| Discharge air flow | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Mode position indication | Condition | Air outlet/distribution | | | | | | |
| | | VENT | | | FOOT | | DEF | |
| | | Front | Upper | Rear | Front | Rear | | |
|  | DUAL switch: OFF<br>UPPER VENT switch : ON | 81% | 8% | 11% | — | — | — | |
|  | | 41% | 10% | 17% | 24% | 8% | — | |
|  | | 12% | 12% | 16% | 27% | 10% | 23% | |
|  | | 11% | 11% | 14% | 25% | 10% | 29% | |
|  | | 11% | 11% | 12% | — | — | 66% | |

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4. Press the UPPER VENT switch again.
5. The UPPER VENT switch indicator is turned OFF.
6. The air blown from the UPPER VENT stops.

Does it operate normally?

YES >> GO TO 5.
NO >> Upper ventilator door system malfunction: HAC-194, "Diagnosis Procedure".

## 5. CHECK INTAKE AIR

1. Press the intake switch. Indicator is turned ON (REC).
2. Press the intake switch again. Indicator is turned OFF (FRE).
3. Listen for the intake door position change. (Slight change of blower sound can be heard.)

**NOTE:**
Confirm that the compressor clutch is engaged (sound or visual inspection) and intake door position is at FRE when the D/F or DEF is selected.

Is the inspection result normal?

YES >> GO TO 6.
NO >> Intake door system malfunction: HAC-192, "Diagnosis Procedure".

## 6. CHECK A/C SWITCH

1. Press the A/C switch.
2. The A/C switch indicator is turned ON.
   Confirm that the compressor clutch engages (sound or visual inspection).

Is the inspection result normal?

YES >> GO TO 7.
NO >> Magnet clutch system malfunction: HAC-200, "Diagnosis Procedure".

## 7. CHECK WITH TEMPERATURE SETTING LOWERED

1. Operate the compressor.
2. Operate the temperature control switch (driver side) and lower the temperature setting to 18°C (60°F).
3. Check that the cool air blows from the outlets.

Is the inspection result normal?

YES >> GO TO 8.
NO >> Insufficient cooling: HAC-233, "Inspection procedure".

## 8. CHECK WITH TEMPERATURE SETTING RAISED

1. Operate the temperature control dial (driver side) and raise the temperature setting to 32°C (90°F) after warming up the engine.
2. Check that the warm air blows from the outlets.

Is the inspection result normal?

YES >> GO TO 9.
NO >> Insufficient heating: HAC-236, "Inspection procedure".

## 9. CHECK LH/RH INDEPENDENT TEMPERATURE ADJUSTMENT FUNCTION

1. Press the DUAL switch, and then check that “DUAL” is shown on the display.
2. Operate the temperature control dial (driver side). Check that the discharge air temperature (driver side) changes.
3. Operate the temperature control dial (passenger side). Check that the discharge air temperature (passenger side) changes.
4. Press the DUAL switch, and then check that the temperature setting (LH/RH) is unified to the driver side temperature setting.

Is the inspection result normal?

YES >> GO TO 10.
NO >> Refer to HAC-232, "Diagnosis Chart By Symptom" and perform the appropriate diagnosis.

## 10. CHECK AUTO MODE

1. Press the AUTO switch, and then check that “AUTO” is shown on the display.
2. Operate the temperature control dial (driver side). Check that the fan speed or outlet changes (the discharge air temperature or fan speed varies depending on the ambient temperature, in-vehicle temperature, and temperature setting).

Is the inspection result normal?

YES >> INSPECTION END
NO >> Refer to HAC-232, "Diagnosis Chart By Symptom" and perform the appropriate diagnosis.

# Temperature Setting Trimmer

INFOID:0000000009722130

## Description

If the temperature felt by the customer is different than the air flow temperature controlled by the temperature setting, the auto amplifier control temperature can be adjusted to compensate for the temperature setting.

## How to set

Using CONSULT, perform “TEMP SET CORRECT” on “WORK SUPPORT” of HVAC.

| Work support items | Display (°F) | Display (°C) |
|---|---|---|
| TEMP SET CORRECT | 6 | 3.0 |
| | 5 | 2.5 |
| | 4 | 2.0 |
| | 3 | 1.5 |
| | 2 | 1.0 |
| | 1 | 0.5 |
| | 0 (initial status) | 0 (initial status) |
| | –1 | –0.5 |
| | –2 | –1.0 |
| | –3 | –1.5 |
| | –4 | –2.0 |
| | –5 | –2.5 |
| | –6 | –3.0 |

**NOTE:**

- When the temperature setting is set to 25.0°C (77°F) and –3.0°C (–6°F), the temperature controlled by auto amp is 25.0°C (77°F) – 3.0°C (6°F) = 22.0°C (71°F) and the temperature becomes lower than the temperature setting.
- When the battery cable is disconnected from the negative terminal or when the battery voltage becomes 10 V or less, the setting of the difference between the temperature setting and control temperature may be cancelled.

# Foot Position Setting Trimmer

INFOID:0000000009722131

## Description

In the FOOT mode, the air blowing to the DEF can be turned ON/OFF.

How to set

Using CONSULT, perform “BLOW SET” on “WORK SUPPORT” of HVAC.

| Work support items | Display | DEF door position | |
|---|---|---|---|
| | | Auto control | Manual control |
| BLOW SET | Mode 1 | OPEN | CLOSE |
| | Mode 2 (initial status) | OPEN | OPEN |
| | Mode 3 | CLOSE | OPEN |
| | Mode 4 | CLOSE | CLOSE |

**NOTE:**

When the battery cable is disconnected from the negative terminal or when the battery voltage becomes 10 V or less, the setting of the discharge air mix ratio in FOOT mode may be cancelled.

## Inlet Port Memory Function (FRE)

INFOID:0000000009722132

### Description

- If the ignition switch is turned to the OFF position while the FRE switch is set to ON (fresh air intake), “Perform the memory” or “Do not perform the memory” of the FRE switch ON (fresh air intake) condition can be selected.
- If “Perform the memory” was set, the FRE switch will be ON (fresh air intake) when turning the ignition switch to the ON position again.
- If “Do not perform the memory” was set, the air inlets will be controlled automatically when turning the ignition switch to the ON position again.

### How to set

Using CONSULT, perform “FRE MEMORY SET” on “WORK SUPPORT” of HVAC.

| Work support items | Display | Setting |
|---|---|---|
| FRE MEMORY SET | WITHOUT | Perform the memory of manual FRE |
| | WITH (initial status) | Do not perform the memory of manual FRE (auto control) |

**NOTE:**

When the battery cable is disconnected from the negative terminal or when the battery voltage becomes 10 V or less, the setting of the FRE switch memory function may be cancelled.

## Inlet Port Memory Function (REC)

INFOID:0000000009722133

### Description

- If the ignition switch is turned to the OFF position while the REC switch is set to ON (recirculation), “Perform the memory” or “Do not perform the memory” of the REC switch ON (recirculation) condition can be selected.
- If “Perform the memory” was set, the REC switch will be ON (recirculation) when turning the ignition switch to the ON position again.
- If “Do not perform the memory” was set, the air inlets will be controlled automatically when turning the ignition switch to the ON position again.

### How to set

Using CONSULT, perform “REC MEMORY SET” on “WORK SUPPORT” of HVAC.

| Work support items | Display | Setting |
|---|---|---|
| REC MEMORY SET | WITHOUT (initial status) | Perform the memory of manual REC |
| | WITH | Do not perform the memory of manual REC (auto control) |

**NOTE:**

When the battery cable is disconnected from the negative terminal or when the battery voltage becomes 10 V or less, the setting of the REC switch memory function may be cancelled.

# SYSTEM DESCRIPTION

## COMPRESSOR CONTROL FUNCTION

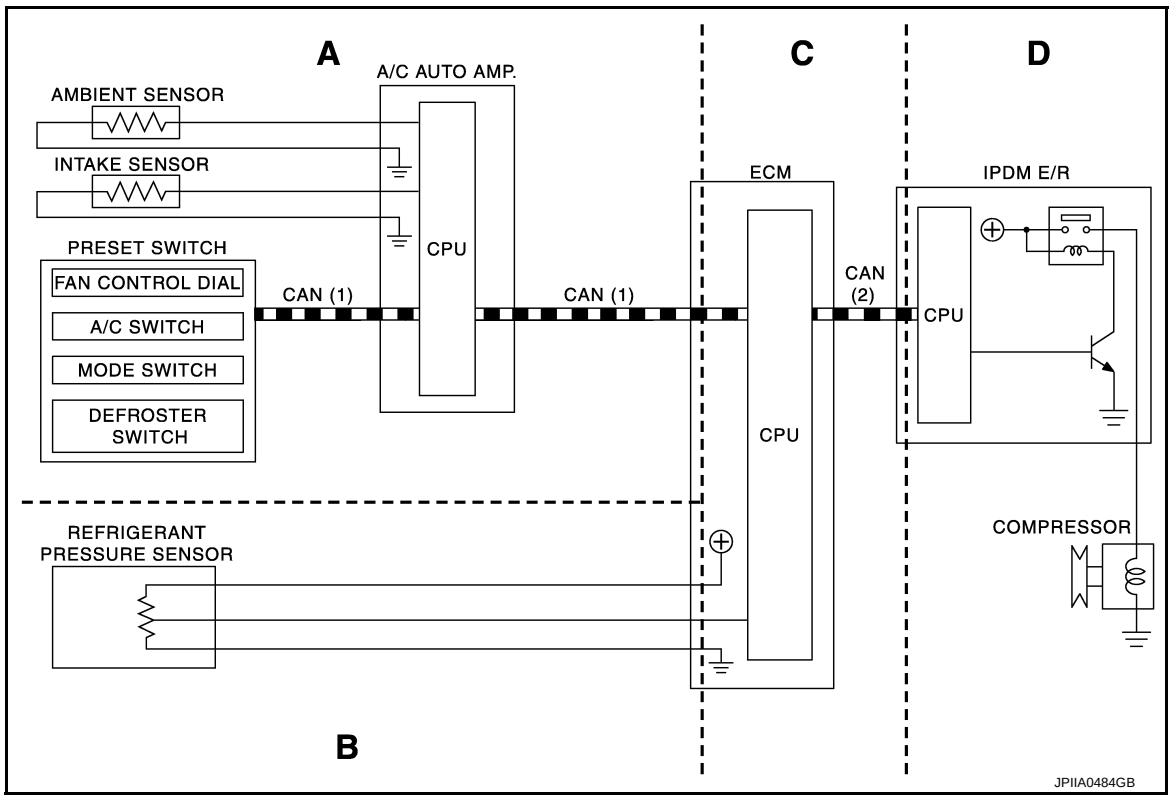
### Description

INFOID:0000000009722134

PRINCIPLE OF OPERATION

Compressor is not activated.

Functional circuit diagram




CAN (1) : A/C switch signal
: Blower fan motor switch signal

CAN (2) : A/C compressor request signal

Functional initial inspection chart

×: Applicable

| Control unit | Diagnosis item | | Location | | | |
|---|---|---|---|---|---|---|
| | | | A | B | C | D |
| A/C auto amp. | “HVAC” | Self-diagnosis | × | — | — | — |
| | | Data monitor | × | — | — | — |
| | | Active test | × | — | — | × |
| ECM | “ENGINE” | Self-diagnosis function (CAN system diagnosis) | — | — | × | — |
| | | Data monitor | — | × | × | — |
| IPDM E/R | “IPDM E/R” | Self-diagnosis function (CAN system diagnosis) | — | — | — | × |
| | | Data monitor | — | — | × | — |
| | Auto active test | | — | — | — | × |

## Fail-Safe

INFOID:0000000009722135

FAIL-SAFE FUNCTION

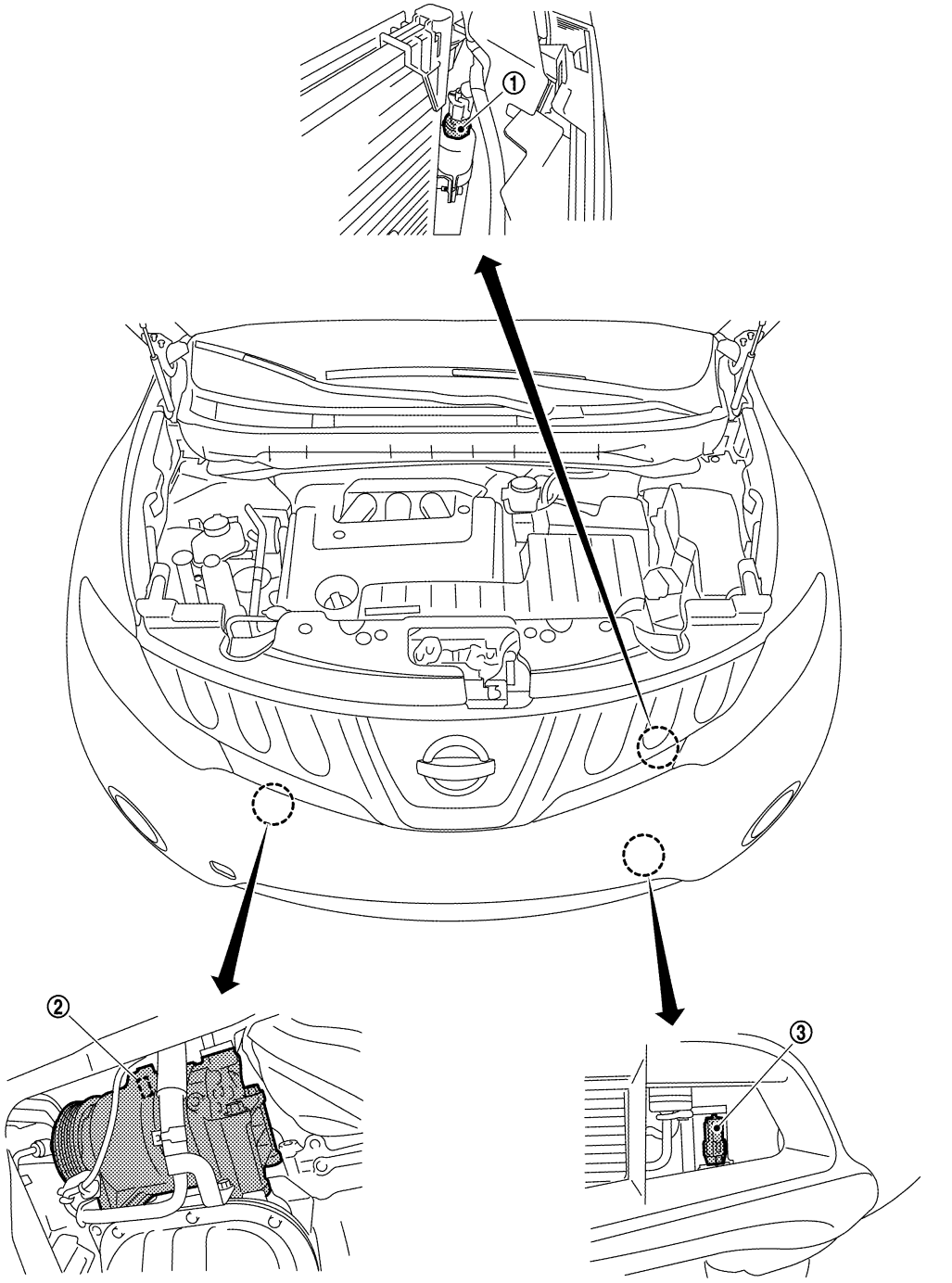
- If a communication error exists between the A/C auto amp., and the AV control unit and preset switch for 30 seconds or longer, air conditioner is controlled under the following conditions:

| | |
|---|---|
| **Compressor** | **: ON** |
| **Air outlet** | **: AUTO** |
| **Air inlet** | **: FRE (Fresh)** |
| **Blower fan speed** | **: AUTO** |
| **Set temperature** | **: Setting before communication error occurs** |

## Component Part Location

INFOID:0000000009722136

ENGINE COMPARTMENT

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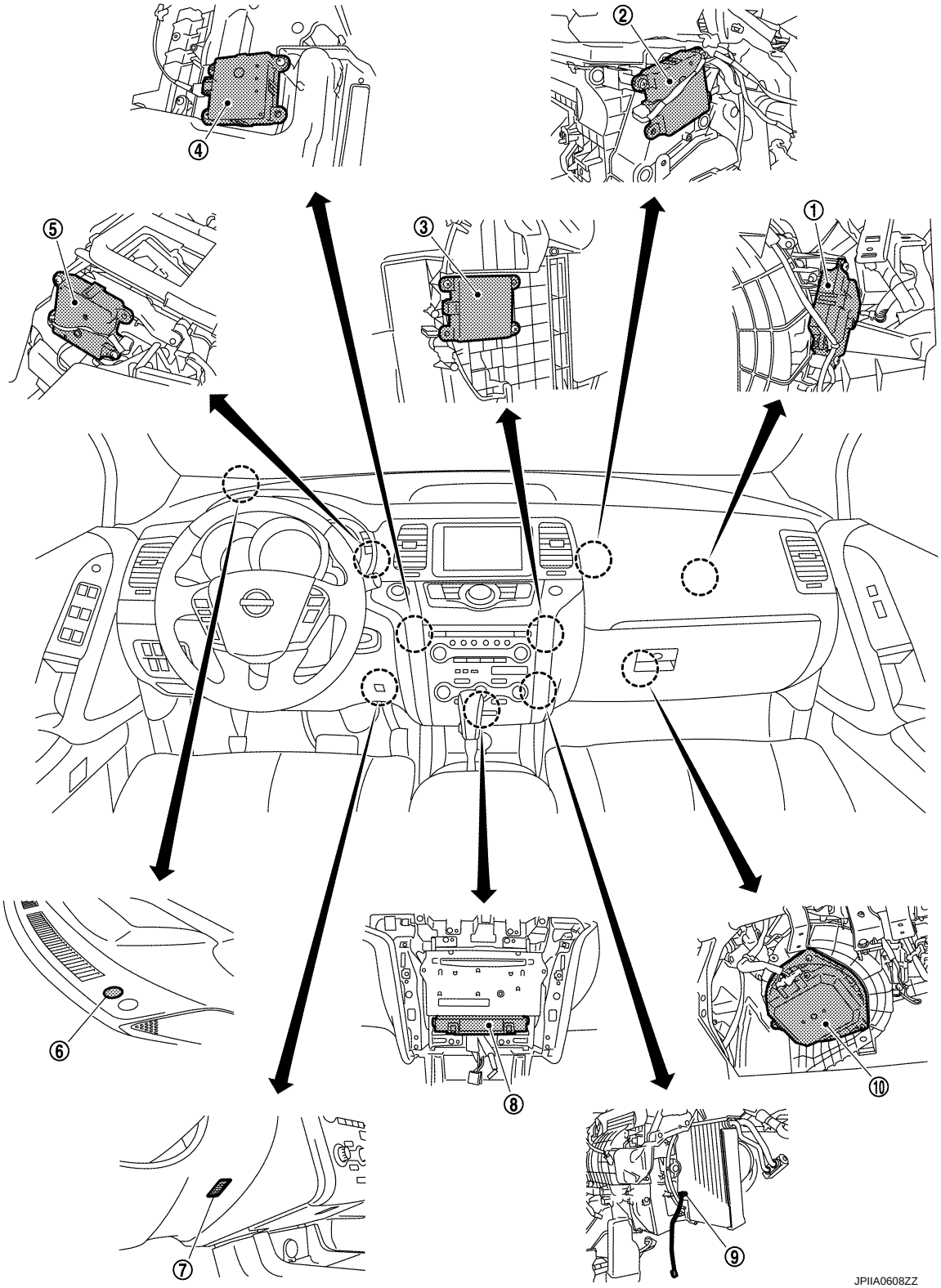
1. Refrigerant pressure sensor 2. Compressor (magnet clutch) 3. Ambient sensor

PASSENGER COMPARTMENT




1. Intake door motor
2. Upper ventilator door motor
3. Air mix door motor (passenger side)
4. Air mix door motor (driver side)
5. Mode door motor
6. Sunload sensor
7. In-vehicle sensor
8. A/C auto amp.
9. Intake sensor
10. Blower motor

## Component's Role

INFOID:0000000009722137

| Component | Reference |
|---|---|
| Refrigerant pressure sensor | EC-465, "Description" |
| Compressor | HAC-200, "Description" |
| Ambient sensor | HAC-172, "Description" |
| Intake door motor | HAC-191, "Description" |
| Upper ventilator door motor | HAC-193, "Description" |
| Air mix door motor (driver side) | HAC-184, "Description" |
| Air mix door motor (passenger side) | HAC-186, "Description" |
| Mode door motor | HAC-188, "Description" |
| Sunload sensor | HAC-181, "Description" |
| In-vehicle sensor | HAC-175, "Description" |
| A/C auto amp. | HAC-202, "A/C AUTO AMP. : Description" |
| Intake sensor | HAC-178, "Description" |
| Blower motor | HAC-196, "Description" |

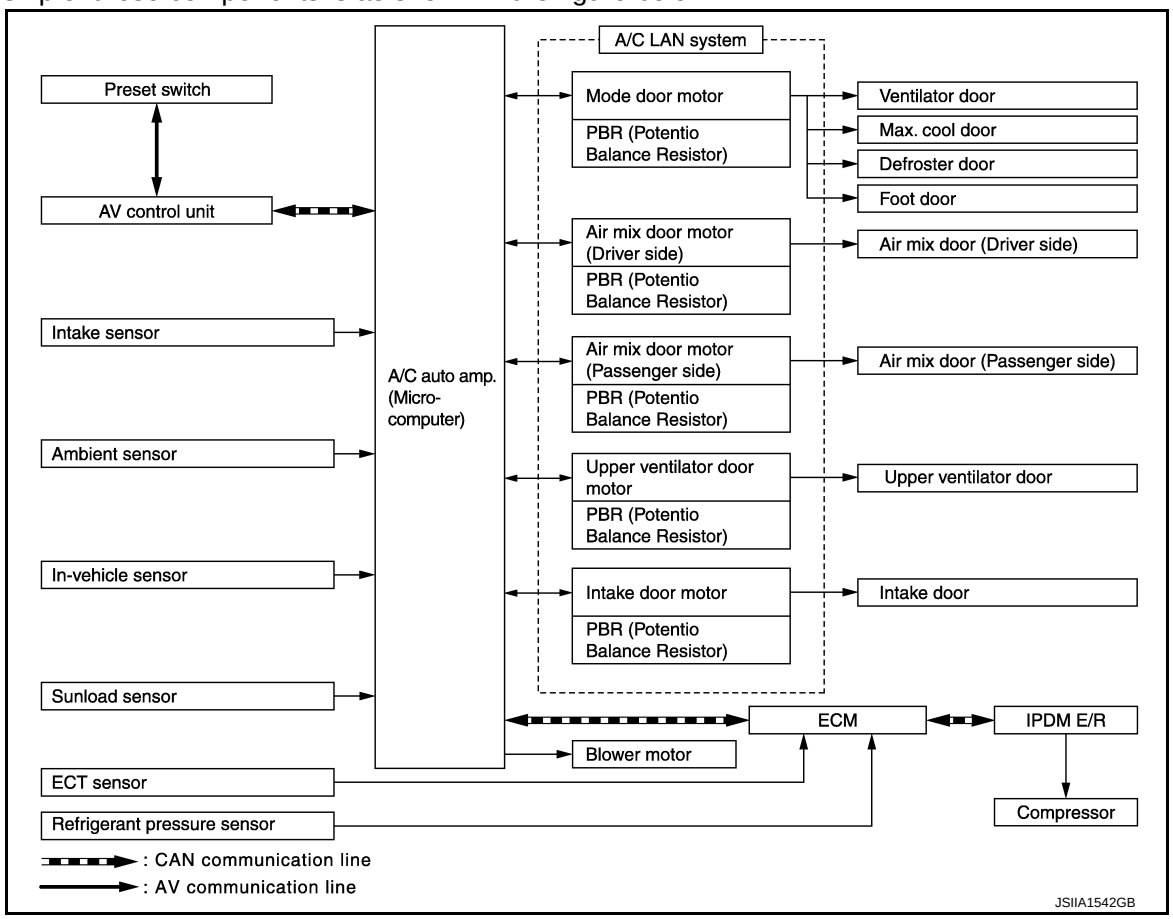
# AUTOMATIC AIR CONDITIONER SYSTEM

## System Diagram

INFOID:0000000009722138

### CONTROL SYSTEM

The control system consists of input sensors, switches, the A/C auto amp. (microcomputer) and outputs. The relationship of these components is as shown in the figure below:




## System Description

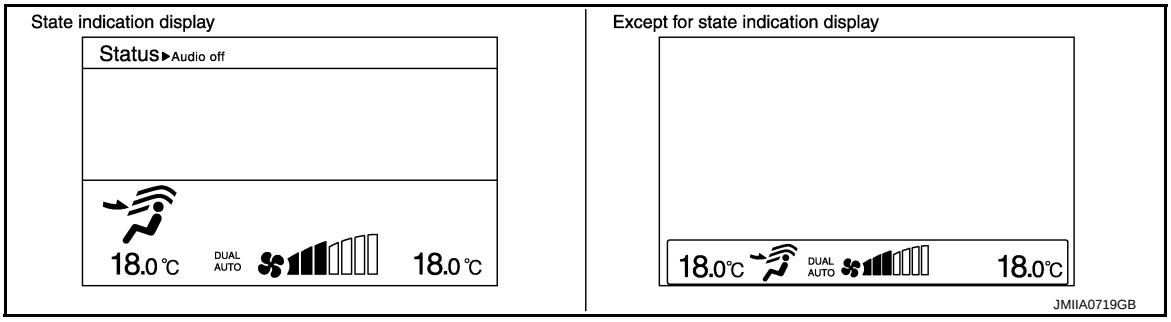
INFOID:0000000009722139

### CONTROL OPERATION

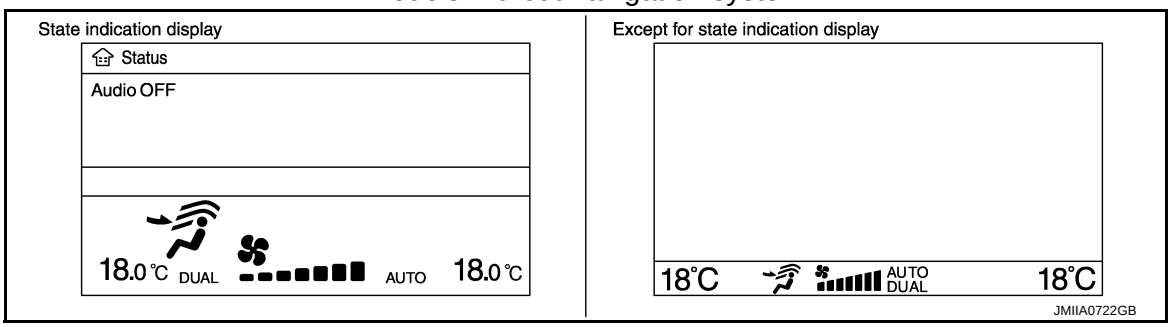
Display

The operation status of the system is displayed on the screen.

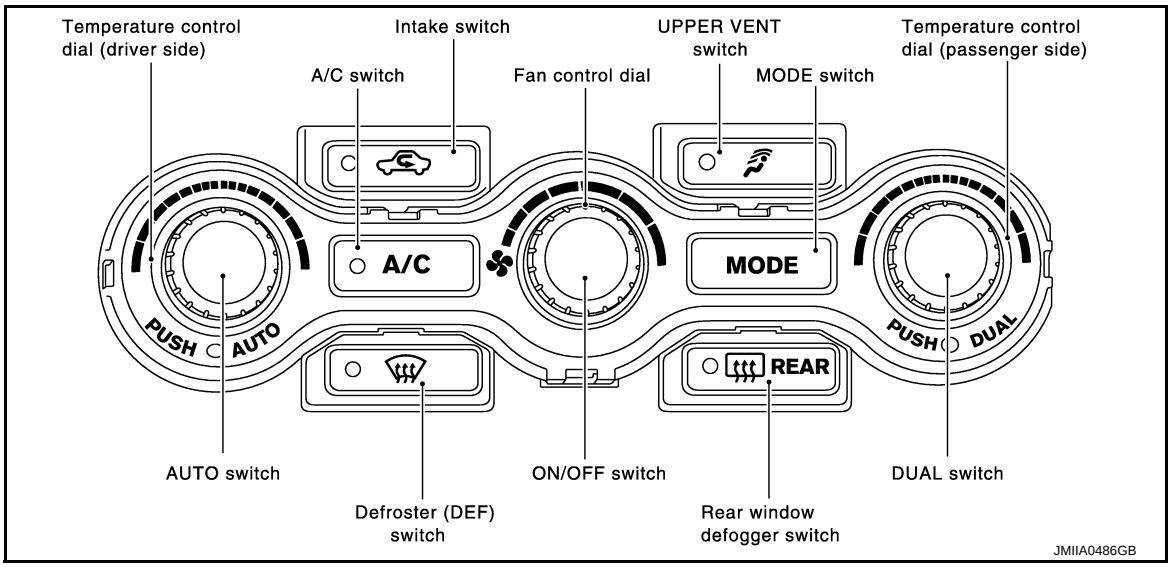
Models with navigation system



Models without navigation system




Preset Switch




MODE Switch

The air discharge outlets are controlled with this switch.

Temperature Control Dial (Driver Side)

The set temperature is increased or decreased with this dial.

Temperature Control Dial (Passenger Side)

- The set temperature is increased or decreased with this dial.
- When the temperature control dial is turned, DUAL switch indicator is turned ON.

AUTO Switch

- The compressor, intake doors, air mix doors, mode doors and blower speed are automatically controlled so that the in-vehicle temperature will reach, and be maintained at the set temperature selected by the operator.
- When pressing the AUTO switch, air inlet, air outlet, fan speed, and discharge air temperature are automatically controlled.

Defroster (DEF) Switch

Mode doors are set to the defrost position with this switch. Also, intake doors are set to the outside air position, and compressor turns ON.

UPPER VENT Switch

- When the UPPER VENT switch is pressed, the UPPER VENT switch indicator is turned ON.
- When the UPPER VENT switch indicator is turned ON, the UPPER VENT switch indicator is turned OFF by pressing the defroster (DEF) switch (after the above operation, the UPPER VENT switch indicator is turned ON by pressing the UPPER VENT switch).

A/C Switch

Compressor turns ON or OFF with this switch.
(Pressing the A/C switch when the A/C switch is ON turns OFF the A/C switch and compressor.)

Fan Control Dial

The blower speed is manually controlled with this dial. Seven speeds are available for manual control (as shown on the display screen).

ON/OFF Switch

Compressor and blower turn OFF, intake doors and the mode doors are automatically controlled.

Rear Window Defogger Switch

When indicator is ON, rear window is defogged.

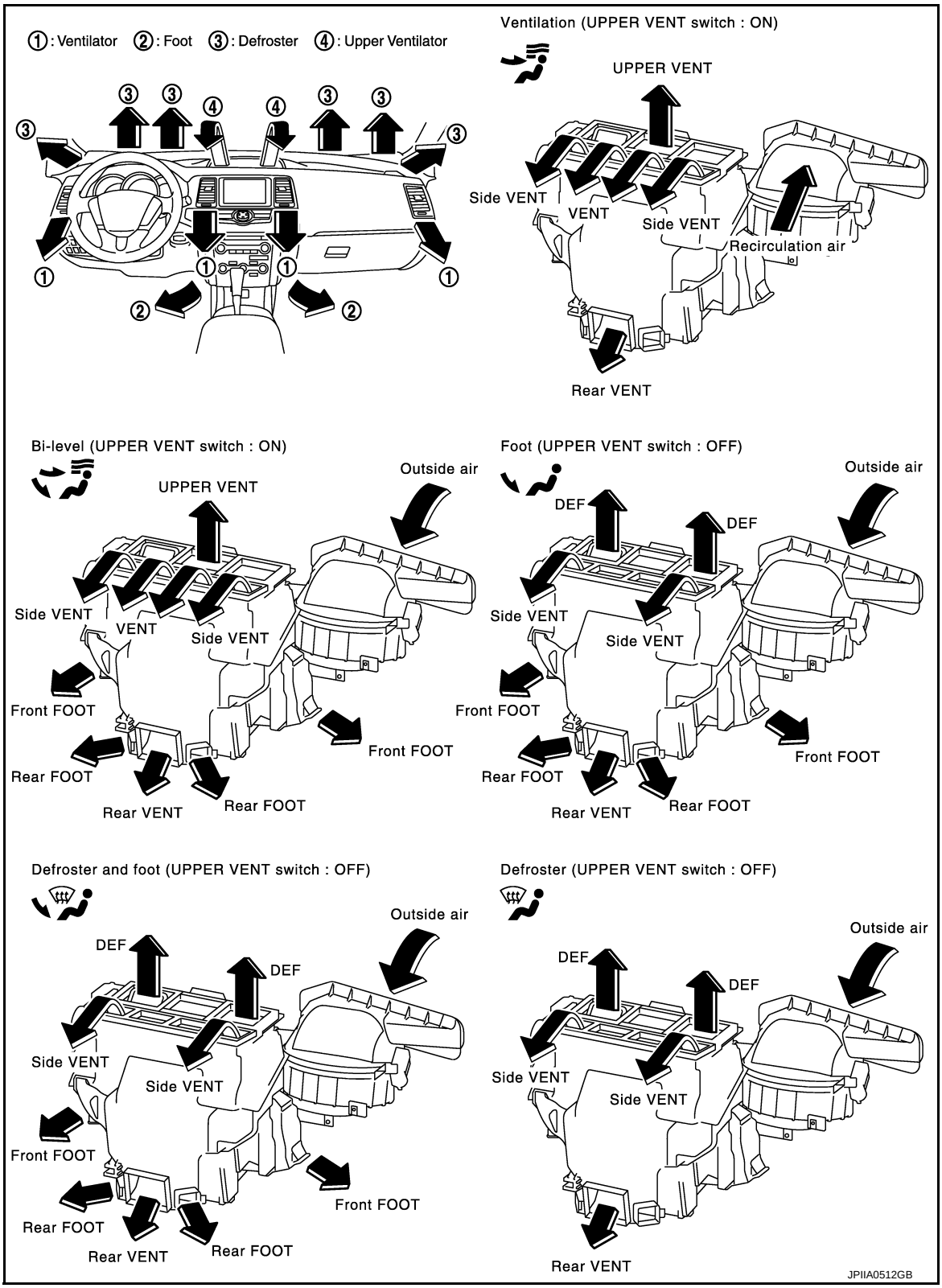
Intake Switch

- When the intake switch is ON, the intake switch indicator is turned ON, and air inlet is set to REC.
- When the intake switch is pressed again, the intake switch indicator is turned OFF, and air inlet is set to FRE.
- When the intake switch is pressed for approximately 1.5 seconds or longer, the intake switch indicator lamps blink twice. Then, automatic control mode is entered. Inlet status is displayed by indicator even when automatically controlled.
- When the intake switch indicator is turned OFF, shifting mode position to D/F or DEF, or when compressor is turned from ON to OFF, intake switch is automatically turned OFF (set to FRE mode). REC mode can be re-entered by pressing intake switch again, and then compressor is turned ON. (Except D/F or DEF position)

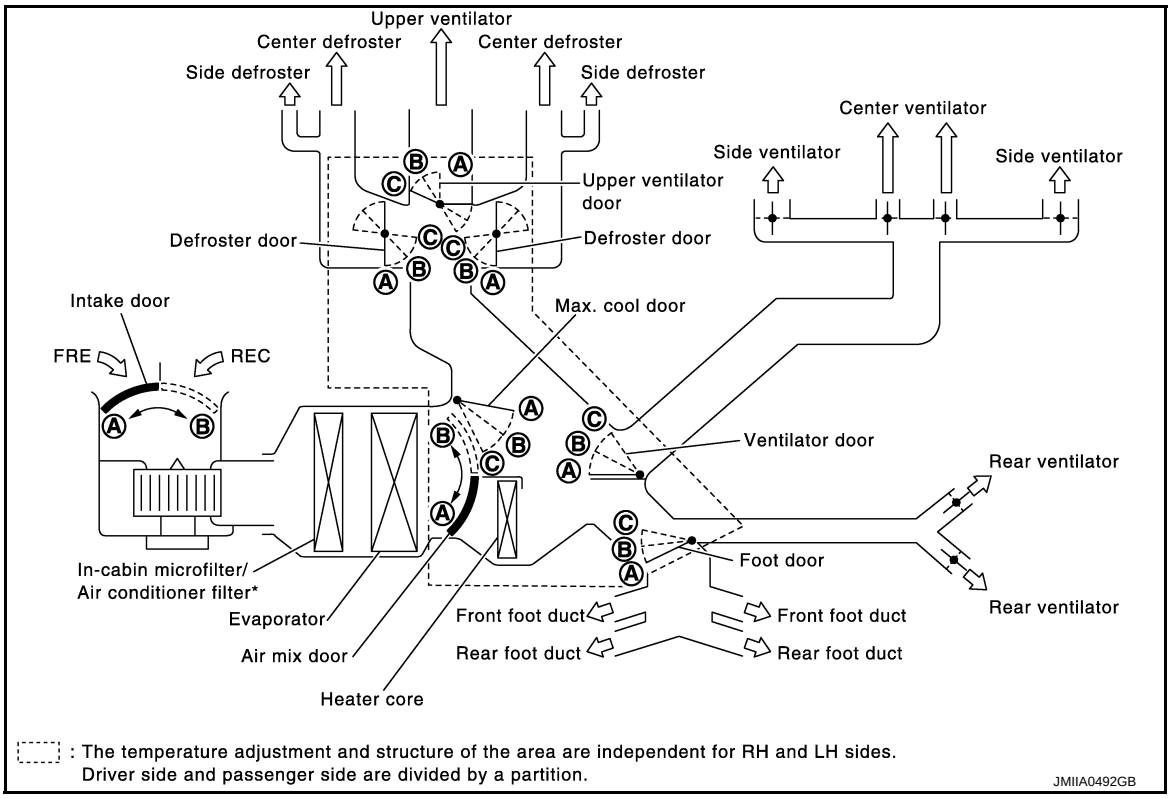
DUAL Switch

- When the DUAL switch indicator is ON, the driver side and passenger side, temperature can each be set independently.
- When the DUAL switch indicator is OFF, the driver side outlet and setting temperature are applied to both sides.

## DISCHARGE AIR FLOW



## SWITCHES AND THEIR CONTROL FUNCTION



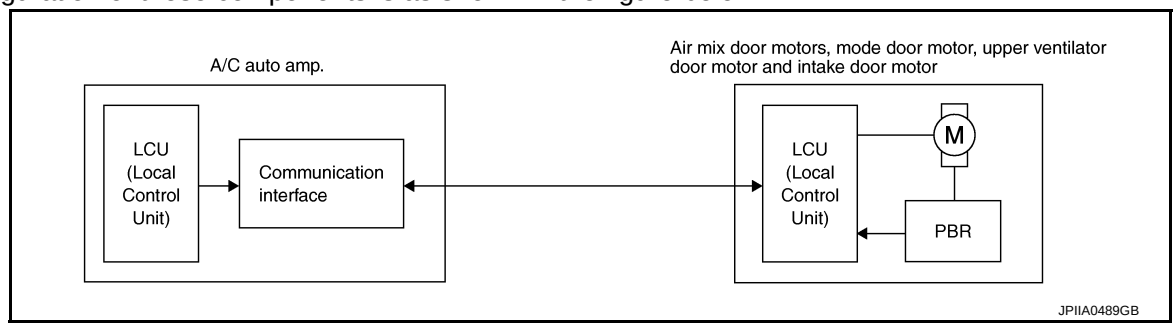

* : Models for Mexico.

| Switch position | | | Door position | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Ventilator door | Max. cool door | Defroster door | Foot door | Upper ventilator door | Intake door | Air mix door (Driver side) | Air mix door (Passenger side) |
| AUTO switch | ☀ | | AUTO | | | | | | AUTO | |
| MODE switch | VENT | | A | A | A | A | | | | |
| | B/L | | B | B | A | B | | — | | |
| | FOOT | | C | B | B | C | — | | | |
| | D/F | | C | B | B | B | | B | | |
| DEF switch | | ☀ | C | C | C | A | | B | — | — |
| UPPER VENT switch | ON | ☀ | — | | | | A-B | — | | |
| | OFF | ○ | | | | | C | | | |
| Intake switch | ON | ☀ | — | — | — | — | — | A* | | |
| | OFF | ○ | | | | | | B* | | |
| Temperature control dial (Driver side) | DUAL switch: OFF | 18.0°C (60°F) | | | | | | | A | |
| | | 18.5°C ⇔ 31.5°C (61°F ⇔ 89°F) | | | | | | | AUTO | |
| | | 32.0°C (90°F) | | | | | | | B | |
| Temperature control dial (Driver side) | DUAL switch: ON | 18.0°C (60°F) | | | | | | | A | |
| | | 18.5°C ⇔ 31.5°C (61°F ⇔ 89°F) | | | | | | — | AUTO | — |
| | | 32.0°C (90°F) | | | | | | | B | |
| Temperature control dial (Passenger side) | | 18.0°C (60°F) | | | | | | | — | A |
| | | 18.5°C ⇔ 31.5°C (61°F ⇔ 89°F) | | | | | | | | AUTO |
| | | 32.0°C (90°F) | | | | | | | | B |
| ON/OFF switch | | | C | C | B | C | — | B | — | — |

*: Inlet status is displayed by indicator when activating automatic control.

## AIR CONDITIONER LAN CONTROL SYSTEM

The LAN (Local Area Network) system consists of the A/C auto amp., the mode door motor, the air mix door motors, the upper ventilator door motor and the intake door motor.
A configuration of these components is as shown in the figure below.



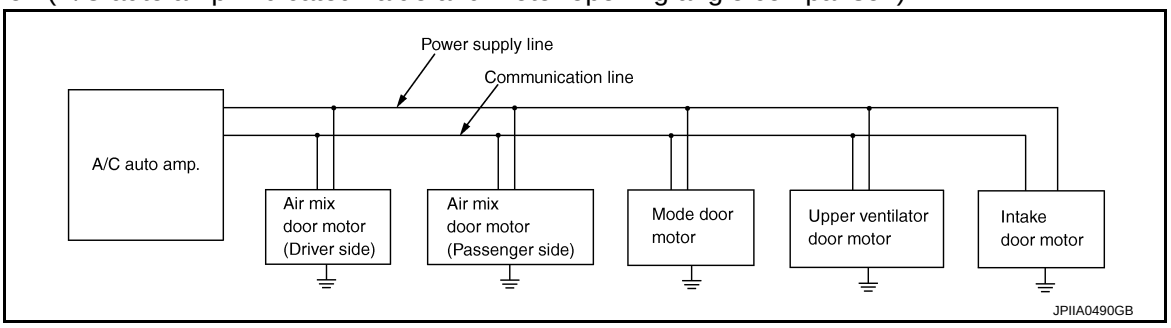
## SYSTEM CONSTRUCTION

A small network exists between the A/C auto amp., the mode door motor, the air mix door motors, the upper ventilator door motor and the intake door motor. The A/C auto amp. and motors are connected by data transmission lines and motor power supply lines. The LAN network is built through the ground circuits of each door motor.

Addresses, motor opening angle signals, motor stop signals and error checking messages are all transmitted through the data transmission lines connecting the A/C auto amp. and each door motor.

The following functions are contained in LCUs built into the mode door motor, the air mix door motors, the upper ventilator door motor and the intake door motor.

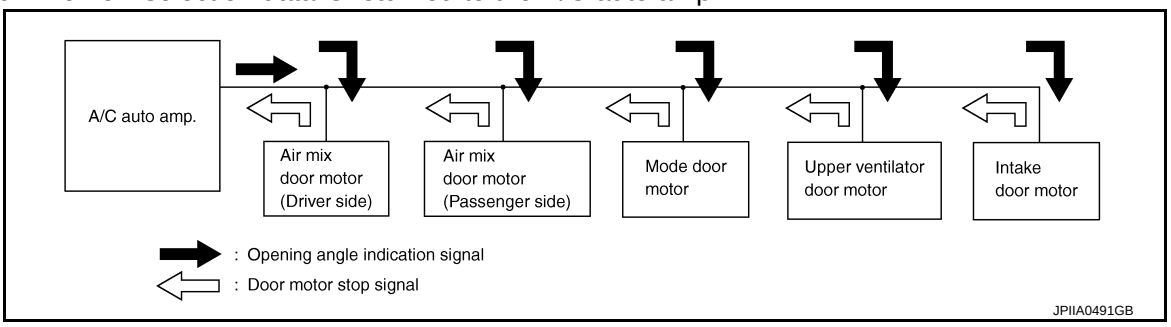
- Address
- Motor opening angle signals
- Data transmission
- Motor stop and drive decision
- Opening angle sensor (PBR function)
- Comparison
- Decision (A/C auto amp. indicated value and motor opening angle comparison)




Operation

The A/C auto amp. receives data from each of the sensors. The A/C auto amp. sends mode door, the air mix door and the intake door opening angle data to the mode door motor LCU, the air mix door motor LCUs, the upper ventilator door motor LCU and the intake door motor LCU.

The mode door motor, the air mix door motors, the upper ventilator door motor and the intake door motor read their respective signals according to the address signal. Opening angle indication signals received from the A/C auto amp. and each of the motor position sensors is compared by the LCUs in each door motor with the existing decision and opening angles. Next, HOT/COLD, DEF/VENT, OPEN/SHUT or FRE/REC operation is selected. The new selection data is returned to the A/C auto amp.




Transmission Data and Transmission Order

A/C auto amp. data is transmitted consecutively to each of the door motors following the form as shown in the figure below.

START:

- Initial compulsory signal is sent to each of the door motors.

ADDRESS:

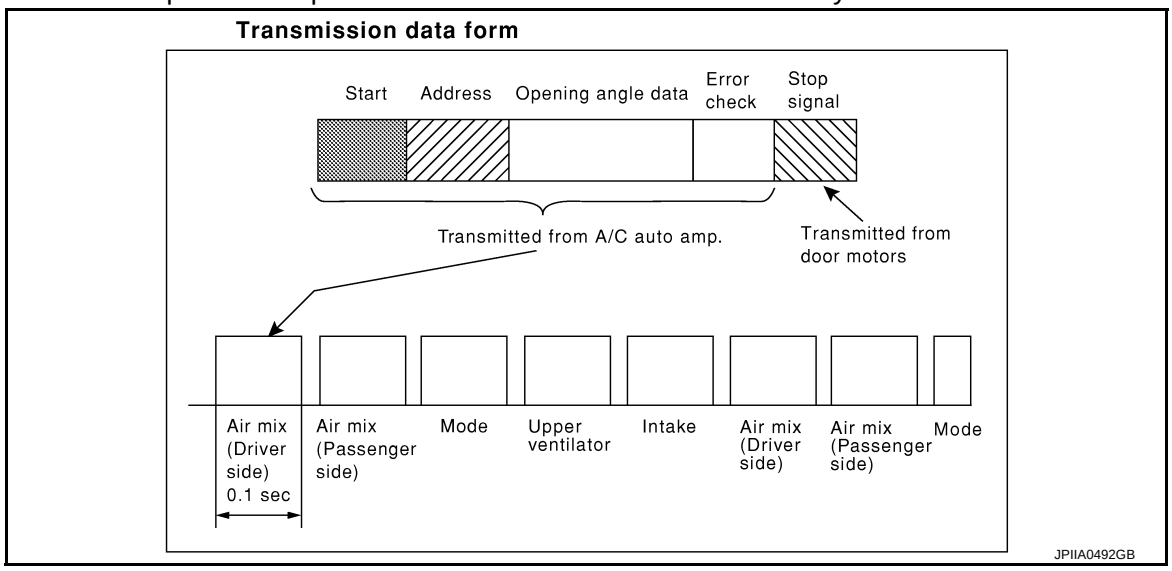
- Data sent from the A/C auto amp. is selected according to data-based decisions made by the mode door motor, the air mix door motors, the upper ventilator door motor and the intake door motor.
- If the addresses are identical, the opening angle data and error check signals are received by the door motor LCUs. The LCUs then make the appropriate error decision. If the opening angle data has no error, door control begins.
- If an error exists, the received data is rejected and corrected the data received. Finally, door control is based upon the corrected opening angle data.

OPENING ANGLE:
- Data that shows the indicated door opening angle of each door motor.

ERROR CHECK:
- In this procedure, transmitted and received data is checked for errors. Error data is then compiled. The error check prevents corrupted data from being used by the mode door motor, the air mix door motors, the upper ventilator door motor and the intake door motor. Error data can be related to the following symptoms.

- Malfunction of electrical frequency
- Poor electrical connections
- Signal leakage from transmission lines
- Signal level fluctuation

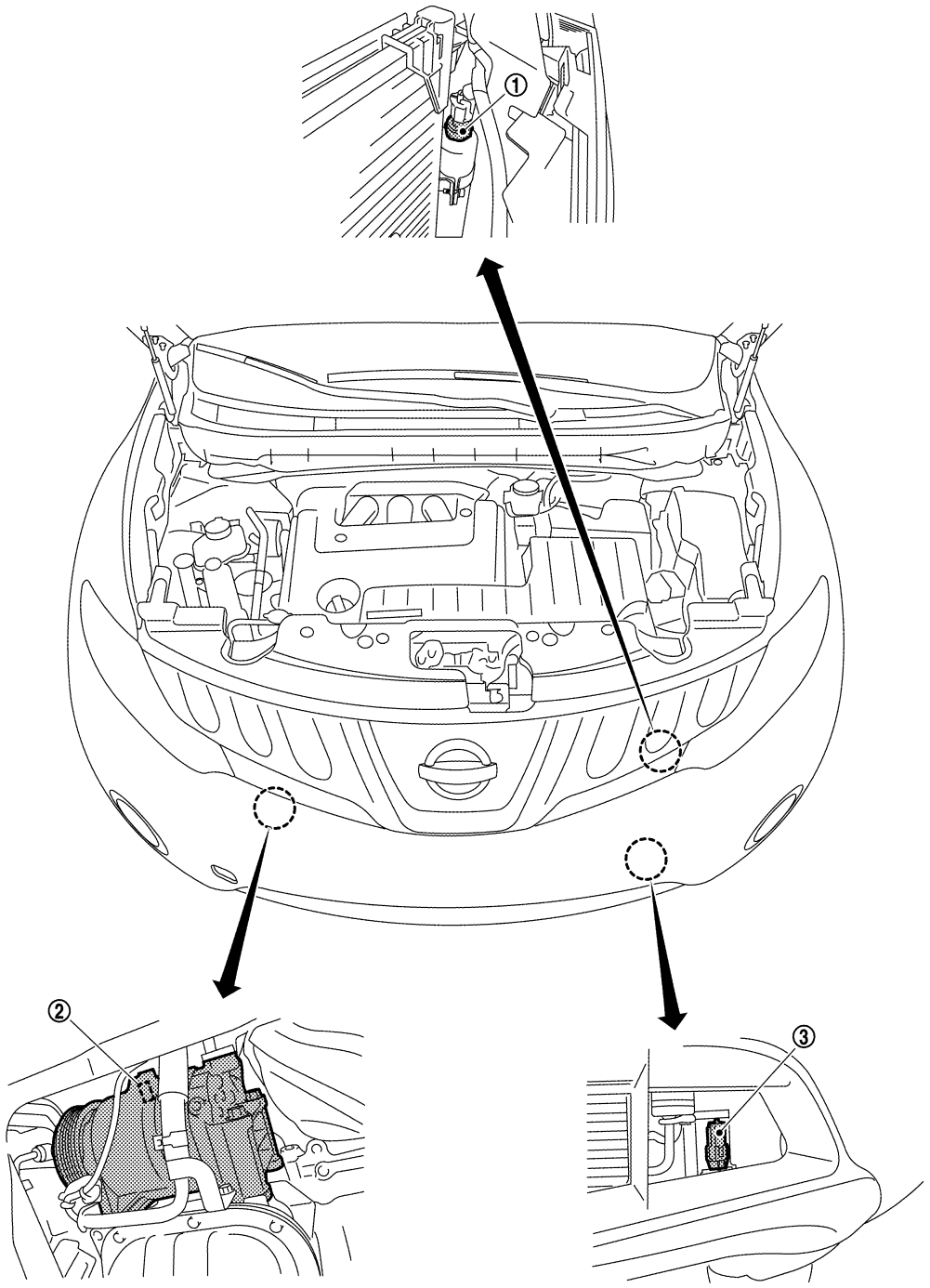
STOP SIGNAL:
- At the end of each transmission, a stop operation, in-operation, or internal malfunction message is delivered to the A/C auto amp. This completes one data transmission and control cycle.




## Component Part Location

INFOID:0000000009722140

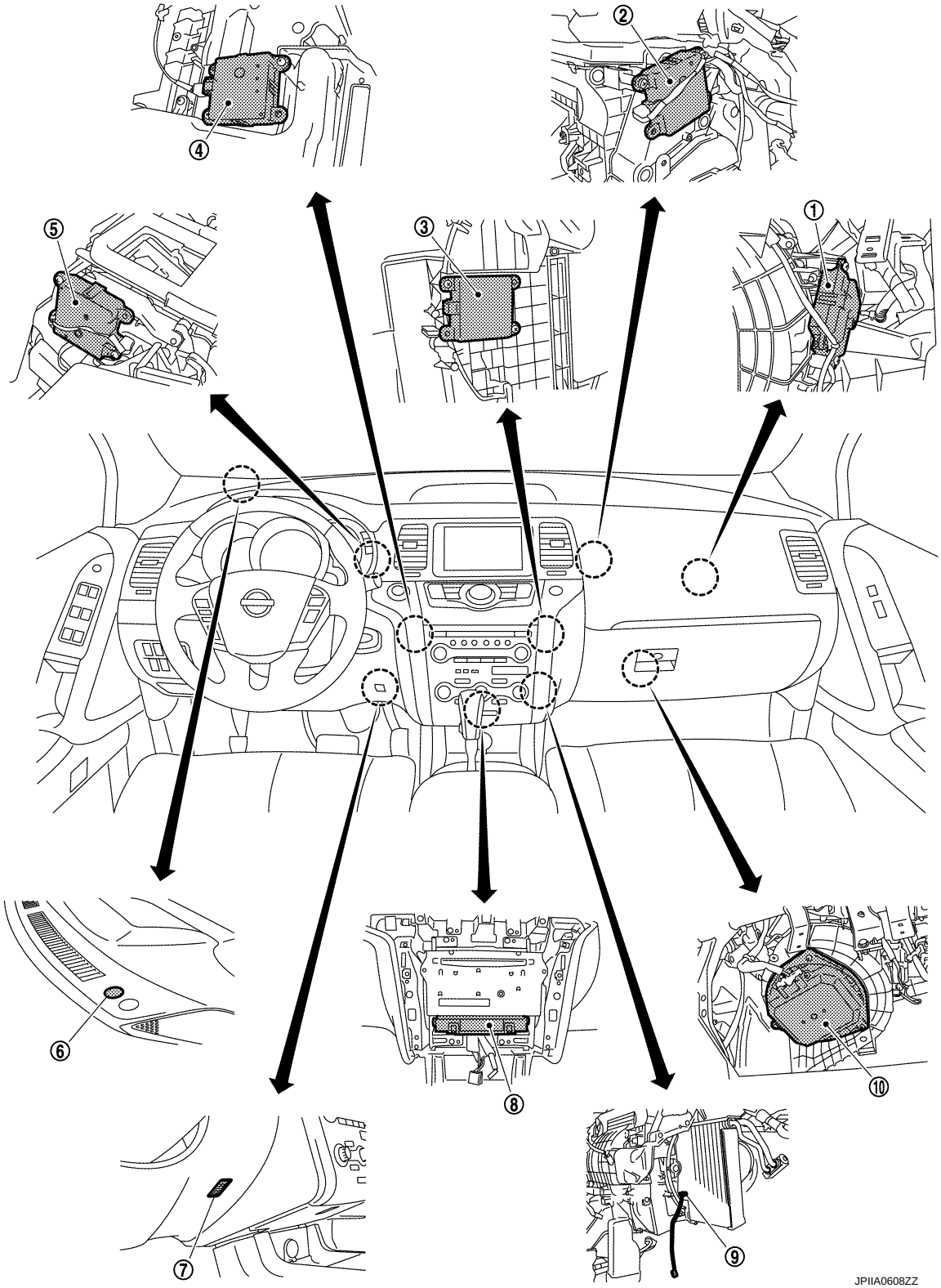
ENGINE COMPARTMENT




JPIIA0607ZZ

1. Refrigerant pressure sensor 2. Compressor (magnet clutch) 3. Ambient sensor

PASSENGER COMPARTMENT




1. Intake door motor
2. Upper ventilator door motor
3. Air mix door motor (passenger side)
4. Air mix door motor (driver side)
5. Mode door motor
6. Sunload sensor
7. In-vehicle sensor
8. A/C auto amp.
9. Intake sensor
10. Blower motor

## Component Description

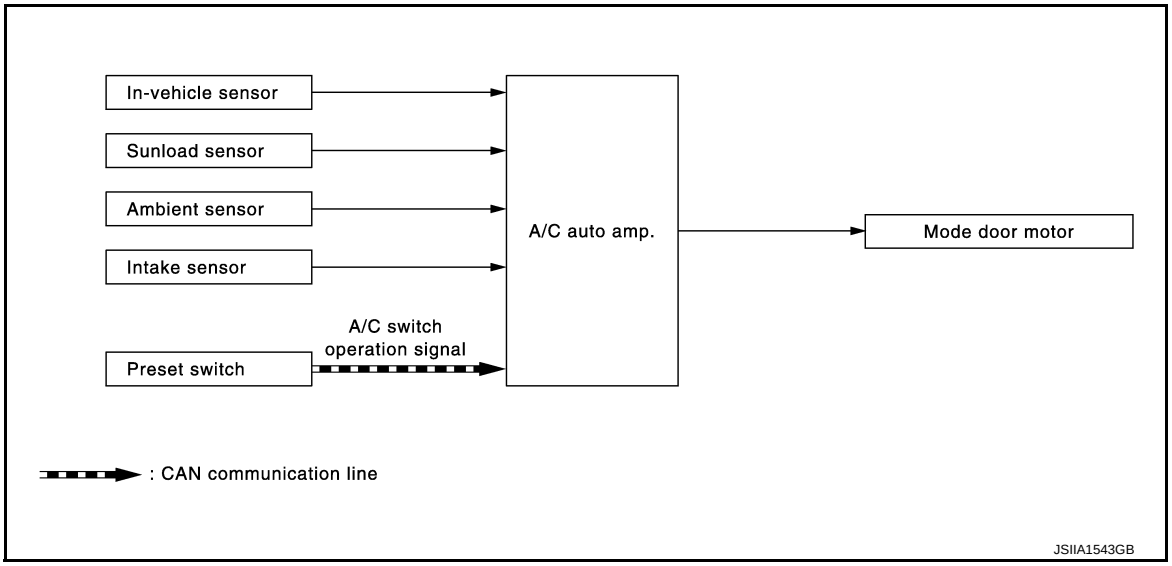
INFOID:0000000009722141

| Component | Reference |
|---|---|
| Refrigerant pressure sensor | EC-465, "Description" |
| Compressor | HAC-200, "Description" |
| Ambient sensor | HAC-172, "Description" |
| Intake door motor | HAC-191, "Description" |
| Upper ventilator door motor | HAC-193, "Description" |
| Air mix door motor (driver side) | HAC-184, "Description" |
| Air mix door motor (passenger side) | HAC-186, "Description" |
| Mode door motor | HAC-188, "Description" |
| Sunload sensor | HAC-181, "Description" |
| In-vehicle sensor | HAC-175, "Description" |
| A/C auto amp. | HAC-202, "A/C AUTO AMP. : Description" |
| Intake sensor | HAC-178, "Description" |
| Blower motor | HAC-196, "Description" |

# MODE DOOR CONTROL SYSTEM

## System Diagram

INFOID:0000000009722142




## System Description

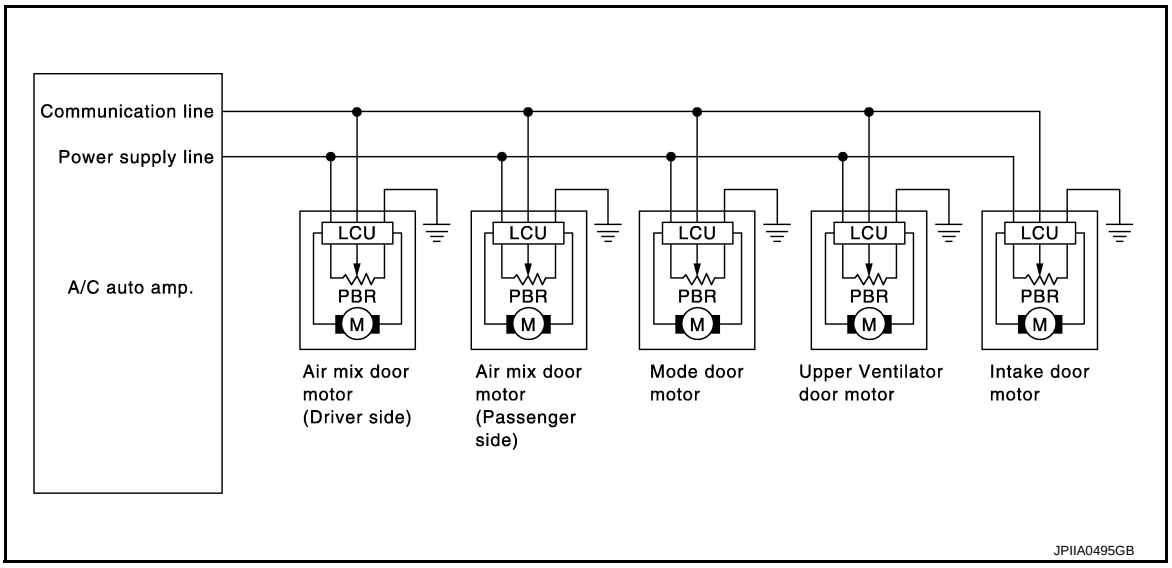
INFOID:0000000009722143

The mode door is automatically controlled by the temperature setting, ambient temperature, in-vehicle temperature, intake temperature and amount of sunload.

SYSTEM OPERATION

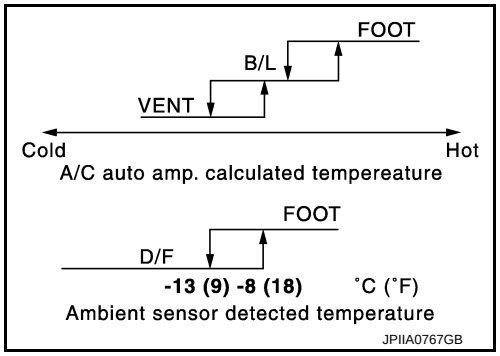
- The A/C auto amp. receives data from each of the sensors.
- The A/C auto amp. sends the air mix door, the mode door, the upper ventilator door and the intake door opening angle data to the air mix door motor LCU(s), the mode door motor LCU, the upper ventilator door motor LCU and the intake door motor LCU.
- The air mix door motor(s), the mode door motor, the upper ventilator door motor and the intake door motor read their respective signals according to the address signal. Opening angle indication signals received from the A/C auto amp. and each of the motor position sensors are compared by the LCUs in each door motor with the existing decision and opening angles.
- Next, HOT/COLD, DEF/VENT, OPEN/SHUT or FRE/REC operations is selected. The newly selected data is returned to the A/C auto amp.

Door Motor Circuit




Mode Door Control Specification

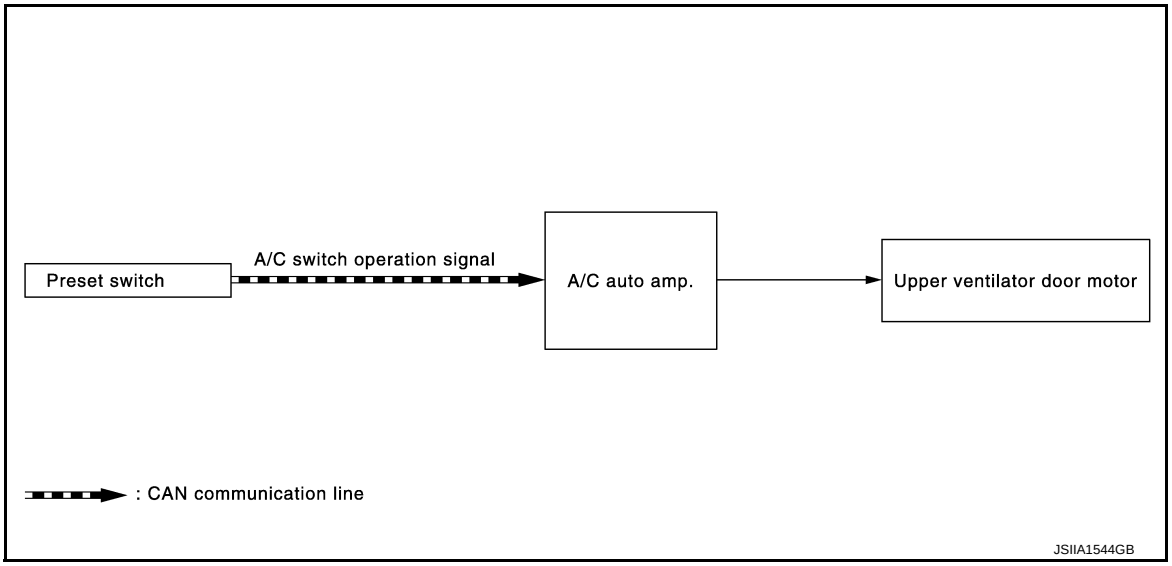
Mode position can be selected manually by pressing the MODE switch or the DEF switch on the A/C control. This enables to fix a mode position. Pressing the AUTO switch allows automatic control by the A/C auto amp. During the automatic control of a mode position, a mode door position (VENT, B/L, FOOT, or D/F) is selected based on a target the air mix door opening angle and sunload depending on the temperature calculated by the A/C auto amp. In addition, the D/F is selected to prevent windshield fogging only when ambient temperature is extremely low with mode position the FOOT.



# UPPER VENTILATOR DOOR CONTROL SYSTEM

## System Diagram

INFOID:0000000009722144




## System Description

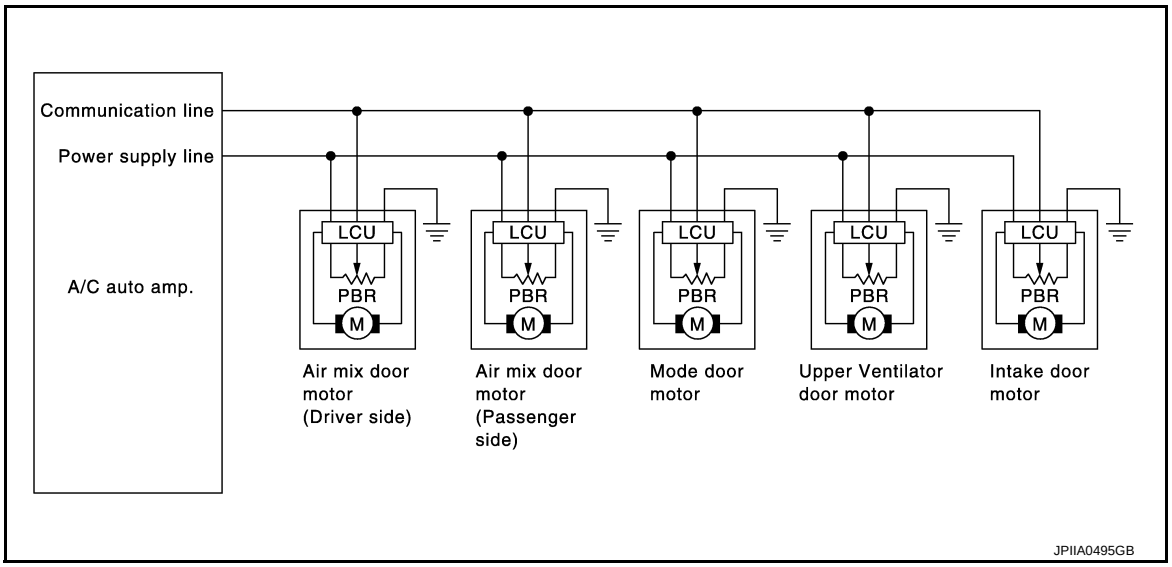
INFOID:0000000009722145

The upper ventilator door motor is attached to the heater & cooling unit assembly. The upper ventilator door motor operates by the UPPER VENT switch ON/OFF. Motor rotation is conveyed to a rod which activates the upper ventilator door.

### SYSTEM OPERATION

- The A/C auto amp. receives data from each of the sensors.
- The A/C auto amp. sends air mix door, the mode door, the upper ventilator door and the intake door opening angle data to the air mix door motor LCU(s), the mode door motor LCU, the upper ventilator door motor LCU and the intake door motor LCU.
- The air mix door motor(s), the mode door motor, the upper ventilator door motor and the intake door motor read their respective signals according to the address signal. Opening angle indication signals received from the A/C auto amp. and each of the motor position sensors are compared by the LCUs in each door motor with the existing decision and opening angles.
- Next, HOT/COLD, DEF/VENT, OPEN/SHUT or FRE/REC operations is selected. The newly selected data is returned to the A/C auto amp.

Door Motor Circuit



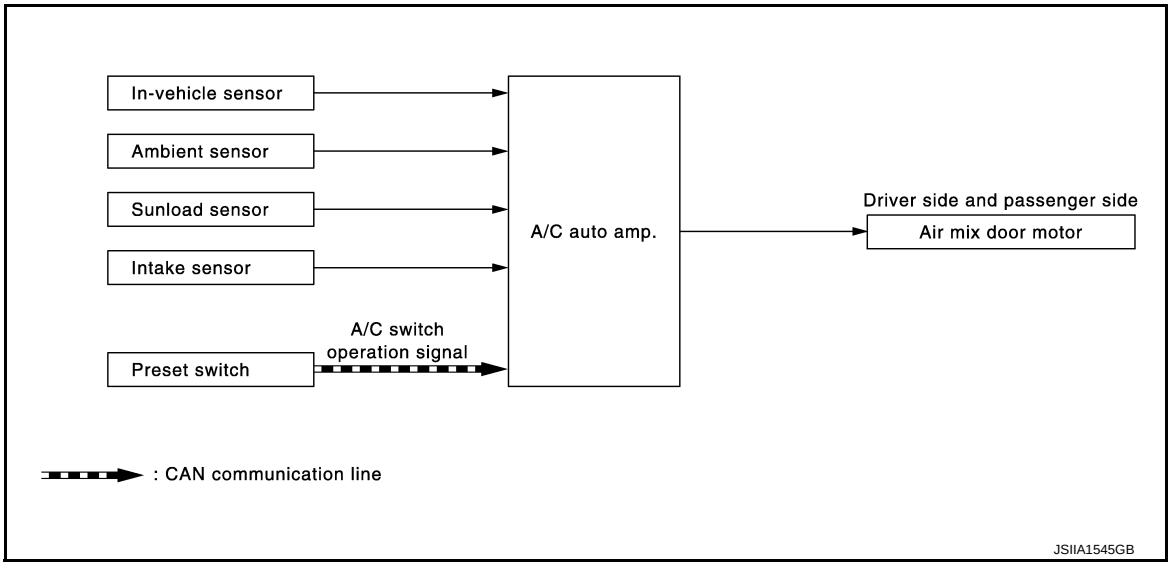

Upper Ventilator Specification

| UPPER VENT switch | MODE position | Upper ventilator door position |
|---|---|---|
| OFF | — | Close |
| ON | VENT or B/L | Open (Fully-open) |
| ON | FOOT or D/F | Open (Intermediate) |
| ON | DEF | Close |

# AIR MIX DOOR CONTROL SYSTEM

## System Diagram

INFOID:0000000009722146




## System Description

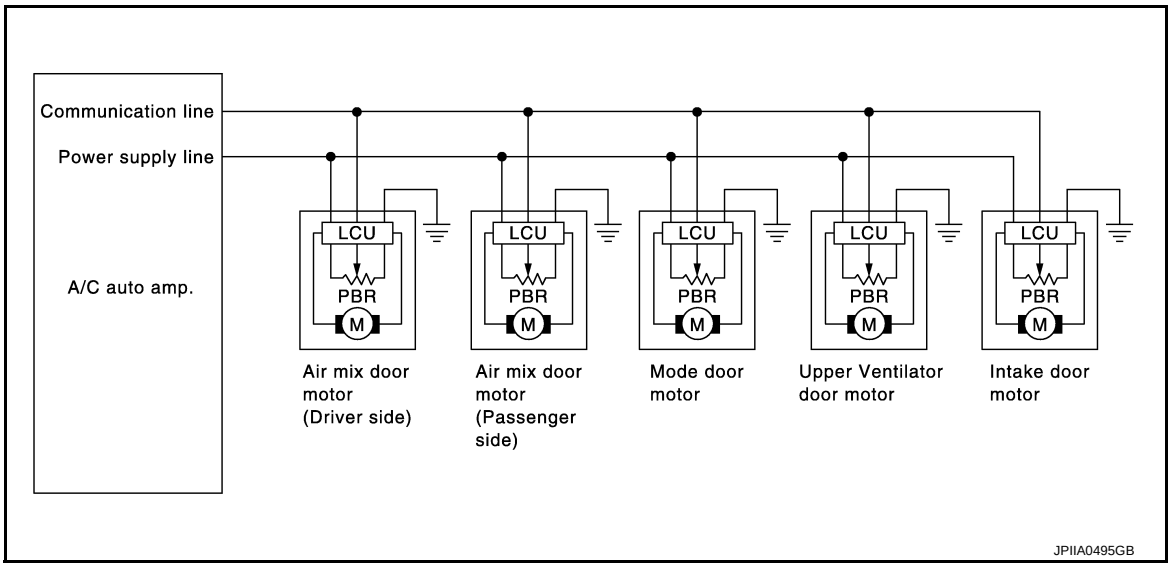
INFOID:0000000009722147

The air mix doors are automatically controlled so that in-vehicle temperature is maintained at a predetermined value by the temperature setting, ambient temperature, intake temperature and amount of sunload.

SYSTEM OPERATION

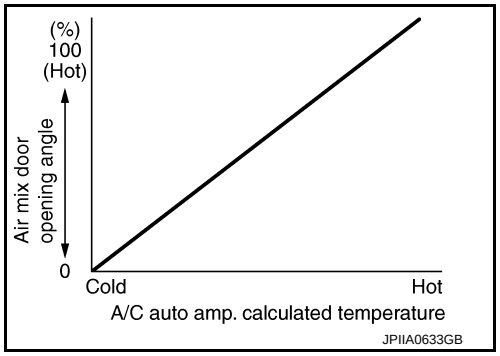
- The A/C auto amp. receives data from each of the sensors.
- The A/C auto amp. sends air mix door, the mode door, the upper ventilator door and the intake door opening angle data to the air mix door motor LCU(s), the mode door motor LCU, the upper ventilator door motor LCU and the intake door motor LCU.
- The air mix door motor(s), the mode door motor, the upper ventilator door motor and the intake door motor read their respective signals according to the address signal. Opening angle indication signals received from the A/C auto amp. and each of the motor position sensors are compared by the LCUs in each door motor with the existing decision and opening angles.
- Next, HOT/COLD, DEF/VENT, OPEN/SHUT or FRE/REC operation is selected. The newly selected data is returned to the A/C auto amp.

Door Motor Circuit




Air Mix Door Control Specification

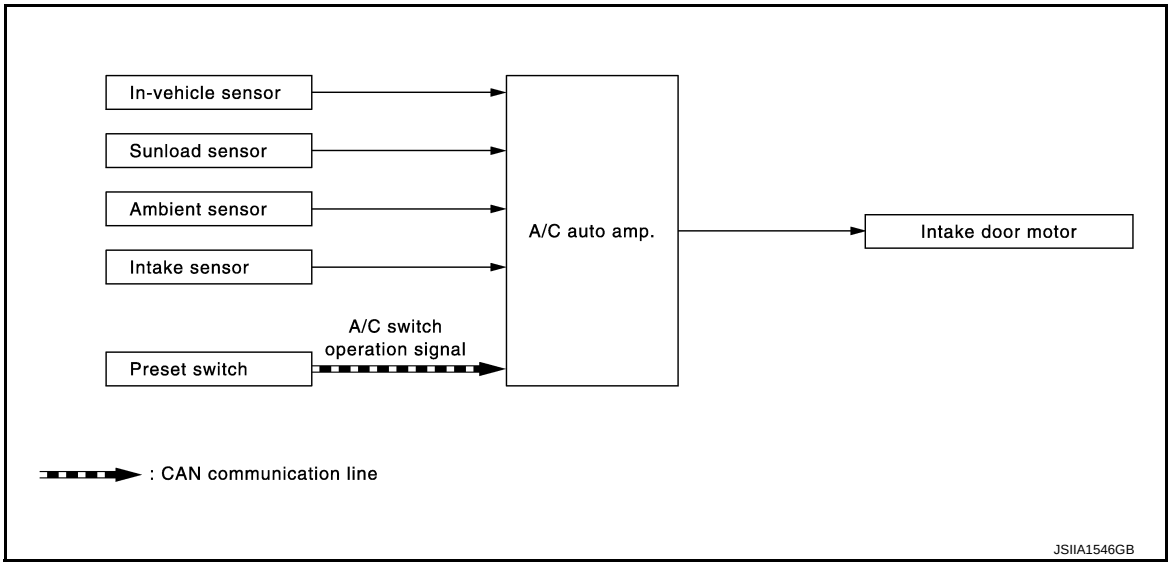
When ignition switch is ON, the A/C auto amp. continuously and automatically controls temperatures regardless of air conditioner operational condition. When setting a target temperature with the temperature control switch, the A/C auto amp. corrects the set temperature and decides a target air mix door opening angle. The A/C auto amp. controls air mix door according to the target air mix door opening angle and current air mix door opening angle, keeping an optimum air mix door opening angle. When the temperature is set at 18°C (60°F), air mix door is set on full cold, and when the temperature is set at 32°C (90°F), it is set to full hot.



# INTAKE DOOR CONTROL SYSTEM

## System Diagram

INFOID:0000000009722148




## System Description

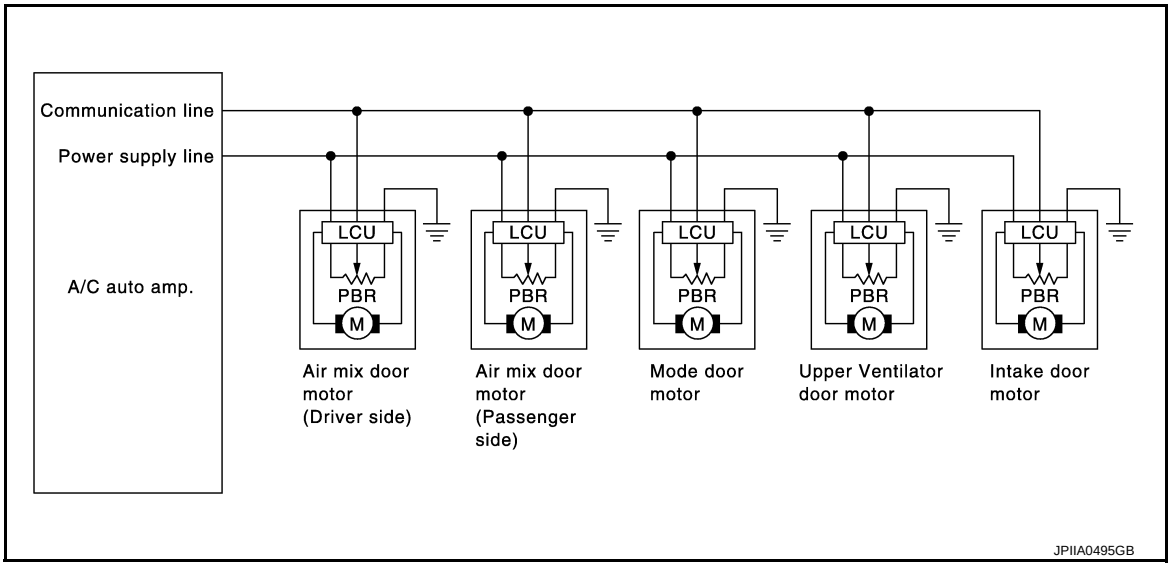
INFOID:0000000009722149

The intake doors are automatically controlled by the temperature setting, ambient temperature, in-vehicle temperature, intake temperature, amount of sunload and ON/OFF operation of the compressor.

### SYSTEM OPERATION

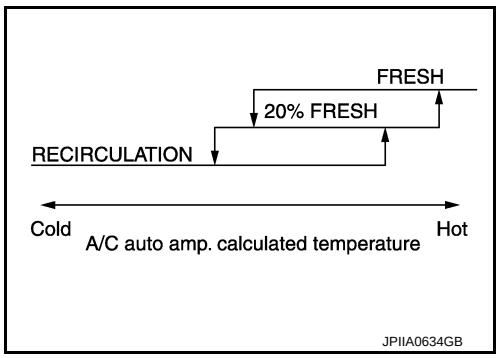
The intake door control judges intake door position based on the ambient temperature, the intake air temperature and the in-vehicle temperature. When in shifting mode position D/F, if the DEF or ON/OFF switches are pressed, or when the A/C switch is OFF, the A/C auto amp. sets the intake door to the FRE position.

Door Motor Circuit




Intake Door Control Specification

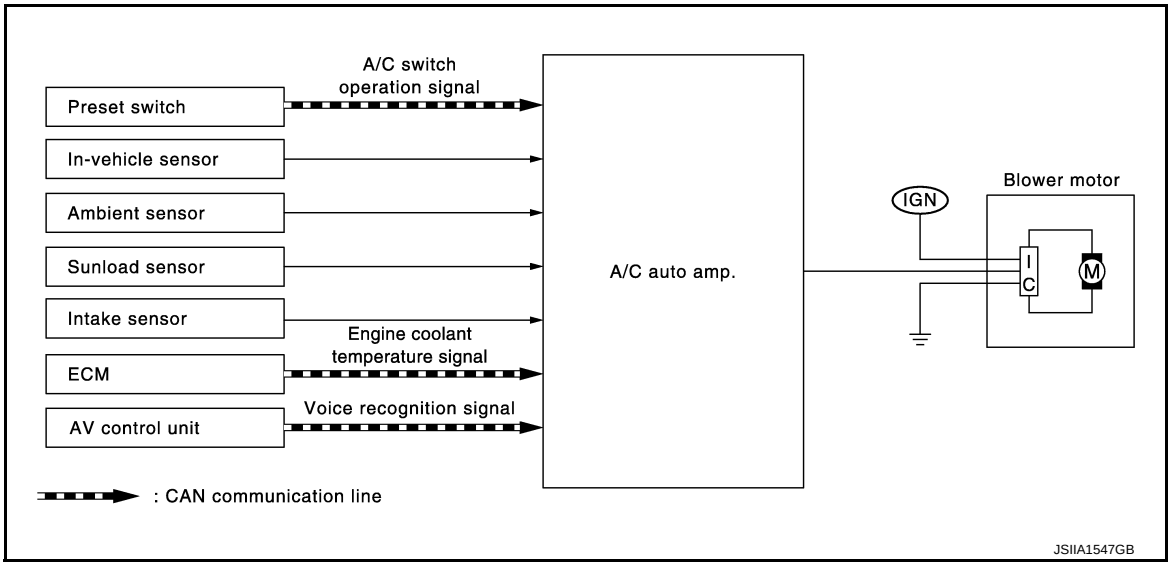
Intake door position is basically set to the FRE when the FRE indicator of the DEF switch and the intake switch turn ON, and set on the REC when the REC indicator of intake switch turns ON.
The intake door automatic control selects the FRE, the 20%FRE, or the REC depending on the target air mix door opening angle, based on in-vehicle temperature, ambient temperature, and sunload.



# BLOWER MOTOR CONTROL SYSTEM

## System Diagram

INFOID:0000000009722150




## System Description

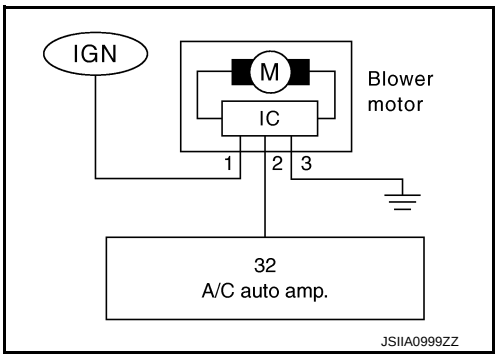
INFOID:0000000009722151

Blower speed is automatically controlled by the temperature setting, ambient temperature, in-vehicle temperature, intake temperature, amount of sunload and air mix door position.
By pressing the AUTO switch, the blower motor starts to gradually increase air flow volume.
When engine coolant temperature is low, the blower motor operation is delayed to prevent cool air from flowing.

### SYSTEM OPERATION

System operation

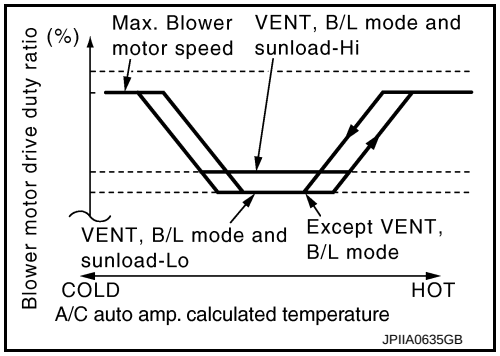
- For air flow, the manual selection (1-7) with the fan control dial has priority.
- If the AUTO switch is pressed or if the DEF switch is pressed while in the OFF condition, it changes to the automatic control by A/C auto amp.
- When increasing the air flow, it changes the duty ratio of the blower motor drive signal to prevent the air flow from suddenly increasing.
- There are the following types of air flow control: starting air flow control, starting air flow control at low coolant temperature, starting air flow control at high in-vehicle temperature, and air flow control at actuator operation in addition to manual control, normal automatic air flow control.




Normal automatic air flow control

- When the target temperature is set by the temperature control dial of preset switch, the A/C auto amp. performs the calculation and decides the target according to the signal from each sensor.
- The A/C auto amp. changes the duty ratio of blower motor drive signal and controls the air flow continuously so that the air flow becomes the target air flow.
- The minimum air flow will change according to the sunload when the air discharge outlet is VENT or B/L.

Fan Speed Control Specification




Starting air flow control

- When starting the automatic control of air flow, the system gradually increases the duty ratio of the blower motor drive signal to prevent too much air from blowing.
- The time period from when the air flow changes from LO to HI is approximately 8 seconds.
- It becomes the starting air flow control at low coolant temperature according to the calculation result of the A/C auto amp. and engine coolant temperature [approximately 58°C (136°F) or less] during the automatic air flow control.
- Do not perform the starting air flow control when the air discharge outlet is set to DEF.

Starting Fan Speed Control

Start up from COLD SOAK Condition (Automatic mode)

In cold start up condition where the engine coolant temperature is below 58°C (136°F), the blower does not operate for a short period of time (up to 150 seconds). The exact start delay time varies depending on the ambient temperature and engine coolant temperature.

In the most extreme case (very low ambient temperature) the blower start delay is 150 seconds as described above. After this delay, the blower will operate at low speed until the engine coolant temperature rises above 58°C (136°F), and then the blower speed increases to the objective speed.

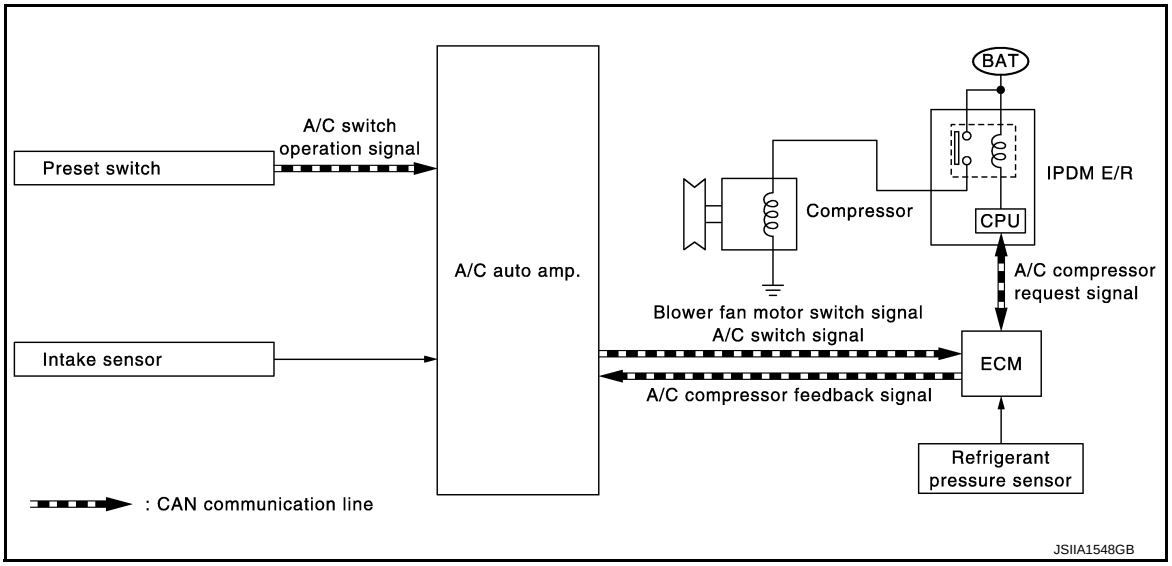
Start up from usual or HOT SOAK Condition (Automatic mode)

The blower will begin operation momentarily after the AUTO switch is pressed. The blower speed rises gradually to the objective speed over a time period of 3 seconds or less (actual time depends on the objective blower speed).

# MAGNET CLUTCH CONTROL SYSTEM

## System Diagram

INFOID:0000000009722152




## System Description

INFOID:0000000009722153

The A/C auto amp. controls compressor operation by ambient temperature, intake air temperature and signal from ECM.

### SYSTEM OPERATION

When the A/C switch, the AUTO switch, or the DEF switch is pressed, or when shifting mode position D/F, A/C auto amp. transmit the A/C switch signal and blower fan motor switch signal to the ECM, via CAN communication.

ECM judges whether compressor can be turned ON, based on each sensor status (refrigerant-pressure sensor signal, throttle angle, etc.). If the ECM judges that the compressor can be turned ON, it sends A/C compressor request signal to the IPDM E/R, via CAN communication.

Upon receipt of A/C compressor request signal from the ECM, the IPDM E/R turns the A/C relay ON to operate the compressor.

When sending A/C compressor request signal to the IPDM E/R via CAN communication line, the ECM simultaneously sends A/C compressor feedback signal to A/C auto amp. via CAN communication line.

The ECM sends A/C compressor feedback signal to A/C auto amp., then, uses input A/C compressor feedback signal to control air inlet.

#### Compressor Protection Control

The ECM makes the A/C relay turn OFF and stops the compressor when pressure on the high-pressure side detected by the refrigerant pressure sensor is over approximately 3,119 kPa (31.8 kg/cm$^2$, 452 psi), or below approximately 118 kPa (1.2 kg/cm$^2$, 17 psi).

#### Low Temperature Protection Control

Turn the A/C relay to OFF and stop the compressor by the signal from the A/C auto amp according to the evaporator passing air temperature detected by the intake sensor and the ambient temperature detected by the ambient sensor.

# CAN COMMUNICATION SYSTEM

## System Description

INFOID:0000000009722154

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto each vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN-H line, CAN-L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only. For details, refer to LAN-28, "CAN System Specification Chart".

# DIAGNOSIS SYSTEM (HVAC)

## CONSULT Function

INFOID:0000000009722155

CONSULT can display each diagnosis item using the diagnosis test modes shown as per the following.

CONSULT application items

| Diagnosis mode | Description |
|---|---|
| ECU Identification | Displays the A/C auto amp. number. |
| Self Diagnostic Result | Displays the diagnosis results judged by A/C auto amp. |
| Data Monitor | Displays A/C auto amp. input/output data in real time. |
| Active Test | The signals used to activate each device are forcibly supplied from A/C auto amp. |
| Work Support | Changes the setting for each system function.<br>• Temperature setting trimmer<br>• Inlet port memory function (FRE)<br>• Inlet port memory function (REC)<br>• Foot position setting trimmer |

### SELF DIAGNOSTIC RESULT

Refer to HAC-230, "DTC Index".

Display Item List

| DTC | Items (CONSULT screen terms) | Diagnostic item is detected when... | Possible cause |
|---|---|---|---|
| U1000 | CAN COMM CIRCUIT | When A/C auto amp. is not transmitting or receiving CAN communication signal for 2 or more seconds. | CAN communication system |
| U1010 | CONTROL UNIT (CAN) | When detecting error during the initial diagnosis of CAN controller of A/C auto amp. | A/C auto amp. |
| B257B | AMB TEMP SEN SHORT | Detected temperature at ambient sensor –44°C (–47°F) or less | • Ambient sensor<br>• A/C auto amp.<br>• Harness and connector (Ambient sensor circuit is open, or there is a short in the circuit) |
| B257C | AMB TEMP SEN OPEN | Detected temperature at ambient sensor 100°C (212°F) or more | |
| B2578 | IN CAR SEN SHORT | Detected temperature at in-vehicle sensor –44°C (–47°F) or less | • In-vehicle sensor<br>• A/C auto amp.<br>• Harness and connector (In-vehicle sensor circuit is open, or there is a short in the circuit) |
| B2579 | IN CAR SEN OPEN | Detected temperature at in-vehicle sensor 100°C (212°F) or more | |
| B2581 | EVAP TEMP SEN SHORT | Detected temperature at intake sensor –33°C (–27°F) or less | • Intake sensor<br>• A/C auto amp.<br>• Harness and connector (Intake sensor circuit is open, or there is a short in the circuit) |
| B2582 | EVAP TEMP SEN OPEN | Detected temperature at intake sensor 69°C (156°F) or more | |
| B2630* | SUNLOAD SEN SHORT | Detected calorie at sunload sensor 64.7 w/m$^2$ (56 kcal/m$^2$·h) or less | • Sunload sensor<br>• A/C auto amp.<br>• Harness and connector (Sunload sensor circuit is open, or there is a short in the circuit) |
| B2631* | SUNLOAD SEN OPEN | Detected calorie at sunload sensor 2832 w/m$^2$ (2436 kcal/m$^2$·h) or more | |
| B2632 | DR AIRMIX ACTR SHORT | Air mix door PBR (driver side) position 5% or less | • Air mix door motor (driver side)<br>• A/C auto amp.<br>• Harness and connector (CAN communication line is open or shorted) (Air mix door motor is open or shorted) |
| B2633 | DR AIRMIX ACTR OPEN | Air mix door PBR (driver side) position 95% or more | |

| DTC | Items (CONSULT screen terms) | Diagnostic item is detected when... | Possible cause |
|---|---|---|---|
| B2634 | PASS AIRMIX ACTR SHORT | Air mix door PBR (passenger side) position 5% or less | • Air mix door motor (passenger side)<br>• A/C auto amp.<br>• Harness and connector (CAN communication line is open or shorted) (Air mix door motor is open or shorted) |
| B2635 | PASS AIRMIX ACTR OPEN | Air mix door PBR (passenger side) position 95% or more | |
| B2636 | DR VENT DOOR FAIL | When the malfunctioning door position is detected at VENT position | • Mode door motor<br>• A/C auto amp.<br>• Harness and connector (CAN communication line is open or shorted) (Mode door motor is open or shorted) |
| B2637 | DR B/L DOOR FAIL | When the malfunctioning door position is detected at B/L position | |
| B2638 | DR D/F1 DOOR FAIL | When the malfunctioning door position is detected at FOOT position | |
| B2639 | DR DEF DOOR FAIL | When the malfunctioning door position is detected at DEF position | |
| B263D | FRE DOOR FAIL | When the malfunctioning intake door position is detected at FRE position | • Intake door motor<br>• A/C auto amp.<br>• Harness and connector (CAN communication line is open or shorted) (Intake door motor is open or shorted) |
| B263E | 20P FRE DOOR FAIL | When the malfunctioning intake door position is detected at 20%FRE position | |
| B263F | REC DOOR FAIL | When the malfunctioning intake door position is detected at REC position | |
| B2654 | D/F2 DOOR FAIL | When the malfunctioning door position is detected at D/F position | • Mode door motor<br>• A/C auto amp.<br>• Harness and connector (CAN communication line is open or shorted) (Mode door motor is open or shorted) |
| B2655 | B/L2 DOOR FAIL | When the malfunctioning door position is detected at B/L2 position | |
| B2661 | UPPER VENT DOOR OPEN POSI FAIL | When the malfunctioning upper ventilator door position is detected at open position. | • Upper ventilator door motor<br>• A/C auto amp.<br>• Harness and connector (CAN communication line is open or shorted) (Upper ventilator door motor is open or shorted) |
| B2662 | UPPER VENT DOOR MID POSI FAIL | When the malfunctioning upper ventilator door position is detected at middle position. | |
| B2663 | UPPER VENT DOOR SHUT POSI FAIL | When the malfunctioning upper ventilator door position is detected at shut position. | |

*: Perform self-diagnosis under sunshine. When performing indoors, aim a light (more than 60 W) at sunload sensor, otherwise self-diagnosis indicates even though the sunload sensor is functioning normally.

## DATA MONITOR

**NOTE:**

The following table includes information (items) inapplicable to this vehicle. For information (items) applicable to this vehicle, refer to CONSULT display items.

Display item list

| Monitor item [Unit] | | Description |
|---|---|---|
| COMP REQ SIG | [On/Off] | Displays A/C switch ON/OFF status transmitted to other units via CAN communication |
| FAN REQ SIG | [On/Off] | Displays blower switch ON/OFF status transmitted to other units via CAN communication |
| AMB TEMP SEN | [°C] | Ambient sensor value converted from ambient sensor signal received from ambient sensor |
| IN-VEH TEMP | [°C] | In-vehicle sensor value converted from in-vehicle sensor signal received from in-vehicle sensor |

| Monitor item [Unit] | | Description |
|---|---|---|
| INT TEMP SEN | [°C] | Intake sensor value converted from intake sensor signal received from intake sensor |
| SUNLOAD SEN | [w/m$^2$] | Sunload sensor value converted from sunload sensor signal received from sunload sensor |
| AMB SEN CAL | [°C] | Ambient sensor value calculated by A/C auto amp. |
| IN-VEH CAL | [°C] | In-vehicle sensor value calculated by A/C auto amp. |
| INT TEMP CAL | [°C] | Intake sensor value calculated by A/C auto amp. |
| SUNL SEN CAL | [w/m$^2$] | Sunload sensor value calculated by A/C auto amp. |
| FAN DUTY | | Duty ratio of blower motor judged by A/C auto amp. |
| XM | | Target discharge air temperature judged by A/C auto amp. according to the temperature setting and the value from each sensor |
| ENG COOL TEMP | [°C] | Water temperature signal value received from ECM via CAN communication |
| VEHICLE SPEED | [Mph (km/h)] | Vehicle speed signal value received from meter via CAN communication |

## ACTIVE TEST

| Test item | Description |
|---|---|
| ALL SEG | **NOTE:**<br>• Item can be displayed but cannot be tested.<br>• When choosing to turn “ALL SEG” on, error message is displayed but it is not malfunction. |
| HVAC TEST | The operation check of A/C system can be performed by selecting the mode. Refer to the following table for the conditions of each mode. |

### HVAC TEST

| | Test item | | | | | | |
|---|---|---|---|---|---|---|---|
| | MODE 1 | MODE 2 | MODE 3 | MODE 4 | MODE 5 | MODE 6 | MODE 7 |
| Mode door position | VENT1 | VENT2 | B/L1 | B/L2 | FOOT | D/F | DEF |
| Intake door position | REC | REC | 20%FRE | 20%FRE | FRE | FRE | FRE |
| Air mix door position (driver & passenger side) | FULL COLD | FULL HOT | FULL COLD | FULL HOT | FULL HOT | FULL HOT | FULL HOT |
| Blower motor duty ratio | 35% | 35% | 61% | 61% | 81% | 81% | 35% |
| Compressor (Magnet clutch) | ON | ON | ON | ON | OFF | OFF | ON |
| Upper ventilator door | OPEN | SHUT | OPEN | SHUT | SHUT | SHUT | SHUT |

**NOTE:**

Perform the inspection of each output device after starting the engine because the compressor is operated.

## WORK SUPPORT

| Work item | Description | Reference |
|---|---|---|
| TEMP SET CORRECT<br>(Setting of difference between temperature setting and control temperature) | If the temperature felt by the customer is different than the air flow temperature controlled by the temperature setting, the auto amplifier control temperature can be adjusted to compensate for the temperature setting. | HAC-136, "Temperature Setting Trimmer" |
| BLOW SET<br>(Blow setting to DEF in FOOT mode) | In the FOOT mode, the air blowing to the DEF can change ON/OFF. | HAC-136, "Foot Position Setting Trimmer" |

| Work item | Description | Reference |
|---|---|---|
| FRE MEMORY SET<br>(FRE memory function setting) | • If the ignition switch is turned to the OFF position while the FRE switch is set to ON (fresh air intake), “Perform the memory” or “Do not perform the memory” of the FRE switch ON (fresh air intake) condition can be selected.<br>• If “Perform the memory” was set, the FRE switch will be ON (fresh air intake) when turning the ignition switch to the ON position again.<br>• If “Do not perform the memory” was set, the air inlets will be controlled automatically when turning the ignition switch to the ON position again. | HAC-137, "Inlet Port Memory Function (FRE)" |
| REC MEMORY SET<br>(REC memory function setting) | • If the ignition switch is turned to the OFF position while the REC switch is set to ON (recirculation), “Perform the memory” or “Do not perform the memory” of the REC switch ON (recirculation) condition can be selected.<br>• If “Perform the memory” was set, the REC switch will be ON (recirculation) when turning the ignition switch to the ON position again.<br>• If “Do not perform the memory” was set, the air inlets will be controlled automatically when turning the ignition switch to the ON position again. | HAC-137, "Inlet Port Memory Function (REC)" |

**NOTE:**

When the battery cable is disconnected from the negative terminal or when the battery voltage becomes 10 V or less, the setting of WORK SUPPORT may be cancelled.

# DTC/CIRCUIT DIAGNOSIS

## U1000 CAN COMM CIRCUIT

### Description

INFOID:0000000009722156

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with two communication lines (CAN-H line, CAN-L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.
CAN Communication Signal Chart. Refer to LAN-17, "How to Use CAN Communication Signal Chart".

### DTC Logic

INFOID:0000000009722157

#### DTC DETECTION LOGIC

| DTC | Items (CONSULT screen terms) | Diagnostic item is detected when... | Possible cause |
|---|---|---|---|
| U1000 | CAN COMM CIRCUIT | When A/C auto amp. is not transmitting or receiving CAN communication signal for 2 or more seconds. | CAN communication system |

### Diagnosis Procedure

INFOID:0000000009722158

#### 1. CHECK WITH SELF-DIAGNOSIS FUNCTION OF CONSULT

1. Turn ignition switch ON and wait for 2 or more seconds.
2. Using CONSULT, perform “SELF-DIAGNOSIS RESULTS” of HVAC.

Is “CAN COMM CIRCUIT” displayed?

YES >> Perform trouble diagnosis for the CAN communication system. Refer to LAN-18, "Trouble Diagnosis Flow Chart".
NO >> Perform the intermittent malfunction diagnosis. Refer to GI-44, "Intermittent Incident".

# U1010 CONTROL UNIT (CAN)

## Description

INFOID:0000000009722159

Initial diagnosis of A/C auto amp.

## DTC Logic

INFOID:0000000009722160

### DTC DETECTION LOGIC

| DTC | Items (CONSULT screen terms) | Diagnostic item is detected when... | Possible cause |
|---|---|---|---|
| U1010 | CONTROL UNIT (CAN) | When detecting error during the initial diagnosis of CAN controller of A/C auto amp. | A/C auto amp. |

## Diagnosis Procedure

INFOID:0000000009722161

### 1.CHECK WITH SELF-DIAGNOSIS FUNCTION OF CONSULT

Using CONSULT, perform “SELF-DIAGNOSIS RESULTS” of HVAC.

Is DTC No.“U1010” displayed?

YES >> Replace A/C auto amp.
NO >> INSPECTION END

# B257B, B257C AMBIENT SENSOR

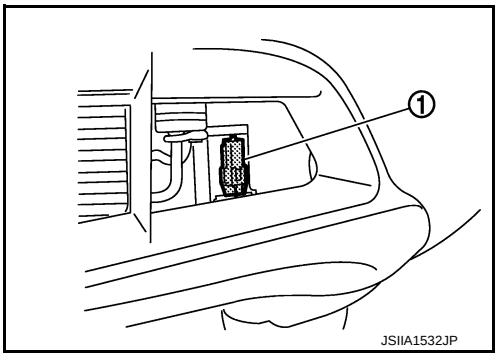
## Description

INFOID:0000000009722162

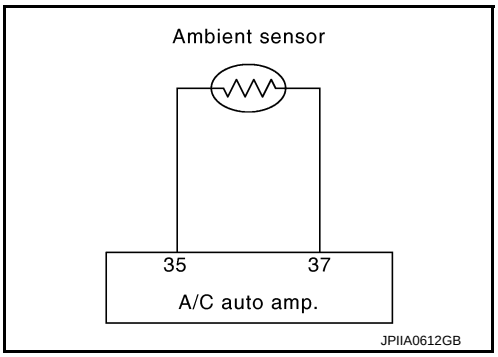
### COMPONENT DESCRIPTION

Ambient Sensor

- The ambient sensor (1) is installed to the front bumper (left back).
- It detects ambient temperature and converts it into a resistance value which is then input into the A/C auto amp.




Ambient Sensor Circuit




### AMBIENT TEMPERATURE INPUT PROCESS

The A/C auto amp. equips a processing circuit for the ambient sensor input. However, when the temperature detected by the ambient sensor increases quickly, the processing circuit retards the A/C auto amp. function. It only allows the A/C auto amp. to recognize an ambient temperature increase of 0.33°C (0.6°F) per 100 seconds.

As an example, consider stopping for a few minutes after high speed driving. Although the actual ambient temperature has not changed, the temperature detected by the ambient sensor increases. This is because the heat from the engine compartment can radiate to the front bumper area, the location of the ambient sensor.

## DTC Logic

INFOID:0000000009722163

### DTC DETECTION LOGIC

**NOTE:**

- If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to HAC-170, "DTC Logic" or HAC-171, "DTC Logic".
- If there is an open circuit in the ambient sensor, A/C auto amp. registers extreme cold [–44°C (–47°F)] and adjusts the temperature control warmer.

| DTC | Items (CONSULT screen terms) | Diagnostic item is detected when... | Possible cause |
|---|---|---|---|
| B257B | AMBIENT SENSOR | Detected temperature at ambient sensor –44°C (–47°F) or less | • Ambient sensor<br>• A/C auto amp.<br>• Harness and connector (Ambient sensor circuit is open, or there is a short in the circuit) |
| B257C | | Detected temperature at ambient sensor 100°C (212°F) or more | |

### DTC CONFIRMATION PROCEDURE

1. CHECK WITH SELF-DIAGNOSIS FUNCTION OF CONSULT

1. Using CONSULT, perform “SELF-DIAGNOSIS RESULTS” of HVAC.
2. Check if any DTC No. is displayed in the self-diagnosis results.

**NOTE:**

- If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to HAC-170, "DTC Logic" or HAC-171, "DTC Logic".
- If there is an open circuit in the ambient sensor, A/C auto amp. registers extreme cold [–44°C (–47°F)] and adjusts the temperature control warmer.

Is DTC No.“B257B” or “B257C” displayed?

YES >> Perform trouble diagnosis for the ambient sensor. Refer to HAC-173, "Diagnosis Procedure".
NO >> INSPECTION END

## Diagnosis Procedure

INFOID:0000000009722164

### 1.CHECK VOLTAGE BETWEEN AMBIENT SENSOR AND GROUND

1. Disconnect ambient sensor connector.
2. Turn ignition switch ON.
3. Check voltage between ambient sensor harness connector and ground.

| (+) | | (–) | Voltage |
|---|---|---|---|
| Ambient sensor | | — | |
| Connector | Terminal | | |
| E337 | 1 | Ground | Approx. 5 V |

Is the inspection result normal?

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

### 2.CHECK CIRCUIT CONTINUITY BETWEEN AMBIENT SENSOR AND A/C AUTO AMP.

1. Turn ignition switch OFF.
2. Disconnect A/C auto amp. connector.
3. Check continuity between ambient sensor harness connector and A/C auto amp. harness connector.

| Ambient sensor | | A/C auto amp. | | Continuity |
|---|---|---|---|---|
| Connector | Terminal | Connector | Terminal | |
| E337 | 2 | M50 | 37 | Existed |

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair harness or connector.

### 3.CHECK AMBIENT SENSOR

Check ambient sensor. Refer to HAC-174, "Component Inspection".

Is the inspection result normal?

YES >> Replace A/C auto amp.
NO >> Replace ambient sensor.

### 4.CHECK CIRCUIT CONTINUITY BETWEEN AMBIENT SENSOR AND A/C AUTO AMP.

1. Turn ignition switch OFF.
2. Disconnect A/C auto amp. connector.
3. Check continuity between ambient sensor harness connector and A/C auto amp. harness connector.

| Ambient sensor | | A/C auto amp. | | Continuity |
|---|---|---|---|---|
| Connector | Terminal | Connector | Terminal | |
| E337 | 1 | M50 | 35 | Existed |

4. Check continuity between ambient sensor harness connector and ground.

| Ambient sensor | | — | Continuity |
|---|---|---|---|
| Connector | Terminal | | |
| E337 | 1 | Ground | Not existed |

Is the inspection result normal?

YES >> Replace A/C auto amp.
NO >> Repair harness or connector.

## Component Inspection

INFOID:0000000009722165

### 1. CHECK AMBIENT SENSOR

1. Turn ignition switch OFF.
2. Disconnect ambient sensor connector. Refer to VTL-90, "Exploded View".
3. Check resistance between ambient sensor terminals.

| Terminal | | Condition | Resistance kΩ |
|---|---|---|---|
| | | Temperature °C (°F) | |
| 1 | 2 | –15 (5) | 12.73 |
| | | –10 (14) | 9.92 |
| | | –5 (23) | 7.80 |
| | | 0 (32) | 6.19 |
| | | 5 (41) | 4.95 |
| | | 10 (50) | 3.99 |
| | | 15 (59) | 3.24 |
| | | 20 (68) | 2.65 |
| | | 25 (77) | 2.19 |
| | | 30 (86) | 1.81 |
| | | 35 (95) | 1.51 |
| | | 40 (104) | 1.27 |
| | | 45 (113) | 1.07 |

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace ambient sensor.

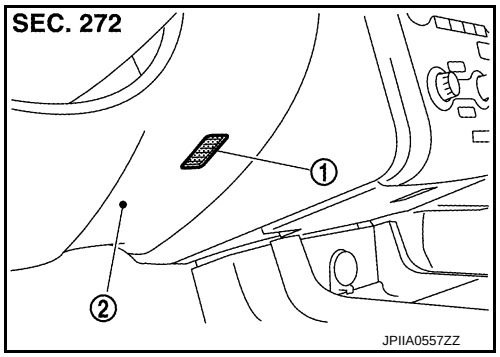
# B2578, B2579 IN-VEHICLE SENSOR

## Description

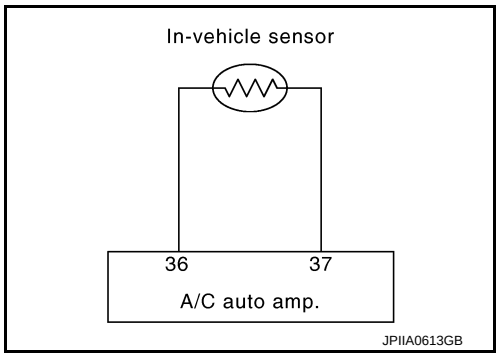
INFOID:0000000009722166

In-vehicle Sensor

- The in-vehicle sensor (1) is located on instrument driver lower panel (2).
- It converts variations in compartment air temperature drawn from the aspirator into a resistance value. It is then input into the A/C auto amp.

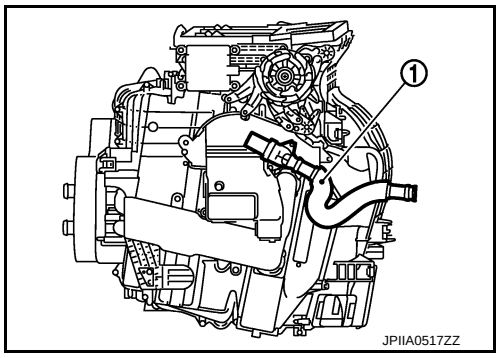


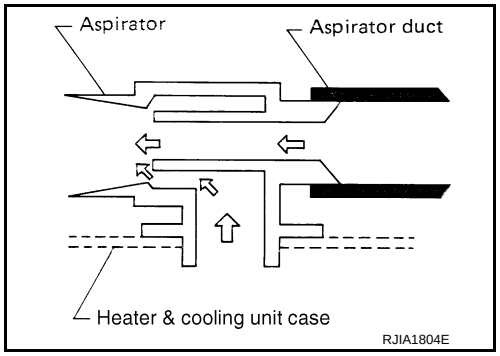

In-vehicle Sensor Circuit




Aspirator

The aspirator (1) is located on driver side of heater & cooling unit assembly. It produces vacuum pressure due to air discharged from the heater & cooling unit assembly, continuously taking compartment air in the aspirator.




## DTC Logic

INFOID:0000000009722167

DTC DETECTION LOGIC

**NOTE:**
If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to HAC-170, "DTC Logic" or HAC-171, "DTC Logic".

| DTC | Items (CONSULT screen terms) | Diagnostic item is detected when... | Possible cause |
|---|---|---|---|
| B2578 | IN-VEHICLE SENSOR | Detected temperature at in-vehicle sensor –44°C (–47°F) or less | • In-vehicle sensor<br>• A/C auto amp.<br>• Harness and connector (In-vehicle sensor circuit is open, or there is a short in the circuit) |
| B2579 | | Detected temperature at in-vehicle sensor 100°C (212°F) or more | |

## DTC CONFIRMATION PROCEDURE

### 1.CHECK WITH SELF-DIAGNOSIS FUNCTION OF CONSULT

1. Using CONSULT, perform “SELF-DIAGNOSIS RESULTS” of HVAC.
2. Check if any DTC No. is displayed in the self-diagnosis results.

**NOTE:**
If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to HAC-170, "DTC Logic" or HAC-171, "DTC Logic".

Is DTC No.“B2578” or “B2579” displayed?

YES >> Perform trouble diagnosis for the in-vehicle sensor. Refer to HAC-176, "Diagnosis Procedure".
NO >> INSPECTION END

## Diagnosis Procedure

INFOID:0000000009722168

### 1.CHECK VOLTAGE BETWEEN IN-VEHICLE SENSOR AND GROUND

1. Disconnect in-vehicle sensor connector.
2. Turn ignition switch ON.
3. Check voltage between in-vehicle sensor harness connector and ground.

| (+) | | (–) | Voltage |
|---|---|---|---|
| In-vehicle sensor | | — | |
| Connector | Terminal | | |
| M41 | 1 | Ground | Approx. 5 V |

Is the inspection result normal?

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

### 2.CHECK CIRCUIT CONTINUITY BETWEEN IN-VEHICLE SENSOR AND A/C AUTO AMP.

1. Turn ignition switch OFF.
2. Disconnect A/C auto amp. connector.
3. Check continuity between in-vehicle sensor harness connector and A/C auto amp. harness connector.

| In-vehicle sensor | | A/C auto amp. | | Continuity |
|---|---|---|---|---|
| Connector | Terminal | Connector | Terminal | |
| M41 | 2 | M50 | 37 | Existed |

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair harness or connector.

### 3.CHECK IN-VEHICLE SENSOR

Check in-vehicle sensor. Refer to HAC-177, "Component Inspection".

Is the inspection result normal?

YES >> Replace A/C auto amp.

NO >> Replace in-vehicle sensor.

## 4. CHECK CIRCUIT CONTINUITY BETWEEN IN-VEHICLE SENSOR AND A/C AUTO AMP.

1. Turn ignition switch OFF.
2. Disconnect A/C auto amp. connector.
3. Check continuity between in-vehicle sensor harness connector and A/C auto amp. harness connector.

| In-vehicle sensor | | A/C auto amp. | | Continuity |
|---|---|---|---|---|
| Connector | Terminal | Connector | Terminal | |
| M41 | 1 | M50 | 36 | Existed |

4. Check continuity between in-vehicle sensor harness connector and ground.

| In-vehicle sensor | | — | Continuity |
|---|---|---|---|
| Connector | Terminal | | |
| M41 | 1 | Ground | Not existed |

Is the inspection result normal?

YES >> Replace A/C auto amp.
NO >> Repair harness or connector.

# Component Inspection

INFOID:0000000009722169

## 1. CHECK IN-VEHICLE SENSOR

1. Turn ignition switch OFF.
2. Disconnect in-vehicle sensor connector. Refer to VTL-91, "Exploded View".
3. Check resistance between in-vehicle sensor terminals.

| Terminal | | Condition | Resistance kΩ |
|---|---|---|---|
| | | Temperature °C (°F) | |
| 1 | 2 | –15 (5) | 12.73 |
| | | –10 (14) | 9.92 |
| | | –5 (23) | 7.80 |
| | | 0 (32) | 6.19 |
| | | 5 (41) | 4.95 |
| | | 10 (50) | 3.99 |
| | | 15 (59) | 3.24 |
| | | 20 (68) | 2.65 |
| | | 25 (77) | 2.19 |
| | | 30 (86) | 1.81 |
| | | 35 (95) | 1.51 |
| | | 40 (104) | 1.27 |
| | | 45 (113) | 1.07 |

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace in-vehicle sensor.

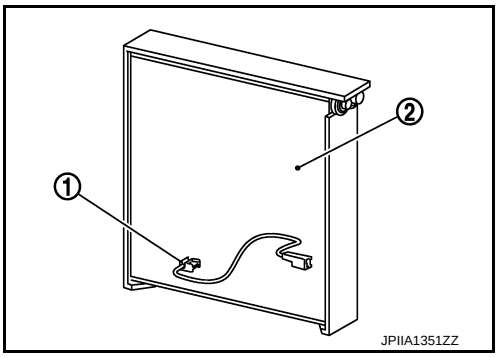
# B2581, B2582 INTAKE SENSOR

## Description

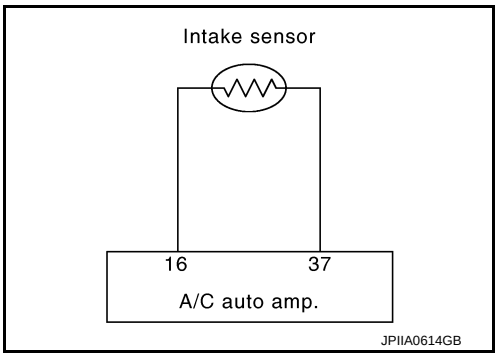
INFOID:0000000009722170

Intake Sensor

- The intake sensor (1) is located on the evaporator (2).
- It converts air temperature after it passes through the evaporator into a resistance value which is then input to the A/C auto amp.




Intake Sensor Circuit




## DTC Logic

INFOID:0000000009722171

### DTC DETECTION LOGIC

**NOTE:**

If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to HAC-170, "DTC Logic" or HAC-171, "DTC Logic".

| DTC | Items (CONSULT screen terms) | Diagnostic item is detected when... | Possible cause |
|---|---|---|---|
| B2581 | INTAKE SENSOR | Detected temperature at intake sensor –33°C (–27°F) or less | • Intake sensor<br>• A/C auto amp.<br>• Harness and connector (Intake sensor circuit is open, or there is a short in the circuit) |
| B2582 | | Detected temperature at intake sensor 69°C (156°F) or more | |

### DTC CONFIRMATION PROCEDURE

#### 1. CHECK WITH SELF-DIAGNOSIS FUNCTION OF CONSULT

1. Using CONSULT, perform “SELF-DIAGNOSIS RESULTS” of HVAC.
2. Check if any DTC No. is displayed in the self-diagnosis results.

**NOTE:**

If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to HAC-170, "DTC Logic" or HAC-171, "DTC Logic".

Is DTC No.“B2581” or “B2582” displayed?

YES >> Perform trouble diagnosis for the intake sensor. Refer to HAC-178, "Diagnosis Procedure".
NO >> INSPECTION END

## Diagnosis Procedure

INFOID:0000000009722172

#### 1. CHECK VOLTAGE BETWEEN INTAKE SENSOR AND GROUND

1. Disconnect intake sensor connector.
2. Turn ignition switch ON.
3. Check voltage between intake sensor harness connector and ground.

| (+) | | (–) | Voltage |
|---|---|---|---|
| Intake sensor | | — | |
| Connector | Terminal | | |
| M42 | 1 | Ground | Approx. 5 V |

Is the inspection result normal?

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

## 2.CHECK CIRCUIT CONTINUITY BETWEEN INTAKE SENSOR AND A/C AUTO AMP.

1. Turn ignition switch OFF.
2. Disconnect A/C auto amp. connector.
3. Check continuity between intake sensor harness connector and A/C auto amp. harness connector.

| Intake sensor | | A/C auto amp. | | Continuity |
|---|---|---|---|---|
| Connector | Terminal | Connector | Terminal | |
| M42 | 2 | M50 | 37 | Existed |

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair harness or connector.

## 3.CHECK INTAKE SENSOR

Check intake sensor. Refer to HAC-179, "Component Inspection".

Is the inspection result normal?

YES >> Replace A/C auto amp.
NO >> Replace intake sensor.

## 4.CHECK CIRCUIT CONTINUITY BETWEEN INTAKE SENSOR AND A/C AUTO AMP.

1. Turn ignition switch OFF.
2. Disconnect A/C auto amp. connector.
3. Check continuity between intake sensor harness connector and A/C auto amp. harness connector.

| Intake sensor | | A/C auto amp. | | Continuity |
|---|---|---|---|---|
| Connector | Terminal | Connector | Terminal | |
| M42 | 1 | M50 | 16 | Existed |

4. Check continuity between intake sensor harness connector and ground.

| Intake sensor | | — | Continuity |
|---|---|---|---|
| Connector | Terminal | | |
| M42 | 1 | Ground | Not existed |

Is the inspection result normal?

YES >> Replace A/C auto amp.
NO >> Repair harness or connector.

# Component Inspection

INFOID:0000000009722173

## 1.CHECK INTAKE SENSOR

1. Turn ignition switch OFF.
2. Disconnect intake sensor connector.
3. Check resistance between intake sensor terminals.

| Terminal | | Condition | Resistance kΩ |
|---|---|---|---|
| | | Temperature °C (°F) | |
| 1 | 2 | −15 (5) | 18.63 |
| | | −10 (14) | 14.15 |
| | | −5 (23) | 10.86 |
| | | 0 (32) | 8.41 |
| | | 5 (41) | 6.58 |
| | | 10 (50) | 5.19 |
| | | 15 (59) | 4.12 |
| | | 20 (68) | 3.30 |
| | | 25 (77) | 2.67 |
| | | 30 (86) | 2.17 |
| | | 35 (95) | 1.78 |
| | | 40 (104) | 1.46 |
| | | 45 (113) | 1.21 |

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace intake sensor.

# B2630, B2631 SUNLOAD SENSOR

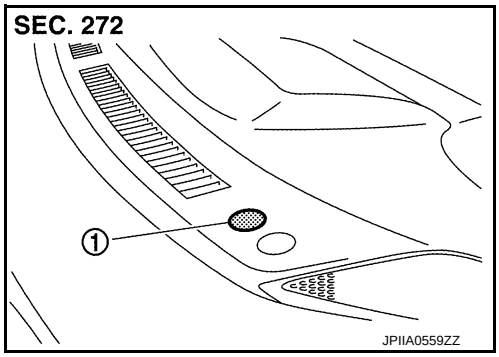
## Description

INFOID:0000000009722174

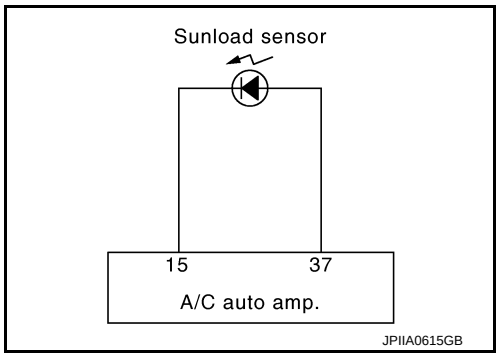
### COMPONENT DESCRIPTION

Sunload Sensor

- The sunload sensor (1) is located on the driver's side instrument panel & pad.
- It detects sunload entering through windshield by means of a photo diode. The sensor converts the sunload into a current value which is then input into the A/C auto amp.




Sunload Sensor Circuit




### SUNLOAD INPUT PROCESS

The A/C auto amp. also equips a processing circuit which averages the variations in detected sunload over a period of time. This prevents drastic swings in the air temperature control system operation due to small or quick variations in detected sunload.

For example, consider driving along a road bordered by an occasional group of large trees. The sunload detected by the sunload sensor varies whenever the trees obstruct the sunlight. The processing circuit averages the detected sunload over a period of time, so that the (insignificant) effect of the trees momentarily obstructing the sunlight does not cause any change in the air temperature control system operation. On the other hand, shortly after entering a long tunnel, the system recognizes the change in sunload, and the system reacts accordingly.

## DTC Logic

INFOID:0000000009722175

### DTC DETECTION LOGIC

**NOTE:**

- If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to HAC-170, "DTC Logic" or HAC-171, "DTC Logic".
- Sunload sensor may register a malfunction when indoors, at dusk, or at other times when light is insufficient. When performing the diagnosis indoors, light the sunload sensor with a lamp (60W or more).

| DTC | Items (CONSULT screen terms) | Diagnostic item is detected when... | Possible cause |
|---|---|---|---|
| B2630 | SUNLOAD SENSOR | Detected calorie at sunload sensor 64.7 w/$m^2$ (56 kcal/$m^2$·h) or less | • Sunload sensor<br>• A/C auto amp.<br>• Harness and connector (Sunload sensor circuit is open, or there is a short in the circuit) |
| B2631 | | Detected calorie at sunload sensor 2832 w/$m^2$ (2436 kcal/$m^2$·h) or more | |

## DTC CONFIRMATION PROCEDURE

### 1. CHECK WITH SELF-DIAGNOSIS FUNCTION OF CONSULT

1. Using CONSULT, perform “SELF-DIAGNOSIS RESULTS” of HVAC.
2. Check if any DTC No. is displayed in the self-diagnosis results.

**NOTE:**

- If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to HAC-170, "DTC Logic" or HAC-171, "DTC Logic".
- Sunload sensor may register a malfunction when indoors, at dusk, or at other times when light is insufficient. When performing the diagnosis indoors, light the sunload sensor with a lamp (60W or more).

Is DTC No.“B2630” or “B2631” displayed?

YES >> Perform trouble diagnosis for the sunload sensor. Refer to HAC-182, "Diagnosis Procedure".
NO >> INSPECTION END

## Diagnosis Procedure

INFOID:0000000009722176

### 1. CHECK VOLTAGE BETWEEN SUNLOAD SENSOR AND GROUND

1. Disconnect sunload sensor connector.
2. Turn ignition switch ON.
3. Check voltage between sunload sensor harness connector and ground.

| (+) | | (–) | Voltage |
|---|---|---|---|
| Sunload sensor | | — | |
| Connector | Terminal | | |
| M74 | 1 | Ground | Approx. 5 V |

Is the inspection result normal?

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

### 2. CHECK CIRCUIT CONTINUITY BETWEEN SUNLOAD SENSOR AND A/C AUTO AMP.

1. Turn ignition switch OFF.
2. Disconnect A/C auto amp. connector.
3. Check continuity between sunload sensor harness connector and A/C auto amp. harness connector.

| Sunload sensor | | A/C auto amp. | | Continuity |
|---|---|---|---|---|
| Connector | Terminal | Connector | Terminal | |
| M74 | 2 | M50 | 37 | Existed |

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair harness or connector.

### 3. CHECK SUNLOAD SENSOR

1. Reconnect sunload sensor connector and A/C auto amp. connector.
2. Check sunload sensor. Refer to HAC-183, "Component Inspection".

Is the inspection result normal?

YES >> Replace A/C auto amp.
NO >> Replace sunload sensor.

### 4. CHECK CIRCUIT CONTINUITY BETWEEN SUNLOAD SENSOR AND A/C AUTO AMP.

1. Turn ignition switch OFF.
2. Disconnect A/C auto amp. connector.
3. Check continuity between sunload sensor harness connector and A/C auto amp. harness connector.

| Sunload sensor | | A/C auto amp. | | Continuity |
|---|---|---|---|---|
| Connector | Terminal | Connector | Terminal | |
| M74 | 1 | M50 | 15 | Existed |

4. Check continuity between sunload sensor harness connector and ground.

| Sunload sensor | | — | Continuity |
|---|---|---|---|
| Connector | Terminal | | |
| M74 | 1 | Ground | Not existed |

Is the inspection result normal?

YES >> Replace A/C auto amp.
NO >> Repair harness or connector.

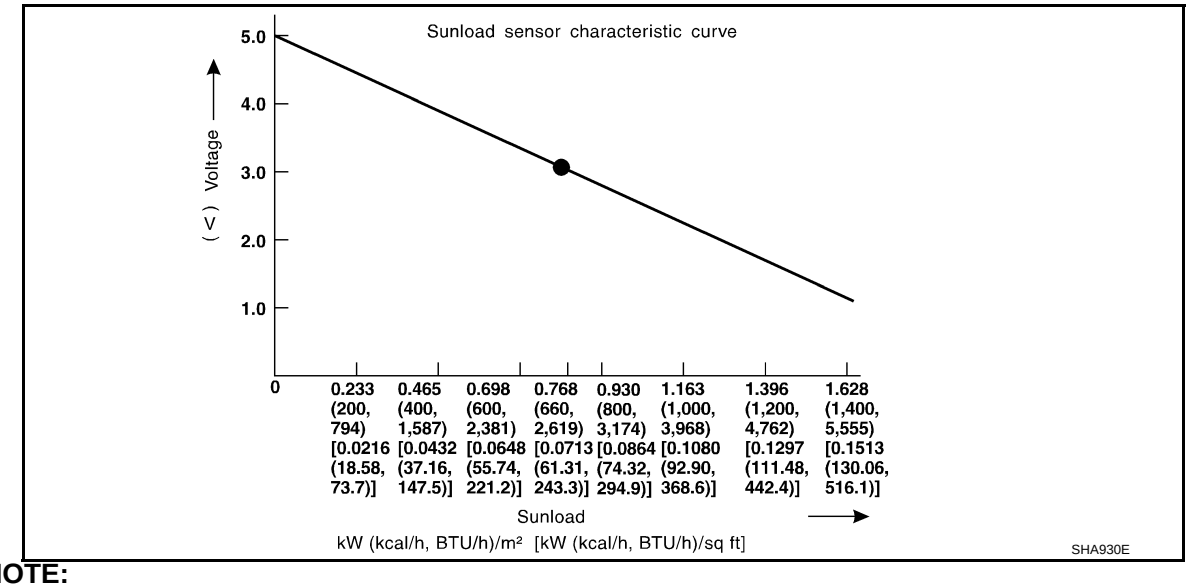
## Component Inspection

INFOID:0000000009722177

### 1. CHECK SUNLOAD SENSOR

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

| (+) | | (–) |
|---|---|---|
| A/C auto amp. | | — |
| Connector | Terminal | |
| M50 | 15 | Ground |




**NOTE:**
Select a place where sunshine directly on it when checking sunload sensor.

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace sunload sensor.

# B2632, B2633 AIR MIX DOOR MOTOR (DRIVER SIDE)

## Description

INFOID:0000000009722178

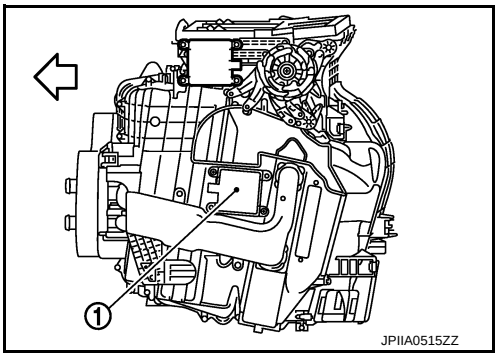
### COMPONENT DESCRIPTION

Air Mix Door Motor (Driver Side)

- The air mix door motor (driver side) (1) are attached to the heater & cooling unit assembly.

⇦: Vehicle front

- It rotates so that the air mix door is opened or closed to a position set by the A/C auto amp.
- Motor rotation is then conveyed through a shaft and the air mix door position feedback is then sent to the A/C auto amp. by PBR built-in air mix door motor.




## DTC Logic

INFOID:0000000009722179

### DTC DETECTION LOGIC

**NOTE:**

If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to HAC-170, "DTC Logic" or HAC-171, "DTC Logic".

| DTC | Items (CONSULT screen terms) | Diagnostic item is detected when... | Possible cause |
|---|---|---|---|
| B2632 | DR AIR MIX DOOR MOT | Air mix door PBR (driver side) position 95% or less | • Air mix door motor (PBR internal circuit is open or shorted)<br>• A/C auto amp.<br>• Harness and connector (LAN communication line is open or shorted) |
| B2633 | | Air mix door PBR (driver side) position 5% or more | |

### DTC CONFIRMATION PROCEDURE

#### 1. CHECK WITH SELF-DIAGNOSIS FUNCTION OF CONSULT

1. Using CONSULT, perform “SELF-DIAGNOSIS RESULTS” of HVAC.
2. Check if any DTC No. is displayed in the self-diagnosis results.

**NOTE:**

If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to HAC-170, "DTC Logic" or HAC-171, "DTC Logic".

Is DTC No.“B2632” or “B2633” displayed?

YES >> Perform trouble diagnosis for the air mix door motor (driver side). Refer to HAC-185, "Diagnosis Procedure".

NO >> GO TO 2.

#### 2. FUNCTION INSPECTION

1. Press temperature control “UP” dial (driver side) until 32°C (90°F) is displayed.
2. Check for warm air at discharge air outlets.
3. Operate the compressor.
4. Press temperature control “DOWN” dial (driver side) until 18°C (60°F) is displayed.
5. Check for cool air at air discharge outlets.

Does it operate normally?

YES >> END.

NO >> Check air mix door motor (driver side) installation, and repair or replace the malfunctioning parts.

## Diagnosis Procedure

INFOID:0000000009722180

### 1. CHECK POWER SUPPLY FOR AIR MIX DOOR MOTOR (DRIVER SIDE)

Check voltage between air mix door motor (driver side) harness connector and ground.

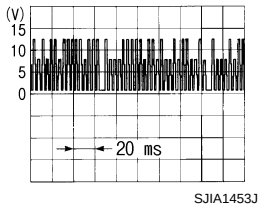
| (+) | | (–) | Voltage |
|---|---|---|---|
| Air mix door motor (driver side) | | — | |
| Connector | Terminal | | |
| M306 | 1 | Ground | Battery voltage |

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair the harnesses or connectors.

### 2. CHECK SIGNAL FOR AIR MIX DOOR MOTOR (DRIVER SIDE)

Check the output waveform (LAN signal) between air mix door motor (driver side) harness connector and ground using an oscilloscope.

| (+) | | (–) | Voltage |
|---|---|---|---|
| Air mix door motor (driver side) | | — | |
| Connector | Terminal | | |
| M306 | 3 | Ground |  |



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Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair the harnesses or connectors.

### 3. CHECK AIR MIX DOOR MOTOR (DRIVER SIDE) GROUND CIRCUIT

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

| Air mix door motor (driver side) | | — | Continuity |
|---|---|---|---|
| Connector | Terminal | | |
| M306 | 2 | Ground | Existed |

Is the inspection result normal?

YES >> Replace air mix door motor (driver side).
NO >> Repair harness or connector.

# B2634, B2635 AIR MIX DOOR MOTOR (PASSENGER SIDE)

## Description

INFOID:0000000009722181

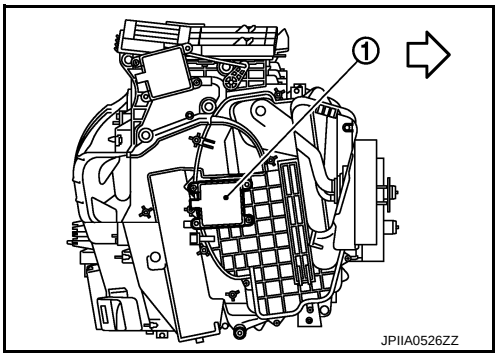
### COMPONENT DESCRIPTION

Air Mix Door Motor (Passenger Side)

- The air mix door motor (passenger side) (1) are attached to the heater & cooling unit assembly.

⇦: Vehicle front

- It rotates so that the air mix door is opened or closed to a position set by the A/C auto amp.
- Motor rotation is then conveyed through a shaft and the air mix door position feedback is then sent to the A/C auto amp. by PBR built-in air mix door motor.




## DTC Logic

INFOID:0000000009722182

### DTC DETECTION LOGIC

**NOTE:**

If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to HAC-170, "DTC Logic" or HAC-171, "DTC Logic".

| DTC | Items (CONSULT screen terms) | Diagnostic item is detected when... | Possible cause |
|---|---|---|---|
| B2634 | PASS AIR MIX DOOR MOT | Air mix door PBR (passenger side) position 95% or less | • Air mix door motor (PBR internal circuit is open or shorted)<br>• A/C auto amp.<br>• Harness and connector (LAN communication line is open or shorted) |
| B2635 | | Air mix door PBR (passenger side) position 5% or more | |

### DTC CONFIRMATION PROCEDURE

#### 1. CHECK WITH SELF-DIAGNOSIS FUNCTION OF CONSULT

1. Using CONSULT, perform “SELF-DIAGNOSIS RESULTS” of HVAC.
2. Check if any DTC No. is displayed in the self-diagnosis results.

**NOTE:**

If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to HAC-170, "DTC Logic" or HAC-171, "DTC Logic".

Is DTC No.“B2634” or “B2635” displayed?

YES >> Perform trouble diagnosis for the air mix door motor (passenger side). Refer to HAC-187, "Diagnosis Procedure".

NO >> GO TO 2.

#### 2. FUNCTION INSPECTION

1. Press temperature control “UP” dial (passenger side) until 32°C (90°F) is displayed.
2. Check for warm air at discharge air outlets.
3. Operate the compressor.
4. Press temperature control “DOWN” dial (passenger side) until 18°C (60°F) is displayed.
5. Check for cool air at air discharge outlets.

Does it operate normally?

YES >> END.

NO >> Check air mix door motor (passenger side) installation, and repair or replace the malfunctioning parts.

## Diagnosis Procedure

INFOID:0000000009722183

### 1. CHECK POWER SUPPLY FOR AIR MIX DOOR MOTOR (PASSENGER SIDE)

Check voltage between air mix door motor (passenger side) harness connector and ground.

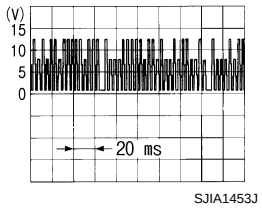
| (+) | | (–) | Voltage |
|---|---|---|---|
| Air mix door motor (passenger side) | | — | |
| Connector | Terminal | | |
| M307 | 1 | Ground | Battery voltage |

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair the harnesses or connectors.

### 2. CHECK SIGNAL FOR AIR MIX DOOR MOTOR (PASSENGER SIDE)

Check the output waveform (LAN signal) between air mix door motor (passenger side) harness connector and ground using an oscilloscope.

| (+) | | (–) | Voltage |
|---|---|---|---|
| Air mix door motor (passenger side) | | — | |
| Connector | Terminal | | |
| M307 | 3 | Ground |  SJIA1453J |

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair the harnesses or connectors.

### 3. CHECK AIR MIX DOOR MOTOR (PASSENGER SIDE) GROUND CIRCUIT

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

| Air mix door motor (passenger side) | | — | Continuity |
|---|---|---|---|
| Connector | Terminal | | |
| M307 | 2 | Ground | Existed |

Is the inspection result normal?

YES >> Replace air mix door motor (passenger side).
NO >> Repair harness or connector.

# B2636, B2637, B2638, B2639, B2654, B2655 MODE DOOR MOTOR

## Description

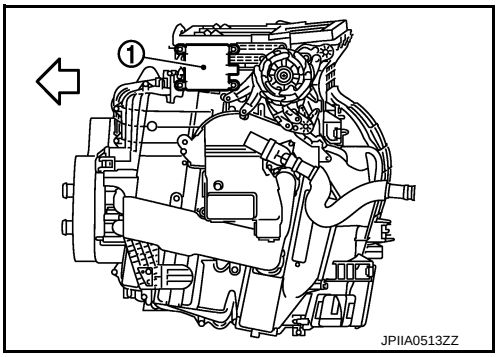
INFOID:0000000009722184

### COMPONENT DESCRIPTION

Mode Door Motor

- The mode door motor (1) are attached to the heater & cooling unit assembly.
- It rotates so that air is discharged from the outlet set by the A/C auto amp. Motor rotation is conveyed to a link which activates the mode door.

⇦: Vehicle front




## DTC Logic

INFOID:0000000009722185

### DTC DETECTION LOGIC

**NOTE:**

If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to HAC-170, "DTC Logic" or HAC-171, "DTC Logic".

| DTC | Items (CONSULT screen terms) | Diagnostic item is detected when... | Possible cause |
|---|---|---|---|
| B2636 | DR VENT DOOR FAIL | When the malfunctioning door position is detected at VENT position | • Mode door motor (PBR internal circuit is open or shorted)<br>• A/C auto amp.<br>• Harness and connector (LAN communication line is open or shorted) |
| B2637 | DR B/L DOOR FAIL | When the malfunctioning door position is detected at B/L position | |
| B2638 | DR D/F1 DOOR FAIL | When the malfunctioning door position is detected at FOOT position | |
| B2639 | DR DEF DOOR FAIL | When the malfunctioning door position is detected at DEF position | |
| B2654 | D/F2 DOOR FAIL | When the malfunctioning door position is detected at D/F position | |
| B2655 | B/L2 DOOR FAIL | When the malfunctioning door position is detected at B/L2 position | |

### DTC CONFIRMATION PROCEDURE

#### 1.CHECK WITH SELF-DIAGNOSIS FUNCTION OF CONSULT

1. Using CONSULT, perform “SELF-DIAGNOSIS RESULTS” of HVAC.
2. Check if any DTC No. is displayed in the self-diagnosis results.

**NOTE:**

If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to HAC-170, "DTC Logic" or HAC-171, "DTC Logic".

Is DTC No.“ B2636 ”, “ B2637 ”, “B2638 ”, “B2639 ”, “B2654 ” or “B2655 ” displayed?

YES >> Perform trouble diagnosis for the mode door motor. Refer to HAC-189, "Diagnosis Procedure".
NO >> GO TO 2.

#### 2.FUNCTION INSPECTION

1. Press MODE switch and DEF switch.
2. Each position indicator should change shape.

3. Confirm that air discharge comes out according to the air distribution table at below. Refer to HAC-143, "System Description".

| Discharge air flow | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Mode position indication | Condition | Air outlet/distribution | | | | | | |
| | | VENT | | | FOOT | | DEF | |
| | | Front | Upper | Rear | Front | Rear | |
|  | DUAL switch: OFF<br>UPPER VENT switch : ON | 81% | 8% | 11% | — | — | — |
|  | | 41% | 10% | 17% | 24% | 8% | — |
|  | | 12% | 12% | 16% | 27% | 10% | 23% |
|  | | 11% | 11% | 14% | 25% | 10% | 29% |
|  | | 11% | 11% | 12% | — | — | 66% |

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| Discharge air flow | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Mode position indication | Condition | Air outlet/distribution | | | | | | |
| | | VENT | | | FOOT | | DEF | |
| | | Front | Upper | Rear | Front | Rear | |
|  | DUAL switch: OFF<br>UPPER VENT switch : OFF | 88% | — | 12% | — | — | — |
|  | | 47% | — | 18% | 26% | 9% | — |
|  | | 13% | — | 17% | 33% | 12% | 25% |
|  | | 12% | — | 16% | 28% | 12% | 32% |
|  | | 11% | — | 15% | — | — | 74% |

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**NOTE:**
Confirm that the compressor clutch is engaged (Sound or visual inspection) and intake door position is at FRE when DEF (  ) or D/F (  ) is selected.

Does it operate normally?

YES >> INSPECTION END
NO >> Check mode door motor installation, and repair or replace the malfunctioning parts.

## Diagnosis Procedure

INFOID:0000000009722186

### 1. CHECK POWER SUPPLY FOR MODE DOOR MOTOR

Check voltage between mode door motor harness connector and ground.

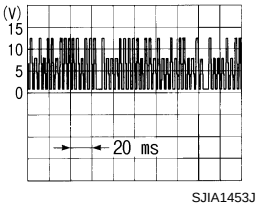
| (+) | | (–) | Voltage |
|---|---|---|---|
| Mode door motor | | — | |
| Connector | Terminal | | |
| M310 | 1 | Ground | Battery voltage |

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair harness or connector.

### 2. CHECK SIGNAL FOR MODE DOOR MOTOR

Confirm A/C LAN signal between mode door motor harness connector and ground using an oscilloscope.

| (+) | | (–) | Voltage |
|---|---|---|---|
| Mode door motor | | — | |
| Connector | Terminal | | |
| M310 | 3 | Ground |  SJIA1453J |

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair harness or connector.

## 3. CHECK MODE DOOR MOTOR GROUND CIRCUIT

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

| Mode door motor | | — | Continuity |
|---|---|---|---|
| Connector | Terminal | | |
| M310 | 2 | Ground | Existed |

Is the inspection result normal?

YES >> Replace mode door motor.
NO >> Repair harness or connector.

# B263D, B263E, B263F INTAKE DOOR MOTOR

## Description

INFOID:0000000009722187

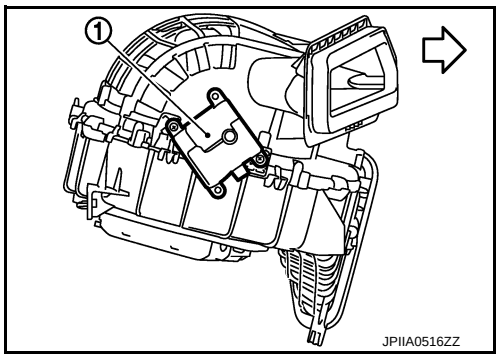
### COMPONENT DESCRIPTION

Intake Door Motor

- The intake door motor (1) is attached to the blower unit.

⇦: Vehicle front

- It rotates so that air is drawn from inlets set by the A/C auto amp. Motor rotation is conveyed to a lever which activates the intake door.




## DTC Logic

INFOID:0000000009722188

### DTC DETECTION LOGIC

**NOTE:**
If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to HAC-170, "DTC Logic" or HAC-171, "DTC Logic".

| DTC | Items (CONSULT screen terms) | Diagnostic item is detected when... | Possible cause |
|---|---|---|---|
| B263D | FRE DOOR FAIL | When the malfunctioning intake door position is detected at FRE position | • Intake door motor (PBR internal circuit is open or shorted)<br>• A/C auto amp.<br>• Harness and connector (LAN communication line is open or shorted) |
| B263E | 20P FRE DOOR FAIL | When the malfunctioning intake door position is detected at 20%FRE position | |
| B263F | REC DOOR FAIL | When the malfunctioning intake door position is detected at REC position | |

### DTC CONFIRMATION PROCEDURE

#### 1. CHECK WITH SELF-DIAGNOSIS FUNCTION OF CONSULT

1. Using CONSULT, perform “SELF-DIAGNOSIS RESULTS” of HVAC.
2. Check if any DTC No. is displayed in the self-diagnosis results.

**NOTE:**
If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to HAC-170, "DTC Logic" or HAC-171, "DTC Logic".

Is DTC No.“B263D”, “B263E” or “B263F” displayed?

YES >> Perform trouble diagnosis for the intake door motor. Refer to HAC-192, "Diagnosis Procedure".
NO >> GO TO 2.

#### 2. FUNCTION INSPECTION

1. Press intake switch.
2. The intake switch indicator is turned ON. (REC position)
3. Listen for intake door position change (Slight change of blower sound can be heard.).
4. Press intake switch again.
5. The intake switch indicator is turned OFF. (FRE position)
6. Listen for intake door position change (Slight change of blower sound can be heard.).

Does it operate normally?

YES >> INSPECTION END
NO >> Check intake door motor installation, and repair or replace the malfunctioning parts.

## Diagnosis Procedure

INFOID:0000000009722189

### 1.CHECK POWER SUPPLY FOR INTAKE DOOR MOTOR

Check voltage between intake door motor harness connector and ground.

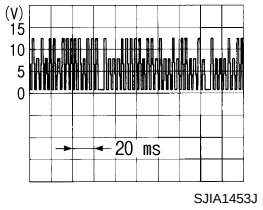
| (+) | | (–) | Voltage |
|---|---|---|---|
| Intake door motor | | — | |
| Connector | Terminal | | |
| M304 | 1 | Ground | Battery voltage |

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair harness or connector.

### 2.CHECK SIGNAL FOR INTAKE DOOR MOTOR

Confirm A/C LAN signal between intake door motor harness connector and ground using an oscilloscope.

| (+) | | (–) | Voltage |
|---|---|---|---|
| Intake door motor | | — | |
| Connector | Terminal | | |
| M304 | 3 | Ground |  |



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Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair harness or connector.

### 3.CHECK INTAKE DOOR MOTOR GROUND CIRCUIT

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

| Intake door motor | | — | Continuity |
|---|---|---|---|
| Connector | Terminal | | |
| M304 | 2 | Ground | Existed |

Is the inspection result normal?

YES >> Replace intake door motor.
NO >> Repair harness or connector.

# B2661, B2662, B2663 UPPER VENTILATOR DOOR MOTOR

## Description

INFOID:0000000009722190

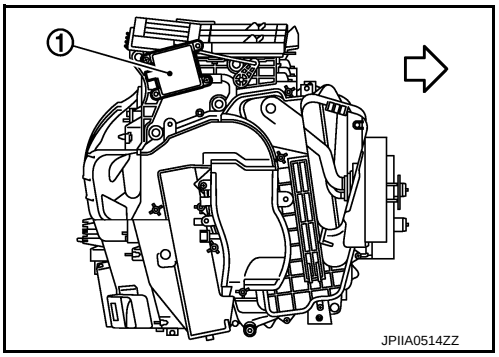
### COMPONENT DESCRIPTION

Upper Ventilator Door Motor

- The upper ventilator door motor (1) are attached to the heater & cooling unit assembly.

⇦: Vehicle front

- Upper ventilator door motor operates by UPPER VENT switch ON/OFF when the DEF switch is OFF.
- Motor rotation is conveyed to a link which activates the upper ventilator door.




## DTC Logic

INFOID:0000000009722191

### DTC DETECTION LOGIC

**NOTE:**
If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to HAC-170, "DTC Logic" or HAC-171, "DTC Logic".

| DTC | Items (CONSULT screen terms) | Diagnostic item is detected when... | Possible cause |
|---|---|---|---|
| B2661 | UPPER VENT DOOR MOT | When the malfunctioning upper ventilator door position is detected at open position. | • Upper ventilator door motor (PBR internal circuit is open or shorted)<br>• A/C auto amp.<br>• Harness and connector (LAN communication line is open or shorted) |
| B2662 | | When the malfunctioning upper ventilator door position is detected at middle position. | |
| B2663 | | When the malfunctioning upper ventilator door position is detected at shut position. | |

### DTC CONFIRMATION PROCEDURE

#### 1.CHECK WITH SELF-DIAGNOSIS FUNCTION OF CONSULT

1. Using CONSULT, perform “SELF-DIAGNOSIS RESULTS” of HVAC.
2. Check if any DTC No. is displayed in the self-diagnosis results.

**NOTE:**
If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to HAC-170, "DTC Logic" or HAC-171, "DTC Logic".

Is DTC No.“B2661”, “B2662” or “B2663” displayed?

YES >> Perform trouble diagnosis for the upper ventilator door motor. Refer to HAC-194, "Diagnosis Procedure".
NO >> GO TO 2.

#### 2.FUNCTION INSPECTION

1. Press the UPPER VENT switch.
2. The UPPER VENT switch indicator is turned ON.

3. Check that the air blown from UPPER VENT does not greatly deviate from the air mix ratio.

| Discharge air flow | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Mode position indication | Condition | Air outlet/distribution | | | | | | |
| | | VENT | | | FOOT | | DEF | |
| | | Front | Upper | Rear | Front | Rear | | |
|  | DUAL switch: OFF<br>UPPER VENT switch : ON | 81% | 8% | 11% | — | — | — | |
|  | | 41% | 10% | 17% | 24% | 8% | — | |
|  | | 12% | 12% | 16% | 27% | 10% | 23% | |
|  | | 11% | 11% | 14% | 25% | 10% | 29% | |
|  | | 11% | 11% | 12% | — | — | 66% | |

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4. Press the UPPER VENT switch again.
5. The UPPER VENT switch indicator is turned OFF.
6. The air blown from UPPER VENT stops.

Does it operate normally?

YES >> INSPECTION END
NO >> Check upper ventilator door motor installation, and repair or replace the malfunctioning parts.

## Diagnosis Procedure

INFOID:0000000009722192

### 1.CHECK POWER SUPPLY FOR UPPER VENTILATOR DOOR MOTOR

Check voltage between upper ventilator door motor harness connector and ground.

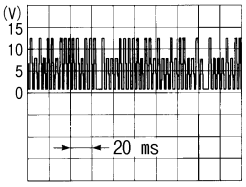
| (+) | | (–) | Voltage |
|---|---|---|---|
| Upper ventilator door motor | | — | |
| Connector | Terminal | | |
| M308 | 1 | Ground | Battery voltage |

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair harness or connector.

### 2.CHECK SIGNAL FOR UPPER VENTILATOR DOOR MOTOR

Confirm A/C LAN signal between upper ventilator door motor harness connector and ground using an oscilloscope.

| (+) | | (–) | Voltage |
|---|---|---|---|
| Upper ventilator door motor | | — | |
| Connector | Terminal | | |
| M308 | 3 | Ground |  SJIA1453J |

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair harness or connector.

## 3. CHECK UPPER VENTILATOR DOOR MOTOR GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect upper ventilator door motor connector.
3. Check continuity between upper ventilator door motor harness connector and ground.

| Upper ventilator door motor | | — | Continuity |
|---|---|---|---|
| Connector | Terminal | | |
| M308 | 2 | Ground | Existed |

Is the inspection result normal?

YES >> Replace upper ventilator door motor.
NO >> Repair harness or connector.

# BLOWER MOTOR

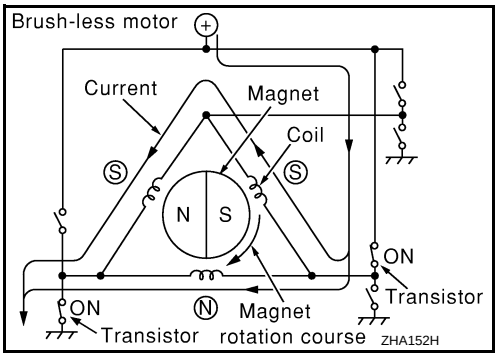
## Description

INFOID:0000000009722193

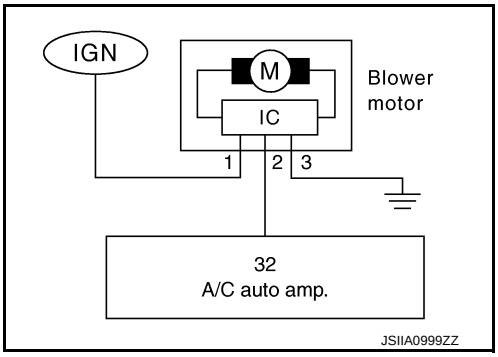
### COMPONENT DESCRIPTION

Brush-less Motor

The blower motor utilizes a brush-less motor with a rotating magnet. Quietness is improved over previous motors where the brush was the point of contact and the coil rotated.




Blower Motor Circuit




## Component Function Check

INFOID:0000000009722194

### 1.CHECK OPERATION

1. Warm up the engine.
2. Operate the fan control dial. Check that the fan speed and indicator are switched for all fan speeds.

Does it operate normally?

YES >> INSPECTION END
NO >> Perform trouble diagnosis for the blower motor. Refer to HAC-196, "Diagnosis Procedure".

## Diagnosis Procedure

INFOID:0000000009722195

### 1.CHECK WITH SELF-DIAGNOSIS FUNCTION OF CONSULT

1. Using CONSULT, perform “SELF-DIAGNOSIS RESULTS” of HVAC.
2. Check if any DTC No. is displayed in the self-diagnosis results.

**NOTE:**
If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to HAC-170, "DTC Logic" or HAC-171, "DTC Logic".

Is any DTC No. displayed?

YES >> Perform the diagnosis that is applicable to the sensor and actuator. Refer to HAC-230, "DTC Index".
NO >> GO TO 2.

### 2.CHECK WITH ACTIVE TEST OF CONSULT

1. Using CONSULT, perform “HVAC TEST” “ACTIVE TEST” of HVAC to check each output device. Refer to HAC-166, "CONSULT Function".
   **NOTE:**
   Perform the ACTIVE TEST after starting the engine because the compressor is operated.

2. Check that the blower motor control signal changes according to each indicator signal.

| | Test item | | | | | | |
|---|---|---|---|---|---|---|---|
| | MODE 1 | MODE 2 | MODE 3 | MODE 4 | MODE 5 | MODE 6 | MODE 7 |
| Mode door position | VENT1 | VENT2 | B/L1 | B/L2 | FOOT | D/F | DEF |
| Intake door position | REC | REC | 20%FRE | 20%FRE | FRE | FRE | FRE |
| Air mix door position (driver & passenger side) | FULL COLD | FULL HOT | FULL COLD | FULL HOT | FULL HOT | FULL HOT | FULL HOT |
| Blower motor duty ratio | 35% | 35% | 61% | 61% | 81% | 81% | 35% |
| Compressor (Magnet clutch) | ON | ON | ON | ON | OFF | OFF | ON |
| Upper ventilator door | OPEN | SHUT | OPEN | SHUT | SHUT | SHUT | SHUT |

**NOTE:**

Perform the inspection of each output device after starting the engine because the compressor is operated.

Does it operate normally?

YES >> INSPECTION END
NO >> GO TO 3.

## 3.CHECK POWER SUPPLY FOR BLOWER MOTOR

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

| (+) | | (–) | Voltage |
|---|---|---|---|
| Blower motor | | — | |
| Connector | Terminal | | |
| M98 | 1 | Ground | Battery voltage |

Is the inspection result normal?

YES >> GO TO 4.
NO >> GO TO 7.

## 4.CHECK BLOWER MOTOR GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Check continuity between blower motor harness connector and ground.

| Blower motor | | — | Continuity |
|---|---|---|---|
| Connector | Terminal | | |
| M98 | 3 | Ground | Existed |

Is the inspection result normal?

YES >> GO TO 5.
NO >> Repair harness or connector.

## 5.CHECK BLOWER MOTOR CIRCUIT CONTINUITY

1. Disconnect A/C auto amp. connector.
2. Check continuity between blower motor harness connector and A/C auto amp. harness connector.

| Blower motor | | A/C auto amp. | | Continuity |
|---|---|---|---|---|
| Connector | Terminal | Connector | Terminal | |
| M98 | 2 | M50 | 32 | Existed |

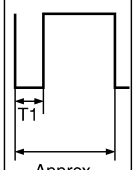
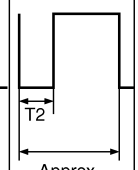
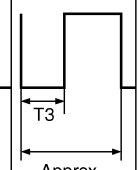
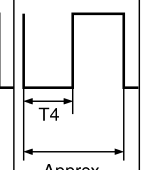
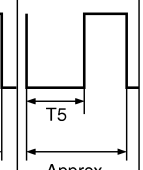
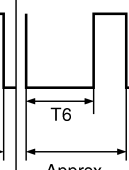
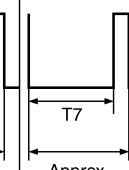
Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair harness or connector.

## 6.CHECK A/C AUTO AMP. OUTPUT SIGNAL

1. Reconnect blower motor connector and A/C auto amp. connector.
2. Turn ignition switch ON.
3. Set MODE switch to the VENT position.
4. Check the output waveform between blower motor harness connector and ground using an oscilloscope, while varying the fan speed from 1 to 7.

| Blower fan speed (Manual) VENT mode | 1st | 2nd | 3rd | 4th | 5th | 6th | 7th |
|---|---|---|---|---|---|---|---|
| Blower motor connector M 98 terminal No. 2 (Oscilloscope) |  |  |  |  |  |  |  |
| Duty ratio | Approx. 25% | Approx. 33% | Approx. 41% | Approx. 51% | Approx. 61% | Approx. 71% | Approx. 81% |

NOTE: Duty ratio = $\frac{Tx}{\text{Approx. } 1.6 \text{ ms}} \times 100\ (\%)$

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Is the inspection result normal?

YES >> Replace the blower motor.
NO >> Replace the A/C auto amp.

## 7.CHECK POWER VOLTAGE OF BLOWER RELAY

1. Turn the ignition switch OFF.
2. Remove the blower relay. Refer to PG-91, "Fuse, Connector and Terminal Arrangement".
3. Turn the ignition switch ON.
4. Check the voltage between blower relay fuse block side terminal and ground. Refer to PG-91, "Fuse, Connector and Terminal Arrangement" for relay terminal assignment.

| (+) | (–) | Voltage |
|---|---|---|
| Blower relay | — | |
| 1 | Ground | Battery voltage |
| 3 | | |

Is the inspection result normal?

YES >> GO TO 8.
NO >> Inspection the power supply circuit. Refer to PG-47, "Wiring Diagram - IGNITION POWER SUPPLY -".

## 8.CHECK BLOWER RELAY

1. Turn the ignition switch OFF.
2. Install the blower relay. Refer to PG-91, "Fuse, Connector and Terminal Arrangement".
3. Turn the ignition switch ON.
4. Check the operating sound of blower relay.

Is the inspection result normal?

YES >> GO TO 9.
NO >> Replace the blower relay.

## 9.CHECK FUSE

Check 15A fuses (Nos. 21 and 22).
**NOTE:**

Refer to PG-91, "Fuse, Connector and Terminal Arrangement" for fuse location.

Is the inspection result normal?

YES >> Repair the harnesses or connectors.
NO >> Replace the fuse after repairing the applicable circuit.

## Component Inspection

INFOID:0000000009722196

### 1. CHECK BLOWER MOTOR

1. Remove the blower motor. Refer to VTL-97, "Exploded View".
2. Check that the blower motor rotates smoothly.

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace blower motor.

# MAGNET CLUTCH

## Description

INFOID:0000000009722197

The magnet clutch drives the compressor, by an IPDM E/R signal.

## Component Function Check

INFOID:0000000009722198

### 1.FUNCTION INSPECTION

1. Press AUTO switch.
2. “AUTO” is indicated on the display.
3. Press the A/C switch.
4. Check that the indicator of the A/C switch turns on. Check visually and by sound that the compressor is operating (the discharge air temperature or fan speed varies depending on the ambient temperature, in-vehicle temperature, and temperature setting).
5. Press the A/C switch again.
6. Check that the indicator of the A/C switch turns OFF. Check visually and by sound that the compressor stops.

Does it operate normally?

YES >> INSPECTION END
NO >> Perform trouble diagnosis for the compressor. Refer to HAC-200, "Diagnosis Procedure".

## Diagnosis Procedure

INFOID:0000000009722199

### 1.INSPECTION IN AUTO ACTIVE TEST MODE

Perform “AUTO ACTIVE TEST”. Refer to PCS-10, "Diagnosis Description".

Does it operate normally?

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

### 2.CHECK MAGNET CLUTCH POWER SUPPLY

1. Turn ignition switch OFF.
2. Disconnect compressor connector.
3. Perform auto active test of IPDM E/R. Refer to PCS-10, "Diagnosis Description".
4. When auto active test operation sequence is compressor (magnet clutch) operation, check voltage between compressor harness connector and ground.

| + | | – | Voltage |
|---|---|---|---|
| Compressor | | | |
| Connector | Terminal | | |
| F18 | 1 | Ground | 0 V ⇔ Battery voltage |

Is the inspection result normal?

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

### 3.CHECK FUSE

Check 10 A fuse (No. 49, located in IPDM E/R).

**NOTE:**
Refer to PG-93, "Fuse, Connector and Terminal Arrangement".

Is the inspection result normal?

YES >> GO TO 4.
NO >> Replace the blown fuse after repairing the affected circuit if a fuse is blown.

### 4.CHECK MAGNET CLUTCH POWER SUPPLY CIRCUIT FOR OPEN

1. Disconnect IPDM E/R connector.
2. Check continuity between IPDM E/R harness connector and compressor harness connector.

| IPDM E/R | | Compressor | | Continuity |
|---|---|---|---|---|
| Connector | Terminal | Connector | Terminal | |
| F12 | 48 | F18 | 1 | Existed |

Is the inspection result normal?

YES >> Replace IPDM E/R. Refer to PCS-37, "Removal and Installation".
NO >> Repair harness or connector.

## 5. CHECK MAGNET CLUTCH GROUND CIRCUIT FOR OPEN

Check continuity between compressor harness connector and ground.

| Compressor | | — | Continuity |
|---|---|---|---|
| Connector | Terminal | | |
| F18 | 2 | Ground | Existed |

Is the inspection result normal?

YES >> Replace magnet clutch. Refer to HA-38, "MAGNET CLUTCH : Removal and Installation".
NO >> Repair harness or connector.

## 6. CHECK WITH SELF-DIAGNOSIS FUNCTION OF CONSULT

1. Using CONSULT, perform “SELF-DIAGNOSIS RESULTS” of HVAC.
2. Check if any DTC No. is displayed in the self-diagnosis results.

**NOTE:**
If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to HAC-170, "DTC Logic" or HAC-171, "DTC Logic".

Is any DTC No. displayed?

YES >> Perform the diagnosis that is applicable to the sensor and actuator. Refer to HAC-230, "DTC Index".
NO >> GO TO 7.

## 7. CHECK A/C AUTO AMP. INPUT SIGNAL

Using CONSULT, check “On/Off” of “COMP REQ SIG” and “FAN REQ SIG” in “DATA MONITOR” of HVAC. Refer to HAC-166, "CONSULT Function".

**A/C SWITCH ON : COMP REQ SIG On**
**A/C SWITCH OFF : COMP REQ SIG Off**
**FAN CONTROL DIAL ON : FAN REQ SIG On**
**FAN CONTROL DIAL OFF : FAN REQ SIG Off**

Is the inspection result normal?

YES >> GO TO 8.
NO >> Replace A/C auto amp.

## 8. CHECK REFRIGERANT PRESSURE SENSOR

Check refrigerant pressure sensor. Refer to EC-465, "Diagnosis Procedure".

Is the inspection result normal?

YES >> INSPECTION END
NO >> Repair or replace malfunctioning parts.

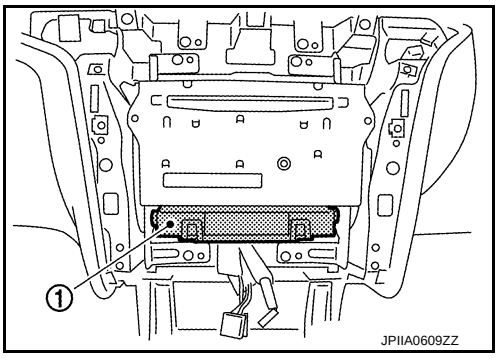
# POWER SUPPLY AND GROUND CIRCUIT
## A/C AUTO AMP.

### A/C AUTO AMP. : Description

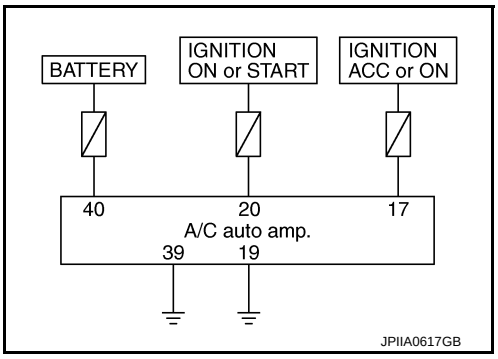
INFOID:0000000009722200

#### COMPONENT DESCRIPTION

A/C Auto Amp. (Air Conditioner Automatic Amplifier)
The A/C auto amp. (1) has a built-in microcomputer that processes information sent from various sensors needed for air conditioner operation. The air mix door motor(s), the mode door motor, the intake door motor, the upper ventilator door motor, the blower motor and the compressor are then controlled.
When the various switches and temperature control dial are operated, data is input to the A/C auto amp. from the AV control unit using CAN communication.
The A/C auto amp. is operated with control mechanisms. Signals from various switches and Potentio Temperature Control (PTC) are directly entered into the A/C auto amp.




Power Supply and Ground Circuit for A/C Auto Amp.




### A/C AUTO AMP. : Component Function Check

INFOID:0000000009722201

#### 1. CHECK OPERATION

1. Press the AUTO switch, and then check that “AUTO” is shown on the display.
2. Operate the temperature control dial (driver side). Check that the fan speed or outlet changes. (The discharge air temperature or fan speed varies depending on the ambient temperature, in-vehicle temperature, and temperature setting.)

Does it operate normally?

YES >> INSPECTION END
NO >> Perform trouble diagnosis for the A/C system. Refer to HAC-202, "A/C AUTO AMP. : Diagnosis Procedure".

### A/C AUTO AMP. : Diagnosis Procedure

INFOID:0000000009722202

#### 1. INSPECTION BY FAIL-SAFE FUNCTION

1. Turn the ignition switch ON.
2. After approximately 30 seconds, check that the air conditioner is operated by the fail-safe function (the operation display of air conditioner is not performed). Refer to HAC-229, "Fail-Safe".

Is the fail-safe function operated?

YES >> GO TO 5.
NO >> GO TO 2.

#### 2. CHECK A/C AUTO AMP. POWER SUPPLY CIRCUIT

1. Disconnect the A/C auto amp. connector.
2. Check voltage between A/C auto amp. harness connector and ground.

| (+) | | (–) | Voltage | | |
|---|---|---|---|---|---|
| A/C auto amp. | | — | Ignition switch position | | |
| Connector | Terminal | | OFF | ACC | ON |
| M50 | 17 | Ground | Approx. 0 V | Battery voltage | Battery voltage |
| | 20 | | Approx. 0 V | Approx. 0 V | Battery voltage |
| | 40 | | Battery voltage | Battery voltage | Battery voltage |

Is the inspection result normal?

YES >> GO TO 4.
NO >> GO TO 3.

## 3. CHECK FUSE

Check 10A fuses [Nos. 3, 6 and 19, located in the fuse block (J/B)].

**NOTE:**
Refer to PG-91, "Fuse, Connector and Terminal Arrangement".

Is the inspection result normal?

YES >> Repair the harnesses or connectors.
NO >> Replace the fuse after repairing the applicable circuit.

## 4. CHECK A/C AUTO AMP. CIRCUIT CONTINUITY

1. Turn ignition switch OFF.
2. Check continuity between A/C auto amp. harness connector and ground.

| A/C auto amp. | | — | Continuity |
|---|---|---|---|
| Connector | Terminal | | |
| M50 | 19 | Ground | Existed |
| | 39 | | |

Is the inspection result normal?

YES >> GO TO 5.
NO >> Repair the harnesses or connectors.

## 5. CHECK PRESET SWITCH

Check the preset switch. Refer to AV-155, "Removal and Installation" (base audio without navigation), AV-286, "Removal and Installation" (bose audio without navigation) or AV-458, "Removal and Installation" (bose audio with navigation).

Is the inspection result normal?

YES >> Replace the A/C auto amp.
NO >> Repair or replace parts according to the inspection results.

# ECU DIAGNOSIS INFORMATION

## ECM

### Reference Value

INFOID:0000000009722203

VALUES ON THE DIAGNOSIS TOOL

**NOTE:**

- The following table includes information (items) inapplicable to this vehicle. For information (items) applicable to this vehicle, refer to CONSULT display items.
- Numerical values in the following table are reference values.
- These values are input/output values that ECM receives/transmits and may differ from actual operations.
  Example:
  The ignition timing shown by the timing light may differ from the ignition timing displayed on the data monitor. This occurs because the timing light shows a value calculated by ECM according to signals received from the cam shaft position sensor and other sensors related to ignition timing.

For outlines of following items, refer to EC-129, "CONSULT Function".

| Monitor Item | Condition | | Values/Status |
|---|---|---|---|
| ENG SPEED | Run engine and compare CONSULT value with the tachometer indication. | | Almost the same speed as the tachometer indication. |
| MAS A/F SE-B1 | See EC-140, "Description". | | |
| B/FUEL SCHDL | See EC-140, "Description". | | |
| A/F ALPHA-B1 | See EC-140, "Description". | | |
| A/F ALPHA-B2 | See EC-140, "Description". | | |
| COOLANT TEMP/S | • Engine: After warming up | | More than 70°C (158°F) |
| A/F SEN1 (B1) | • Engine: After warming up | Maintaining engine speed at 2,000 rpm | Fluctuates around 2.2 V |
| A/F SEN1 (B2) | • Engine: After warming up | Maintaining engine speed at 2,000 rpm | Fluctuates around 2.2 V |
| HO2S2 (B1) | • Revving engine from idle to 3,000 rpm quickly after the following conditions are met.<br>- Engine: After warming up<br>- After keeping engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load | | 0 - 0.3 V ←→ Approx. 0.6 - 1.0 V |
| HO2S2 (B2) | • Revving engine from idle to 3,000 rpm quickly after the following conditions are met.<br>- Engine: After warming up<br>- After keeping engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load | | 0 - 0.3 V ←→ Approx. 0.6 - 1.0 V |
| HO2S2 MNTR (B1) | • Revving engine from idle to 3,000 rpm quickly after the following conditions are met.<br>- Engine: After warming up<br>- After keeping engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load | | LEAN ←→ RICH |
| HO2S2 MNTR (B2) | • Revving engine from idle to 3,000 rpm quickly after the following conditions are met.<br>- Engine: After warming up<br>- After keeping engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load | | LEAN ←→ RICH |
| VHCL SPEED SE | • Turn drive wheels and compare CONSULT value with the speedometer indication. | | Almost the same speed as speedometer indication |
| BATTERY VOLT | • Ignition switch: ON (Engine stopped) | | 11 - 14 V |
| ACCEL SEN 1 | • Ignition switch: ON (Engine stopped) | Accelerator pedal: Fully released | 0.5 - 1.0 V |
| | | Accelerator pedal: Fully depressed | 4.2 - 4.8 V |
| ACCEL SEN 2*1 | • Ignition switch: ON (Engine stopped) | Accelerator pedal: Fully released | 0.5 - 1.0 V |
| | | Accelerator pedal: Fully depressed | 4.2 - 4.8 V |

| Monitor Item | Condition | | Values/Status |
|---|---|---|---|
| TP SEN 1-B1 | • Ignition switch: ON (Engine stopped)<br>• Selector lever: D position | Accelerator pedal: Fully released | More than 0.36 V |
| | | Accelerator pedal: Fully depressed | Less than 4.75 V |
| TP SEN 2-B1*1 | • Ignition switch: ON (Engine stopped)<br>• Selector lever: D position | Accelerator pedal: Fully released | More than 0.36 V |
| | | Accelerator pedal: Fully depressed | Less than 4.75 V |
| FUEL T/TMP SE | • Ignition switch: ON | | Indicates fuel tank temperature |
| INT/A TEMP SE | • Ignition switch: ON | | Indicates intake air temperature |
| EVAP SYS PRES | • Ignition switch: ON | | Approx. 1.8 - 4.8 V |
| FUEL LEVEL SE | • Ignition switch: ON | | Depending on fuel level of fuel tank |
| START SIGNAL | • Ignition switch: ON → START → ON | | OFF → ON → OFF |
| CLSD THL POS | • Ignition switch: ON (Engine stopped) | Accelerator pedal: Fully released | ON |
| | | Accelerator pedal: Slightly depressed | OFF |
| AIR COND SIG | • Engine: After warming up, idle the engine | Air conditioner switch: OFF | OFF |
| | | Air conditioner switch: ON (Compressor operates.) | ON |
| P/N POSI SW | • Ignition switch: ON | Selector lever: P or N position | ON |
| | | Selector lever: Except above position | OFF |
| PW/ST SIGNAL | • Engine: After warming up, idle the engine | Steering wheel: Not being turned | OFF |
| | | Steering wheel: Being turned | ON |
| LOAD SIGNAL | • Ignition switch: ON | Rear window defogger switch: ON and/or Lighting switch: 2nd position | ON |
| | | Rear window defogger switch and lighting switch: OFF | OFF |
| IGNITION SW | • Ignition switch: ON → OFF → ON | | ON → OFF → ON |
| HEATER FAN SW | • Engine: After warming up, idle the engine | Heater fan switch: ON | ON |
| | | Heater fan switch: OFF | OFF |
| BRAKE SW | • Ignition switch: ON | Brake pedal: Fully released | OFF |
| | | Brake pedal: Slightly depressed | ON |
| INJ PULSE-B1 | • Engine: After warming up<br>• Selector lever: P or N position<br>• Air conditioner switch: OFF<br>• No load | Idle | 2.0 - 3.0 msec |
| | | 2,000 rpm | 1.9 - 2.9 msec |
| INJ PULSE-B2 | • Engine: After warming up<br>• Selector lever: P or N position<br>• Air conditioner switch: OFF<br>• No load | Idle | 2.0 - 3.0 msec |
| | | 2,000 rpm | 1.9 - 2.9 msec |
| IGN TIMING | • Engine: After warming up<br>• Selector lever: P or N position<br>• Air conditioner switch: OFF<br>• No load | Idle | 7 - 17°BTDC |
| | | 2,000 rpm | 25 - 45°BTDC |
| CAL/LD VALUE | • Engine: After warming up<br>• Selector lever: P or N position<br>• Air conditioner switch: OFF<br>• No load | Idle | 5 - 35% |
| | | 2,500 rpm | 5 - 35% |
| MASS AIRFLOW | • Engine: After warming up<br>• Selector lever: P or N position<br>• Air conditioner switch: OFF<br>• No load | Idle | 2.0 - 6.0 g/s |
| | | 2,500 rpm | 7.0 - 20.0 g/s |

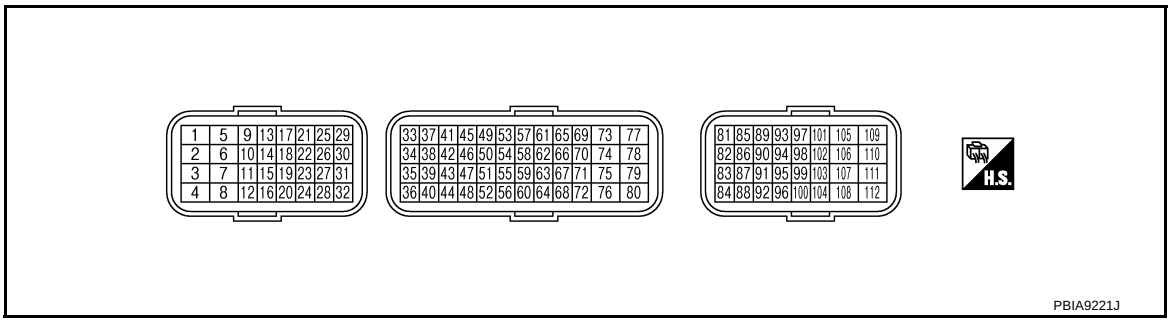
| Monitor Item | Condition | | Values/Status |
|---|---|---|---|
| PURG VOL C/V | • Engine: After warming up<br>• Selector lever: P or N position<br>• Air conditioner switch: OFF<br>• No load | Idle<br>(Accelerator pedal: Not depressed even slightly, after engine starting.) | 0% |
| | | 2,000 rpm | — |
| INT/V TIM (B1) | • Engine: After warming up<br>• Selector lever: P or N position<br>• Air conditioner switch: OFF<br>• No load | Idle | –5 - 5°CA |
| | | 2,000 rpm | Approx. 0 - 30°CA |
| INT/V TIM (B2) | • Engine: After warming up<br>• Selector lever: P or N position<br>• Air conditioner switch: OFF<br>• No load | Idle | –5 - 5°CA |
| | | 2,000 rpm | Approx. 0 - 30°CA |
| INT/V SOL (B1) | • Engine: After warming up<br>• Selector lever: P or N position<br>• Air conditioner switch: OFF<br>• No load | Idle | 0 - 2% |
| | | 2,000 rpm | Approx. 0 - 50% |
| INT/V SOL (B2) | • Engine: After warming up<br>• Selector lever: P or N position<br>• Air conditioner switch: OFF<br>• No load | Idle | 0 - 2% |
| | | 2,000 rpm | Approx. 0 - 50% |
| VIAS S/V-1 | • Engine: After warming up<br>• Selector lever: P or N position<br>• Air conditioner switch: OFF<br>• No load | When revving engine up to 5,000 rpm quickly | OFF →ON → OFF |
| VIAS S/V-2 | • Engine: After warming up<br>• Selector lever: P or N position<br>• Air conditioner switch: OFF<br>• No load | When revving engine up to 5,000 rpm quickly | OFF →ON → OFF |
| AIR COND RLY | • Engine: After warming up, idle the engine | Air conditioner switch: OFF | OFF |
| | | Air conditioner switch: ON<br>(Compressor operates) | ON |
| ENGINE MOUNT | • Engine: After warming up | Idle (With vehicle stopped) | IDLE |
| | | Except above conditions | TRVL |
| FUEL PUMP RLY | • For 1 second after turning ignition switch: ON<br>• Engine running or cranking | | ON |
| | • Except above | | OFF |
| VENT CONT/V | • Ignition switch: ON | | OFF |
| THRTL RELAY | • Ignition switch: ON | | ON |
| COOLING FAN | • Engine: After warming up, idle the engine<br>• Air conditioner switch: OFF | Engine coolant temperature: 97°C (206°F) or less | OFF |
| | | Engine coolant temperature: Between 98°C (208°F) and 99°C (210°F) | LOW |
| | | Engine coolant temperature: Between 100°C (212°F) and 104°C (219°F) | MID |
| | | Engine coolant temperature: 105°C (221°F) or more | HI |
| HO2S2 HTR (B1) | • Engine speed: Below 3,600 rpm after the following conditions are met.<br>- Engine: After warming up<br>- Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load | | ON |
| | • Engine speed: Above 3,600 rpm | | OFF |

| Monitor Item | Condition | | Values/Status |
|---|---|---|---|
| HO2S2 HTR (B2) | • Engine speed: Below 3,600 rpm after the following conditions are met.<br>- Engine: After warming up<br>- Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load | | ON |
| | • Engine speed: Above 3,600 rpm | | OFF |
| I/P PULLY SPD | • Vehicle speed: More than 20 km/h (12 MPH) | | Almost the same speed as the tachometer indication |
| VEHICLE SPEED | • Turn drive wheels and compare CONSULT value with the speedometer indication. | | Almost the same speed as the speedometer indication |
| IDL A/V LEARN | • Engine: Running | Idle air volume learning has not been performed yet. | YET |
| | | Idle air volume learning has already been performed successfully. | CMPLT |
| ENG OIL TEMP | • Engine: After warming up | | More than 70°C (158°F) |
| TRVL AFTER MIL | • Ignition switch: ON | Vehicle has traveled after MIL has illuminated. | 0 - 65,535 km<br>(0 - 40,723 miles) |
| A/F S1 HTR (B1) | • Engine: After warming up, idle the engine<br>(More than 140 seconds after starting engine) | | 4 - 100% |
| A/F S1 HTR (B2) | • Engine: After warming up, idle the engine<br>(More than 140 seconds after starting engine) | | 4 - 100% |
| AC PRESS SEN | • Engine: Idle<br>• Both A/C switch and blower fan switch: ON (Compressor operates) | | 1.0 - 4.0 V |
| VHCL SPEED SE | • Turn drive wheels and compare CONSULT value with the speedometer indication. | | Almost the same speed as the speedometer indication |
| SET VHCL SPD | • Engine: Running | ASCD: Operating | The preset vehicle speed is displayed |
| MAIN SW | • Ignition switch: ON | MAIN switch: Pressed | ON |
| | | MAIN switch: Released | OFF |
| CANCEL SW | • Ignition switch: ON | CANCEL switch: Pressed | ON |
| | | CANCEL switch: Released | OFF |
| RESUME/ACC SW | • Ignition switch: ON | RESUME/ACCELERATE switch: Pressed | ON |
| | | RESUME/ACCELERATE switch: Released | OFF |
| SET SW | • Ignition switch: ON | SET/COAST switch: Pressed | ON |
| | | SET/COAST switch: Released | OFF |
| BRAKE SW1<br>(ASCD brake switch) | • Ignition switch: ON | Brake pedal: Fully released | ON |
| | | Brake pedal: Slightly depressed | OFF |
| BRAKE SW2<br>(Stop lamp switch) | • Ignition switch: ON | Brake pedal: Fully released | OFF |
| | | Brake pedal: Slightly depressed | ON |
| VHCL SPD CUT | • Ignition switch: ON | | NON |
| LO SPEED CUT | • Ignition switch: ON | | NON |
| AT OD MONITOR | • Ignition switch: ON | | OFF |
| AT OD CANCEL | • Ignition switch: ON | | OFF |
| CRUISE LAMP | • Ignition switch: ON | MAIN switch: Pressed at the 1st time → at the 2nd time | ON → OFF |
| SET LAMP | • MAIN switch: ON<br>• When vehicle speed is between 40 km/h (25 MPH) and 144 km/h (89 MPH) | ASCD: Operating | ON |
| | | ASCD: Not operating | OFF |

| Monitor Item | Condition | Values/Status |
|---|---|---|
| ALT DUTY | • Engine: Idle | 0 - 80% |
| A/F ADJ-B1 | • Engine: Running | –0.330 - 0.330 |
| A/F ADJ-B2 | • Engine: Running | –0.330 - 0.330 |
| BAT CUR SEN | • Engine speed: Idle<br>• Battery: Fully charged*2<br>• Selector lever: P or N position<br>• Air conditioner switch: OFF<br>• No load | Approx. 2,600 - 3,500 mV |
| ALT DUTY SIG | • Power generation voltage variable control: Operating | ON |
| | • Power generation voltage variable control: Not operating | OFF |
| HO2 S2 DIAG1 (B1) | DTC P0139 self-diagnosis (delayed response) is incomplete. | INCMP |
| | DTC P0139 self-diagnosis (delayed response) is complete. | CMPLT |
| HO2 S2 DIAG1 (B2) | DTC P0159 self-diagnosis (delayed response) is incomplete. | INCMP |
| | DTC P0159 self-diagnosis (delayed response) is complete. | CMPLT |
| HO2 S2 DIAG2 (B1) | DTC P0139 self-diagnosis (slow response) is incomplete. | INCMP |
| | DTC P0139 self-diagnosis (slow response) is complete. | CMPLT |
| HO2 S2 DIAG2 (B2) | DTC P0159 self-diagnosis (slow response) is incomplete. | INCMP |
| | DTC P0159 self-diagnosis (slow response) is complete. | CMPLT |
| A/F SEN1 DIAG1 (B1) | DTC P015A and P015B self-diagnosis is incomplete. | INCMP |
| | DTC P015A and P015B self-diagnosis is complete. | CMPLT |
| A/F SEN1 DIAG1 (B2) | DTC P015C and P015D self-diagnosis is incomplete. | INCMP |
| | DTC P015C and P015D self-diagnosis is complete. | CMPLT |
| A/F SEN1 DIAG2 (B1) | DTC P014C and P014D self-diagnosis is incomplete. | INCMP |
| | DTC P014C and P014D self-diagnosis is complete. | CMPLT |
| A/F SEN1 DIAG2 (B2) | DTC P014E and P014F self-diagnosis is incomplete. | INCMP |
| | DTC P014E and P014F self-diagnosis is complete. | CMPLT |
| A/F SEN1 DIAG3 (B1) | The vehicle condition is not within the diagnosis range of DTC P014C, P014D, P015A or P015B. | ABSNT |
| | The vehicle condition is within the diagnosis range of DTC P014C, P014D, P015A or P015B. | PRSNT |
| A/F SEN1 DIAG3 (B2) | The vehicle condition is not within the diagnosis range of DTC P014E, P014F, P015C or P015D. | ABSNT |
| | The vehicle condition is within the diagnosis range of DTC P014E, P014F, P015C or P015D. | PRSNT |
| THRTL STK CNT B1*3 | — | — |
| EVAP LEAK DIAG | Ignition switch: ON | Indicates the condition of EVAP leak diagnosis. |
| EVAP DIAG READY | Ignition switch: ON | Indicates the ready condition of EVAP leak diagnosis. |

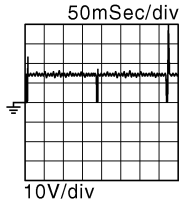
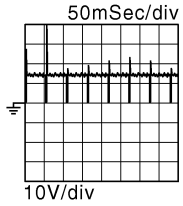
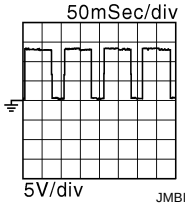
*1: Accelerator pedal position sensor 2 signal and throttle position sensor 2 signal are converted by ECM internally. Thus, they differ from ECM terminals voltage signal.
*2: Before measuring the terminal voltage, confirm that the battery is fully charged. Refer to PG-3, "How to Handle Battery".
*3: The item is indicated, but not used.

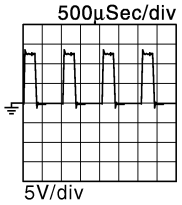
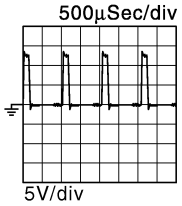
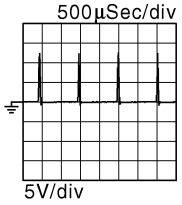
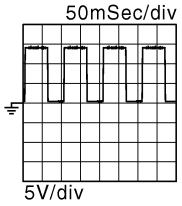
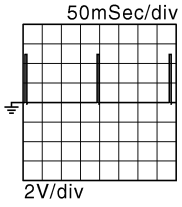
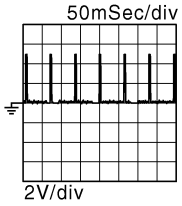
TERMINAL LAYOUT

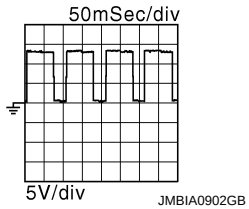
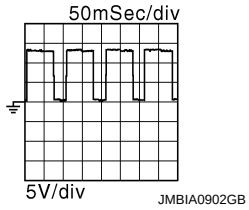


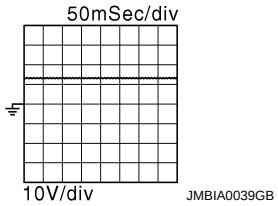
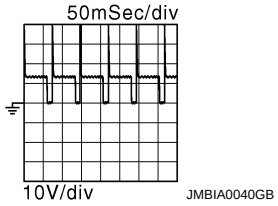

PHYSICAL VALUES

**NOTE:**
- ECM is located in the engine room left side near battery.
- Specification data are reference values.
- Pulse signal is measured by CONSULT.

| Terminal No. | | Description | | Condition | Value (Approx.) |
|---|---|---|---|---|---|
| + | – | Signal name | Input/ Output | | |
| 1 (P/B) | 112 (B) | Fuel injector No. 6 | Output | [Engine is running]<br>• Warm-up condition<br>• Idle speed<br>**NOTE:**<br>The pulse cycle changes depending on rpm at idle | BATTERY VOLTAGE (11 - 14 V)★<br>  <br><br>JMBIA0047GB |
| 3 (L/W) | | Fuel injector No. 5 | | | |
| 29 (LG/R) | | Fuel injector No. 4 | | | |
| 30 (R/Y) | | Fuel injector No. 3 | | [Engine is running]<br>• Warm-up condition<br>• Engine speed: 2,000 rpm | BATTERY VOLTAGE (11 - 14 V)★<br>  <br><br>JMBIA0048GB |
| 31 (R/W) | | Fuel injector No. 2 | | | |
| 32 (R/B) | | Fuel injector No. 1 | | | |
| 2 (G/W) | 112 (B) | Throttle control motor power supply | Input | [Ignition switch: ON] | BATTERY VOLTAGE (11 - 14 V) |
| 4 (BR/Y) | 112 (B) | A/F sensor 1 heater (bank 1) | Output | [Engine is running]<br>• Warm-up condition<br>• Idle speed<br>(More than 140 seconds after starting engine) | 2.9 - 8.8 V★<br>  <br><br>JMBIA0902GB |

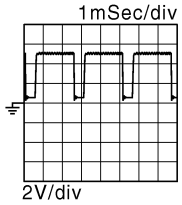
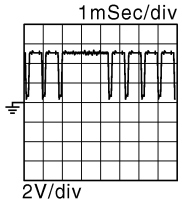
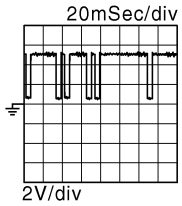
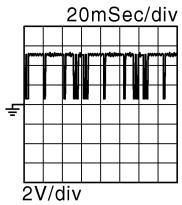
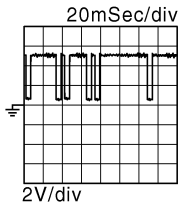
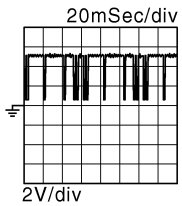
| Terminal No. | | Description | | Condition | Value (Approx.) |
|---|---|---|---|---|---|
| + | – | Signal name | Input/ Output | | |
| 5 (L) | 112 (B) | Throttle control motor (Open) | Output | [Ignition switch: ON]<br>• Engine stopped<br>• Selector lever: D position<br>• Accelerator pedal: Fully depressed | 0 - 14 V★<br>  <br><br>JMBIA0031GB |
| | | | | [Ignition switch: ON]<br>• Engine stopped<br>• Selector lever: D position<br>• Accelerator pedal: Fully released | 0 - 14 V★<br>  <br><br>JMBIA0032GB |
| 6 (P) | 112 (B) | Throttle control motor (Close) | Output | [Ignition switch: ON]<br>• Engine stopped<br>• Selector lever: D position<br>• Accelerator pedal: Fully released | 0 - 14 V★<br>  <br><br>JMBIA1125GB |
| 8 (SB) | 112 (B) | A/F sensor 1 heater (bank 2) | Output | [Engine is running]<br>• Warm-up condition<br>• Idle speed<br>(More than 140 seconds after starting engine) | 2.9 - 8.8 V★<br>  <br><br>JMBIA0030GB |
| 9 (L/B)<br>10 (G/R)<br>11 (Y/R)<br>18 (GR/R)<br>19 (P)<br>21 (W) | 112 (B) | Ignition signal No. 3<br>Ignition signal No. 2<br>Ignition signal No. 1<br>Ignition signal No. 6<br>Ignition signal No. 5<br>Ignition signal No. 4 | Output | [Engine is running]<br>• Warm-up condition<br>• Idle speed<br>**NOTE:**<br>The pulse cycle changes depending on rpm at idle | 0 - 0.2 V★<br>  <br><br>JMBIA0035GB |
| | | | | [Engine is running]<br>• Warm-up condition<br>• Engine speed: 2,000 rpm | 0.1 - 0.4 V★<br>  <br><br>JMBIA0036GB |
| 12 (B) | — | ECM ground | — | — | — |

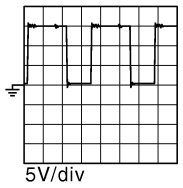
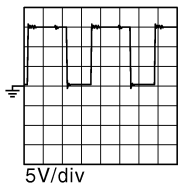
| Terminal No. | | Description | | Condition | Value (Approx.) |
|---|---|---|---|---|---|
| + | – | Signal name | Input/ Output | | |
| 13 (P/B) | 112 (B) | Heated oxygen sensor 2 heater (bank 1) | Output | [Engine is running]<br>• Engine speed: Below 3,600 rpm after the following conditions are met<br>- Engine: after warming up<br>- Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load | 10 V★<br>  <br> |
| | | | | [Ignition switch: ON]<br>• Engine stopped<br>[Engine is running]<br>• Engine speed: Above 3,600 rpm | BATTERY VOLTAGE (11 - 14 V) |
| 14 (GR) | 112 (B) | Fuel pump relay | Output | [Ignition switch: ON]<br>• For 1 second after turning ignition switch ON<br>[Engine is running] | 0 - 1.5 V |
| | | | | [Ignition switch: ON]<br>• More than 1 second after turning ignition switch ON | BATTERY VOLTAGE (11 - 14 V) |
| 15 (O) | 112 (B) | Throttle control motor relay | Output | [Ignition switch: ON → OFF] | 0 - 1.0 V → BATTERY VOLTAGE (11 - 14 V) → 0 V |
| | | | | [Ignition switch: ON] | 0 - 1.0 V |
| 16 (B/Y) | — | ECM ground | — | — | — |
| 17 (R) | 112 (B) | Heated oxygen sensor 2 heater (bank 2) | Output | [Engine is running]<br>• Engine speed: Below 3,600 rpm after the following conditions are met<br>- Engine: after warming up<br>- Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load | 10 V★<br>  <br> |
| | | | | [Ignition switch: ON]<br>• Engine stopped<br>[Engine is running]<br>• Engine speed: Above 3,600 rpm | BATTERY VOLTAGE (11 - 14 V) |
| 24 (W/B) | 112 (B) | ECM relay (Self shut-off) | Output | [Engine is running]<br>[Ignition switch: OFF]<br>• A few seconds after turning ignition switch OFF | 0 - 1.5 V |
| | | | | [Ignition switch: OFF]<br>• More than a few seconds after turning ignition switch OFF | BATTERY VOLTAGE (11 - 14 V) |

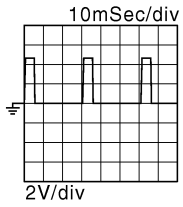
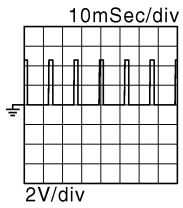
| Terminal No. | | Description | | Condition | Value (Approx.) |
|---|---|---|---|---|---|
| + | – | Signal name | Input/ Output | | |
| 25 (P/L) | 112 (B) | EVAP canister purge volume control solenoid valve | Output | [Engine is running]<br>• Idle speed<br>• Accelerator pedal: Not depressed even slightly, after engine starting | BATTERY VOLTAGE (11 - 14 V)★<br>  <br> |
| | | | | [Engine is running]<br>• Engine speed: approximately 2,000 rpm (More than 100 seconds after starting engine) | BATTERY VOLTAGE (11 - 14 V)★<br>  <br> |
| 26 (GR/B) | 112 (B) | VIAS control solenoid valve 2 | Output | [Engine is running]<br>• Warm-up condition<br>• Idle speed | BATTERY VOLTAGE (11 - 14 V) |
| | | | | [Engine is running]<br>• Warm-up condition<br>• When revving engine up to 5,000 rpm quickly | BATTERY VOLTAGE (11 - 14 V)<br>↓<br>0 - 1.0 V<br>↓<br>BATTERY VOLTAGE (11 - 14 V) |
| 27 (V) | 112 (B) | VIAS control solenoid valve 1 | Output | [Engine is running]<br>• Warm-up condition<br>• Idle speed | BATTERY VOLTAGE (11 - 14 V) |
| | | | | [Engine is running]<br>• Warm-up condition<br>• When revving engine up to 5,000 rpm quickly | BATTERY VOLTAGE (11 - 14 V)<br>↓<br>0 - 1.0 V<br>↓<br>BATTERY VOLTAGE (11 - 14 V) |
| 28 (BR/W) | 112 (B) | Electronic controlled engine mount control solenoid valve | Output | [Engine is running]<br>• Engine speed: For 2 seconds after reaching 950 rpm or less | 0 - 1.0 V |
| | | | | [Engine is running]<br>• Engine speed: After a lapse of 2 seconds after reaching 950 rpm or less | 2.0 - 3.0 V |
| | | | | [Engine is running]<br>• Engine speed: 950 rpm or more | BATTERY VOLTAGE (11 - 14 V) |
| 33 (W) | 112 (B) | Heated oxygen sensor 2 (bank 1) | Input | [Engine is running]<br>• Revving engine from idle to 3,000 rpm quickly after the following conditions are met<br>- Engine: after warming up<br>- Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load | 0 - 1.0 V |

| Terminal No. | | Description | | Condition | Value (Approx.) |
|---|---|---|---|---|---|
| + | -– | Signal name | Input/ Output | | |
| 34 (W/L) | 112 (B) | Heated oxygen sensor 2 (bank 2) | Input | [Engine is running]<br>• Revving engine from idle to 3,000 rpm quickly after the following conditions are met<br>- Engine: after warming up<br>- Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load | 0 - 1.0 V |
| 35 (B) | — | Sensor ground (Heated oxygen sensor 2) | — | — | — |
| 36 (B) | — | Sensor ground (Throttle position sensor) | — | — | — |
| 37 (W) | 112 (B) | Throttle position sensor 1 | Input | [Ignition switch: ON]<br>• Engine stopped<br>• Selector lever: D position<br>• Accelerator pedal: Fully released | More than 0.36 V |
| | | | | [Ignition switch: ON]<br>• Engine stopped<br>• Selector lever: D position<br>• Accelerator pedal: Fully depressed | Less than 4.75 V |
| 38 (R) | 112 (B) | Throttle position sensor 2 | Input | [Ignition switch: ON]<br>• Engine stopped<br>• Selector lever: D position<br>• Accelerator pedal: Fully released | Less than 4.75 V |
| | | | | [Ignition switch: ON]<br>• Engine stopped<br>• Selector lever: D position<br>• Accelerator pedal: Fully depressed | More than 0.36 V |
| 39 (R) | 40 (G) | Refrigerant pressure sensor | Input | [Engine is running]<br>• Warm-up condition<br>• Both A/C switch and blower fan motor switch: ON (Compressor operates) | 1.0 - 4.0 V |
| 40 (G) | — | Sensor ground (Refrigerant pressure sensor) | — | — | — |
| 41 (O/B) | 48 (B/P) | Power steering pressure sensor | Output | [Engine is running]<br>• Steering wheel: Being turned | 0.5 - 4.5 V |
| | | | | [Engine is running]<br>• Steering wheel: Not being turned | 0.4 - 0.8 V |
| 42 (BR) | 44 (G/B) | Battery current sensor | Input | [Engine is running]<br>• Battery: Fully charged*2<br>• Idle speed | 2.6 - 3.5 V |
| 44 (G/B) | — | Sensor ground (Battery current sensor) | — | — | — |
| 45 (P) | 49 (L) | A/F sensor 1 (bank 1) | Input | [Ignition switch: ON] | 2.2 V |
| 46 (Y) | 52 (B/R) | Engine coolant temperature sensor | Input | [Engine is running] | 0 - 4.8 V<br>Output voltage varies with engine coolant temperature. |

| Terminal No. | | Description | | Condition | Value (Approx.) |
|---|---|---|---|---|---|
| + | – | Signal name | Input/ Output | | |
| 47 (G) | 36 (B) | Sensor power supply (Throttle position sensor) | — | [Ignition switch: ON] | 5 V |
| 48 (B/P) | — | Sensor ground (Power steering pressure sensor) | — | — | — |
| 49 (L) | 112 (B) | A/F sensor 1 (bank 1) | Input | [Engine is running]<br>• Warm-up condition<br>• Engine speed: 2,000 rpm | 1.8 V<br>Output voltage varies with air fuel ratio. |
| 50 (L/Y) | 56 (G/B) | Intake air temperature sensor | Input | [Engine is running] | 0 - 4.8 V<br>Output voltage varies with intake air temperature. |
| 51 (R/Y) | 44 (G/B) | Sensor power supply (Battery current sensor) | — | [Ignition switch: ON] | 5 V |
| 52 (B/R) | — | Sensor ground (Engine coolant temperature sensor/Engine oil temperature sensor) | — | — | — |
| 53 (V) | 57 (LG) | A/F sensor 1 (bank 2) | Input | [Ignition switch: ON] | 2.2 V |
| 54 (G) | 52 (B/R) | Engine oil temperature sensor | Input | [Engine is running] | 0 - 4.8 V<br>Output voltage varies with engine oil temperature. |
| 55 (SB) | 48 (Y) | Sensor power supply (Power steering pressure sensor) | — | [Ignition switch: ON] | 5 V |
| 56 (G/B) | — | Sensor ground (Mass air flow sensor/Intake air temperature sensor) | — | — | — |
| 57 (LG) | 112 (B) | A/F sensor 1 (bank 2) | Input | [Engine is running]<br>• Warm-up condition<br>• Engine speed: 2,000 rpm | 1.8 V<br>Output voltage varies with air fuel ratio. |
| 58 (O) | 56 (G/B) | Mass air flow sensor | Input | [Engine is running]<br>• Warm-up condition<br>• Idle speed | 0.9 - 1.2 V |
| | | | | [Engine is running]<br>• Warm-up condition<br>• Engine speed: 2,500 rpm | 1.6 - 1.9 V |
| 59 (G/W) | 64 (B/R) | Sensor power supply [Camshaft position sensor (PHASE) (bank 1)] | — | [Ignition switch: ON] | 5 V |
| 60 (Y/B) | — | Sensor ground [Crankshaft position sensor (POS)] | — | — | — |
| 61 (B) | 67 (—) | Knock sensor (bank 1) | Input | [Engine is running]<br>• Idle speed | 2.5 V*1 |
| 62 (W) | 67 (—) | Knock sensor (bank 2) | Input | [Engine is running]<br>• Idle speed | 2.5 V*1 |
| 63 (R/W) | 68 (Y/G) | Sensor power supply [Camshaft position sensor (PHASE) (bank 2)] | — | [Ignition switch: ON] | 5 V |
| 64 (B/R) | — | Sensor ground [Camshaft position sensor (PHASE) (bank 1)] | — | — | — |

| Terminal No. | | Description | | Condition | Value (Approx.) |
|---|---|---|---|---|---|
| + | – | Signal name | Input/ Output | | |
| 65 (W/B) | 60 (Y/B) | Crankshaft position sensor (POS) | Input | [Engine is running]<br>• Warm-up condition<br>• Idle speed<br>**NOTE:**<br>The pulse cycle changes depending on rpm at idle | 4.0 - 5.0 V★<br>  <br><br>JMBIA0041GB |
| | | | | [Engine is running]<br>• Engine speed: 2,000 rpm | 4.0 - 5.0 V★<br>  <br><br>JMBIA0042GB |
| 67 (—) | — | Sensor ground (Knock sensor) | — | — | — |
| 68 (Y/G) | — | Sensor ground [Camshaft position sensor (PHASE) (bank 2)] | — | — | — |
| 69 (BR/W) | 68 (Y/G) | Camshaft position sensor (PHASE) (bank 2) | Input | [Engine is running]<br>• Warm-up condition<br>• Idle speed<br>**NOTE:**<br>The pulse cycle changes depending on rpm at idle | 3.0 - 5.0 V★<br>  <br><br>JMBIA0045GB |
| | | | | [Engine is running]<br>• Engine speed is 2,000 rpm | 3.0 - 5.0 V★<br>  <br><br>JMBIA0046GB |
| 70 (W/R) | 64 (B/R) | Camshaft position sensor (PHASE) (bank 1) | Input | [Engine is running]<br>• Warm-up condition<br>• Idle speed<br>**NOTE:**<br>The pulse cycle changes depending on rpm at idle | 3.0 - 5.0 V★<br>  <br><br>JMBIA0045GB |
| | | | | [Engine is running]<br>• Engine speed is 2,000 rpm | 3.0 - 5.0 V★<br>  <br><br>JMBIA0046GB |

| Terminal No. | | Description | | Condition | Value (Approx.) |
|---|---|---|---|---|---|
| + | – | Signal name | Input/ Output | | |
| 72 (BR/W) | 40 (G) | Sensor power supply (Refrigerant pressure sensor) | — | [Ignition switch: ON] | 5 V |
| 75 (Y) | 112 (B) | Intake valve timing control solenoid valve (bank 2) | Output | [Engine is running]<br>• Warm-up condition<br>• Idle speed | BATTERY VOLTAGE (11 - 14 V) |
| | | | | [Engine is running]<br>• Warm-up condition<br>• Engine speed: 2,000 rpm | 7 - 12 V★<br>  <br>5V/div JMBIA0038GB |
| 76 (R/G) | 60 (Y/B) | Sensor power supply [Crankshaft position sensor (POS)] | — | [Ignition switch: ON] | 5 V |
| 77 (W/L) | 112 (B) | Power supply for ECM (Back-up) | Input | [Ignition switch: OFF] | BATTERY VOLTAGE (11 - 14 V) |
| 78 (R/L) | 112 (B) | Intake valve timing control solenoid valve (bank 1) | Output | [Engine is running]<br>• Warm-up condition<br>• Idle speed | BATTERY VOLTAGE (11 - 14 V) |
| | | | | [Engine is running]<br>• Warm-up condition<br>• Engine speed: 2,000 rpm | 7 - 12 V★<br>  <br>5V/div JMBIA0038GB |
| 81 (W) | 84 (B) | Accelerator pedal position sensor 1 | Input | [Ignition switch: ON]<br>• Engine stopped<br>• Accelerator pedal: Fully released | 0.5 - 1.0 V |
| | | | | [Ignition switch: ON]<br>• Engine stopped<br>• Accelerator pedal: Fully depressed | 4.2 - 4.8 V |
| 82 (O) | 100 (G) | Accelerator pedal position sensor 2 | Input | [Ignition switch: ON]<br>• Engine stopped<br>• Accelerator pedal: Fully released | 0.25 - 0.50 V |
| | | | | [Ignition switch: ON]<br>• Engine stopped<br>• Accelerator pedal: Fully depressed | 2.0 - 2.5 V |
| 83 (BR) | 84 (B) | Sensor power supply (Accelerator pedal position sensor 1) | — | [Ignition switch: ON] | 5 V |
| 84 (B) | — | Sensor ground (Accelerator pedal position sensor 1) | — | — | — |

| Terminal No. | | Description | | Condition | Value (Approx.) |
|---|---|---|---|---|---|
| + | – | Signal name | Input/ Output | | |
| 85 (Y) | 92 (BR) | ASCD steering switch | Input | [Ignition switch: ON]<br>• ASCD steering switch: OFF | 4 V |
| | | | | [Ignition switch: ON]<br>• MAIN switch: Pressed | 0 V |
| | | | | [Ignition switch: ON]<br>• CANCEL switch: Pressed | 1 V |
| | | | | [Ignition switch: ON]<br>• RESUME/ACCELERATE switch: Pressed | 3 V |
| | | | | [Ignition switch: ON]<br>• SET/COAST switch: Pressed | 2 V |
| 86 (SB) | 96 (GR) | EVAP control system pressure sensor | Input | [Ignition switch: ON] | 1.8 - 4.8 V |
| 87 (GR) | 100 (G) | Sensor power supply (Accelerator pedal position sensor 2) | — | [Ignition switch: ON] | 5 V |
| 88 (O) | — | Data link connector | Input/ Output | — | — |
| 91 (L) | 96 (GR) | Sensor power supply (EVAP control system pressure sensor) | — | [Ignition switch: ON] | 5 V |
| 92 (BR) | — | Sensor ground (ASCD steering switch) | — | — | — |
| 93 (BR) | 112 (B) | Ignition switch | Input | [Ignition switch: OFF] | 0 V |
| | | | | [Ignition switch: ON] | BATTERY VOLTAGE (11 - 14 V) |
| 94 (GR) | 112 (B) | Engine speed output signal | Output | [Engine is running]<br>• Warm-up condition<br>• Idle speed<br>**NOTE:**<br>The pulse cycle changes depending on rpm at idle | 1 V★<br>  <br><br>JMBIA0076GB |
| | | | | [Engine is running]<br>• Engine speed: 2,000 rpm | 1 V★<br>  <br><br>JMBIA0077GB |
| 95 (Y) | 104 (SB) | Fuel tank temperature sensor | Input | [Engine is running] | 0 - 4.8 V<br>Output voltage varies with fuel tank temperature. |
| 96 (GR) | — | Sensor ground (EVAP control system pressure sensor) | — | — | — |
| 97 (P) | — | CAN communication line (CAN-L) | Input/ Output | — | — |
| 98 (L) | — | CAN communication line (CAN-H) | Input/ Output | — | — |

| Terminal No. | | Description | | Condition | Value (Approx.) |
|---|---|---|---|---|---|
| + | – | Signal name | Input/ Output | | |
| 100 (G) | — | Sensor ground (Accelerator pedal position sensor 2) | — | — | — |
| 102 (R) | 112 (B) | PNP signal | Input | [Ignition switch: ON]<br>• Selector lever: P or N position | BATTERY VOLTAGE (11 - 14 V) |
| | | | | [Ignition switch: ON]<br>• Selector lever: Except above position | 0 V |
| 104 (SB) | — | Sensor ground (Fuel tank temperature sensor) | — | — | — |
| 105 (V) | 112 (B) | Power supply for ECM | Input | [Ignition switch: ON] | BATTERY VOLTAGE (11 - 14 V) |
| 106 (SB) | 112 (B) | Stop lamp switch | Input | [Ignition switch: OFF]<br>• Brake pedal: Fully released | 0 V |
| | | | | [Ignition switch: OFF]<br>• Brake pedal: Slightly depressed | BATTERY VOLTAGE (11 - 14 V) |
| 107 (B) 108 (B) | — | ECM ground | — | — | — |
| 109 (W) | 112 (B) | EVAP canister vent control valve | Output | [Ignition switch: ON] | BATTERY VOLTAGE (11 - 14 V) |
| 110 (G) | 112 (B) | ASCD brake switch | Input | [Ignition switch: ON]<br>• Brake pedal: Slightly depressed | 0 V |
| | | | | [Ignition switch: ON]<br>• Brake pedal: Fully released | BATTERY VOLTAGE (11 - 14 V) |
| 111 (B) 112 (B) | — | ECM ground | — | — | — |

★: Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

*1: This may vary depending on internal resistance of the tester.

*2: Before measuring the terminal voltage, confirm that the battery is fully charged. Refer to PG-3, "How to Handle Battery".

# A/C AUTO AMP.

## Reference Value

INFOID:0000000009722204

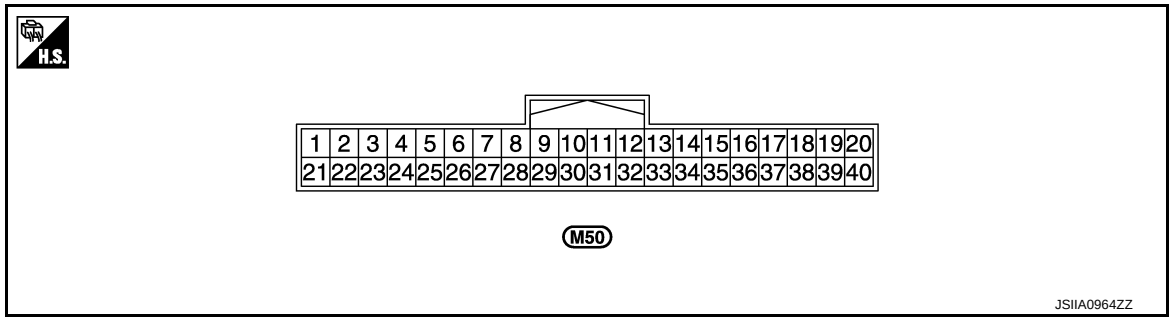
### VALUES ON THE DIAGNOSIS TOOL

**NOTE:**
The following table includes information (items) inapplicable to this vehicle. For information (items) applicable to this vehicle, refer to CONSULT display items.

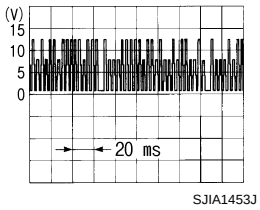
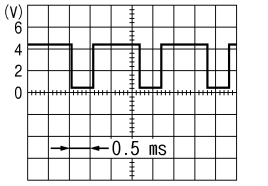
CONSULT MONITOR ITEM

| Monitor item | Condition | | Value/Status |
|---|---|---|---|
| COMP REQ SIG | Engine: Run at idle after warming up | A/C switch: ON (Compressor operation status) | On |
| | | A/C switch: OFF | Off |
| FAN REQ SIG | Engine: Run at idle after warming up | Blower fan: ON | On |
| | | Blower fan: OFF | Off |
| AMB TEMP SEN | Ignition switch ON | — | 22 - 131°F (–30 - 55°C) |
| IN-VEH TEMP | Ignition switch ON | — | 22 - 131°F (–30 - 55°C) |
| INT TEMP SEN | Ignition switch ON | — | 22 - 131°F (–30 - 55°C) |
| SUNLOAD SEN | Ignition switch ON | — | 0 - 1045 w/m$^2$ (0 - 900 kcal/m$^2$·h) |
| AMB SEN CAL | Ignition switch ON | — | 22 -131°F (–30 - 55°C) |
| IN-VEH CAL | Ignition switch ON | — | 22 -131°F (–30 - 55°C) |
| INT TEMP CAL | Ignition switch ON | — | 22 -131°F (–30 - 55°C) |
| SUNL SEN CAL | Ignition switch ON | — | 0 - 1045 w/m$^2$ (0 - 900 kcal/m$^2$·h) |
| FAN DUTY | Engine: Run at idle after warming up | Blower fan: ON | 25 - 81 |
| | | Blower fan: OFF | 0 |
| XM | Ignition switch ON | — | –100 - 155 |
| ENG COOL TEMP | Ignition switch ON | — | Values according to coolant temperature |
| VEHICLE SPEED | Driving | — | Equivalent to speedometer reading |

### TERMINAL LAYOUT

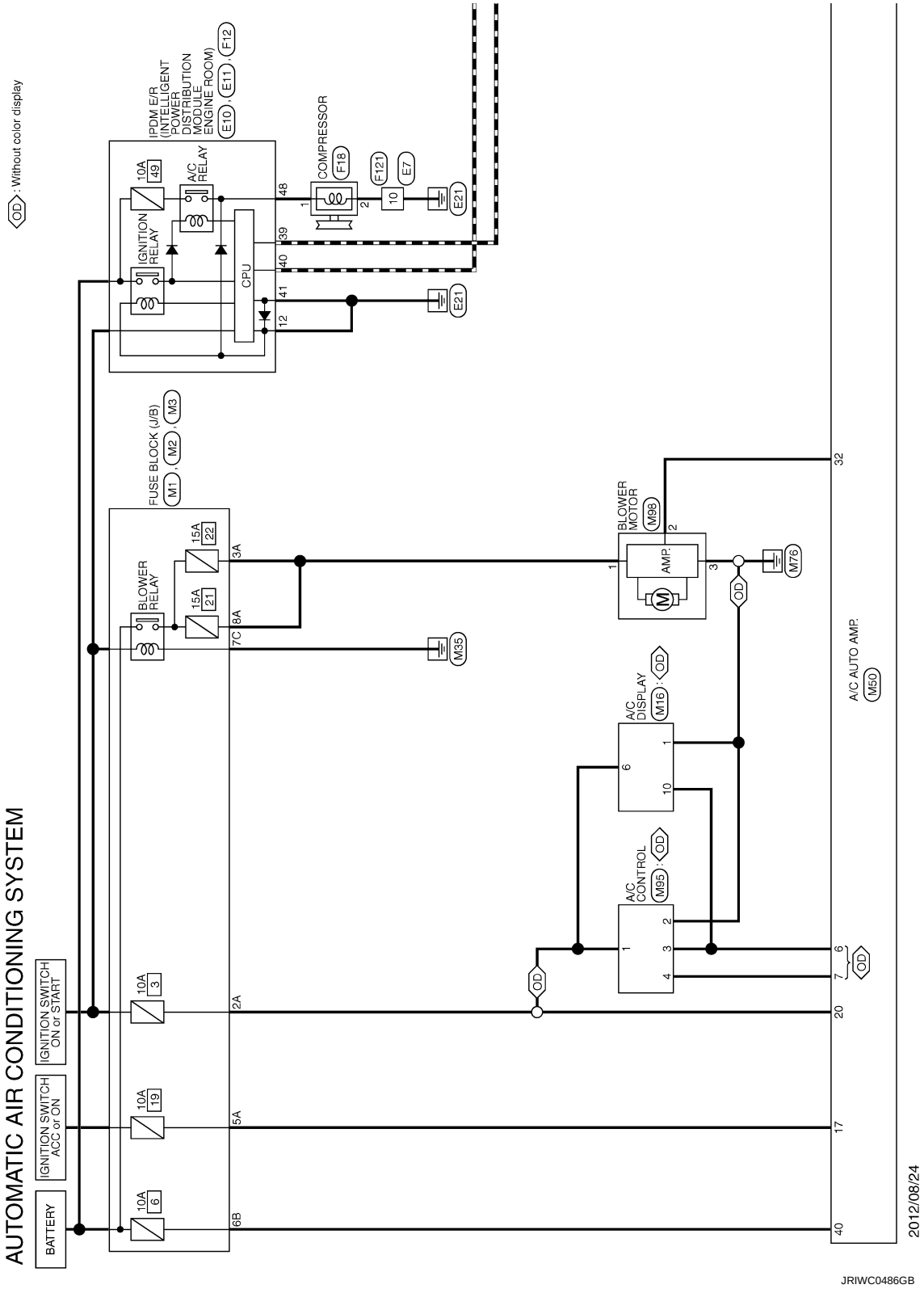


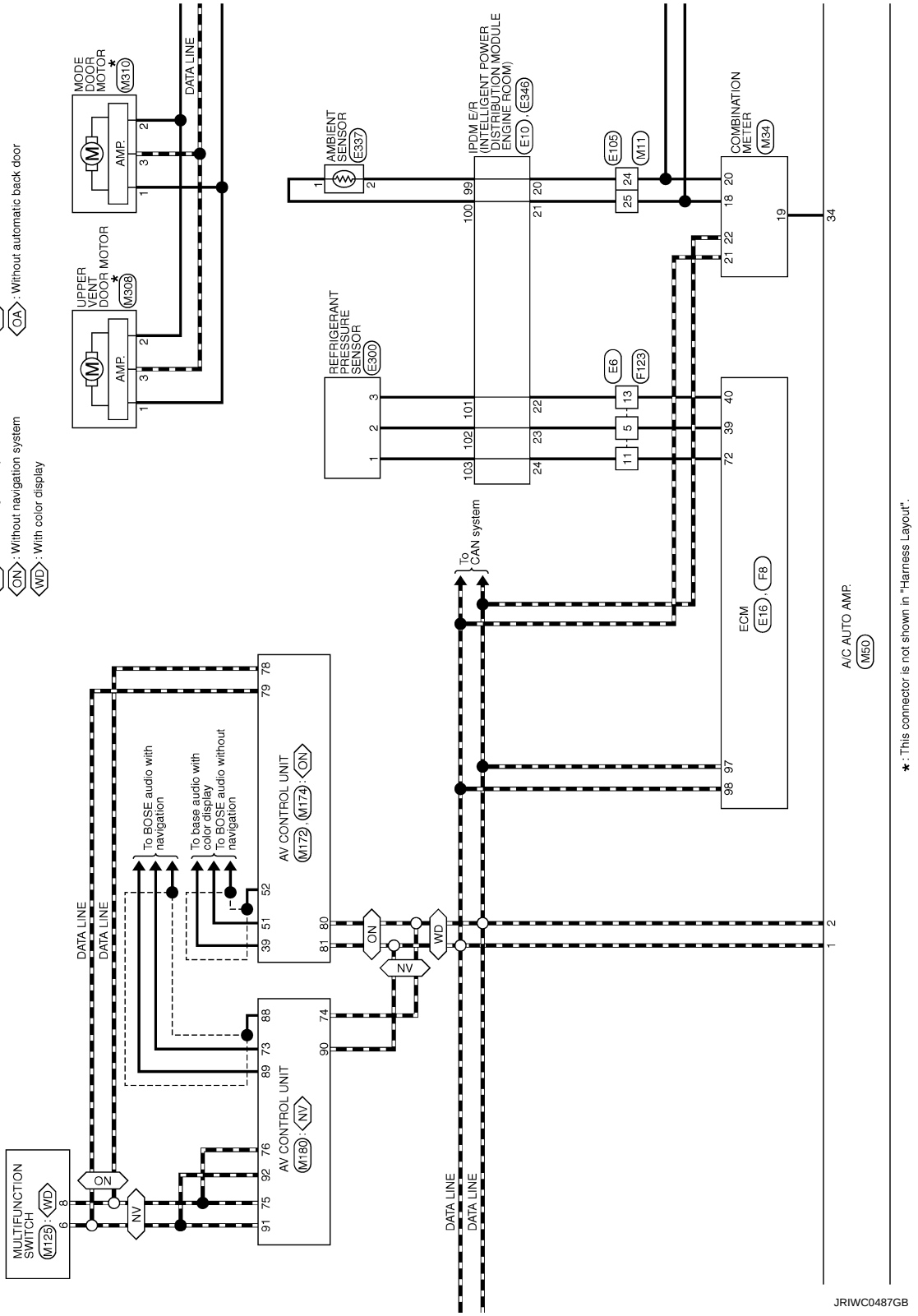

### PHYSICAL VALUES

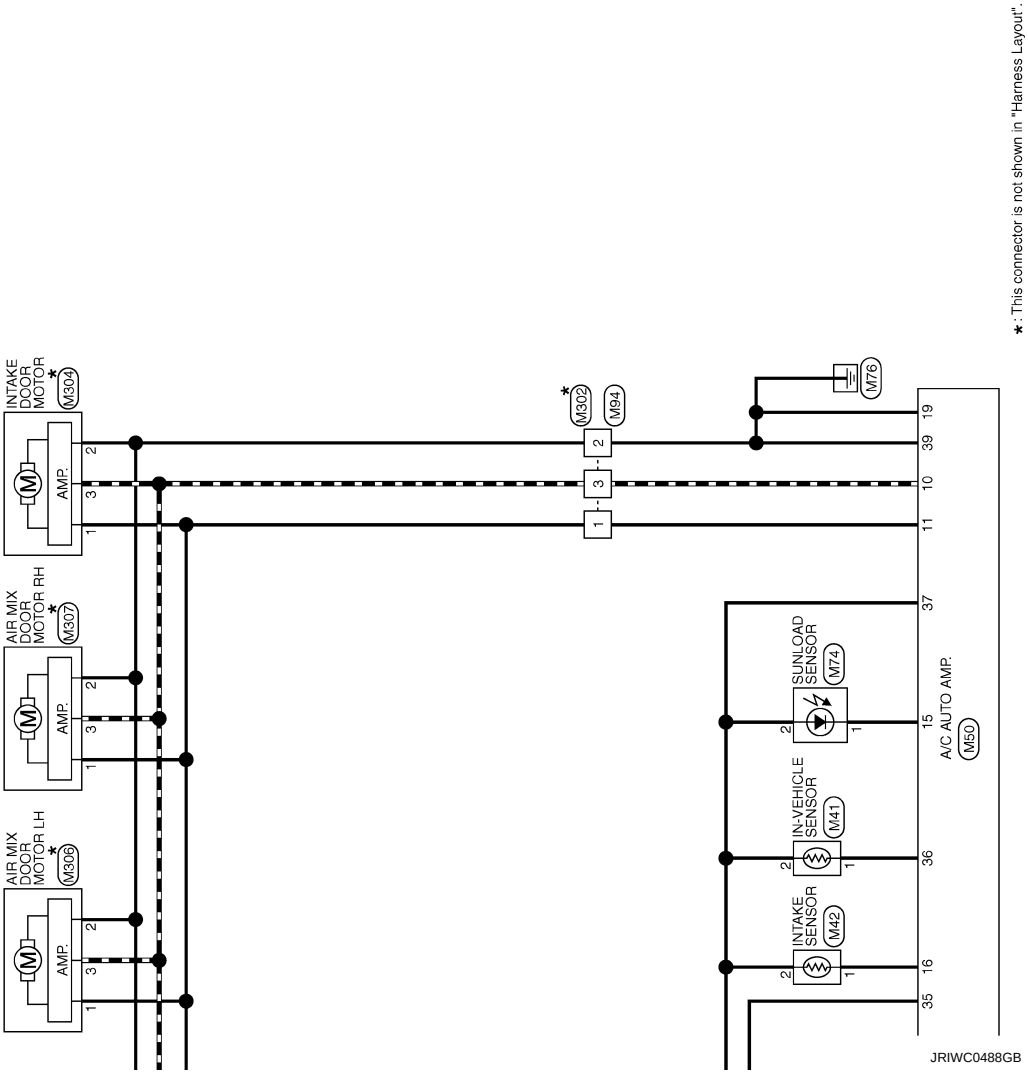
| Terminal No. (Wire color) | | Description | | Condition | Value (Approx.) |
|---|---|---|---|---|---|
| + | − | Signal name | Input/ Output | | |
| 1 (L) | — | CAN-H | Input/ Output | — | — |
| 2 (P) | — | CAN-L | Input/ Output | — | — |
| 10 (L) | Ground | LAN signal | Input/ Output | — |  SJIA1453J |
| 11 (R) | Ground | Power supply for each door motor | Input | Ignition switch ON | Battery voltage |
| 15 (BR) | Ground | Sunload sensor | Input | — | — |
| 16 (G) | Ground | Intake sensor | Input | — | — |
| 17 (R) | Ground | Power supply from ACC | — | Ignition switch ACC | Battery voltage |
| 19 (B) | Ground | Ground | — | Ignition switch ON | 0 V |
| 20 (G) | Ground | Power supply from IGN | — | Ignition switch ON | Battery voltage |
| 32 (L) | Ground | Blower motor control signal | Output | • Ignition switch ON<br>• Blower speed:1st speed (manual) |  JSIIA0096ZZ |
| 34 (P) | Ground | Power supply for ambient meter | Output | Ignition switch ON | 5V |
| 35 (L) | Ground | Ambient sensor | Input | — | — |
| 36 (LG) | Ground | In-vehicle sensor | Input | — | — |
| 37 (Y) | Ground | Sensor ground | — | Ignition switch ON | 0 V |
| 39 (B) | Ground | Ground | — | Ignition switch ON | 0 V |
| 40 (Y) | Ground | Power supply from BATT | — | Ignition switch OFF | Battery voltage |

## Wiring Diagram - AIR CONDITIONER CONTROL SYSTEM -

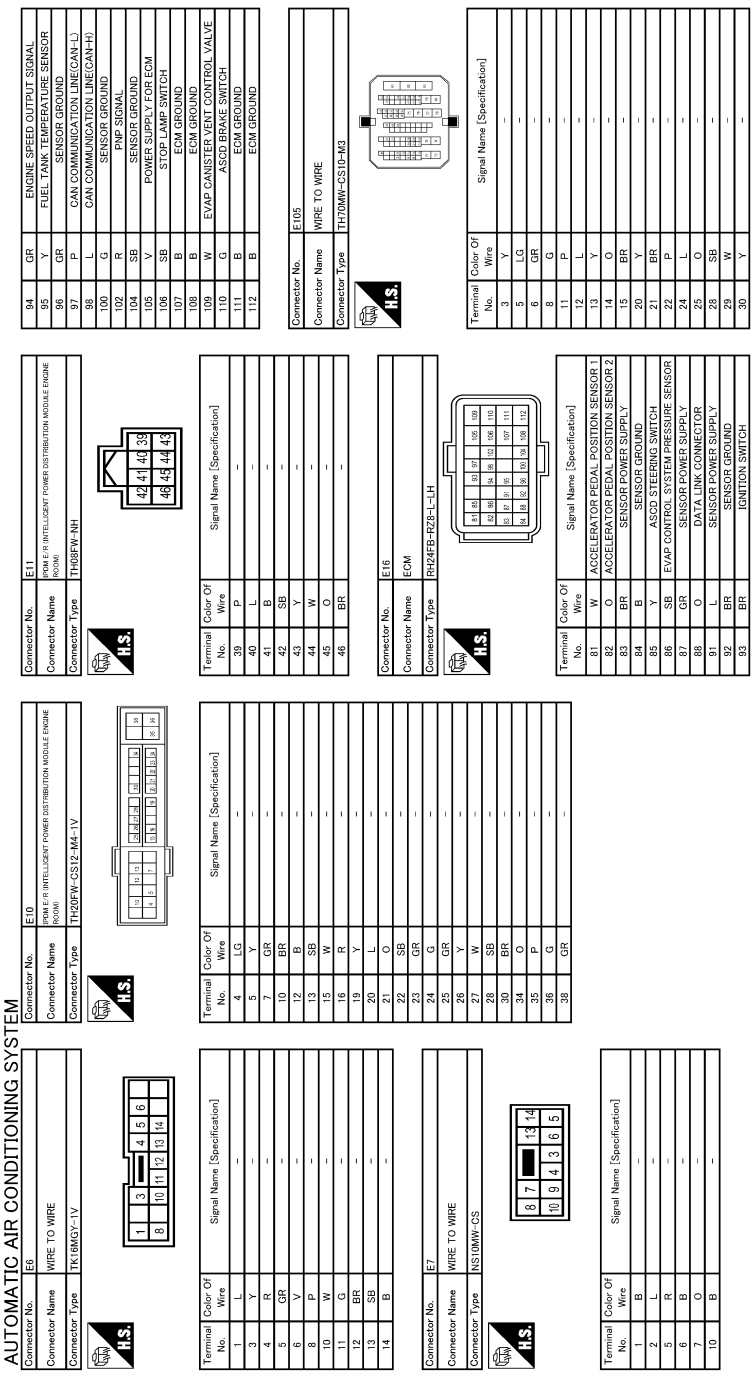
INFOID:0000000009722205



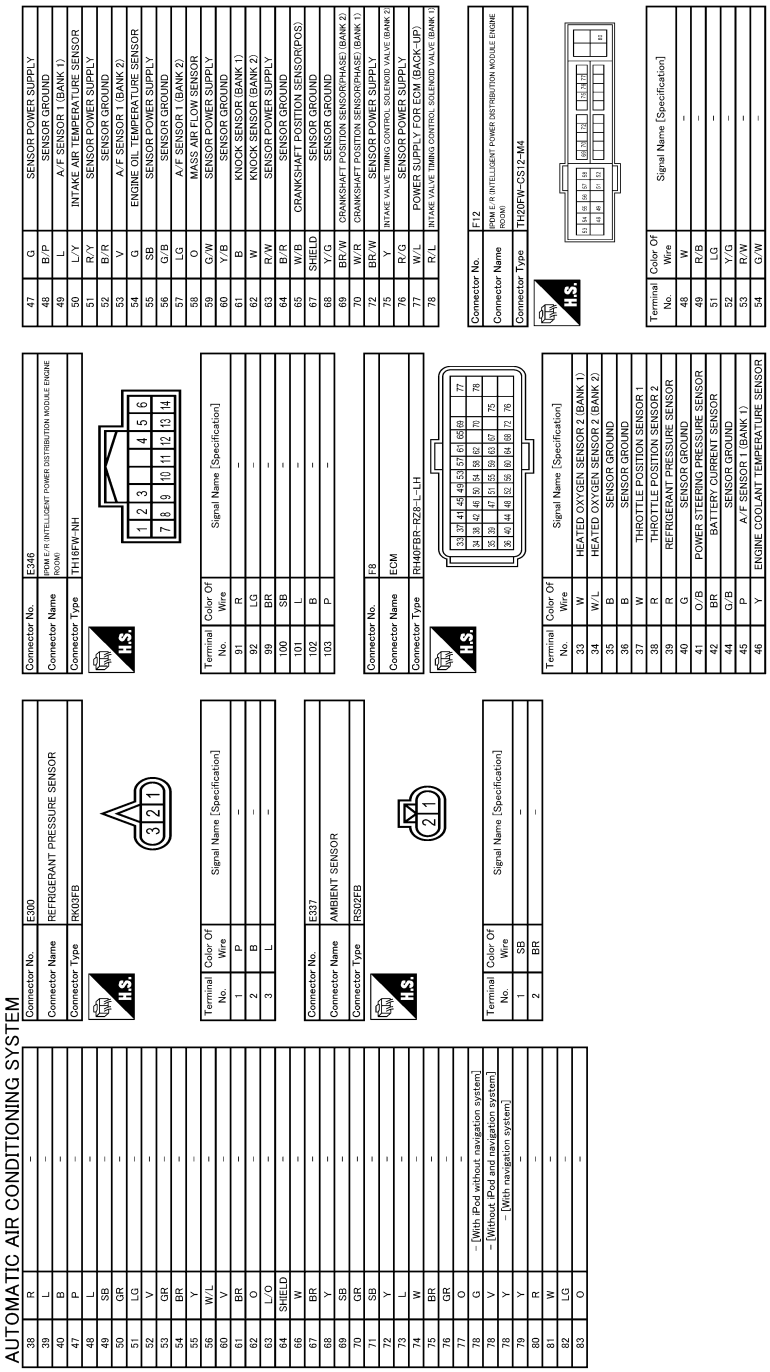

AB : With automatic back door
OA : Without automatic back door
NV : With navigation system
ON : Without navigation system
WD : With color display
MODE DOOR MOTOR * M310
UPPER VENT DOOR MOTOR * M308
AMP.
DATA LINE
AMBIENT SENSOR E337
REFRIGERANT PRESSURE SENSOR E300
IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM) E10, E346
E105 M11
E6 F123
COMBINATION METER M34
ECM E16, F8
To CAN system
A/C AUTO AMP. M50
AV CONTROL UNIT M172, M174 : ON
AV CONTROL UNIT M180 : NV
To BOSE audio with navigation
To base audio with color display
To BOSE audio without navigation
MULTIFUNCTION SWITCH M125 : WD
* : This connector is not shown in "Harness Layout".
JRIWC0487GB


✱: This connector is not shown in "Harness Layout".
INTAKE DOOR MOTOR ✱ M304
AMP.
AIR MIX DOOR MOTOR RH ✱ M307
AMP.
AIR MIX DOOR MOTOR LH ✱ M306
AMP.
✱ M302
M94
M76
SUNLOAD SENSOR M74
IN-VEHICLE SENSOR M41
INTAKE SENSOR M42
A/C AUTO AMP. M50
19
39
10
11
37
15
36
16
35
JRIWC0488GB

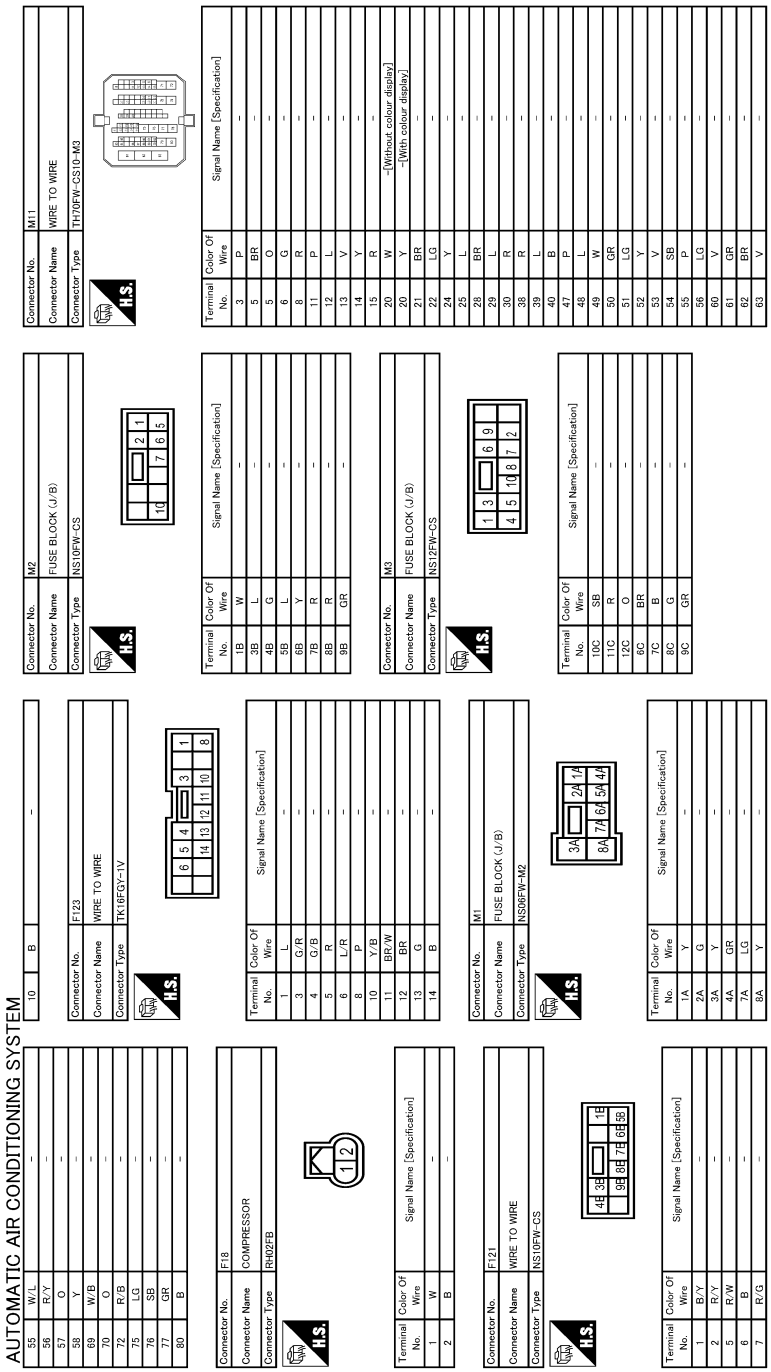
AUTOMATIC AIR CONDITIONING SYSTEM




JRIWC1462GB




JRIWC1463GB



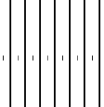

JRIWC1464GB

AUTOMATIC AIR CONDITIONING SYSTEM

| | | |
|---|---|---|
| 64 | SHIELD | – |
| 66 | W | – |
| 67 | R | – |
| 68 | W | – |
| 69 | P | – |
| 70 | G | – |
| 71 | G | – |
| 72 | BR | – |
| 73 | L | – |
| 74 | W | – |
| 75 | BR | – |
| 76 | R | – |
| 77 | G | – |
| 78 | Y | – |
| 79 | G | – |
| 80 | R | – |
| 81 | W | – |
| 82 | W | – |
| 83 | BG | – |

| | |
|---|---|
| Connector No. | M16 |
| Connector Name | A/C DISPLAY |
| Connector Type | TH10FB-NH |

H.S.




| Terminal No. | Color Of Wire | Signal Name [Specification] |
|---|---|---|
| 1 | B | GROUND |
| 6 | G | IGN |
| 8 | R | ILL+ |
| 9 | BR | ILL– |
| 10 | L | RX (AMP DISP) |

| | |
|---|---|
| Connector No. | M34 |
| Connector Name | COMBINATION METER |
| Connector Type | TH40FW-NH |

H.S.


| Terminal No. | Color Of Wire | Signal Name [Specification] |
|---|---|---|
| 1 | Y | BATTERY POWER SUPPLY |
| 2 | LG | IGN SIGNAL |
| 3 | B | GROUND |
| 4 | B | GROUND |
| 5 | SB | ILLUMINATION CONTROL SIGNAL |
| 8 | SB | TRIP RESET SIGNAL |
| 9 | W | SW ILL POWER |
| 10 | LG | METER CONTROL SWITCH GROUND |
| 11 | L | ENTER SWITCH SIGNAL |
| 12 | R | SELECT SWITCH SIGNAL |
| 13 | V | ILLUMINATION CONTROL SWITCH SIGNAL (–) (With automatic drive positioner) |
| 14 | GR | ILLUMINATION CONTROL SWITCH SIGNAL (+) |
| 15 | BR | AIR BAG SIGNAL |
| 18 | L | AMBIENT SENSOR SIGNAL |
| 19 | P | AMBIENT SENSOR POWER |
| 20 | Y | AMBIENT SENSOR GROUND |
| 21 | L | CAN-H |
| 22 | P | CAN-L |
| 23 | B | GROUND |
| 24 | W | FUEL LEVEL SENSOR GROUND |
| 25 | BR | ALTERNATOR SIGNAL |
| 26 | G | PARKING BRAKE SWITCH SIGNAL |
| 27 | V | BRAKE FLUID LEVEL SWITCH SIGNAL |
| 29 | R | WASHER LEVEL SWITCH SIGNAL |
| 30 | P | VEHICLE SPEED SIGNAL (2-PULSE) |
| 31 | V | VEHICLE SPEED SIGNAL (8-PULSE) |
| 32 | LG | OVERDRIVE CONTROL SWITCH SIGNAL |
| 34 | G | FUEL LEVEL SENSOR SIGNAL |
| 35 | SB | SEAT BELT BUCKLE SWITCH SIGNAL (DRIVER SIDE) |
| 36 | R | SEAT BELT BUCKLE SWITCH SIGNAL (PASSENGER SIDE) |

| | |
|---|---|
| Connector No. | M41 |
| Connector Name | IN-VEHICLE SENSOR |
| Connector Type | A02FW |

H.S.


| Terminal No. | Color Of Wire | Signal Name [Specification] |
|---|---|---|
| 1 | LG | – |
| 2 | SB | –[Without colour display] |
| 2 | Y | –[With colour display] |

| | |
|---|---|
| Connector No. | M42 |
| Connector Name | INTAKE SENSOR |
| Connector Type | C02FW |

H.S.


| Terminal No. | Color Of Wire | Signal Name [Specification] |
|---|---|---|
| 1 | G | –[With colour display] |
| 1 | R | –[Without colour display] |
| 2 | SB | –[Without colour display] |
| 2 | Y | –[With colour display] |

| | |
|---|---|
| Connector No. | M50 |
| Connector Name | A/C AUTO AMP |
| Connector Type | SAB40FW |

H.S.




| Terminal No. | Color Of Wire | Signal Name [Specification] |
|---|---|---|
| 1 | L | CAN–H |
| 2 | P | CAN–L |
| 6 | L | TX (AMP SW & DISP) |
| 7 | P | RX (SW AMP) |
| 10 | G | LAN SIG [Without colour display] |
| 10 | L | LAN SIG [With colour display] |
| 11 | R | VACTR |
| 15 | BR | SUN SENS |
| 16 | G | INTAKE SENS [With colour display] |
| 16 | R | INTAKE SENS [Without colour display] |
| 19 | B | GROUND |
| 20 | G | IGN |
| 26 | GR | RR DEF F/B |
| 27 | BR | RR DEF ON |
| 32 | L | FAN PWM |
| 34 | P | AMB POWER [With colour display] |
| 34 | V | AMB POWER [Without colour display] |
| 35 | G | AMB SENS [Without colour display] |
| 35 | L | AMB SENS [With colour display] |
| 36 | LG | INCAR SENS |
| 37 | SB | SENS GND [Without colour display] |
| 37 | Y | SENS GND [With colour display] |
| 39 | B | GND (POWER) |
| 40 | Y | BAT |

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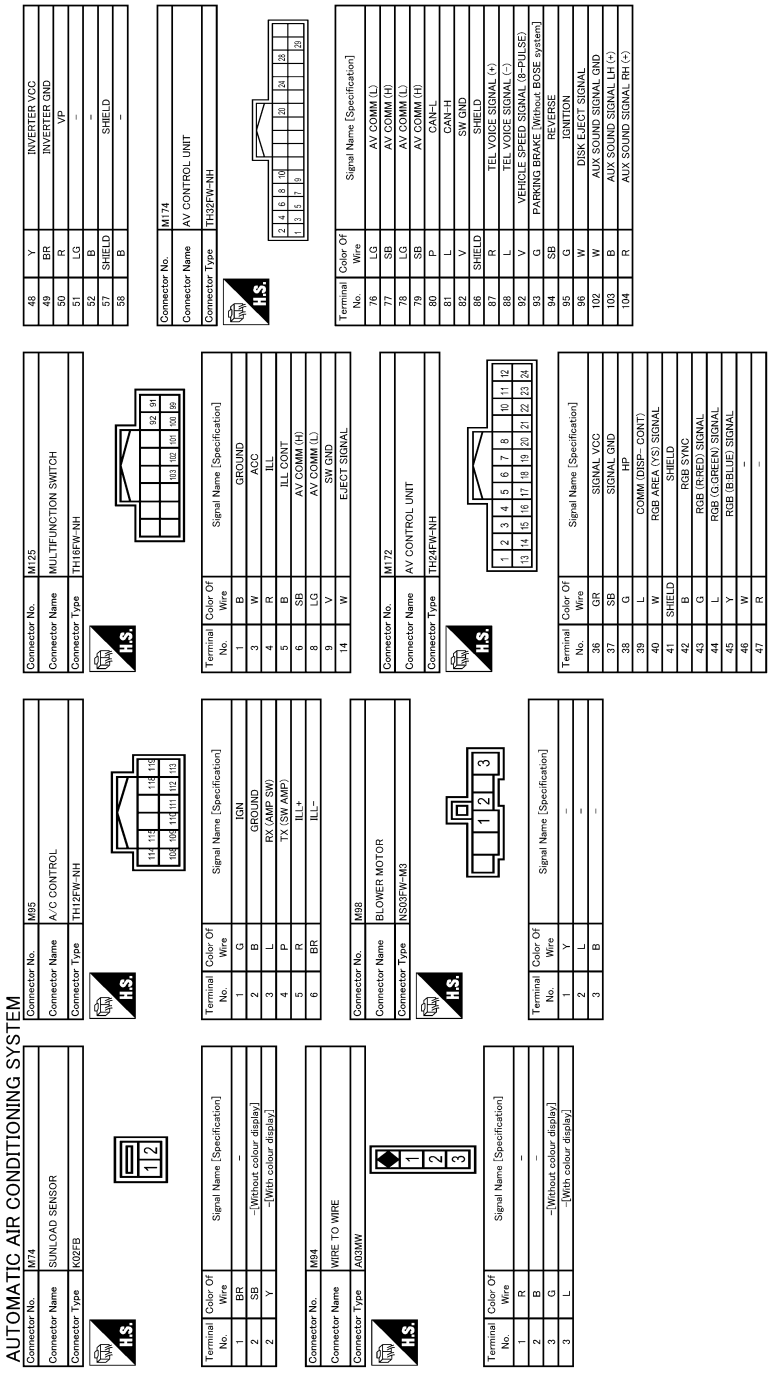


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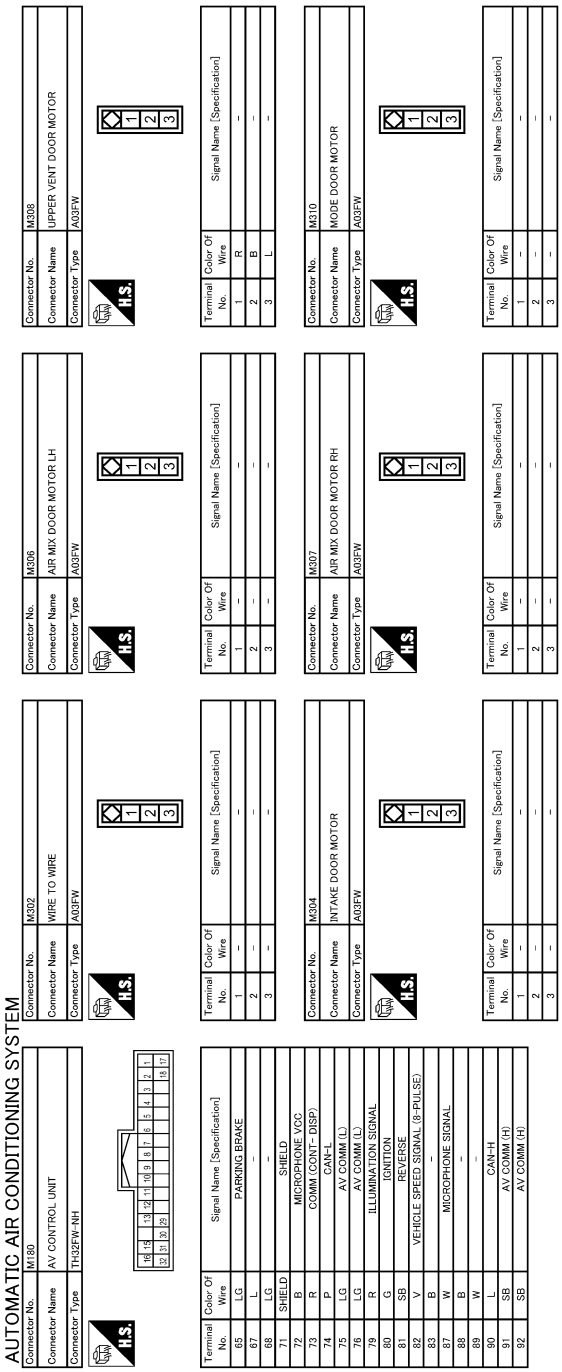


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## Fail-Safe

*INFOID:0000000009722206*

### FAIL-SAFE FUNCTION

- If a communication error exists between the A/C auto amp., and the AV control unit and preset switch for 30 seconds or longer, air conditioner is controlled under the following conditions:

**Compressor : ON**
**Air outlet : AUTO**
**Air inlet : FRE (Fresh)**
**Blower fan speed : AUTO**
**Set temperature : Setting before communication error occurs**

## DTC Inspection Priority Chart

INFOID:0000000009722207

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

| Priority | Detected items (DTC) |
|---|---|
| 1 | • U1000: CAN COMM CIRCUIT<br>• U1010: CONTROL UNIT (CAN) |
| 2 | • B2578: IN-VEHICLE SENSOR<br>• B2579: IN-VEHICLE SENSOR<br>• B257B: AMBIENT SENSOR<br>• B257C: AMBIENT SENSOR<br>• B2581: INTAKE SENSOR<br>• B2582: INTAKE SENSOR<br>• B2630: SUNLOAD SENSOR<br>• B2631: SUNLOAD SENSOR<br>• B2632: DR AIR MIX DOOR MOT<br>• B2633: DR AIR MIX DOOR MOT<br>• B2634: PASS AIR MIX DOOR MOT<br>• B2635: PASS AIR MIX DOOR MOT<br>• B2636: DR VENT DOOR FAIL<br>• B2637: DR B/L DOOR FAIL<br>• B2638: DR D/F1 DOOR FAIL<br>• B2639: DR DEF DOOR FAIL<br>• B263D: FRE DOOR FAIL<br>• B263E: 20P FRE DOOR FAIL<br>• B263F: REC DOOR FAIL<br>• B2654: D/F2 DOOR FAIL<br>• B2655: B/L2 DOOR FAIL<br>• B2661: UPPER VENT DOOR MOT<br>• B2662: UPPER VENT DOOR MOT<br>• B2663: UPPER VENT DOOR MOT |

## DTC Index

INFOID:0000000009722208

| DTC | Items (CONSULT screen terms) | Reference |
|---|---|---|
| U1000 | CAN COMM CIRCUIT | HAC-170, "DTC Logic" |
| U1010 | CONTROL UNIT (CAN) | HAC-171, "DTC Logic" |
| B257B | IN-VEHICLE SENSOR | HAC-172, "DTC Logic" |
| B257C | IN-VEHICLE SENSOR | HAC-172, "DTC Logic" |
| B2578 | AMBIENT SENSOR | HAC-175, "DTC Logic" |
| B2579 | AMBIENT SENSOR | HAC-175, "DTC Logic" |
| B2581 | INTAKE SENSOR | HAC-178, "DTC Logic" |
| B2582 | INTAKE SENSOR | HAC-178, "DTC Logic" |
| B2630* | SUNLOAD SENSOR | HAC-181, "DTC Logic" |
| B2631* | SUNLOAD SENSOR | HAC-181, "DTC Logic" |
| B2632 | DR AIR MIX DOOR MOT | HAC-184, "DTC Logic" |
| B2633 | DR AIR MIX DOOR MOT | HAC-184, "DTC Logic" |

| DTC | Items (CONSULT screen terms) | Reference |
|---|---|---|
| B2634 | PASS AIR MIX DOOR MOT | HAC-186, "DTC Logic" |
| B2635 | PASS AIR MIX DOOR MOT | HAC-186, "DTC Logic" |
| B2636 | DR VENT DOOR FAIL | HAC-188, "DTC Logic" |
| B2637 | DR B/L DOOR FAIL | HAC-188, "DTC Logic" |
| B2638 | DR D/F1 DOOR FAIL | HAC-188, "DTC Logic" |
| B2639 | DR DEF DOOR FAIL | HAC-188, "DTC Logic" |
| B263D | FRE DOOR FAIL | HAC-191, "DTC Logic" |
| B263E | 20P FRE DOOR FAIL | HAC-191, "DTC Logic" |
| B263F | REC DOOR FAIL | HAC-191, "DTC Logic" |
| B2654 | D/F2 DOOR FAIL | HAC-188, "DTC Logic" |
| B2655 | B/L2 DOOR FAIL | HAC-188, "DTC Logic" |
| B2661 | UPPER VENT DOOR MOT | HAC-193, "DTC Logic" |
| B2662 | UPPER VENT DOOR MOT | HAC-193, "DTC Logic" |
| B2663 | UPPER VENT DOOR MOT | HAC-193, "DTC Logic" |

*: Perform self-diagnosis under sunshine. When performing indoors, aim a light (more than 60 W) at sunload sensor, otherwise self-diagnosis indicates even though the sunload sensor is functioning normally.

# SYMPTOM DIAGNOSIS

## AIR CONDITIONER CONTROL

### Diagnosis Chart By Symptom

INFOID:0000000009722209

| Symptom | Reference | |
|---|---|---|
| A/C system does not activate. | Go to Trouble Diagnosis Procedure for A/C System. | HAC-202, "A/C AUTO AMP. : Diagnosis Procedure" |
| A/C system cannot be controlled. | Go to Trouble Diagnosis Procedure for Preset Switch System. | AV-142, "Symptom Table" (base audio without navigation), AV-269, "Symptom Table" (BOSE audio without navigation) or AV-436, "Symptom Table" (BOSE audio with navigation) |
| Air outlet does not change. | Go to Trouble Diagnosis Procedure for Mode Door Motor. (LAN) | HAC-189, "Diagnosis Procedure" |
| Mode door motor does not operate normally. | | |
| Discharge air temperature does not change. | Go to Trouble Diagnosis Procedure for Air Mix Door Motor. (LAN) | HAC-185, "Diagnosis Procedure" (driver side) or HAC-187, "Diagnosis Procedure" (passenger side) |
| Air mix door motor does not operate normally. | | |
| Intake door does not change. | Go to Trouble Diagnosis Procedure for Intake Door Motor. (LAN) | HAC-192, "Diagnosis Procedure" |
| Intake door motor does not operate normally. | | |
| Blower motor operation is malfunctioning. | Go to Trouble Diagnosis Procedure for Blower Motor. | HAC-196, "Diagnosis Procedure" |
| Magnet clutch does not engage. | Go to Trouble Diagnosis Procedure for Magnet Clutch. | HAC-200, "Diagnosis Procedure" |
| Insufficient cooling | Go to Trouble Diagnosis Procedure for Insufficient Cooling. | HAC-233, "Inspection procedure" |
| No cool air comes out. (Air flow volume is normal.) | | |
| Insufficient heating | Go to Trouble Diagnosis Procedure for Insufficient Heating. | HAC-236, "Inspection procedure" |
| No warm air comes out. (Air flow volume is normal.) | | |
| Noise | Go to Trouble Diagnosis Procedure for Noise. | HAC-239, "Inspection procedure" |
| Memory function does not operate. | Go to Trouble Diagnosis Procedure for Memory Function. | HAC-241, "Inspection procedure" |

# INSUFFICIENT COOLING

## Description

INFOID:0000000009722210

Symptom
- Insufficient cooling
- No cool air comes out. (Air flow volume is normal.)

## Inspection procedure

INFOID:0000000009722211

### 1. CHECK WITH A GAUGE OF RECOVERY/RECYCLING RECHARGING EQUIPMENT

Connect the recovery/recycling recharging equipment to the vehicle and perform the pressure inspection with the gauge.

Is there refrigerant?

YES >> GO TO 2.
NO-1 >> Check for refrigerant leakages with the refrigerant leakage detecting fluorescent leak detector. Refer to HA-30, "Inspection".
NO-2 >> GO TO 2 after repairing or replacing the parts according to the inspection results.

### 2. CHECK CHARGED REFRIGERANT AMOUNT

1. Connect recovery/recycling recharging equipment to the vehicle and discharge the refrigerant.
2. Recharge with the proper amount of refrigerant and perform the inspection with the refrigerant leakage detecting fluorescent leak detector. Refer to HA-30, "Inspection".

Is the inspection result normal?

YES >> GO TO 3.
NO >> Refill the refrigerant and repair or replace the parts according to the inspection results.

### 3. CHECK REFRIGERANT CYCLE PRESSURE

Connect recovery/recycling recharging equipment to the vehicle and perform the performance test. Refer to HA-28, "Performance Chart".

Is the inspection result normal?

YES >> GO TO 4.
NO >> Perform the diagnosis with the gauge pressure. Refer to HA-8, "Trouble Diagnosis For Unusual Pressure".

### 4. CHECK SETTING OF TEMPERATURE SETTING TRIMMER

Using CONSULT, check the setting of “TEMP SET CORRECT” on “WORK SUPPORT” of HVAC. Refer to HAC-136, "Temperature Setting Trimmer".

1. Check that the temperature setting trimmer is set to “+ direction”.
   **NOTE:**
   The control temperature can be set with the setting of the temperature setting trimmer.
2. Set temperature control dial to “0”.

Are the malfunction solved?

YES >> Perform the setting separately if necessary. END.
NO >> GO TO 5.

### 5. CHECK WITH SELF-DIAGNOSIS FUNCTION OF CONSULT

1. Using CONSULT, perform “SELF-DIAGNOSIS RESULTS” of HVAC.
2. Check if any DTC No. is displayed in the trouble diagnosis results.
   **NOTE:**
   If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to HAC-170, "DTC Logic" or HAC-171, "DTC Logic".

Is any DTC No. displayed?

YES >> Perform the diagnosis that is applicable to the sensor and the door motor. Refer to HAC-230, "DTC Index".
NO >> GO TO 6.

### 6. CHECK WITH ACTIVE TEST OF CONSULT

1. Using CONSULT, perform “HVAC TEST” “ACTIVE TEST” of HVAC to check each output device. Refer to HAC-166, "CONSULT Function".
   **NOTE:**
   Perform the ACTIVE TEST after starting the engine because the compressor is operated.
2. Refer to the table and check the outlet, inlet, air flow temperature, blower motor control signal, magnet clutch operation, and air mix ratio. Visually check each operating condition, by listening for noise, touching air outlets with a hand, etc.

| | Test item | | | | | | |
|---|---|---|---|---|---|---|---|
| | MODE 1 | MODE 2 | MODE 3 | MODE 4 | MODE 5 | MODE 6 | MODE 7 |
| Mode door position | VENT1 | VENT2 | B/L1 | B/L2 | FOOT | D/F | DEF |
| Intake door position | REC | REC | 20%FRE | 20%FRE | FRE | FRE | FRE |
| Air mix door position (driver & passenger side) | FULL COLD | FULL HOT | FULL COLD | FULL HOT | FULL HOT | FULL HOT | FULL HOT |
| Blower motor duty ratio | 35% | 35% | 61% | 61% | 81% | 81% | 35% |
| Compressor (Magnet clutch) | ON | ON | ON | ON | OFF | OFF | ON |
| Upper ventilator door | OPEN | SHUT | OPEN | SHUT | SHUT | SHUT | SHUT |

**NOTE:**
Perform the inspection of each output device after starting the engine because the compressor is operated.

| Discharge air flow | | | | | | | |
|---|---|---|---|---|---|---|---|
| Mode position indication | Condition | Air outlet/distribution | | | | | |
| | | VENT | | | FOOT | | DEF |
| | | Front | Upper | Rear | Front | Rear | |
|  | DUAL switch: OFF<br>UPPER VENT switch : ON | 81% | 8% | 11% | — | — | — |
|  | | 41% | 10% | 17% | 24% | 8% | — |
|  | | 12% | 12% | 16% | 27% | 10% | 23% |
|  | | 11% | 11% | 14% | 25% | 10% | 29% |
|  | | 11% | 11% | 12% | — | — | 66% |

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| Discharge air flow | | | | | | | |
|---|---|---|---|---|---|---|---|
| Mode position indication | Condition | Air outlet/distribution | | | | | |
| | | VENT | | | FOOT | | DEF |
| | | Front | Upper | Rear | Front | Rear | |
|  | DUAL switch: OFF<br>UPPER VENT switch : OFF | 88% | — | 12% | — | — | — |
|  | | 47% | — | 18% | 26% | 9% | — |
|  | | 13% | — | 17% | 33% | 12% | 25% |
|  | | 12% | — | 16% | 28% | 12% | 32% |
|  | | 11% | — | 15% | — | — | 74% |

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Does it operate normally?

YES >> GO TO 7.

NO-1 >> Air outlet does not change. Refer to HAC-189, "Diagnosis Procedure".
NO-2 >> Air inlet does not change. Refer to HAC-192, "Diagnosis Procedure".
NO-3 >> Discharge air temperature does not change. Refer to HAC-185, "Diagnosis Procedure" and HAC-187, "Diagnosis Procedure".
NO-4 >> Blower motor does not operate normally. Refer to HAC-196, "Diagnosis Procedure".
NO-5 >> Magnet clutch does not operate. Refer to HAC-200, "Diagnosis Procedure".

## 7. CHECK AMBIENT TEMPERATURE DISPLAY

Check that there is not much difference between actual ambient temperature and indicated temperature on information display in combination meter.

Is the inspection result normal?

YES >> GO TO 8.
NO >> Perform the diagnosis for the A/C auto amp. connection recognition signal. Refer to MWI-56, "Diagnosis Procedure".

## 8. CHECK DRIVE BELT

Check tension of the drive belt. Refer to EM-17, "Checking".

Is the inspection result normal?

YES >> GO TO 9.
NO >> Adjust or replace drive belt.

## 9. CHECK AIR LEAKAGE FROM DUCT

Check duct and nozzle, etc, of the A/C system for air leakage.

Is the inspection result normal?

YES >> INSPECTION END
NO >> Repair or replace parts according to the inspection results.

# INSUFFICIENT HEATING

## Description

INFOID:0000000009722212

Symptom
- Insufficient heating
- No warm air comes out. (Air flow volume is normal.)

## Inspection procedure

INFOID:0000000009722213

### 1.CHECK COOLING SYSTEM

1. Check engine coolant level and check for leakage. Refer to CO-11, "Inspection".
2. Check radiator cap. Refer to CO-15, "RADIATOR CAP : Inspection".
3. Check water flow sounds of engine coolant. Refer to CO-12, "Refilling".

Is the inspection result normal?

YES >> GO TO 2.
NO >> Refill the engine coolant and repair or replace the parts according to the inspection results.

### 2.CHECK OPERATION

1. Press temperature dial (driver side) and raise temperature setting to 32°C (90°F) after warming up the engine.
2. Check that warm air blows from the outlets.

Is the inspection result normal?

YES >> INSPECTION END
NO >> GO TO 3.

### 3.CHECK SETTING OF TEMPERATURE SETTING TRIMMER

Using CONSULT, check the setting of “TEMP SET CORRECT” on “WORK SUPPORT” of HVAC. Refer to HAC-136, "Temperature Setting Trimmer".

1. Check that the temperature setting trimmer is set to “– direction”.
   **NOTE:**
   The control temperature can be set by the temperature setting trimmer.
2. Set temperature control dial to “0”.

Are the malfunction solved?

YES >> Perform the setting separately if necessary. END.
NO >> GO TO 4.

### 4.CHECK WITH SELF-DIAGNOSIS FUNCTION OF CONSULT

1. Using CONSULT, perform “SELF-DIAGNOSIS RESULTS” of HVAC.
2. Check if any DTC No. is displayed in the trouble diagnosis results.
   **NOTE:**
   If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to HAC-170, "DTC Logic" or HAC-171, "DTC Logic".

Is any DTC No. displayed?

YES >> Perform the diagnosis that is applicable to the sensor and the door motor. Refer to HAC-230, "DTC Index".
NO >> GO TO 5.

### 5.CHECK WITH ACTIVE TEST OF CONSULT

1. Using CONSULT, perform “HVAC TEST” in “ACTIVE TEST” of HVAC to check each output device. Refer to HAC-166, "CONSULT Function".
   **NOTE:**
   Perform the ACTIVE TEST after starting the engine because the compressor is operated.
2. Refer to the table and check the outlet, inlet, air flow temperature, blower motor control signal, magnet clutch operation, and air mix ratio. Visually check each operating condition, by listening for noise, touching air outlets with a hand, etc.

| | Test item | | | | | | |
|---|---|---|---|---|---|---|---|
| | MODE 1 | MODE 2 | MODE 3 | MODE 4 | MODE 5 | MODE 6 | MODE 7 |
| Mode door position | VENT1 | VENT2 | B/L1 | B/L2 | FOOT | D/F | DEF |
| Intake door position | REC | REC | 20%FRE | 20%FRE | FRE | FRE | FRE |
| Air mix door position (driver & passenger side) | FULL COLD | FULL HOT | FULL COLD | FULL HOT | FULL HOT | FULL HOT | FULL HOT |
| Blower motor duty ratio | 35% | 35% | 61% | 61% | 81% | 81% | 35% |
| Compressor (Magnet clutch) | ON | ON | ON | ON | OFF | OFF | ON |
| Upper ventilator door | OPEN | SHUT | OPEN | SHUT | SHUT | SHUT | SHUT |

**NOTE:**
Perform the inspection of each output device after starting the engine because the compressor is operated.

| Discharge air flow | | | | | | | |
|---|---|---|---|---|---|---|---|
| Mode position indication | Condition | Air outlet/distribution | | | | | |
| | | VENT | | | FOOT | | DEF |
| | | Front | Upper | Rear | Front | Rear | |
|  | DUAL switch: OFF<br>UPPER VENT switch : ON | 81% | 8% | 11% | — | — | — |
|  | | 41% | 10% | 17% | 24% | 8% | — |
|  | | 12% | 12% | 16% | 27% | 10% | 23% |
|  | | 11% | 11% | 14% | 25% | 10% | 29% |
|  | | 11% | 11% | 12% | — | — | 66% |

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| Discharge air flow | | | | | | | |
|---|---|---|---|---|---|---|---|
| Mode position indication | Condition | Air outlet/distribution | | | | | |
| | | VENT | | | FOOT | | DEF |
| | | Front | Upper | Rear | Front | Rear | |
|  | DUAL switch: OFF<br>UPPER VENT switch : OFF | 88% | — | 12% | — | — | — |
|  | | 47% | — | 18% | 26% | 9% | — |
|  | | 13% | — | 17% | 33% | 12% | 25% |
|  | | 12% | — | 16% | 28% | 12% | 32% |
|  | | 11% | — | 15% | — | — | 74% |

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Does it operate normally?

YES >> GO TO 6.
NO-1 >> Air outlet does not change. Refer to HAC-189, "Diagnosis Procedure".
NO-2 >> Air inlet does not change. Refer to HAC-192, "Diagnosis Procedure".
NO-3 >> Discharge air temperature does not change. Refer to HAC-185, "Diagnosis Procedure" and HAC-187, "Diagnosis Procedure".
NO-4 >> Blower motor does not operate normally. Refer to HAC-196, "Diagnosis Procedure".
NO-5 >> Magnet clutch does not operate. Refer to HAC-200, "Diagnosis Procedure".

## 6. CHECK AIR LEAKAGE FROM DUCT

Check duct and nozzle, etc, of the A/C system for air leakage.

Is the inspection result normal?

YES >> GO TO 7.
NO >> Repair or replace parts according to the inspection results.

## 7. CHECK HEATER HOSE INSTALLATION CONDITION

Check the heater hose installation condition visually (for twists, crushes, etc.).

Is the inspection result normal?

YES >> GO TO 8.
NO >> Repair or replace parts according to the inspection results.

## 8. CHECK TEMPERATURE OF HEATER HOSE

1. Check the temperature of inlet hose and outlet hose of heater core.
2. Check that the inlet side of heater core is hot and the outlet side is slightly lower than/almost equal to the inlet side.

   **CAUTION:**
   **Always perform the temperature inspection in a short period of time because the engine coolant temperature is very hot.**

Is the inspection result normal?

YES >> GO TO 9.
NO >> Replace the heater core after performing the procedures after the cooling system inspection. GO TO 1.

## 9. REPLACE HEATER CORE

Replace the heater core. Refer to VTL-111, "Exploded View".

Are the malfunction solved?

YES >> INSPECTION END
NO >> Perform the procedures again after the cooling system inspection. GO TO 1.

# NOISE

## Description

INFOID:0000000009722214

Symptom
- Noise
- Noise is heard when the A/C system operates.

## Inspection procedure

INFOID:0000000009722215

### 1.CHECK OPERATION

1. Operate the A/C system and check the operation. Refer to HAC-134, "Description & Inspection".
2. Check the parts where noise is occurring.

Can the parts where noise is occurring be checked?

YES-1 >> Noise from blower motor: GO TO 2.
YES-2 >> Noise from compressor: GO TO 3.
YES-3 >> Noise from expansion valve: GO TO 4.
YES-4 >> Noise from A/C piping (pipe, flexible hose): GO TO 6.
YES-5 >> Noise from drive belt: GO TO 7.
NO >> INSPECTION END

### 2.CHECK BLOWER MOTOR

1. Remove blower motor.
2. Remove foreign materials that are in the blower unit.
3. Check the noise from blower motor again.

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace blower motor.

### 3.CHECK COMPRESSOR

Perform trouble diagnosis for the compressor and check the compressor. Refer to HA-11, "Symptom Table".

Is the inspection result normal?

YES >> INSPECTION END
NO >> Refill the refrigerant or replace the compressor according to the inspection results.

### 4.CHECK WITH GAUGE PRESSURE

Perform the diagnosis with the gauge pressure. Refer to HA-8, "Trouble Diagnosis For Unusual Pressure".

Is the inspection result normal?

YES >> GO TO 5.
NO >> Repair or replace parts according to the inspection results.

### 5.CHECK EXPANSION VALVE

1. Correct the refrigerant with recovery/recycling recharging equipment.
2. Recharge with the proper amount of the collected refrigerant after recycling or new refrigerant.
3. Check for the noise from expansion valve again.

Are the malfunction solved?

YES >> INSPECTION END
NO >> Replace expansion valve.

### 6.CHECK A/C PIPING (PIPE, FLEXIBLE HOSE)

1. Check the A/C piping (pipes, flexible hoses) (for deformation and damage, etc.).
2. Check the installation condition of clips and brackets, etc, of the A/C piping (pipes, flexible hoses).

Is the inspection result normal?

YES >> Fix the line with rubber or come vibration absorbing material.
NO >> Repair or replace parts according to the inspection results.

### 7.CHECK DRIVE BELT

Check tension of the drive belt. Refer to EM-17, "Checking".

Is the inspection result normal?

YES >> Check the noise from compressor: GO TO 3.
NO >> Adjust or replace drive belt according to the inspection results.

# MEMORY FUNCTION DOES NOT OPERATE

## Description

INFOID:0000000009722216

Symptom
- Memory function does not operate normally.
- The setting is not maintained. (It returns to the initial condition.)

## Inspection procedure

INFOID:0000000009722217

### 1.CHECK OPERATION

1. Set temperature control dial to 32°C (90°F).
2. Press the ON/OFF switch.
3. Turn the ignition switch OFF.
4. Turn the ignition switch ON.
5. Press the AUTO switch.
6. Check that the set temperature is maintained.

Is the inspection result normal?

YES >> INSPECTION END
NO >> GO TO 2.

### 2.CHECK POWER SUPPLY AND GROUND CIRCUIT OF A/C AUTO AMP.

Check power supply and ground circuit of the A/C auto amp. Refer to HAC-202, "A/C AUTO AMP. : Diagnosis Procedure".

Is the inspection result normal?

YES >> Replace the A/C auto amp.
NO >> Repair or replace malfunctioning parts.

# PRECAUTION

## PRECAUTIONS

## FOR USA AND CANADA

### FOR USA AND CANADA : Precaution for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER"

INFOID:0000000009722218

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 AIR BAG” and “SEAT BELT” of this Service Manual.

**WARNING:**

**Always observe the following items for preventing accidental activation.**

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision that 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 “SRS AIR BAG”.**
- **Never use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

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

**WARNING:**

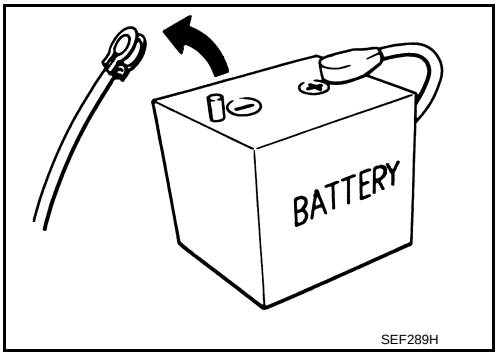
**Always observe the following items for preventing accidental activation.**

- **When working near the Air Bag Diagnosis Sensor Unit or other Air Bag System sensors with the ignition ON or engine running, never use air or electric power tools or strike near the sensor(s) with a hammer. Heavy vibration could activate the sensor(s) and deploy the air bag(s), possibly causing serious injury.**
- **When using air or electric power tools or hammers, always switch the ignition OFF, disconnect the battery, and wait at least 3 minutes before performing any service.**

### FOR USA AND CANADA : Precautions for Removing of Battery Terminal

INFOID:0000000010092860

- When removing the 12V battery terminal, turn OFF the ignition switch and wait at least 30 seconds.
  **NOTE:**
  ECU may be active for several tens of seconds after the ignition switch is turned OFF. If the battery terminal is removed before ECU stops, then a DTC detection error or ECU data corruption may occur.
- For vehicles with the 2-batteries, be sure to connect the main battery and the sub battery before turning ON the ignition switch.
  **NOTE:**
  If the ignition switch is turned ON with any one of the terminals of main battery and sub battery disconnected, then DTC may be detected.




- After installing the 12V battery, always check "Self Diagnosis Result" of all ECUs and erase DTC.
  **NOTE:**
  The removal of 12V battery may cause a DTC detection error.

### FOR USA AND CANADA : Working with HFC-134a (R-134a)

INFOID:0000000009722219

**CAUTION:**

- **CFC-12 (R-12) refrigerant and HFC-134a (R-134a) refrigerant are not compatible. Compressor malfunction is likely to occur if the refrigerants are mixed, refer to “CONTAMINATED REFRIGERANT”**

**below. To determine the purity of HFC-134a (R-134a) in the vehicle and recovery tank, use Refrigerant Recovery/Recycling Recharging equipment and Refrigerant Identifier.**

- **Use only specified lubricant for the HFC-134a (R-134a) A/C system and HFC-134a (R-134a) components. Compressor malfunction is likely to occur if lubricant other than that specified is used.**
- **The specified HFC-134a (R-134a) lubricant rapidly absorbs moisture from the atmosphere. The following handling precautions must be observed:**

- **Immediately cap (seal) the component to minimize the entry of moisture from the atmosphere when removing refrigerant components from a vehicle.**
- **Never remove the caps (unseal) until just before connecting the components when installing refrigerant components to a vehicle. Connect all refrigerant loop components as quickly as possible to minimize the entry of moisture into system.**
- **Use only the specified lubricant from a sealed container. Immediately reseal containers of lubricant. Lubricant becomes moisture saturated and should not be used without proper sealing.**
- **Never allow lubricant (NISSAN A/C System Oil Type S) to come in to contact with styrene foam parts. Damage may result.**

CONTAMINATED REFRIGERANT

**Take the appropriate steps shown below if a refrigerant other than pure HFC-134a (R-134a) is identified in a vehicle:**

- Explain to the customer that environmental regulations prohibit the release of contaminated refrigerant into the atmosphere.
- Explain that recovery of the contaminated refrigerant could damage service equipment and refrigerant supply.
- Suggest the customer return the vehicle to the location of previous service where the contamination may have occurred.
- If repairing, recover the refrigerant using only **dedicated equipment and containers. Never reintroduce contaminated refrigerant into the existing service equipment.** Contact a local refrigerant product retailer for available service if the facility does not have dedicated recovery equipment. This refrigerant must be disposed of in accordance with all federal and local regulations. In addition, replacement of all refrigerant system components on the vehicle is recommended.
- The air conditioner warranty is void if the vehicle is within the warranty period. Please contact Nissan Customer Affairs for further assistance.

## FOR USA AND CANADA : General Refrigerant Precaution

INFOID:0000000009722220

**WARNING:**

- **Never breath A/C refrigerant, lubricant vapor or mist. Exposure may irritate eyes, nose and throat. Remove HFC-134a (R-134a) from the A/C system, using certified service equipment meeting requirements of SAE J-2210 [HFC-134a (R-134a) recycling equipment], or J-2209 [HFC-134a (R-134a) recovery equipment]. Ventilate work area before resuming service if accidental system discharge occurs. Additional health and safety information may be obtained from refrigerant and lubricant manufacturers.**
- **Never release refrigerant into the air. Use approved recovery/recycling equipment to capture the refrigerant each time an air conditioning system is discharged.**
- **Always wear eye and hand protection (goggles and gloves) when working with any refrigerant or air conditioning system.**
- **Never store or heat refrigerant containers above 52°C (126°F).**
- **Never heat a refrigerant container with an open flame. Place the bottom of the container in a warm pail of water if container warming is required.**
- **Never intentionally drop, puncture, or incinerate refrigerant containers.**
- **Keep refrigerant away from open flames. Poisonous gas is produced if refrigerant burns.**
- **Refrigerant displaces oxygen, therefore be certain to work in well ventilated areas to prevent suffocation.**
- **Never pressure test or leakage test HFC-134a (R-134a) service equipment and/or vehicle air conditioning systems with compressed air during repair. Some mixtures of air and HFC-134a (R-134a) have been shown to be combustible at elevated pressures. These mixtures, if ignited, may cause injury or property damage. Additional health and safety information may be obtained from refrigerant manufacturers.**

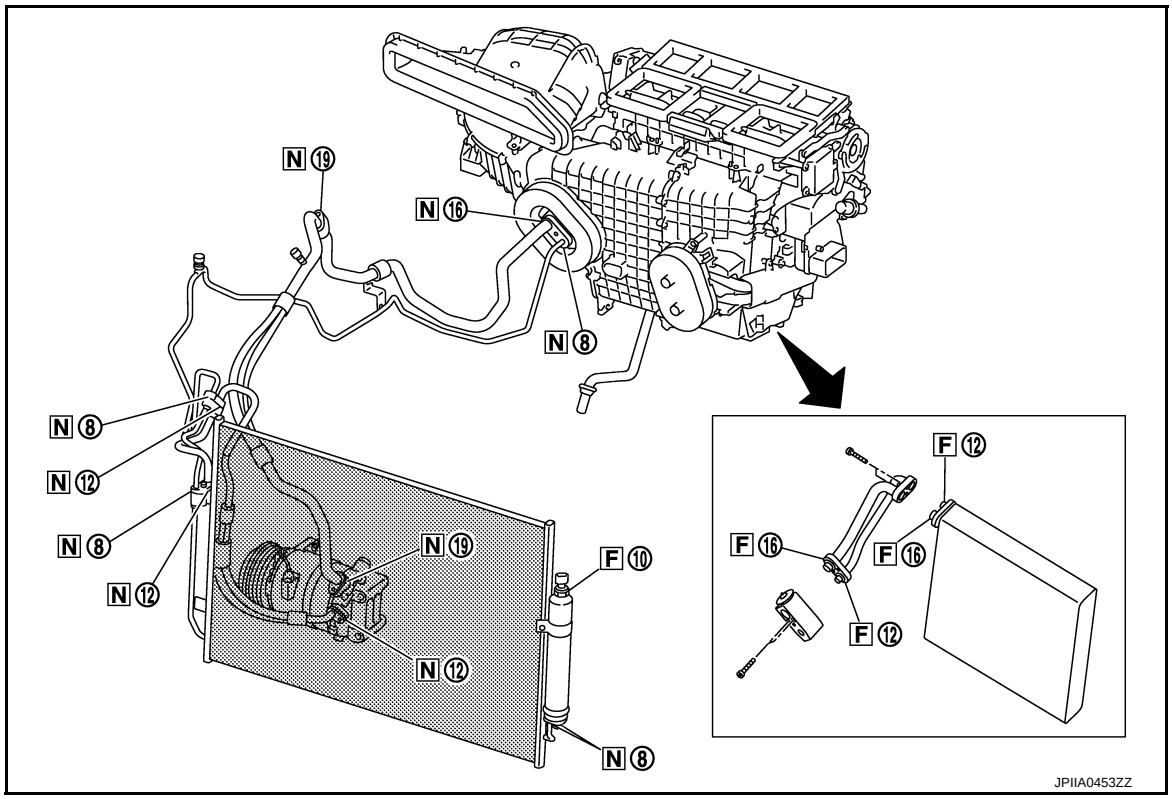
## FOR USA AND CANADA : Refrigerant Connection

INFOID:0000000009722221

A new type refrigerant connection has been introduced to all refrigerant lines except the following location.

- Expansion valve to evaporator
- Refrigerant pressure sensor to liquid tank

O-RING AND REFRIGERANT CONNECTION




F. Former type refrigerant connection N. New type refrigerant connection

O: O-ring size

**CAUTION:**

**The new and former refrigerant connections use different O-ring configurations. Never confuse O-rings since they are not interchangeable. Refrigerant may leak at the connection if a wrong O-ring is installed.**

O-Ring Part Numbers and Specifications

| Connection type | Piping connection point | | Part number | QTY | O-ring size |
|---|---|---|---|---|---|
| New | Low-pressure flexible hose to low-pressure pipe | | 92474 N8210 | 1 | ϕ19 |
| | High-pressure pipe to condenser pipe assembly (Outlet) | | 92471 N8210 | 1 | ϕ8 |
| | Condenser pipe assembly (Inlet) to high-pressure flexible hose (One-touch joint) | | 92472 N8210 | 1 | ϕ12 |
| | Condenser assembly to condenser pipe assembly | Inlet | 92472 N8210 | 1 | ϕ12 |
| | | Outlet | 92471 N8210 | 1 | ϕ8 |
| | Low-pressure pipe to expansion valve | | 92473 N8210 | 1 | ϕ16 |
| | High-pressure pipe to expansion valve | | 92471 N8210 | 1 | ϕ8 |
| | Compressor to low-pressure flexible hose | | 92474 N8210 | 1 | ϕ19 |
| | Compressor to high-pressure flexible hose | | 92472 N8210 | 1 | ϕ12 |
| | Liquid tank to condenser assembly | Inlet | 92471 N8210 | 1 | ϕ8 |
| | | Outlet | | 1 | |

| Connection type | Piping connection point | | Part number | QTY | O-ring size |
|---|---|---|---|---|---|
| Former | Refrigerant pressure sensor to liquid tank | | J2476 89956 | 1 | ϕ10 |
| | Expansion valve to evaporator pipe assembly | Inlet | 92475 71L00 | 1 | ϕ12 |
| | | Outlet | 92475 72L00 | 1 | ϕ16 |
| | Evaporator to evaporator pipe assembly | Inlet | 92475 71L00 | 1 | ϕ12 |
| | | Outlet | 92475 72L00 | 1 | ϕ16 |

**WARNING:**

**Check that all refrigerant is discharged into the recycling equipment and the pressure in the system is less than atmospheric pressure. Then gradually loosen the discharge side hose fitting and remove it.**

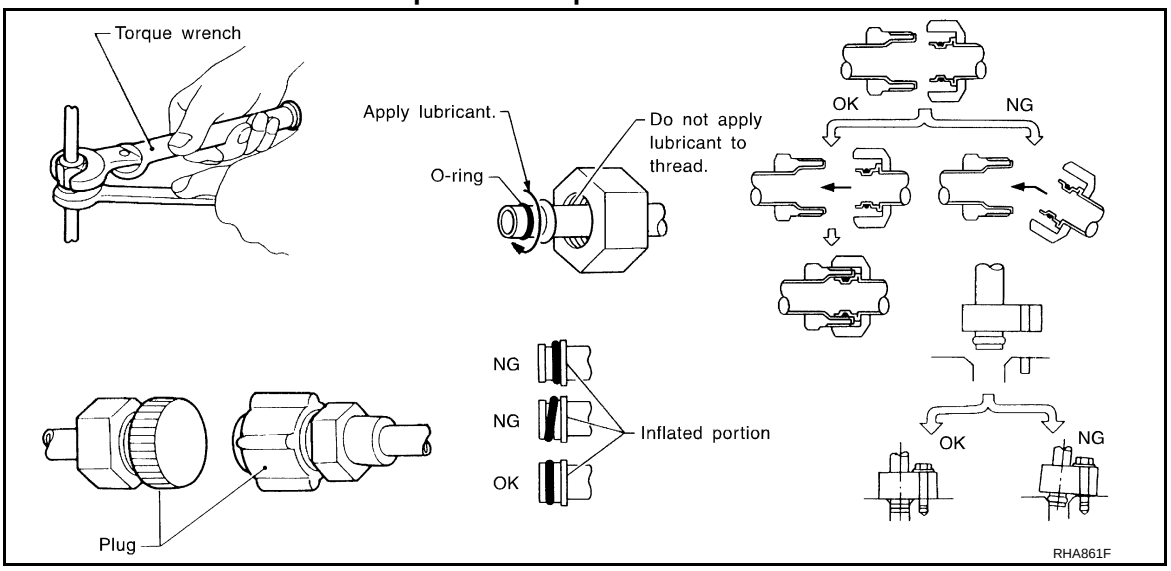
**CAUTION:**

**Observe the following when replacing or cleaning refrigerant cycle components.**

- **Store it in the same way at it is when mounted on the car when the compressor is removed. Failure to do so will cause lubricant to enter the low-pressure chamber.**
- **Always use a torque wrench and a back-up wrench when connecting tubes.**
- **Immediately plug all openings to prevent entry of dust and moisture after disconnecting tubes.**
- **Connect the pipes at the final stage of the operation when installing an air conditioner in the vehicle. Never remove the seal caps of pipes and other components until just before required for connection.**
- **Allow components stored in cool areas to warm to working area temperature before removing seal caps. This prevents condensation from forming inside A/C components.**
- **Thoroughly remove moisture from the refrigeration system before charging the refrigerant.**
- **Replace always used O-rings.**
- **Apply lubricant to circle of the O-rings shown in illustration when connecting tube. Be careful not to apply lubricant to threaded portion.**

**Name : NISSAN A/C System Oil Type S**

- **O-ring must be closely attached to the groove portion of tube.**
- **Be careful not to damage O-ring and tube when replacing the O-ring.**
- **Connect tube until a click can be heard. Then tighten the nut or bolt by hand. Check that the O-ring is installed to tube correctly.**
- **Perform leakage test and make sure that there is no leakage from connections after connecting line. Disconnect the line and replace the O-ring when the refrigerant leaking point is found. Then tighten the connections of seal seat to the specified torque.**




## FOR USA AND CANADA : Service Equipment

INFOID:0000000009722222

### RECOVERY/RECYCLING EQUIPMENT

Be certain to follow the manufacturer instructions for machine operation and machine maintenance. Never introduce any refrigerant other than that specified into the machine.

### ELECTRICAL LEAK DETECTOR

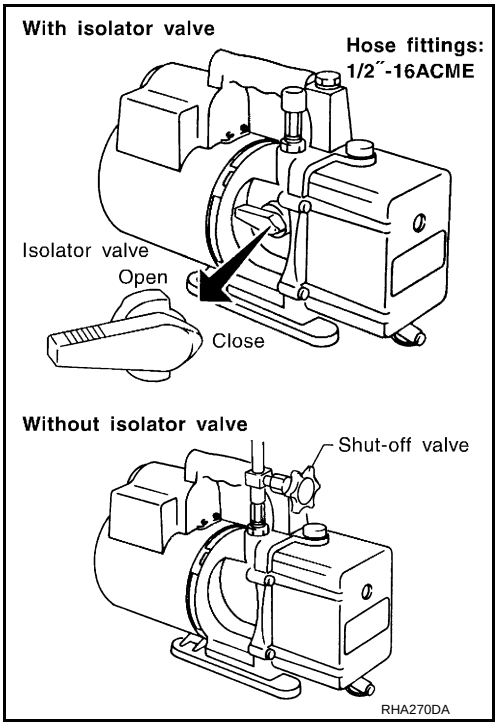
Be certain to follow the manufacturer instructions for tester operation and tester maintenance.

VACUUM PUMP

The lubricant contained inside the vacuum pump is not compatible with the specified lubricant for HFC-134a (R-134a) A/C systems. The vent side of the vacuum pump is exposed to atmospheric pressure. So the vacuum pump lubricant may migrate out of the pump into the service hose. This is possible when the pump is switched OFF after evacuation (vacuuming) and hose is connected to it.
To prevent this migration, use a manual valve placed near the hose-to-pump connection, as per the following.

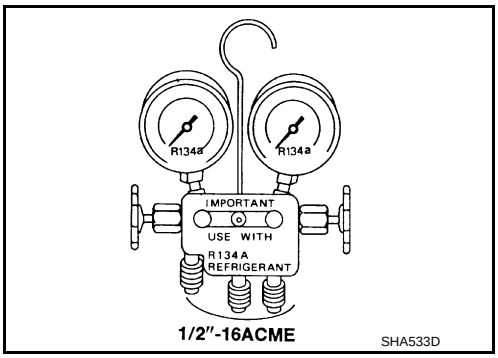
- Vacuum pumps usually have a manual isolator valve as part of the pump. Close this valve to isolate the service hose from the pump.
- Use a hose equipped with a manual shut-off valve near the pump end for pumps without an isolator. Close the valve to isolate the hose from the pump.
- Disconnect the hose from the pump if the hose has an automatic shut-off valve. As long as the hose is connected, the valve is open and lubricating oil may migrate.

Some one-way valves open when vacuum is applied and close under no vacuum condition. Such valves may restrict the ability of the pump to create a deep vacuum and are not recommended.



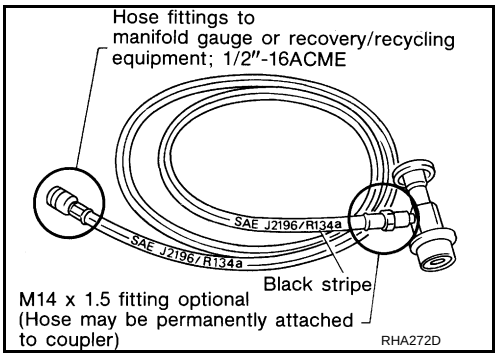

MANIFOLD GAUGE SET

Be certain that the gauge face indicates HFC-134a or R-134a. Be sure the gauge set has 1/2″-16 ACME threaded connections for service hoses. Confirm the set has been used only with refrigerant HFC-134a (R-134a) and specified lubricants.




SERVICE HOSES

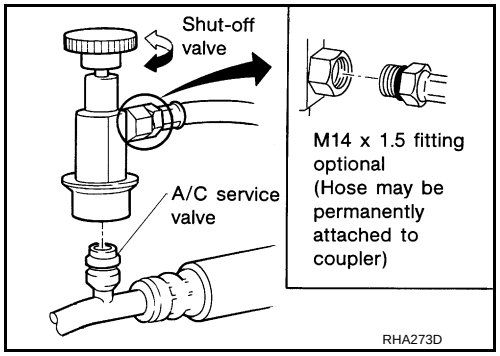
Be certain that the service hoses display the markings described (colored hose with a black stripe). All hoses must equip positive shut-off devices (either manual or automatic) near the end of the hoses opposite to the manifold gauge.




SERVICE COUPLERS

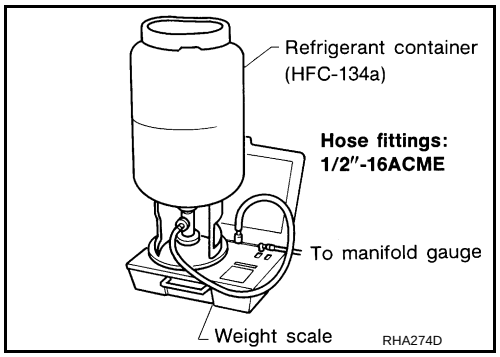
Never attempt to connect HFC-134a (R-134a) service couplers to a CFC-12 (R-12) A/C system. The HFC-134a (R-134a) couplers do not properly connect to the CFC-12 (R-12) system. However, if an improper connection is attempted, discharge and contamination may occur.

| Shut-off valve rotation | A/C service valve |
|---|---|
| Clockwise | Open |
| Counterclockwise | Close |




REFRIGERANT WEIGHT SCALE

Verify that no refrigerant other than HFC-134a (R-134a) and specified lubricants have been used with the scale. The hose fitting must be 1/2″-16 ACME if the scale controls refrigerant flow electronically.




CHARGING CYLINDER

Use of a charging cylinder is not recommended. Refrigerant may be vented into the air from the top valve of the cylinder when filling the cylinder with refrigerant. Also, the accuracy of the cylinder is generally less than that of an electronic scale or of quality recycle/recharge equipment.

## FOR MEXICO

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

INFOID:0000000009722223

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. Information necessary to service the system safely is included in the “SRS AIR BAG” and “SEAT BELT” of this Service Manual.

**WARNING:**

**Always observe the following items for preventing accidental activation.**

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision that 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 “SRS AIR BAG”.**
- **Never use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

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

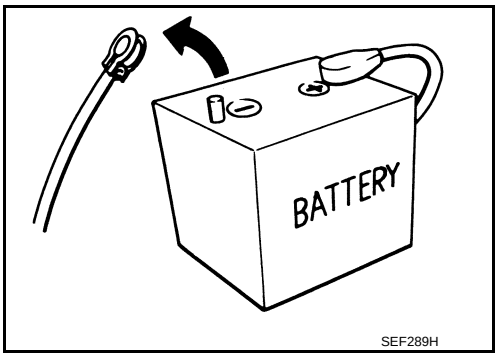
**WARNING:**

**Always observe the following items for preventing accidental activation.**

- **When working near the Air Bag Diagnosis Sensor Unit or other Air Bag System sensors with the ignition ON or engine running, never use air or electric power tools or strike near the sensor(s) with a hammer. Heavy vibration could activate the sensor(s) and deploy the air bag(s), possibly causing serious injury.**
- **When using air or electric power tools or hammers, always switch the ignition OFF, disconnect the battery, and wait at least 3 minutes before performing any service.**

## FOR MEXICO : Precautions for Removing of Battery Terminal

INFOID:0000000010092862




- When removing the 12V battery terminal, turn OFF the ignition switch and wait at least 30 seconds.
  **NOTE:**
  ECU may be active for several tens of seconds after the ignition switch is turned OFF. If the battery terminal is removed before ECU stops, then a DTC detection error or ECU data corruption may occur.
- For vehicles with the 2-batteries, be sure to connect the main battery and the sub battery before turning ON the ignition switch.
  **NOTE:**
  If the ignition switch is turned ON with any one of the terminals of main battery and sub battery disconnected, then DTC may be detected.
- After installing the 12V battery, always check "Self Diagnosis Result" of all ECUs and erase DTC.
  **NOTE:**
  The removal of 12V battery may cause a DTC detection error.

## FOR MEXICO : Working with HFC-134a (R-134a)

INFOID:0000000009722224

**CAUTION:**

- **CFC-12 (R-12) refrigerant and HFC-134a (R-134a) refrigerant are not compatible. Compressor malfunction is likely to occur if the refrigerants are mixed, refer to "CONTAMINATED REFRIGERANT" below. To determine the purity of HFC-134a (R-134a) in the vehicle and recovery tank, use Refrigerant Recovery/Recycling Recharging equipment and Refrigerant Identifier.**
- **Use only specified lubricant for the HFC-134a (R-134a) A/C system and HFC-134a (R-134a) components. Compressor malfunction is likely to occur if lubricant other than that specified is used.**
- **The specified HFC-134a (R-134a) lubricant rapidly absorbs moisture from the atmosphere. The following handling precautions must be observed:**
- **Immediately cap (seal) the component to minimize the entry of moisture from the atmosphere when removing refrigerant components from a vehicle.**
- **Never remove the caps (unseal) until just before connecting the components when installing refrigerant components to a vehicle. Connect all refrigerant loop components as quickly as possible to minimize the entry of moisture into system.**
- **Use only the specified lubricant from a sealed container. Immediately reseal containers of lubricant. Lubricant becomes moisture saturated and should not be used without proper sealing.**
- **Never allow lubricant (NISSAN A/C System Oil Type S) to come in to contact with styrene foam parts. Damage may result.**

### CONTAMINATED REFRIGERANT

**Take the appropriate steps shown below if a refrigerant other than pure HFC-134a (R-134a) is identified in a vehicle:**

- Explain to the customer that environmental regulations prohibit the release of contaminated refrigerant into the atmosphere.
- Explain that recovery of the contaminated refrigerant could damage service equipment and refrigerant supply.
- Suggest the customer return the vehicle to the location of previous service where the contamination may have occurred.
- If repairing, recover the refrigerant using only **dedicated equipment and containers. Never reintroduce contaminated refrigerant into the existing service equipment.** Contact a local refrigerant product retailer for available service if the facility does not have dedicated recovery equipment. This refrigerant must be disposed of in accordance with all federal and local regulations. In addition, replacement of all refrigerant system components on the vehicle is recommended.
- The air conditioner warranty is void if the vehicle is within the warranty period. Please contact Nissan Customer Affairs for further assistance.

## FOR MEXICO : General Refrigerant Precaution

INFOID:0000000009722225

**WARNING:**

- **Never breath A/C refrigerant, lubricant vapor or mist. Exposure may irritate eyes, nose and throat. Remove HFC-134a (R-134a) from the A/C system, using certified service equipment meeting require-**

**ments of SAE J-2210 [HFC-134a (R-134a) recycling equipment], or J-2209 [HFC-134a (R-134a) recovery equipment]. Ventilate work area before resuming service if accidental system discharge occurs. Additional health and safety information may be obtained from refrigerant and lubricant manufacturers.**

- **Never release refrigerant into the air. Use approved recovery/recycling equipment to capture the refrigerant each time an air conditioning system is discharged.**
- **Always wear eye and hand protection (goggles and gloves) when working with any refrigerant or air conditioning system.**
- **Never store or heat refrigerant containers above 52°C (126°F).**
- **Never heat a refrigerant container with an open flame. Place the bottom of the container in a warm pail of water if container warming is required.**
- **Never intentionally drop, puncture, or incinerate refrigerant containers.**
- **Keep refrigerant away from open flames. Poisonous gas is produced if refrigerant burns.**
- **Refrigerant displaces oxygen, therefore be certain to work in well ventilated areas to prevent suffocation.**
- **Never pressure test or leakage test HFC-134a (R-134a) service equipment and/or vehicle air conditioning systems with compressed air during repair. Some mixtures of air and HFC-134a (R-134a) have been shown to be combustible at elevated pressures. These mixtures, if ignited, may cause injury or property damage. Additional health and safety information may be obtained from refrigerant manufacturers.**

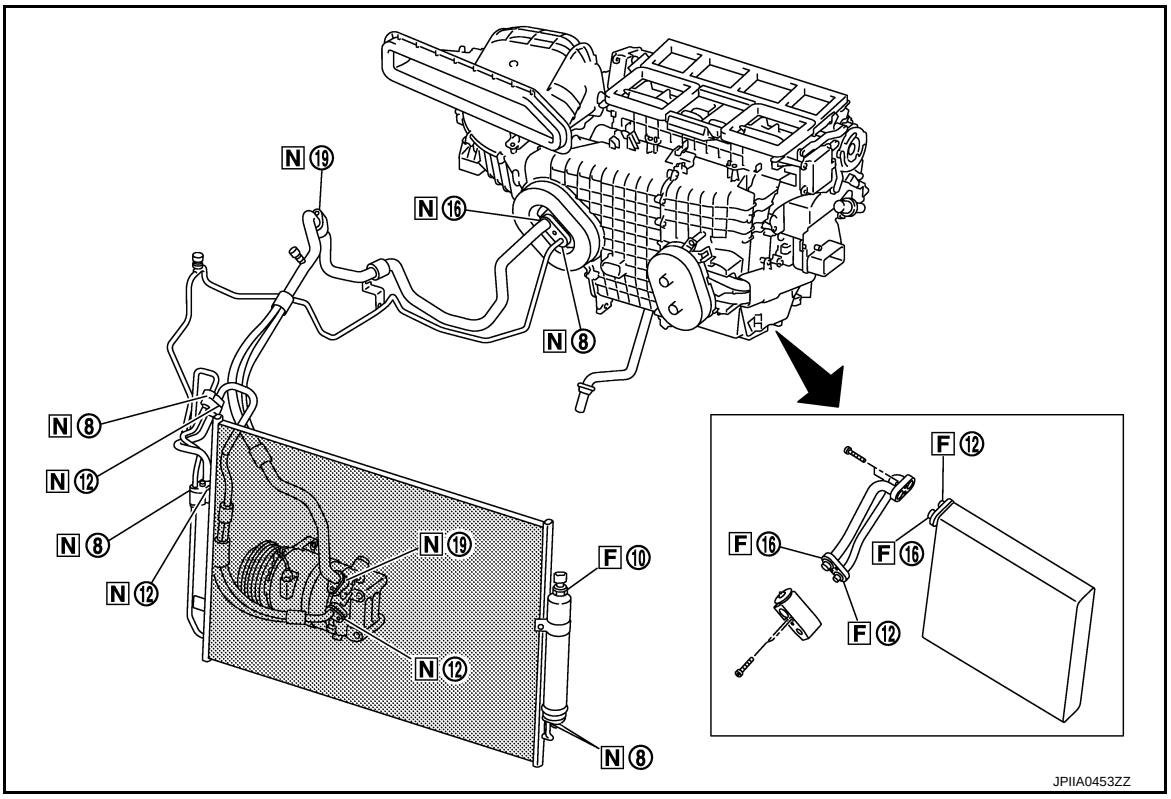
## FOR MEXICO : Refrigerant Connection

INFOID:0000000009722226

A new type refrigerant connection has been introduced to all refrigerant lines except the following location.

- Expansion valve to evaporator
- Refrigerant pressure sensor to liquid tank

### O-RING AND REFRIGERANT CONNECTION




F. Former type refrigerant connection N. New type refrigerant connection

O: O-ring size

**CAUTION:**

**The new and former refrigerant connections use different O-ring configurations. Never confuse O-rings since they are not interchangeable. Refrigerant may leak at the connection if a wrong O-ring is installed.**

O-Ring Part Numbers and Specifications

| Connection type | Piping connection point | | Part number | QTY | O-ring size |
|---|---|---|---|---|---|
| New | Low-pressure flexible hose to low-pressure pipe | | 92474 N8210 | 1 | ϕ19 |
| | High-pressure pipe to condenser pipe assembly (Outlet) | | 92471 N8210 | 1 | ϕ8 |
| | Condenser pipe assembly (Inlet) to high-pressure flexible hose (One-touch joint) | | 92472 N8210 | 1 | ϕ12 |
| | Condenser assembly to condenser pipe assembly | Inlet | 92472 N8210 | 1 | ϕ12 |
| | | Outlet | 92471 N8210 | 1 | ϕ8 |
| | Low-pressure pipe to expansion valve | | 92473 N8210 | 1 | ϕ16 |
| | High-pressure pipe to expansion valve | | 92471 N8210 | 1 | ϕ8 |
| | Compressor to low-pressure flexible hose | | 92474 N8210 | 1 | ϕ19 |
| | Compressor to high-pressure flexible hose | | 92472 N8210 | 1 | ϕ12 |
| | Liquid tank to condenser assembly | Inlet | 92471 N8210 | 1 | ϕ8 |
| | | Outlet | | 1 | |
| Former | Refrigerant pressure sensor to liquid tank | | J2476 89956 | 1 | ϕ10 |
| | Expansion valve to evaporator pipe assembly | Inlet | 92475 71L00 | 1 | ϕ12 |
| | | Outlet | 92475 72L00 | 1 | ϕ16 |
| | Evaporator to evaporator pipe assembly | Inlet | 92475 71L00 | 1 | ϕ12 |
| | | Outlet | 92475 72L00 | 1 | ϕ16 |

**WARNING:**

**Check that all refrigerant is discharged into the recycling equipment and the pressure in the system is less than atmospheric pressure. Then gradually loosen the discharge side hose fitting and remove it.**

**CAUTION:**

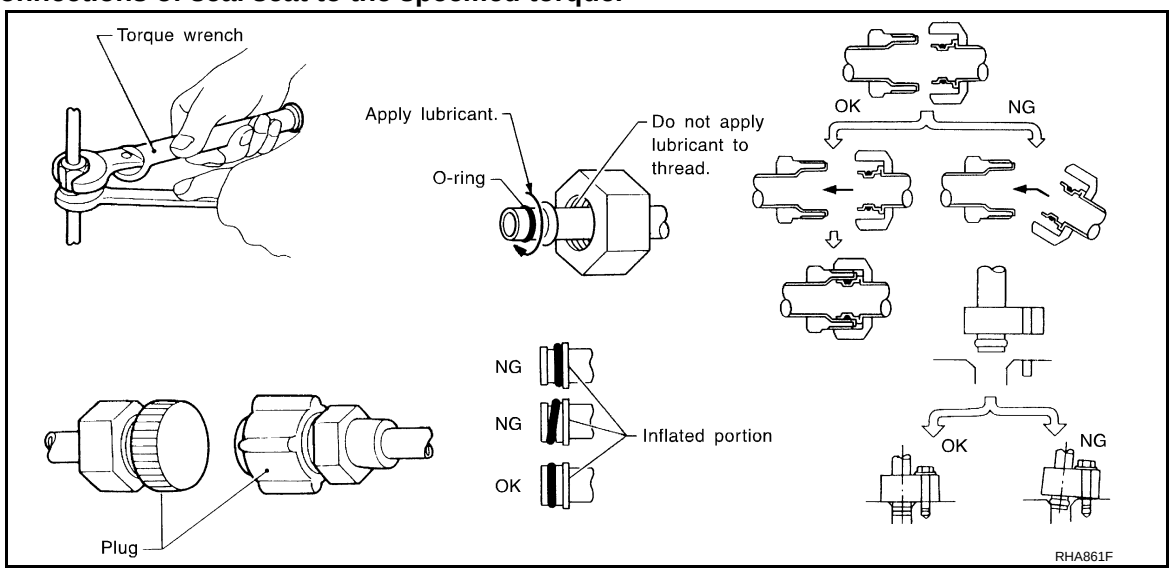
**Observe the following when replacing or cleaning refrigerant cycle components.**

- **Store it in the same way at it is when mounted on the car when the compressor is removed. Failure to do so will cause lubricant to enter the low-pressure chamber.**
- **Always use a torque wrench and a back-up wrench when connecting tubes.**
- **Immediately plug all openings to prevent entry of dust and moisture after disconnecting tubes.**
- **Connect the pipes at the final stage of the operation when installing an air conditioner in the vehicle. Never remove the seal caps of pipes and other components until just before required for connection.**
- **Allow components stored in cool areas to warm to working area temperature before removing seal caps. This prevents condensation from forming inside A/C components.**
- **Thoroughly remove moisture from the refrigeration system before charging the refrigerant.**
- **Replace always used O-rings.**
- **Apply lubricant to circle of the O-rings shown in illustration when connecting tube. Be careful not to apply lubricant to threaded portion.**

**Name : NISSAN A/C System Oil Type S**

- **O-ring must be closely attached to the groove portion of tube.**
- **Be careful not to damage O-ring and tube when replacing the O-ring.**
- **Connect tube until a click can be heard. Then tighten the nut or bolt by hand. Check that the O-ring is installed to tube correctly.**

- **Perform leakage test and make sure that there is no leakage from connections after connecting line. Disconnect the line and replace the O-ring when the refrigerant leaking point is found. Then tighten the connections of seal seat to the specified torque.**




## FOR MEXICO : Service Equipment

INFOID:0000000009722227

### RECOVERY/RECYCLING EQUIPMENT

Be certain to follow the manufacturer instructions for machine operation and machine maintenance. Never introduce any refrigerant other than that specified into the machine.

### ELECTRICAL LEAK DETECTOR

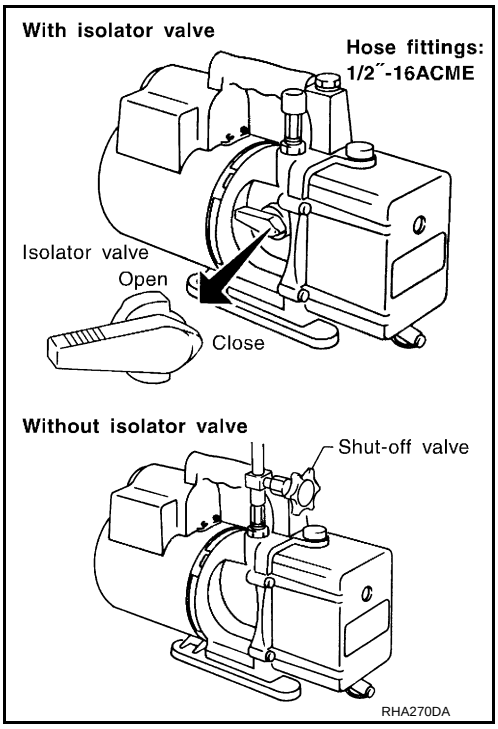
Be certain to follow the manufacturer instructions for tester operation and tester maintenance.

### VACUUM PUMP

The lubricant contained inside the vacuum pump is not compatible with the specified lubricant for HFC-134a (R-134a) A/C systems. The vent side of the vacuum pump is exposed to atmospheric pressure. So the vacuum pump lubricant may migrate out of the pump into the service hose. This is possible when the pump is switched OFF after evacuation (vacuuming) and hose is connected to it.
To prevent this migration, use a manual valve placed near the hose-to-pump connection, as per the following.

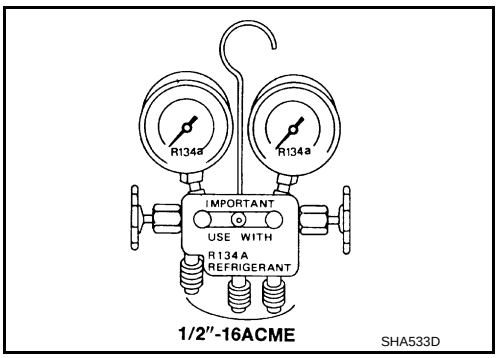
- Vacuum pumps usually have a manual isolator valve as part of the pump. Close this valve to isolate the service hose from the pump.
- Use a hose equipped with a manual shut-off valve near the pump end for pumps without an isolator. Close the valve to isolate the hose from the pump.
- Disconnect the hose from the pump if the hose has an automatic shut-off valve. As long as the hose is connected, the valve is open and lubricating oil may migrate.

Some one-way valves open when vacuum is applied and close under no vacuum condition. Such valves may restrict the ability of the pump to create a deep vacuum and are not recommended.



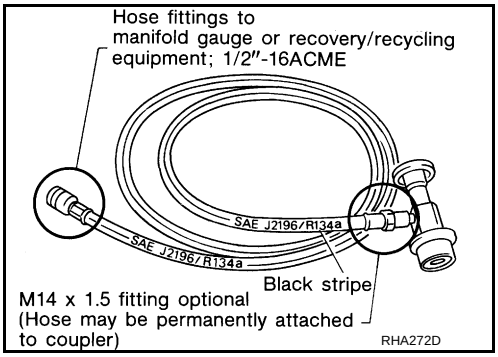

### MANIFOLD GAUGE SET

Be certain that the gauge face indicates HFC-134a or R-134a. Be sure the gauge set has 1/2″-16 ACME threaded connections for service hoses. Confirm the set has been used only with refrigerant HFC-134a (R-134a) and specified lubricants.




## SERVICE HOSES

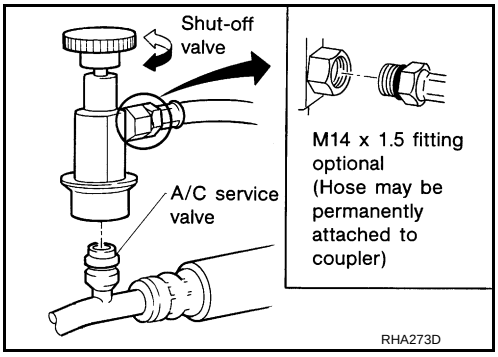
Be certain that the service hoses display the markings described (colored hose with a black stripe). All hoses must equip positive shut-off devices (either manual or automatic) near the end of the hoses opposite to the manifold gauge.




## SERVICE COUPLERS

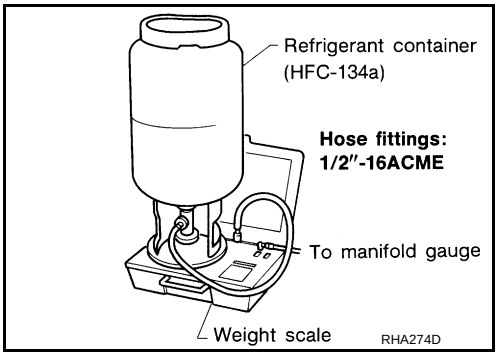
Never attempt to connect HFC-134a (R-134a) service couplers to a CFC-12 (R-12) A/C system. The HFC-134a (R-134a) couplers do not properly connect to the CFC-12 (R-12) system. However, if an improper connection is attempted, discharge and contamination may occur.

| Shut-off valve rotation | A/C service valve |
|---|---|
| Clockwise | Open |
| Counterclockwise | Close |




## REFRIGERANT WEIGHT SCALE

Verify that no refrigerant other than HFC-134a (R-134a) and specified lubricants have been used with the scale. The hose fitting must be 1/2″-16 ACME if the scale controls refrigerant flow electronically.




## CHARGING CYLINDER

Use of a charging cylinder is not recommended. Refrigerant may be vented into the air from the top valve of the cylinder when filling the cylinder with refrigerant. Also, the accuracy of the cylinder is generally less than that of an electronic scale or of quality recycle/recharge equipment.

# COMPRESSOR

## General Precautions

INFOID:0000000009722228

**CAUTION:**

- **Plug all openings to prevent moisture and foreign matter from entering.**
- **Store it in the same way at it is when mounted on the car when the compressor is removed.**
- **Follow “Maintenance of Lubricant Quantity in Compressor” exactly when replacing or repairing the compressor. Refer to HA-25, "Maintenance of Lubricant Quantity".**
- **Keep friction surfaces between clutch and pulley clean. Wipe it off by using a clean waste cloth moistened with thinner if the surface is contaminated with lubricant.**
- **Turn the compressor shaft by hand more than five turns in both directions after compressor service operation. This equally distributes lubricant inside the compressor. Let the engine idle and operate the compressor for one hour after the compressor is installed.**
- **Apply voltage to the new compressor and check for normal operation after replacing the compressor magnet clutch.**

# FLUORESCENT LEAK DETECTOR

## General Precautions

INFOID:0000000009722229

**CAUTION:**

- **The A/C system contains a fluorescent leak detection dye used for locating refrigerant leakages. An ultraviolet (UV) lamp is required to illuminate the dye when inspecting for leakages.**
- **Always wear fluorescence enhancing UV safety goggles to protect eyes and enhance the visibility of the fluorescent dye.**
- **The fluorescent dye leak detector is not a replacement for an electrical leak detector (SST: J-41995). The fluorescent dye leak detector should be used in conjunction with an electrical leak detector (SST: J-41995) to pin-point refrigerant leakages.**
- **Read and follow all manufacture operating instructions and precautions prior to performing the work for the purpose of safety and customer satisfaction.**
- **A compressor shaft seal should not necessarily be repaired because of dye seepage. The compressor shaft seal should only be repaired after confirming the leakage with an electrical leak detector (SST: J-41995).**
- **Always remove any remaining dye from the leakage area after repairs are completed to avoid a misdiagnosis during future service.**
- **Never allow dye to come into contact with painted body panels or interior components. Clean immediately with the approved dye cleaner if dye is spilled. Fluorescent dye left on a surface for an extended period of time cannot be removed.**
- **Never spray the fluorescent dye cleaning agent on hot surfaces (engine exhaust manifold, etc.).**
- **Never use more than one refrigerant dye bottle (1/4 ounce /7.4 cc) per A/C system.**
- **Leak detection dyes for HFC-134a (R-134a) and CFC-12 (R-12) A/C systems are different. Never use HFC-134a (R-134a) leak detection dye in CFC-12 (R-12) A/C system, or CFC-12 (R-12) leak detection dye in HFC-134a (R-134a) A/C system, or A/C system damage may result.**
- **The fluorescent properties of the dye remains for three or more years unless a compressor malfunction occurs.**

### IDENTIFICATION

**NOTE:**

Vehicles with factory installed fluorescent dye have a green label.
Vehicles without factory installed fluorescent dye have a blue label.

### IDENTIFICATION LABEL FOR VEHICLE

Vehicles with factory installed fluorescent dye have an identification label on the front side of hood.