# SECTION HAC

# HEATER & AIR CONDITIONING CONTROL SYSTEM

## CONTENTS

### WITHOUT 7 INCH DISPLAY

## WITH 7 INCH DISPLAY

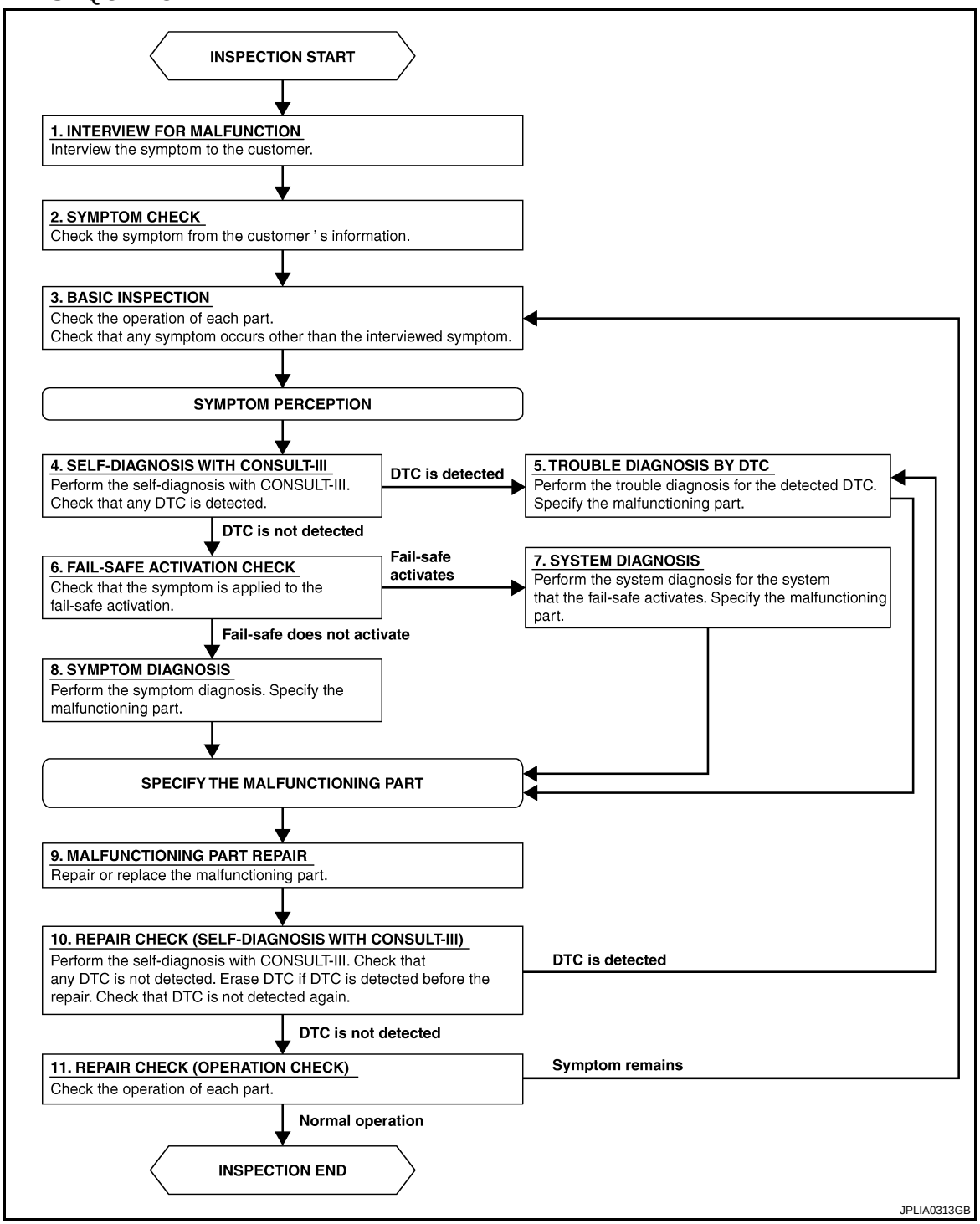
# BASIC INSPECTION

## DIAGNOSIS AND REPAIR WORK FLOW

### Work Flow

INFOID:0000000004443177

#### OVERALL SEQUENCE




#### DETAILED FLOW

### 1. INTERVIEW FOR MALFUNCTION

Interview the symptom to the customer.

>> GO TO 2.

## 2.SYMPTOM CHECK

Check the symptom from the customer's information.

>> GO TO 3.

## 3.BASIC INSPECTION

Check the operation of each part. Check that any symptom occurs other than the interviewed symptom.

>> GO TO 4.

## 4.SELF-DIAGNOSIS WITH CONSULT-III

Perform the self-diagnosis with CONSULT-III. Check that any DTC is detected.

Is any DTC detected?

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

## 5.TROUBLE DIAGNOSIS BY DTC

Perform the trouble diagnosis for the detected DTC. Specify the malfunctioning part.

>> GO TO 9.

## 6.FAIL-SAFE ACTIVATION CHECK

Check that the symptom is applied to the fail-safe activation.

Does the fail-safe activate?

YES >> GO TO 7.
NO >> GO TO 8.

## 7.SYSTEM DIAGNOSIS

Perform the system diagnosis for the system that the fail-safe activates. Specify the malfunctioning part.

>> GO TO 9.

## 8.SYMPTOM DIAGNOSIS

Perform the symptom diagnosis. Specify the malfunctioning part.

>> GO TO 9.

## 9.MALFUNCTION PART REPAIR

Repair or replace the malfunctioning part.

>> GO TO 10.

## 10.REPAIR CHECK (SELF-DIAGNOSIS WITH CONSULT-III)

Perform the self-diagnosis with CONSULT-III. Check that any DTC is not detected. Erase DTC if DTC is detected before the repair. Check that DTC is not detected again.

Is any DTC detected?

YES >> GO TO 5.
NO >> GO TO 11.

## 11.REPAIR CHECK (OPERATION CHECK)

Check the operation of each part.

Does it operate normally?

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

# INSPECTION AND ADJUSTMENT

## Description & Inspection

INFOID:0000000004443178

### DESCRIPTION

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

**Check condition : Engine running at normal operating temperature.**

### 1.CHECK BLOWER MOTOR

1. Start the engine.
2. Operate the fan control dial. Check that the fan speed changes. Check the operation for all fan speeds.
3. Leave blower on maximum speed.

Is the inspection result normal?

YES >> GO TO 2.
NO >> Blower motor system malfunction. Refer to HAC-52, "Diagnosis Procedure".

### 2.CHECK DISCHARGE AIR

1. Turn mode control dial to each position.
2. Check that the air outlets change according to each indicated air outlet by placing a hand in front of the outlets. Refer to VTL-2, "System Description".

Is the inspection result normal?

YES >> GO TO 3.
NO >> Mode door system malfunction. Refer to HAC-43, "Diagnosis Procedure".

### 3.CHECK INTAKE AIR

1. Press intake switch to set the air outlet to recirculation.
2. The REC indicator turns ON.
3. Listen to intake sound and confirm air inlets change.
4. Press intake switch again to set the air outlet to fresh air intake.
5. The FRE indicator turns ON.
6. Listen to intake sound and confirm air inlets change.

Is the inspection result normal?

YES >> GO TO 4.
NO >> Intake door system malfunction. Refer to HAC-45, "Diagnosis Procedure".

### 4.CHECK A/C SWITCH

1. Press the A/C switch.
2. Check that the indicator of the A/C switch turns ON. Check visually and by sound that the compressor operates.
3. Press the A/C switch again.
4. Check that the indicator of the A/C switch turns OFF. Check that the compressor stops.

Is the inspection result normal?

YES >> GO TO 5.
NO >> Magnet clutch system malfunction. Refer to HAC-56, "Diagnosis Procedure".

### 5.CHECK DISCHARGE AIR TEMPERATURE

Operate the temperature control dial. Check that the discharge air temperature changes.

Is the inspection result normal?

YES >> GO TO 6.
NO >> Air mix door malfunction. Refer to HAC-41, "Diagnosis Procedure".

### 6.CHECK TEMPERATURE DECREASE

1. Operate the compressor.
2. Operate the temperature control dial and lower the set temperature to 18.0°C (60°F).
3. Check that the cool air blows from the outlets.

Is the inspection result normal?

YES >> GO TO 7.
NO >> Insufficient cooling. Refer to HAC-73, "Diagnosis Procedure".

## 7. CHECK TEMPERATURE INCREASE

1. Turn temperature control dial and raise temperature setting to 32.0°C (90°F) after warming up the engine.
2. Check that warm air blows from outlets.

Is the inspection result normal?

YES >> GO TO 8.
NO >> Insufficient heating. Refer to HAC-75, "Diagnosis Procedure".

## 8. CHECK AUTO MODE

1. Operate the fun control dial and mode control dial to AUTO position.
2. Operate the temperature control dial. Check that the fan speed or air outlet changes (the air flow temperature or fan speed varies depending on the ambient temperature, in-vehicle temperature, and set temperature).

Is the inspection result normal?

YES >> INSPECTION END
NO >> Refer to HAC-72, "Diagnosis Chart By Symptom" and perform the appropriate diagnosis.

# Temperature Setting Trimmer

INFOID:0000000004443179

## DESCRIPTION

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

## HOW TO SET

With CONSULT-III
Perform “TEMP SET CORRECT” of HVAC work support item.

| 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 –3.0°C (–6°F) is corrected on the temperature setting set as 25.0°C (77°F), the temperature controlled by A/C auto amp. is 25.0°C (77°F) – 3.0°C (–6°F) = 22.0°C (72°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 set temperature and control temperature may be cancelled.

# Foot Position Setting Trimmer

INFOID:0000000004443180

## DESCRIPTION

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

HOW TO SET

With CONSULT-III

Perform the “BLOW SET” of HVAC work support item.

| Work support items | Display | Defroster 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:0000000004443181

DESCRIPTION

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

With CONSULT-III

Perform the “FRE MEMORY SET” of HVAC work support item.

| 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 memory function may be cancelled.

## Inlet Port Memory Function (REC)

INFOID:0000000004443182

DESCRIPTION

- If the ignition switch is turned to the OFF position while the REC indicator is set to ON (recirculation), “Perform the memory” or “Do not perform the memory” of REC indicator ON (recirculation) condition can be selected.
- If “Perform the memory” was set, the REC indicator 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

With CONSULT-III

Perform the “REC MEMORY SET” of HVAC work support item.

| 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 memory function may be cancelled.

# SYSTEM DESCRIPTION

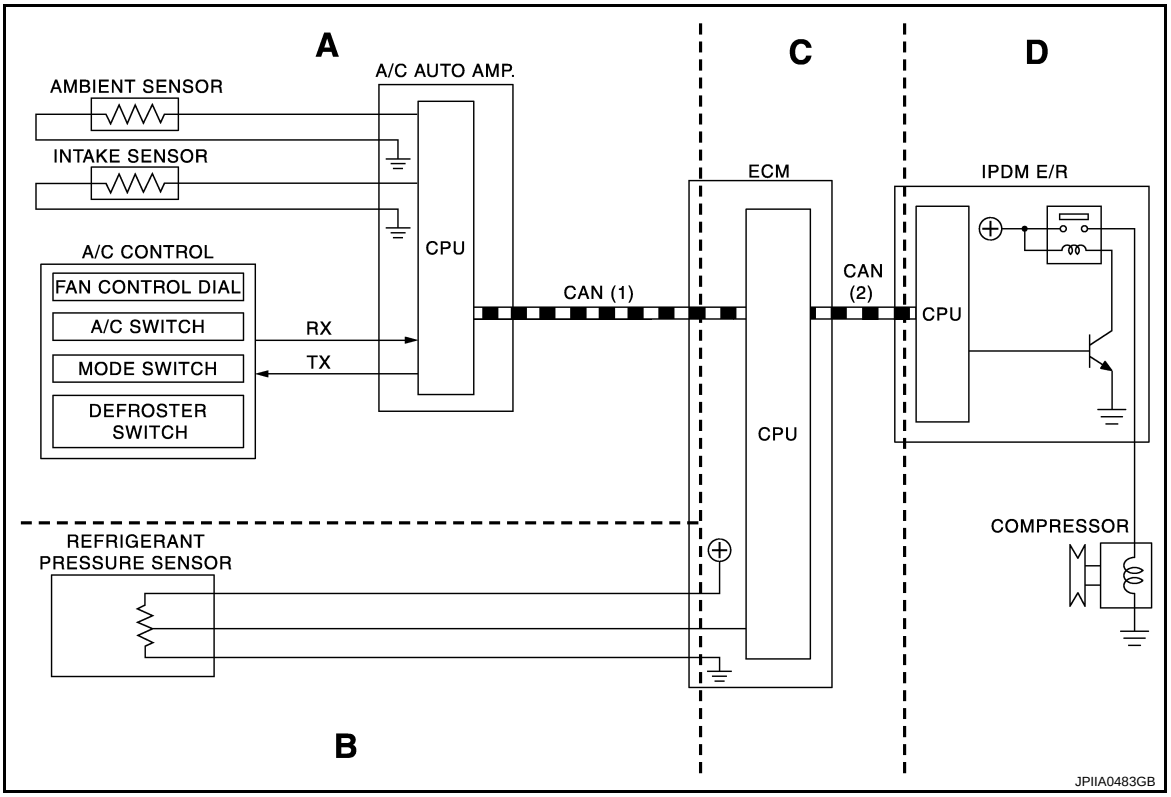
## COMPRESSOR CONTROL FUNCTION

### Description

INFOID:0000000004780970

#### PRINCIPLE OF OPERATION

Functional circuit diagram




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

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

CAN (2) : A/C compressor request signal

Functional initial inspection chart

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

## Fail-safe

INFOID:0000000004780976

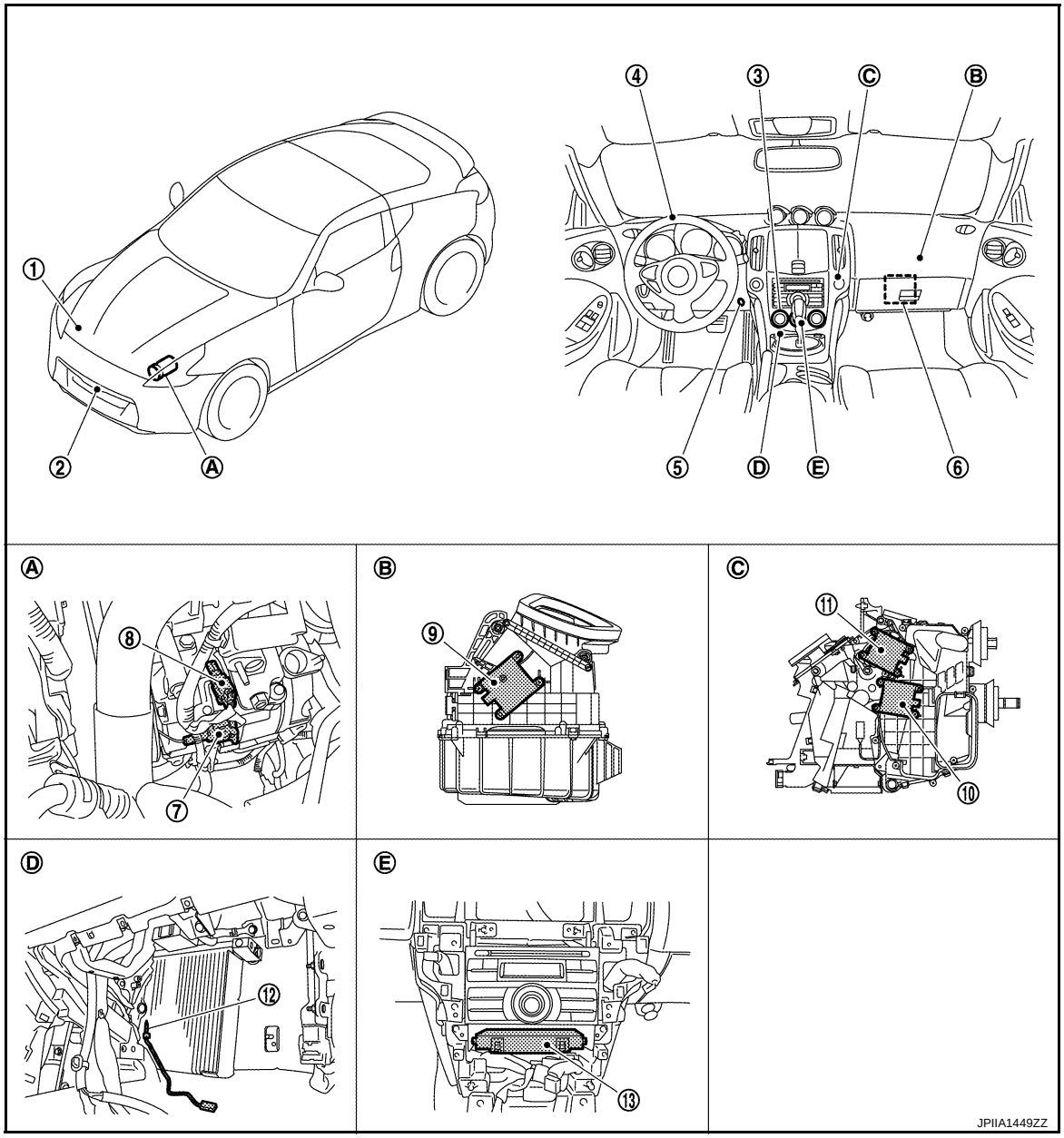
### FAIL-SAFE FUNCTION

When a communication malfunction between A/C auto amp. and A/C control continued for approximately 30 seconds or more, control the air conditioner under the following conditions.

| | |
|---|---|
| **Compressor** | **: ON** |
| **Air outlet** | **: AUTO** |
| **Air inlet** | **: FRE (Fresh air intake)** |
| **Fan speed** | **: AUTO** |
| **Preset temperature** | **: Setting before communication malfunction** |

## Component Parts Location

INFOID:0000000004780974




1. Refrigerant pressure sensor
2. Ambient sensor
3. A/C control
4. Sunload sensor
5. In-vehicle sensor
6. Blower motor

7. Magnet clutch
8. ECV
9. Intake door motor
10. Air mix door motor
11. Mode door motor
12. Intake sensor
13. A/C auto amp.

A. Installed on the compressor
B. Installed to the blower unit assembly (RH)
C. Installed to the heater & cooling unit assembly (RH)
D. Located on the evaporator
E. Behind of the cluster lid C

## Component Description

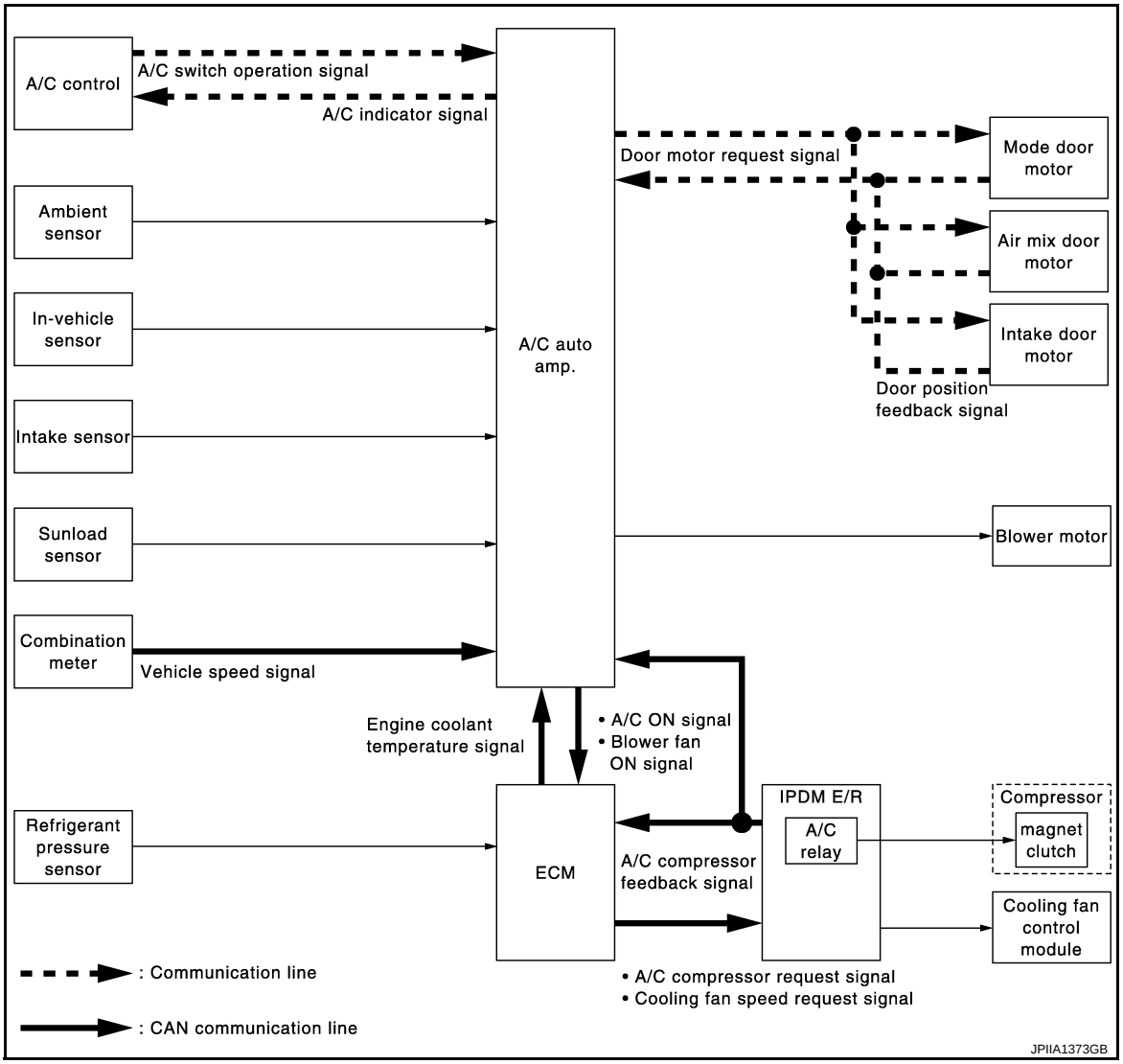
INFOID:0000000004780975

| Component | Description |
|---|---|
| Ambient sensor | HAC-42, "Description" |
| In-vehicle sensor | HAC-40, "Description" |
| Intake sensor | HAC-44, "Description" |
| Sunload sensor | HAC-52, "Description" |
| Air mix door motor | HAC-56, "Description" |
| Mode door motor | EC-506, "Description" |
| Intake door motor | HAC-28, "Description" |
| A/C control | The operation of the A/C control is communicated with the A/C auto amp. via communication line. |
| A/C auto amp. | HAC-31, "Description" |
| Blower motor | HAC-37, "Description" |
| Magnet clutch | HAC-56, "Description" |
| ECV | HAC-58, "Description" |
| Refrigerant pressure sensor | HAC-51, "Description" |

# AUTOMATIC AIR CONDITIONER SYSTEM

## System Diagram

INFOID:0000000004509557




## System Description

INFOID:0000000004697174

### OUTLINE

• Automatic air conditioner system is controlled by each function of A/C auto amp., ECM and IPDM E/R.

Control by A/C auto amp.
- Air outlet control
- Temperature control
- Air inlet control
- Air flow control
- Compressor control
- Door motor control (LCU communication control)

Control by ECM
- Cooling fan control. (Refer to EC-72, "System Description".)
- Air conditioning cut control. (Refer to EC-54, "System Description".)

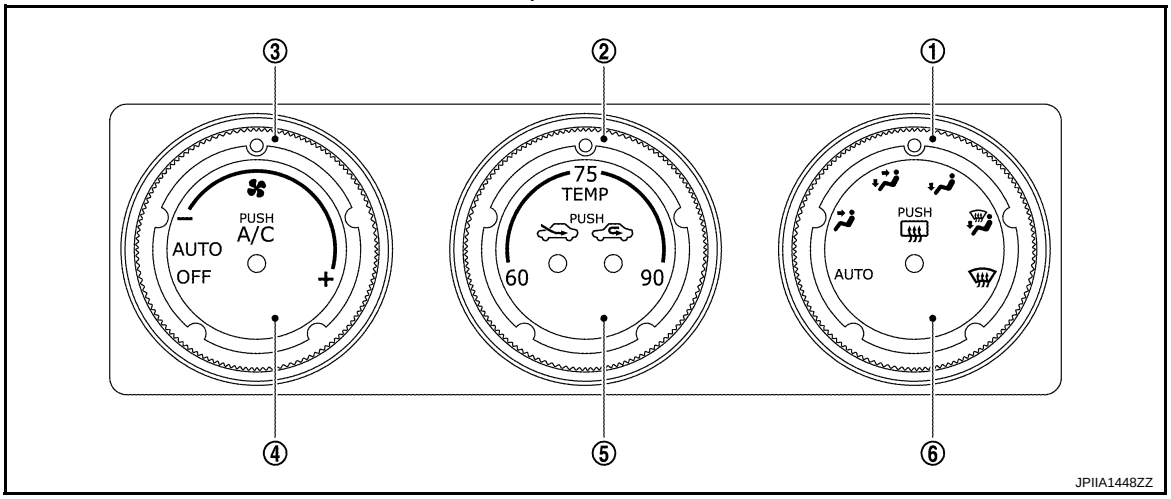
Control by IPDM E/R
- Relay control. (Refer to PCS-3, "System Description".)
- Cooling fan control. (Refer to PCS-6, "System Description".)

- Controller (A/C control) transmits the commands for air conditioner system operation to A/C auto amp. via communication line.

## OPERATION

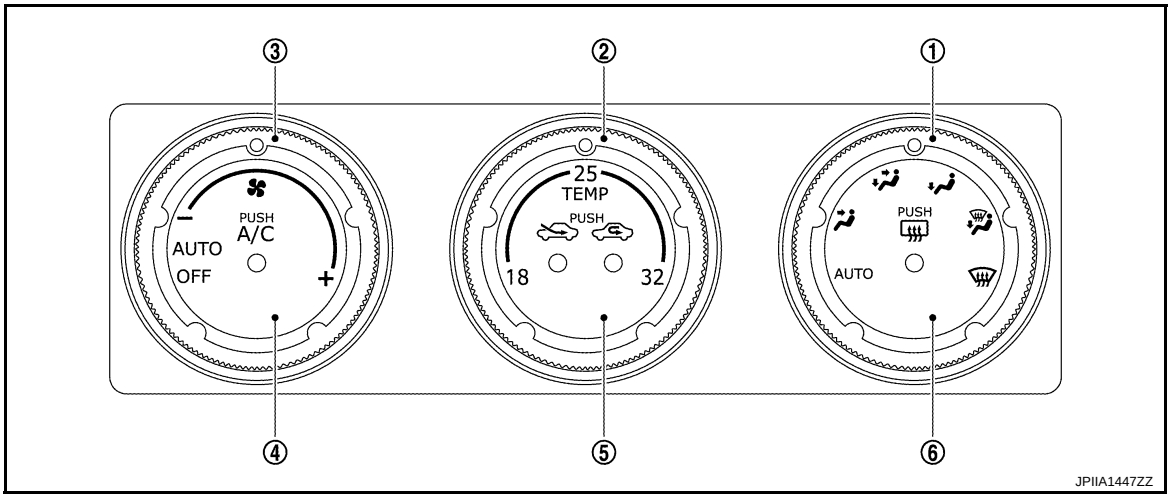
### Controller (A/C Control)

Except for Canada




1. Mode control dial
2. Temperature control dial
3. Fan control dial
4. A/C switch
5. Intake switch
6. Rear window defogger switch

For Canada




1. Mode control dial
2. Temperature control dial
3. Fan control dial
4. A/C switch
5. Intake switch
6. Rear window defogger switch

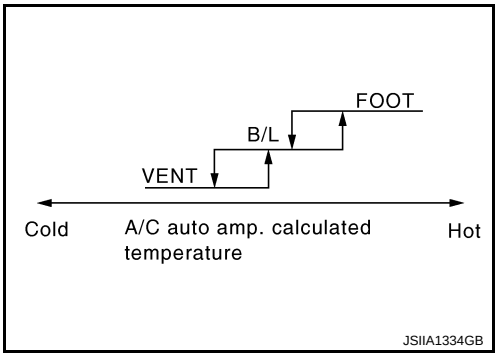
### Switch Operation

| | |
|---|---|
| Mode control dial | Selects mode position to an optimal position.<br>• When AUTO is selected, the mode position is controlled automatically.<br>• When D/F or DEF is selected while blower motor is activated, and air conditioner system becomes the following state.<br>- Compressor: ON<br>- Air inlet: Fresh air intake |
| Temperature control dial | Selects set temperature within a range between 18°C (60°F) - 32°C (90°F).<br>**NOTE:**<br>When air conditioner system is in the OFF position, set temperature can be selected depending on temperature control dial operation. |

| | |
|---|---|
| Fan control dial | Selects fan speed within a range between 1st - 25th speed.<br>• When AUTO is selected, fan speed is controlled automatically.<br>• When OFF is selected, air conditioner system becomes the following state.<br>- Air conditioner system: OFF<br>- Air inlet: Fresh air intake<br>- Air outlet: FOOT |
| A/C switch | Turns the compressor control (switch indicator) between ON ⇔ OFF each time while blower is activated.<br>**NOTE:**<br>When A/C switch turns OFF, air inlet changes to fresh air intake. |
| Intake switch | • Selects air inlet changes between recirculation (REC) ⇔ fresh air intake (FRE) each time.<br>- FRE indicator ON: Fresh air intake<br>- REC indicator ON: Recirculation<br>• Press and held for 2 seconds or more, intake switch indicator lamp blinks 2 times and air inlet is set to automatic control. (Air intake switch indicator indicates air inlet state during automatic control.)<br>**NOTE:**<br>• When air conditioner system is in the OFF position, air inlet can be selected.<br>• When mode control dial is in the D/F or DEF position, air inlet cannot be selected to REC.<br>• When intake switch is set to REC, the compressor is turned ON. |
| Rear window defogger switch | Turns rear window defogger (switch indicator) between ON ⇔ OFF each time.<br>Rear window defogger system details. Refer toDEF-6, "WITHOUT NAVIGATION : System Description". |

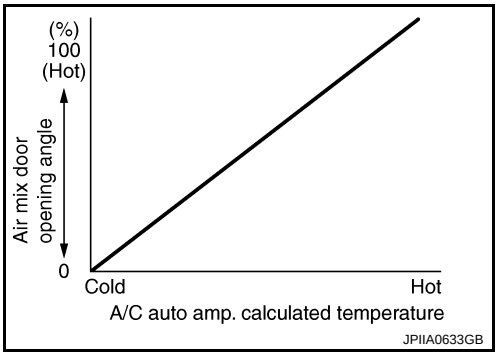
## AIR OUTLET CONTROL

- While air outlet is in automatic control, A/C auto amp. selects the mode door position depending on a target air mix door angle and outlet air temperature calculated from sunload.
- If ambient temperature is excessively low, D/F is selected to prevent windshield fogging when air outlet is set to FOOT.



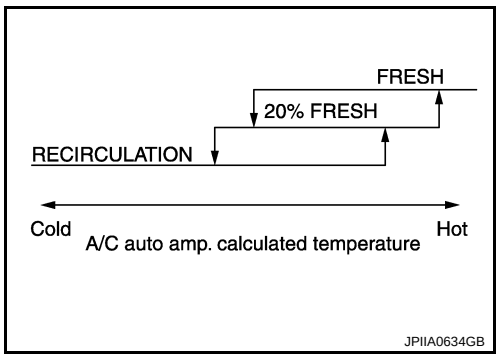

## TEMPERATURE CONTROL

- When ignition switch is in the ON position, A/C auto amp. always automatically controls temperature regardless of air conditioner operational state.
- A/C auto amp. calculates the target air mix door opening angle depending on set temperature, in-vehicle temperature, ambient temperature, and sunload.
- Air mix door is controlled depending on the comparison of current air mix door opening angle and target air mix door opening angle.
- Regardless of in-vehicle temperature, ambient temperature, and sunload, air mix door is fixed at the fully cold position when set temperature is 18.0°C (60°F), and at the fully hot position when set temperature is 32.0°C (90°F).




## AIR INLET FUNCTION

While air inlet is in automatic control, A/C auto amp. selects air inlet (fresh air intake, 20 % fresh air intake, or recirculation) depending on set temperature, in-vehicle temperature, and ambient temperature.



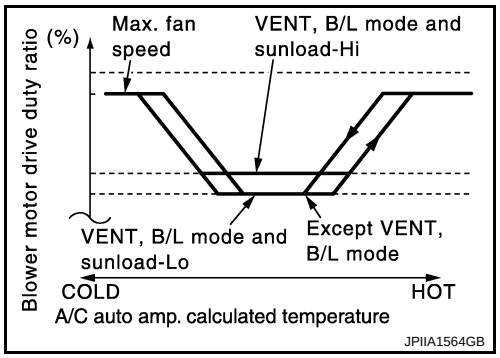

## AIR FLOW CONTROL

Description

- A/C auto amp. changes duty ratio of blower motor drive signal and controls air flow continuously. When air flow is increased, duty ratio of blower motor drive signal gradually increases to prevent a sudden increase in air flow.
- In addition to manual control and automatic control, air flow control is compose of starting fan speed control, low coolant temperature starting control, high in-vehicle temperature starting control, blower speed control at door motor operation, and fan speed control at voice recognition.

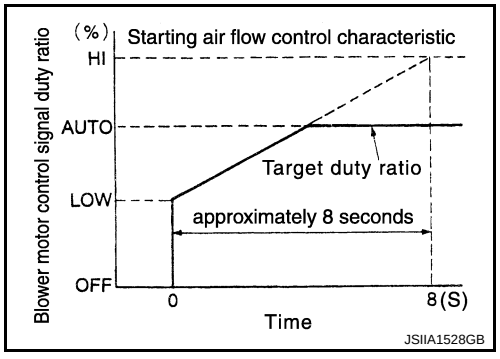
Automatic Air Flow Control

- A/C auto amp. decides target air flow depending on target air mix door opening angle.
- A/C auto amp. changes duty ratio of blower motor drive signal and controls air flow continuously so that air flow matches to target air flow.
- When air outlet is VENT or B/L, the minimum air flow is changed depending on sunload.



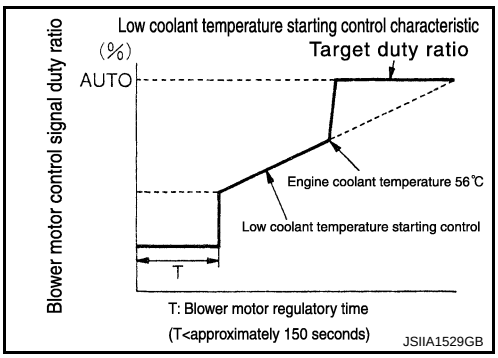

Starting Fan Speed Control

When blower motor is activated, A/C auto amp. gradually increases duty ratio of blower fan drive signal to prevent a sudden increase in discharge air flow. (It takes approximately 8 seconds for air flow to reach HI from LOW)




Low Coolant Temperature Starting Control

If the engine coolant temperature is 56°C (133°F) or less, to prevent a cold discharged air flow, A/C auto amp. suspends blower motor activation for the maximum 150 seconds depending on target air mix door opening angle. After this, blower fan drive signal is increased gradually, and blower motor is activated.




High In-vehicle Temperature Starting Control

When evaporator temperature is high [intake air temperature sensor value is 35°C (95°F) or more], to prevent a hot discharged air flow, A/C auto amp. suspends blower motor activation for approximately 3 seconds so that evaporator is cooled by refrigerant.

Fan speed Control at Door Motor Operation

When mode door motor is activated while air flow is more than the specified value, A/C auto amp. reduces temporarily fan speed so that mode door moves smoothly.

Fan speed Control at Voice Recognition

When the voice control (voice command) switch is operated during air flow automatic control, A/C auto amp. decreases the air flow of the blower motor once and controls the air flow so as not to disturb the voice recognition function. This control continues while voice recognition function is operating.

## COMPRESSOR CONTROL

Description

- When the compressor activation condition is satisfied while blower motor is activated, A/C auto amp. transmits A/C ON signal and blower fan ON signal to ECM via CAN communication.
- ECM judges that the compressor can be activated depending on each sensors state (refrigerant pressure sensor signal, throttle opening angle sensor signal, and others). And transmits air conditioner relay control signal to IPDM E/R via CAN communication.
- IPDM E/R turns air conditioner relay ON and activates the compressor depending on request from ECM.

Compressor Protection Control at Pressure Malfunction

When high-pressure side value that is detected by refrigerant pressure sensor is as per the following state, ECM requests IPDM E/R to turn air conditioner relay OFF and stops the compressor.

- 3.12 MPa (31.8 kg/cm$^2$·G) or more (When the engine speed is less than 1,500 rpm)
- 2.74 MPa (27.9 kg/cm$^2$·G) or more (When the engine speed is 1,500 rpm or more)
- 0.14 MPa (1.4 kg/cm$^2$·G) or less

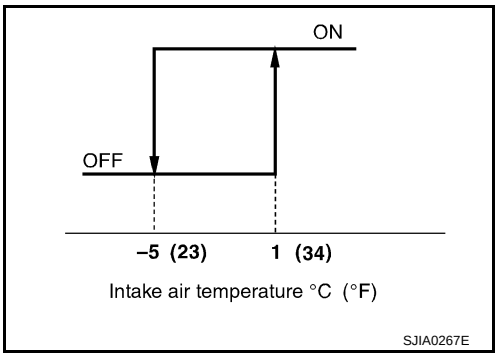
Compressor Oil Circulation Control

When the engine starts while the engine coolant temperature is 56°C (133°F) or less, ECM activates the compressor for approximately 6 seconds and circulates the compressor lubricant once.

Low Temperature Protection Control

When intake air temperature sensor detects that air temperature after passing through evaporator is –5°C (23°F) or less, A/C auto amp. requests ECM to turn the compressor OFF, and stops the compressor.

When the air temperature returns to 1°C (34°F) or more, the compressor is activated.



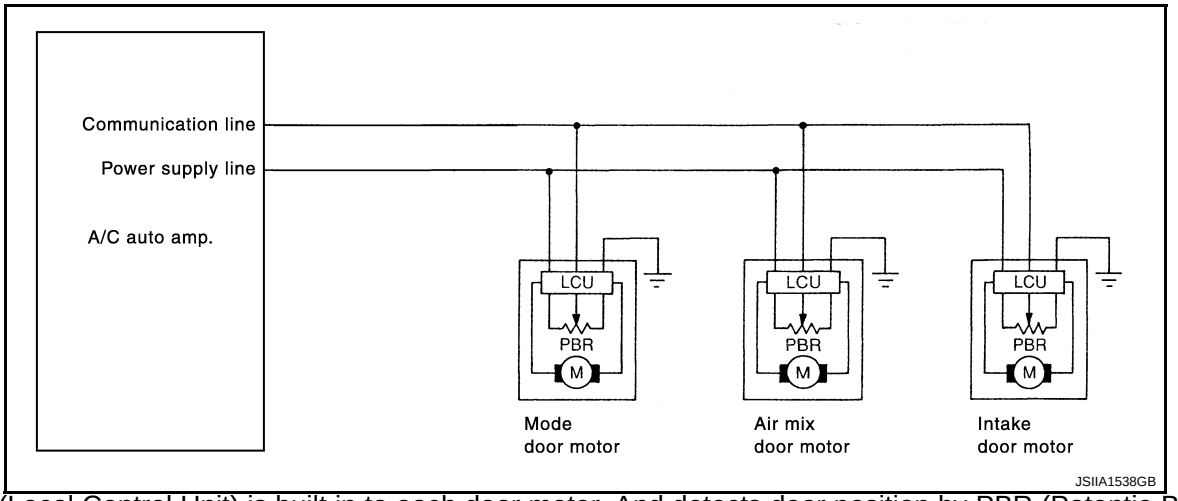

Operating Rate Control

When set temperature is other than fully cold or air outlet is “VENT”, “B/L” or “FOOT” A/C auto amp. controls the compressor activation depending on ambient temperature.

Air Conditioner Cut Control

When the engine is running in excessively high load condition, ECM requests IPDM E/R to turn air conditioner relay OFF, and stops the compressor. Refer to EC-54, "System Description" for details.

## DOOR MOTOR CONTROL



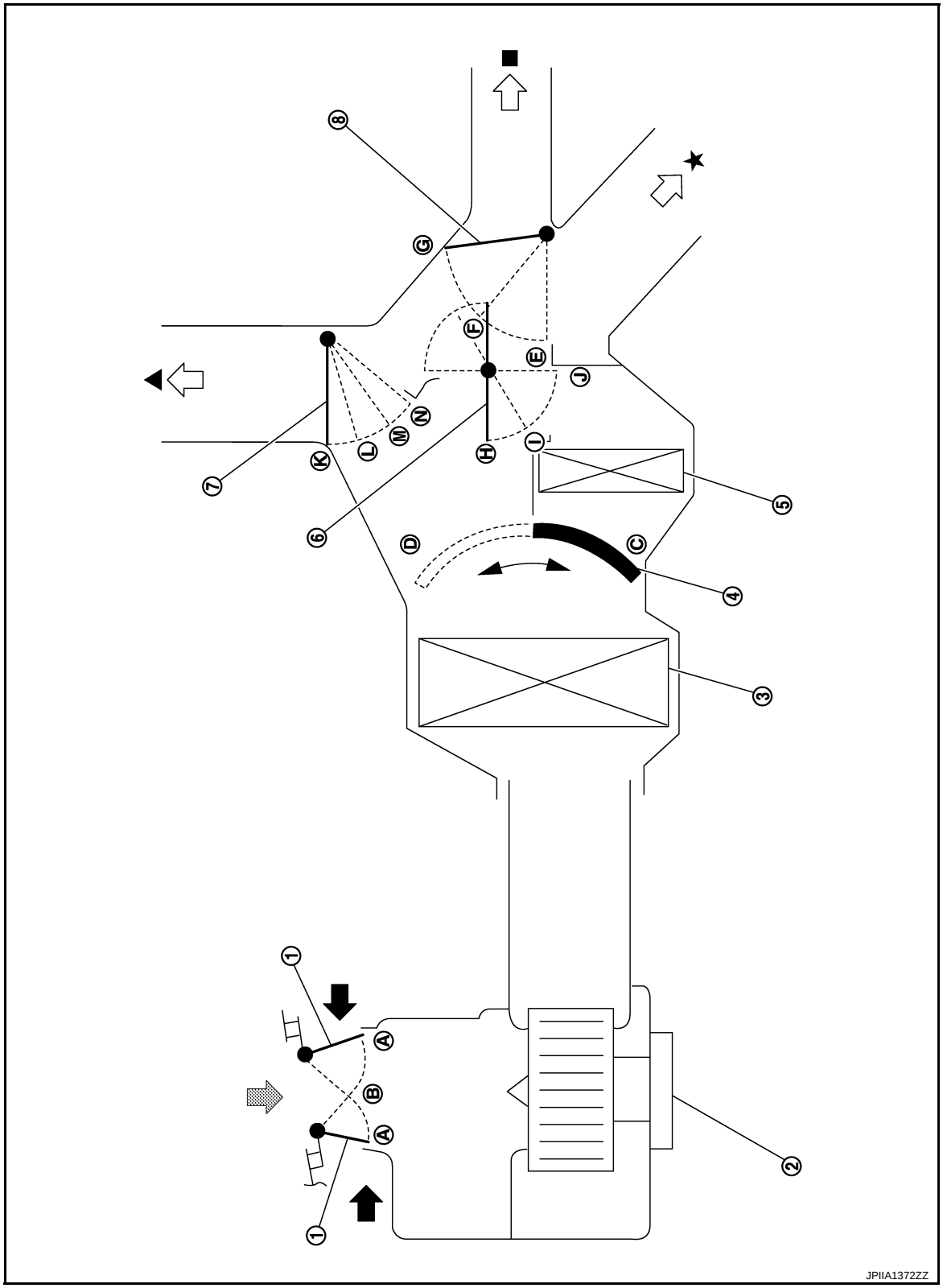

- LCU (Local Control Unit) is built in to each door motor. And detects door position by PBR (Potentio Balance Resistor).
- A/C auto amp. communicates with each LCU via communication line. And receives each door position feedback signal from each LCU.
- Each LCU controls each door to the appropriate position depending on the control signal from A/C auto amp. when the door movement is complete, transmits the signal of door movement completion to A/C auto amp.

## FAIL-SAFE CONTROL

When a communication malfunction occurs between A/C auto amp. and A/C control for 30 seconds or more, A/C auto amp. automatically controls air outlet and fan speed, fixes air inlet to fresh air intake, maintains set temperature data before the communication malfunction, and activates the compressor. Even if the condition before the communication error occurs is A/C OFF, A/C auto amp. turns the compressor ON with following conditions.

| | |
|---|---|
| **Compressor** | **: ON** |
| **Air outlet** | **: AUTO** |
| **Air inlet** | **: FRE (Fresh air intake)** |
| **Fan speed** | **: AUTO** |
| **Preset temperature** | **: Setting before communication malfunction** |

## SWITCHES AND THEIR CONTROL FUNCTIONS




1. Intake door
2. Blower motor
3. Evaporator
4. Air mix door
5. Heater core
6. Max. cool door
7. Defroster door
8. Ventilator door

⇦ Fresh air intake
⬅ Recirculation air
▲ Defroster
■ Ventilator
★ Foot

| Switch /Dial position | | Door position | | | | |
|---|---|---|---|---|---|---|
| | | Ventilator door | Max. cool door | Defroster door | Intake door | Air mix door |
| Mode control dial | AUTO | AUTO | | | | |
| |  | E | H | K | — | — |
| |  | F | I | | | |
| |  | G | J | L | | |
| |  | | | M | A | |
| |  | | | N | A | |
| Intake switch |  | — | — | — | B* | |
| |  | | | | A* | |
| Temperature control dial | Full cold 18.0°C (60°F) | | | | — | C |
| | 18.5°C -31.5°C (61°F - 89°F) | | | | | AUTO |
| | Full hot 32.0°C (90°F) | | | | | D |
| Fan control dial | OFF | G | J | L | A | — |

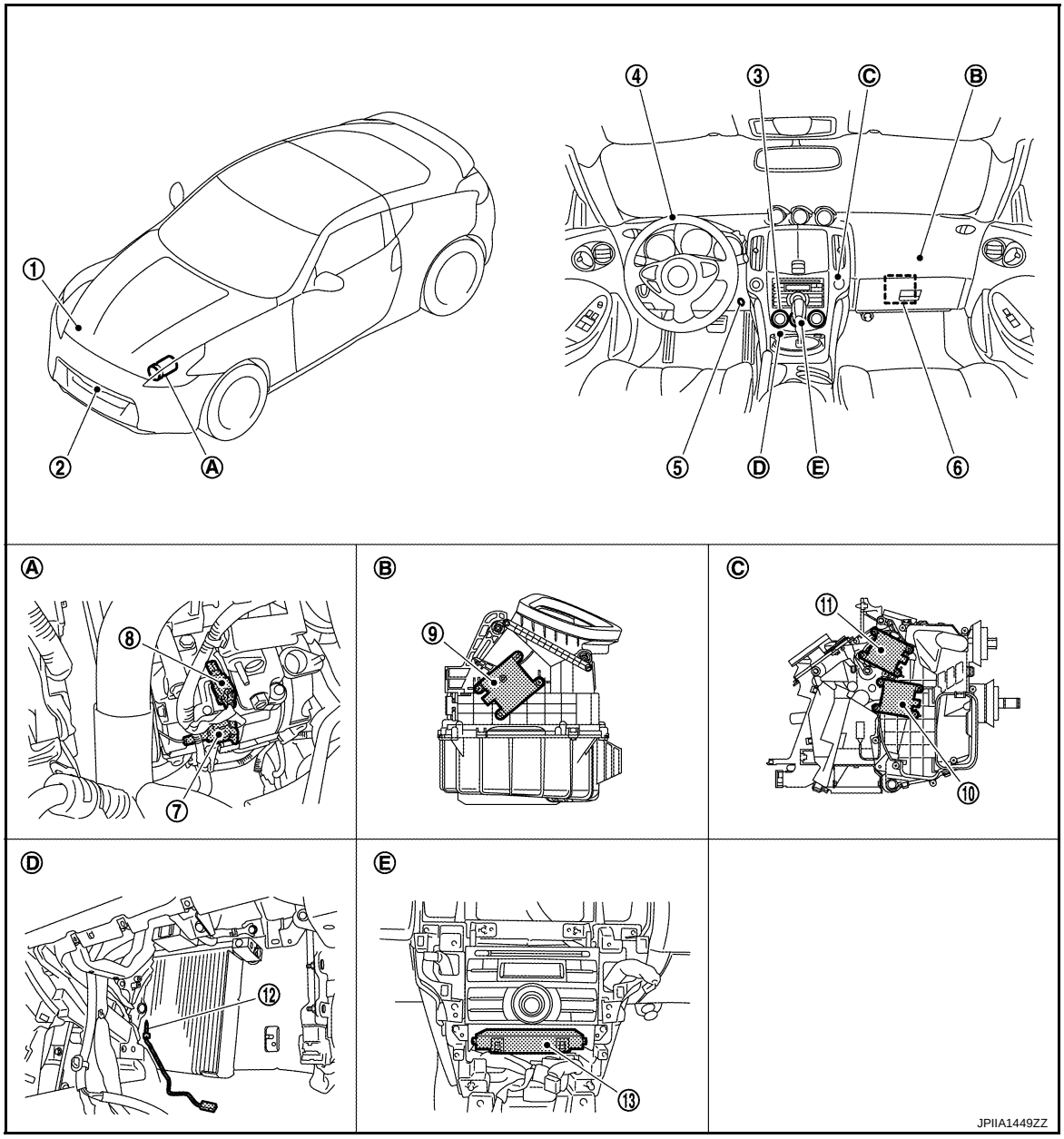
*: Inlet status is displayed by indicator when activating automatic control

## AIR DISTRIBUTION

| Discharge air flow | | | |
|---|---|---|---|
| Mode position indication | Air outlet/distribution | | |
| | Ventilator | Foot | Defroster |
|  | 100% | — | — |
|  | 60% | 40% | — |
|  | 12% | 62% | 26% |
|  | 10% | 52% | 38% |
|  | — | — | 100% |

## Component Parts Location

INFOID:0000000004509559




1. Refrigerant pressure sensor
2. Ambient sensor
3. A/C control
4. Sunload sensor
5. In-vehicle sensor
6. Blower motor
7. Magnet clutch
8. ECV
9. Intake door motor
10. Air mix door motor
11. Mode door motor
12. Intake sensor
13. A/C auto amp.

A. Installed on the compressor
B. Installed to the blower unit assembly (RH)
C. Installed to the heater & cooling unit assembly (RH)
D. Located on the evaporator
E. Behind of the cluster lid C

## Component Description

INFOID:0000000004509560

| Component | Description |
|---|---|
| Ambient sensor | HAC-42, "Description" |
| In-vehicle sensor | HAC-40, "Description" |

| Component | Description |
|---|---|
| Intake sensor | HAC-44, "Description" |
| Sunload sensor | HAC-52, "Description" |
| Air mix door motor | HAC-56, "Description" |
| Mode door motor | EC-506, "Description" |
| Intake door motor | HAC-28, "Description" |
| A/C control | The operation of the A/C control is communicated with the A/C auto amp. via communication line. |
| A/C auto amp. | HAC-31, "Description" |
| Blower motor | HAC-37, "Description" |
| Magnet clutch | HAC-56, "Description" |
| ECV | HAC-58, "Description" |
| Refrigerant pressure sensor | HAC-51, "Description" |

# DIAGNOSIS SYSTEM (HVAC)

## CONSULT-III Function

INFOID:0000000004443202

CONSULT-III performs the following functions via CAN communication with A/C auto amp.

| Diagnostic mode | Description |
|---|---|
| Self diagnostic result | Displays the diagnosis results judged by A/C auto amp. |
| Data monitor | Displays the input/output signal of A/C auto amp. |
| Active test | The signals used to activate each device are forcibly supplied from A/C auto amp. |
| Work support | Changes the setting for each setting function. |
| ECU identification | Displays the part number of A/C auto amp. |

**NOTE:**
Diagnosis should be performed with the engine running. Door motor operation speeds become slower and NO results may be returned even for normal operation if battery voltage drops below 12 V during self-diagnosis.

### SELF-DIAGNOSIS RESULTS

Refer to HAC-70, "DTC Index".

### DATA MONITOR

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 fan 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 |
| 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. depending on 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 | The signals used to activate A/C control indicator are forcibly supplied from A/C auto amp. |
| HVAC TEST | The operation check of air conditioner system can be performed by selecting the mode. Refer to the following table for the conditions of each mode. |

Check each output device

| | Test item | | | | | | |
|---|---|---|---|---|---|---|---|
| | MODE 1 | MODE 2 | MODE 3 | MODE 4 | MODE 5 | MODE 6 | MODE 7 |
| Mode door position | VENT | B/L 1 | B/L 2 | FOOT | D/F | DEF | — |
| Intake door position | REC | REC | 20% FRE | FRE | FRE | FRE | — |
| Air mix door position | FULL COLD | FULL COLD | FULL HOT | FULL HOT | FULL HOT | FULL HOT | — |
| Blower motor control signal duty ratio | 37% | 91% | 65% | 65% | 65% | 91% | — |
| Magnet clutch | ON | ON | OFF | OFF | ON | ON | — |
| ECV duty ratio | 100% | 100% | 0% | 0% | 50% | 100% | — |

**NOTE:**
- Perform the inspection of each output device after starting the engine because the compressor is operated.
- If the Mode 7 is selected, the malfunction is displayed but it is normal.

## WORK SUPPORT

| Work item | Description | Refer to |
|---|---|---|
| TEMP SET CORRECT (Temperature setting trimmer) | If the temperature felt by the customer is different than the air flow temperature controlled by the temperature setting, the A/C auto amp. control temperature can be adjusted to compensate for the temperature setting. | HAC-8, "Temperature Setting Trimmer" |
| FRE MEMORY SET [Inlet port memory function (FRE)] | • If the ignition switch is turned to the OFF position while the FRE indicator is set to ON (fresh air intake), “Perform the memory” or “Do not perform the memory” of FRE indicator ON (fresh air intake) condition can be selected.<br>• If “Perform the memory” was set, the FRE indicator 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-9, "Inlet Port Memory Function (FRE)" |
| REC MEMORY SET [Inlet port memory function (REC)] | • If the ignition switch is turned to the OFF position while the REC indicator is set to ON (recirculation), “Perform the memory” or “Do not perform the memory” of REC indicator ON (recirculation) condition can be selected.<br>• If “Perform the memory” was set, the REC indicator 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-9, "Inlet Port Memory Function (REC)" |
| BLOWER SET (Foot position setting trimmer) | In FOOT mode, the air blowing to DEF can change ON/OFF. | HAC-8, "Foot Position Setting Trimmer" |

**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:0000000004443203

CAN (Controller Area Network) is a serial communication line for real time applications. It is an on-board multiplex communication line with high data communication speed and excellent error detection ability. A modern vehicle is equipped with many ECMs, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, 2 control units are connected with 2 communication lines (CAN-L-line and CAN-H-line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.
Refer to LAN-23, "CAN Communication Signal Chart" for details of the communication signal.

### DTC Logic

INFOID:0000000004443204

#### DTC DETECTION LOGIC

| DTC | Items (CONSULT-III 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:0000000004443205

#### 1. PERFORM SELF-DIAGNOSIS

With CONSULT-III
1. Turn the ignition switch ON and wait for 2 seconds or more.
2. Perform the “SELF-DIAGNOSIS”.
3. Check if any DTC is detected in the self-diagnostic results.

Is DTC “U1000” displayed?

YES >> Perform the diagnosis for the CAN communication system. Refer to LAN-14, "Trouble Diagnosis Flow Chart".
NO >> Perform the intermittent malfunction diagnosis. Refer to GI-39, "Intermittent Incident".

# U1010 CONTROL UNIT (CAN)

## Description

INFOID:0000000004443206

Initial diagnosis of A/C auto amp.

## DTC Logic

INFOID:0000000004443207

### DTC DETECTION LOGIC

| DTC | Items (CONSULT-III 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:0000000004443208

### 1.REPLACE A/C AUTO AMP.

When DTC “U1010” is detected, replace A/C auto amp.

>> INSPECTION END

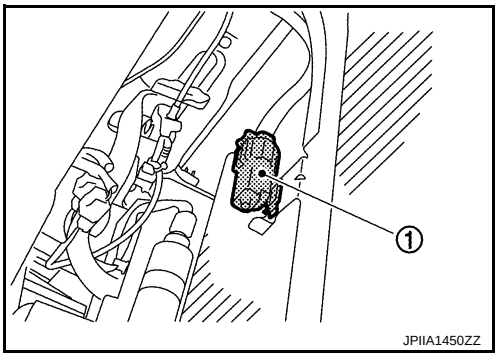
# B257B, B257C AMBIENT SENSOR

## Description

INFOID:0000000004443209

### AMBIENT SENSOR

- The ambient sensor (1) is installed to the hood lock stay.
- The ambient sensor converts the ambient temperature detected with thermistor into the voltage, and the A/C auto amp. inputs this voltage.




### AMBIENT TEMPERATURE CORRECTION

- The A/C auto amp. inputs the temperature detected with the ambient sensor as the ambient temperature.
- Perform the correction of the temperature detected with the ambient sensor for air conditioner control and for ambient temperature display.
- Since the engine heat influences on the ambient sensor during idling condition, the A/C auto amp. retards the ambient temperature indication of the combination meter to avoid the effect of steep temperature change.
- Select and use the initial value of ambient temperature data depending on the coolant temperature when turning the ignition switch from OFF to ON. Use the detection temperature of the ambient sensor at low coolant temperature [less than approximately 56°C (133°F)]. Use the memory data (before the ignition switch is OFF) when the engine is warming up [approximately 56°C (133°F) or more].
- Do not perform the correction of the ambient temperature when the detection temperature of the ambient temperature is less than approximately –29°C (–20°F) (for ambient temperature display) or less than approximately –20°C (–4°F) (for air conditioner control).

### SET TEMPERATURE CORRECTION

The A/C auto amp. performs the correction to the target temperature set by the temperature control dial so as to match the temperature felt by the passengers depending on the ambient temperature detected with the ambient sensor and controls it so that the interior air temperature is always the most suitable.

## DTC Logic

INFOID:0000000004443210

### DTC DETECTION LOGIC

| DTC | Items (CONSULT-III screen terms) | Diagnostic item is detected when... | Possible causes |
|---|---|---|---|
| B257B | AMB TEMP SEN SHORT | The ambient sensor recognition temperature is too high. | • Ambient sensor<br>• A/C auto amp.<br>• Harness and connector (Short in the ambient sensor circuit) |
| B257C | AMB TEMP SEN OPEN | The ambient sensor recognition temperature is too low. | • Ambient sensor<br>• A/C auto amp.<br>• Harness and connector (Open in the ambient sensor circuit) |

### DTC CONFIRMATION PROCEDURE

#### 1.PERFORM SELF-DIAGNOSIS

With CONSULT-III

1. Perform the “SELF-DIAGNOSIS”.
2. Check if any DTC is detected in the self-diagnostic results.

**NOTE:**

- If DTC is displayed along with DTC “U1000” or “U1010”, first diagnose the DTC “U1000” or “U1010”. Refer to HAC-26, "DTC Logic" or HAC-27, "DTC Logic".

- If there is an open circuit in the ambient sensor, A/C auto amp registers extreme cold [–30°C (–22°F)] and adjusts the temperature control warmer.

Is DTC “B257B” or “B257C” displayed?

YES >> Perform the diagnosis for the ambient sensor. Refer to HAC-29, "Diagnosis Procedure".
NO >> INSPECTION END

## Diagnosis Procedure

INFOID:0000000004443211

### 1. CHECK AMBIENT SENSOR POWER SUPPLY CIRCUIT

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

| (+) | | (–) | Voltage (Approx.) |
|---|---|---|---|
| Ambient sensor | | — | |
| Connector | Terminal | | |
| E76 | 1 | Ground | 5 V |

Is the inspection result normal?

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

### 2. CHECK AMBIENT SENSOR CIRCUIT CONTINUITY

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

| Ambient sensor | | A/C auto amp. | | Continuity |
|---|---|---|---|---|
| Connector | Terminal | Connector | Terminal | |
| E76 | 2 | M66 | 37 | Existed |

Is the inspection result normal?

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

### 3. CHECK AMBIENT SENSOR

Check the ambient sensor components. Refer to HAC-30, "Component Inspection".

Is the inspection result normal?

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

### 4. CHECK AMBIENT SENSOR CIRCUIT CONTINUITY

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

| Ambient sensor | | A/C auto amp. | | Continuity |
|---|---|---|---|---|
| Connector | Terminal | Connector | Terminal | |
| E76 | 1 | M66 | 35 | Existed |

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

| Ambient sensor | | — | Continuity |
|---|---|---|---|
| Connector | Terminal | | |
| E76 | 1 | Ground | Not existed |

Is the inspection result normal?

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

## Component Inspection

INFOID:0000000004443212

### 1. CHECK AMBIENT SENSOR

1. Turn the ignition switch OFF.
2. Remove the ambient sensor. Refer to HAC-86, "Exploded View".
3. Check the resistance between the ambient sensor terminals. Refer to the applicable table for the normal value.

| 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 the ambient sensor.

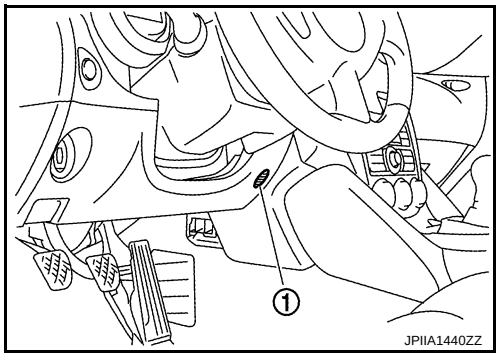
# B2578, B2579 IN-VEHICLE SENSOR

## Description

INFOID:0000000004443213

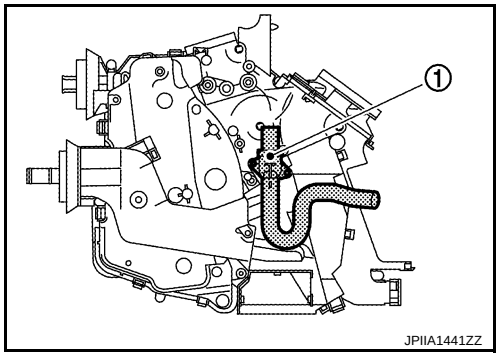
### IN-VEHICLE SENSOR

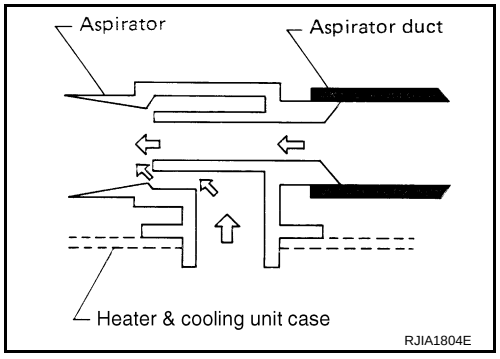
- The in-vehicle sensor (1) is installed to the instrument lower panel LH.
- The in-vehicle sensor converts the interior air temperature of the passenger room sucked by the aspirator detected with the thermistor into the voltage, and the A/C auto amp. inputs this voltage.




### ASPIRATOR

The aspirator (1) generates the vacuum by the air blown from the heater & cooling unit and draws the air of the passenger room to the in-vehicle sensor area via the aspirator duct.




### INTERIOR AIR TEMPERATURE CORRECTION

- The A/C auto amp. inputs the temperature detected with the in-vehicle sensor as the interior air temperature.
- Perform the correction of the temperature detected with the in-vehicle sensor for each air conditioner control.

## DTC Logic

INFOID:0000000004443214

### DTC DETECTION LOGIC

| DTC | Items (CONSULT-III screen terms) | Diagnostic item is detected when... | Possible causes |
|---|---|---|---|
| B2578 | IN CAR SEN SHORT | The in-vehicle sensor recognition temperature is too high. | • In-vehicle sensor<br>• A/C auto amp.<br>• Harness and connector (Short in the in-vehicle sensor circuit) |
| B2579 | IN CAR SEN OPEN | The in-vehicle sensor recognition temperature is too low. | • In-vehicle sensor<br>• A/C auto amp.<br>• Harness and connector (Open in the in-vehicle sensor circuit) |

## DTC CONFIRMATION PROCEDURE

### 1.PERFORM SELF-DIAGNOSIS

With CONSULT-III
1. Perform the “SELF-DIAGNOSIS”.
2. Check if any DTC is detected in the self-diagnostic results.

**NOTE:**
If DTC is displayed along with DTC “U1000” or “U1010”, first diagnose the DTC “U1000” or “U1010”. Refer to HAC-26, "DTC Logic" or HAC-27, "DTC Logic".

Is DTC “B2578” or “B2579” displayed?

YES >> Perform the diagnosis for the in-vehicle sensor. Refer to HAC-32, "Diagnosis Procedure".
NO >> INSPECTION END

## Diagnosis Procedure

INFOID:0000000004443215

### 1.CHECK IN-VEHICLE SENSOR POWER SUPPLY CIRCUIT

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

| (+) | | (–) | Voltage (Approx.) |
|---|---|---|---|
| In-vehicle sensor | | — | |
| Connector | Terminal | | |
| M61 | 1 | Ground | 5 V |

Is the inspection result normal?

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

### 2.CHECK IN-VEHICLE SENSOR CIRCUIT CONTINUITY-

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

| In-vehicle sensor | | A/C auto amp. | | Continuity |
|---|---|---|---|---|
| Connector | Terminal | Connector | Terminal | |
| M61 | 2 | M66 | 37 | Existed |

Is the inspection result normal?

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

### 3.CHECK IN-VEHICLE SENSOR

Check the in-vehicle sensor components. Refer to HAC-33, "Component Inspection".

Is the inspection result normal?

YES >> Replace the A/C auto amp.
NO >> Replace the in-vehicle sensor.

## 4. CHECK IN-VEHICLE SENSOR CIRCUIT CONTINUITY

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

| In-vehicle sensor | | A/C auto amp. | | Continuity |
|---|---|---|---|---|
| Connector | Terminal | Connector | Terminal | |
| M61 | 1 | M66 | 36 | Existed |

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

| In-vehicle sensor | | — | Continuity |
|---|---|---|---|
| Connector | Terminal | | |
| M61 | 1 | Ground | Not existed |

Is the inspection result normal?

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

# Component Inspection

INFOID:0000000004443216

## 1. CHECK IN-VEHICLE SENSOR

1. Turn the ignition switch OFF.
2. Remove the in-vehicle sensor. Refer to HAC-87, "Exploded View".
3. Check the resistance between the in-vehicle sensor terminals. Refer to the applicable table for the normal value.

| 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 the in-vehicle sensor.

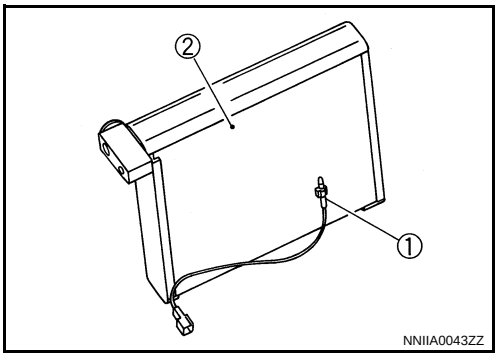
# B2581, B2582 INTAKE SENSOR

## Description

INFOID:0000000004443217

### INTAKE SENSOR

- Intake sensor (1) is located on the evaporator (2).
- The intake sensor converts the evaporator passing air temperature detected with thermistor into the voltage, and the A/C auto amp. inputs this voltage.




### INTAKE TEMPERATURE CORRECTION

- The A/C auto amp. inputs the temperature detected with the intake sensor as the evaporator passing air temperature.
- Perform the correction of the temperature detected with the intake sensor for air conditioner control.
- The A/C auto amp. performs the correction so that the recognition intake temperature changes depending on the difference between the detected intake temperature and the recognition intake temperature. If the difference is large, the changing is early. The changing becomes slow as the difference becomes small.

## DTC Logic

INFOID:0000000004443218

### DTC DETECTION LOGIC

| DTC | Items (CONSULT-III screen terms) | Diagnostic item is detected when... | Possible causes |
|---|---|---|---|
| B2581 | EVAP TEMP SEN SHORT | The intake sensor recognition temperature is too high. | • Intake sensor<br>• A/C auto amp.<br>• Harness and connector (Short in the intake sensor circuit) |
| B2582 | EVAP TEMP SEN OPEN | The intake sensor recognition temperature is too low. | • Intake sensor<br>• A/C auto amp.<br>• Harness and connector (Open in the intake sensor circuit) |

### DTC CONFIRMATION PROCEDURE

#### 1.PERFORM SELF-DIAGNOSIS

With CONSULT-III

1. Perform the “SELF-DIAGNOSIS”.
2. Check if any DTC is detected in the self-diagnostic results.

**NOTE:**

If DTC is displayed along with DTC “U1000” or “U1010”, first diagnose the DTC “U1000” or “U1010”. Refer to HAC-26, "DTC Logic" or HAC-27, "DTC Logic".

Is DTC “B2581” or “B2582” displayed?

YES >> Perform the diagnosis for the intake sensor. Refer to HAC-34, "Diagnosis Procedure".
NO >> INSPECTION END

## Diagnosis Procedure

INFOID:0000000004443219

#### 1.CHECK INTAKE SENSOR POWER SUPPLY CIRCUIT

1. Turn the ignition switch OFF.
2. Disconnect the intake sensor connector.
3. Turn the ignition switch ON.

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

| (+) | | (–) | Voltage (Approx.) |
|---|---|---|---|
| Intake sensor | | — | |
| Connector | Terminal | | |
| M205 | 1 | Ground | 5 V |

Is the inspection result normal?

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

## 2.CHECK INTAKE SENSOR CIRCUIT CONTINUITY

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

| Intake sensor | | A/C auto amp. | | Continuity |
|---|---|---|---|---|
| Connector | Terminal | Connector | Terminal | |
| M205 | 2 | M66 | 37 | Existed |

Is the inspection result normal?

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

## 3.CHECK INTAKE SENSOR

Check the intake sensor components. Refer to HAC-35, "Component Inspection".

Is the inspection result normal?

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

## 4.CHECK INTAKE SENSOR CIRCUIT CONTINUITY

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

| Intake sensor | | A/C auto amp. | | Continuity |
|---|---|---|---|---|
| Connector | Terminal | Connector | Terminal | |
| M205 | 1 | M66 | 16 | Existed |

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

| Intake sensor | | — | Continuity |
|---|---|---|---|
| Connector | Terminal | | |
| M205 | 1 | Ground | Not existed. |

Is the inspection result normal?

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

# Component Inspection

INFOID:0000000004443220

## 1.CHECK INTAKE SENSOR

1. Turn the ignition switch OFF.
2. Disconnect the intake sensor connector. Refer to HAC-89, "Exploded View".
3. Check the resistance between the intake sensor terminals. Refer to the applicable table for the normal value.

| Terminal | | Condition | Resistance: kΩ |
|---|---|---|---|
| | | Temperature: °C (°F) | |
| 1 | 2 | –15 (5) | 12.28 |
| | | –10 (14) | 9.58 |
| | | –5 (23) | 7.55 |
| | | 0 (32) | 6.00 |
| | | 5 (41) | 4.81 |
| | | 10 (50) | 3.88 |
| | | 15 (59) | 3.16 |
| | | 20 (68) | 2.59 |
| | | 25 (77) | 2.14 |
| | | 30 (86) | 1.77 |
| | | 35 (95) | 1.48 |
| | | 40 (104) | 1.24 |
| | | 45 (113) | 1.05 |

Is the inspection result normal?

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

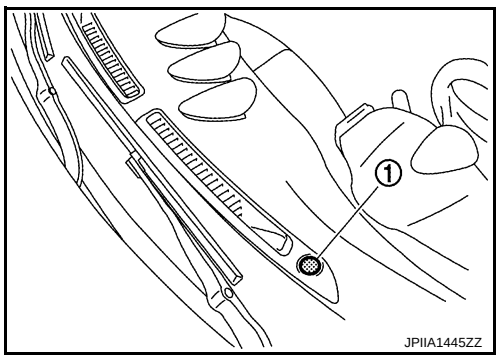
# B2630, B2631 SUNLOAD SENSOR

## Description

INFOID:0000000004443221

### SUNLOAD SENSOR

- The sunload sensor (1) is installed to the front defroster grille LH.
- The sunload sensor converts the sunload amount (illuminance) into the current value with the photodiode. The A/C auto amp. calculates this current value to the voltage and inputs it.




### SUNLOAD AMOUNT CORRECTION

- The A/C auto amp. inputs the sunload amount detected with the sunload sensor.
- Perform the correction of the sunload amount detected with the sunload sensor for each air conditioner control.
- When the sunload amount suddenly changes, for example when entering a tunnel, perform the correction so that the recognition sunload amount of the A/C auto amp. changes slowly.

## DTC Logic

INFOID:0000000004443222

### DTC DETECTION LOGIC

| DTC | Items (CONSULT-III screen terms) | Diagnostic item is detected when... | Possible causes |
|---|---|---|---|
| B2630 | SUNLOAD SEN SHORT | Detected calorie at sunload sensor 2832 $W/m^2$ (2436 $kcal/m^2 \cdot h$) or more | • Sunload sensor<br>• A/C auto amp.<br>• Harness and connector (Short in the sunload sensor circuit) |
| B2631 | SUNLOAD SEN OPEN | Detected calorie at sunload sensor 64.7 $W/m^2$ (56 $kcal/m^2 \cdot h$) or less | • Sunload sensor<br>• A/C auto amp.<br>• Harness and connector (Open in the sunload sensor circuit) |

### DTC REPRODUCTION PROCEDURE

#### 1. PERFORM SELF-DIAGNOSIS

With CONSULT-III

1. Perform the “SELF-DIAGNOSIS”.
2. Check if any DTC is detected in the self-diagnostic results.

**NOTE:**

- If DTC is displayed along with DTC “U1000” or “U1010”, first diagnose the DTC “U1000” or “U1010”. Refer to HAC-26, "DTC Logic" or HAC-27, "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, use a lamp (60 W or more) that is pointed at the sunload sensor.

Is DTC “B2630” or “B2631” displayed?

YES >> Perform the diagnosis for the sunload sensor. Refer to HAC-37, "Diagnosis Procedure".
NO >> INSPECTION END

## Diagnosis Procedure

INFOID:0000000004443223

#### 1. CHECK SUNLOAD SENSOR POWER SUPPLY CIRCUIT

1. Turn the ignition switch OFF.
2. Disconnect the sunload sensor connector.

3. Turn the ignition switch ON.
4. Check voltage between sunload sensor harness connector and ground.

| (+) | | (–) | Voltage (Approx.) |
|---|---|---|---|
| Sunload sensor | | — | |
| Connector | Terminal | | |
| M46 | 1 | Ground | 5 V |

Is the inspection result normal?

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

## 2.CHECK SUNLOAD SENSOR CIRCUIT CONTINUITY

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

| Sunload sensor | | A/C auto amp. | | Continuity |
|---|---|---|---|---|
| Connector | Terminal | Connector | Terminal | |
| M46 | 2 | M66 | 37 | Existed |

Is the inspection result normal?

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

## 3.CHECK SUNLOAD SENSOR

1. Connect the sunload sensor connector.
2. Connect the A/C auto amp. connector.
3. Check the sunload sensor components. Refer to HAC-38, "Component Inspection".

Is the inspection result normal?

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

## 4.CHECK SUNLOAD SENSOR CIRCUIT CONTINUITY

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

| Sunload sensor | | A/C auto amp. | | Continuity |
|---|---|---|---|---|
| Connector | Terminal | Connector | Terminal | |
| M46 | 1 | M66 | 15 | Existed |

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

| Sunload sensor | | — | Continuity |
|---|---|---|---|
| Connector | Terminal | | |
| M46 | 1 | Ground | Not existed |

Is the inspection result normal?

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

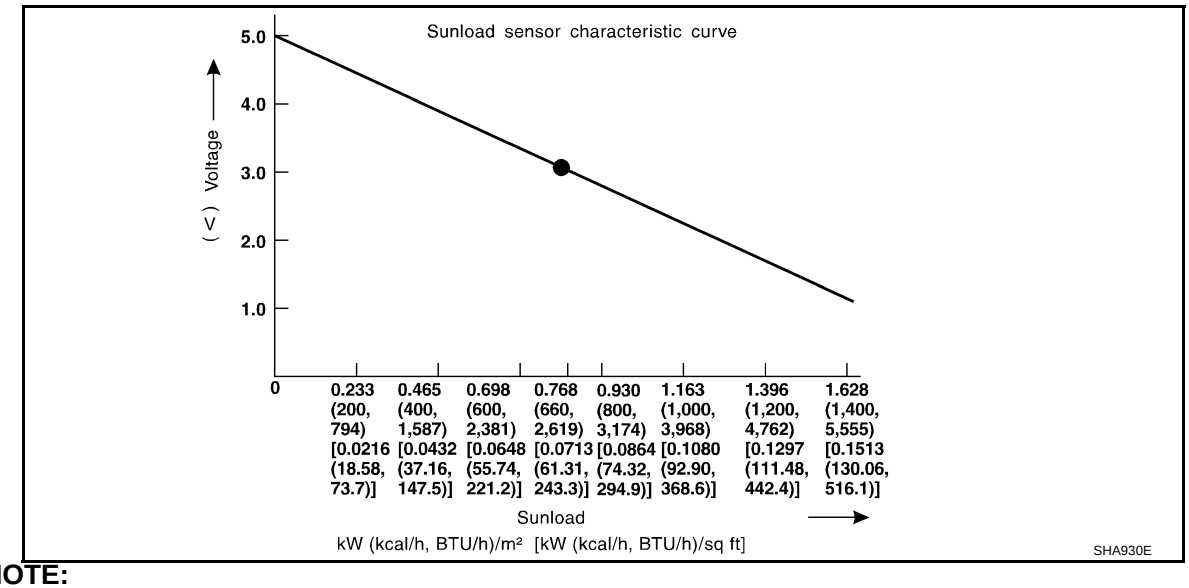
# Component Inspection

INFOID:0000000004443224

## 1.CHECK SUNLOAD SENSOR

1. Turn the ignition switch ON.
2. Check the input voltage from the sunload sensor between the A/C auto amp. harness connector and ground. Refer to the applicable table for the normal value.

| (+) | | (–) |
|---|---|---|
| A/C auto amp. | | — |
| Connector | Terminal | |
| M66 | 15 | Ground |




**NOTE:**

- When checking indoors, use a lamp of approximately 60 W. Move the lamp towards and away from the sensor to check.
- The sunload amount produced by direct sunshine in fair weather is equivalent to approximately 0.77 $kW/m^2$ (662 $kcal/m^2 \cdot h$).

Is the inspection result normal?

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

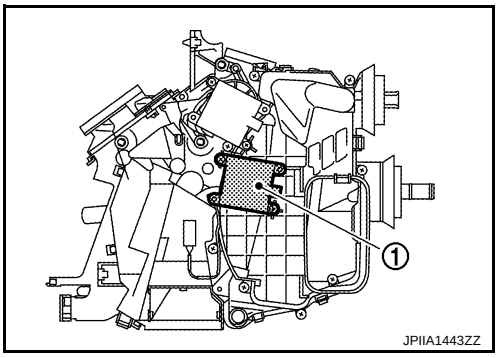
# B2632, B2633 AIR MIX DOOR MOTOR PBR

## Description

INFOID:0000000004443225

### AIR MIX DOOR MOTOR

- The air mix door motor (1) is installed to the heater & cooling unit assembly.
- The LCU (Local Control Unit) is installed to each door motor so as to perform the multiplex communication control (LAN) between each door motor of the mode door motor, air mix door motor and intake door motor in one communication line.
- When each LCU receives the control signal (combination of the pulse wave with two types of amplitude) from the A/C auto amp., it moves each door to the appropriate position based on the door position detection signal of each PBR (Potentio Balance Resistor). When the movement was completed, each LCU transmits the signal that reports the movement completion to the A/C auto amp.




## DTC Logic

INFOID:0000000004443226

### DTC DETECTION LOGIC

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

### DTC CONFIRMATION PROCEDURE

#### 1.PERFORM SELF-DIAGNOSIS

With CONSULT-III
1. Perform the “SELF-DIAGNOSIS”.
2. Check if any DTC is detected in the self-diagnostic results.

**NOTE:**
- If DTC is displayed along with DTC “U1000” or “U1010”, first diagnose the DTC “U1000” or “U1010”. Refer to HAC-26, "DTC Logic" or HAC-27, "DTC Logic".
- If all of door motors DTC (B2632 - B2655) are detected, check door motor communication circuit. Refer to HAC-48, "Diagnosis Procedure".

Is DTC “B2632” or “B2633” displayed?

YES >> Perform the diagnosis of air mix door motor system. Refer to HAC-41, "Diagnosis Procedure".
NO >> GO TO 2.

#### 2.FUNCTION INSPECTION

1. Turn temperature dial and raise temperature setting to 32.0°C (90°F) after warming up the engine.
2. Check that warm air blows from outlets.
3. Operate the compressor.
4. Operate the temperature control dial and lower the set temperature to 18.0°C (60°F).
5. Check that the cool air blows from the outlets.

Does it operate normally?

YES >> INSPECTION END
NO >> Check the air mix door motor system installation condition. Repair or replace the malfunctioning parts.

## Diagnosis Procedure

INFOID:0000000004443227

### 1.CHECK BATTERY VOLTAGE OF AIR MIX DOOR MOTOR

1. Turn the ignition switch ON.
2. Check voltage between the air mix door motor harness connector and ground.

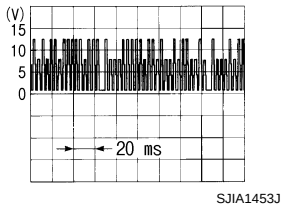
| (+) | | (–) | Voltage (Approx.) |
|---|---|---|---|
| Air mix door motor | | — | |
| Connector | Terminal | | |
| M204 | 1 | Ground | 12 V |

Is the inspection result normal?

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

### 2.CHECK SIGNAL OF AIR MIX DOOR MOTOR

Check output waveform between the air mix door motor harness connector and ground with the oscilloscope.

| (+) | | (–) | Output waveform |
|---|---|---|---|
| Air mix door motor | | — | |
| Connector | Terminal | | |
| M204 | 3 | Ground |  |



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Is the inspection result normal?

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

### 3.CHECK GROUND CIRCUIT OF AIR MIX DOOR MOTOR

1. Turn the ignition switch OFF.
2. Disconnect the air mix door motor connector.
3. Check for continuity between the air mix door motor harness connector and ground.

| Air mix door motor | | — | Continuity |
|---|---|---|---|
| Connector | Terminal | | |
| M204 | 2 | Ground | Existed |

Is the inspection result normal?

YES >> Replace the air mix door motor.
NO >> Repair the harnesses or connectors.

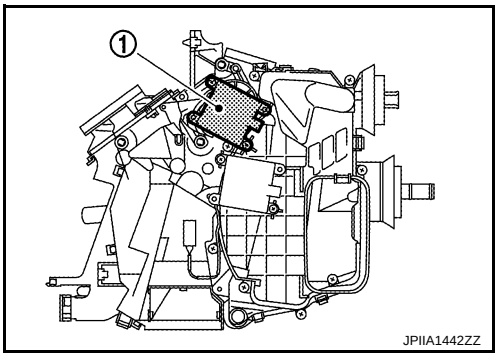
# B2636, B2637, B2638, B2639, B2654, B2655 MODE DOOR MOTOR

## Description

INFOID:0000000004443231

### MODE DOOR MOTOR

- The mode door motor (1) is installed to the heater & cooling unit assembly.
- The LCU (Local Control Unit) is installed to each door motor so as to perform the multiplex communication control (LAN) between each door motor of the mode door motor, air mix door motor and intake door motor in one communication line.
- When each LCU receives the control signal (combination of the pulse wave with two type of amplitude) from the A/C auto amp., it moves each door to the appropriate position based on the door position detection signal of each PBR (Potentio Balance Resistor). When the movement was completed, each LCU transmits the signal that reports the movement completion to the A/C auto amp.




## DTC Logic

INFOID:0000000004443232

### DTC DETECTION LOGIC

| DTC | Items (CONSULT-III 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.PERFORM SELF-DIAGNOSIS

1. Perform the “SELF-DIAGNOSIS”.
2. Check if any DTC is detected in the self-diagnostic results.

**NOTE:**

- If DTC is displayed along with DTC “U1000” or “U1010”, first diagnose the DTC “U1000” or “U1010”. Refer to HAC-26, "DTC Logic" or HAC-27, "DTC Logic".
- If all of door motors DTC (B2632 - B2655) are detected, check door motor communication circuit. Refer to HAC-48, "Diagnosis Procedure".

Is DTC “ B2636 ”, “ B2637 ”, “B2638 ”, “B2639 ”, “B2654 ” or “B2655 ” displayed?

YES >> Perform the diagnosis of mode door motor system. Refer to HAC-43, "Diagnosis Procedure".
NO >> GO TO 2.

#### 2.FUNCTION INSPECTION

1. Turn mode control dial to each position.
2. Check that the air outlets change according to each indicated air outlet by placing a hand in front of the outlets. Refer to VTL-2, "System Description".

Does it operate normally?

YES >> INSPECTION END
NO >> Check the mode door system installation condition. Repair or replace the malfunctioning parts.

## Diagnosis Procedure

INFOID:0000000004443233

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

1. Turn the ignition switch ON.
2. Check voltage between the mode door motor harness connector and ground.

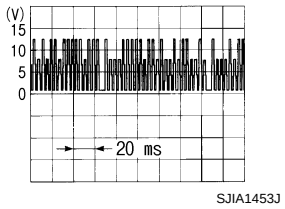
| (+) | | (–) | Voltage (Approx.) |
|---|---|---|---|
| Mode door motor | | — | |
| Connector | Terminal | | |
| M203 | 1 | Ground | 12 V |

Is the inspection result normal?

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

### 2. CHECK MODE DOOR MOTOR SIGNAL

Check output waveform between the mode door motor harness connector and ground with the oscilloscope.

| (+) | | (–) | Output waveform |
|---|---|---|---|
| Mode door motor | | — | |
| Connector | Terminal | | |
| M203 | 3 | Ground |  |



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Is the inspection result normal?

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

### 3. CHECK MODE DOOR MOTOR GROUND CIRCUIT

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

| Mode door motor | | — | Continuity |
|---|---|---|---|
| Connector | Terminal | | |
| M203 | 2 | Ground | Existed |

Is the inspection result normal?

YES >> Replace the Mode door motor.
NO >> Repair the harnesses or connectors.

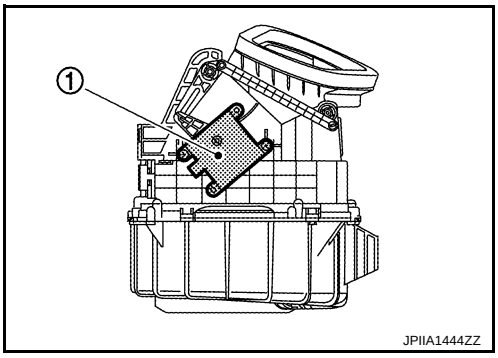
# B263D, B263E, B263F INTAKE DOOR MOTOR

## Description

INFOID:0000000004443234

### INTAKE DOOR MOTOR

- The intake door motor (1) is installed to the blower unit.
- The LCU (Local Control Unit) is installed to each door motor so as to perform the multiplex communication control (LAN) between each door motor of the mode door motor, air mix door motor and intake door motor in one communication line.
- When each LCU receives the control signal (combination of the pulse wave with two type of amplitude) from the A/C auto amp., it moves each door to the appropriate position based on the door position detection signal of each PBR (Potentio Balance Resistor). When the movement was completed, each LCU transmits the signal that reports the movement completion to the A/C auto amp.




## DTC Logic

INFOID:0000000004443235

### DTC DETECTION LOGIC

| DTC | Items (CONSULT-III 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.PERFORM SELF-DIAGNOSIS

With CONSULT-III

1. Perform the “SELF-DIAGNOSIS”.
2. Check if any DTC is detected in the self-diagnostic results.

**NOTE:**

- If DTC is displayed along with DTC “U1000” or “U1010”, first diagnose the DTC “U1000” or “U1010”. Refer to HAC-26, "DTC Logic" or HAC-27, "DTC Logic".
- If all of door motors DTC (B2632 - B2655) are detected, check door motor communication circuit. Refer to HAC-48, "Diagnosis Procedure".

Is DTC “ B263D ”, “ B263E ” or “B263F ” ?

YES >> Perform the diagnosis of intake door motor system. Refer to HAC-45, "Diagnosis Procedure".
NO >> GO TO 2.

#### 2.FUNCTION INSPECTION

1. Press intake switch to set the air outlet to recirculation.
2. The REC indicator turns ON.
3. Listen to intake sound and confirm air inlets change.
4. Press intake switch again to set the air outlet to fresh air intake.
5. The FRE indicator turns ON.
6. Listen to intake sound and confirm air inlets change.

Does it operate normally?

YES >> INSPECTION END
NO >> Check the intake door system installation condition. Repair or replace the malfunctioning parts.

## Diagnosis Procedure

INFOID:0000000004443236

### 1. CHECK BATTERY VOLTAGE OF INTAKE DOOR MOTOR

1. Turn the ignition switch ON.
2. Check voltage between the intake door motor harness connector and ground.

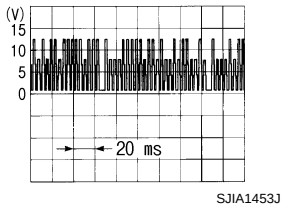
| (+) | | (–) | Voltage (Approx.) |
|---|---|---|---|
| Intake door motor | | — | |
| Connector | Terminal | | |
| M206 | 1 | Ground | 12 V |

Is the inspection result normal?

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

### 2. CHECK INTAKE DOOR MOTOR SIGNAL

Check output waveform between the intake door motor harness connector and ground with the oscilloscope.

| (+) | | (–) | Output waveform |
|---|---|---|---|
| Intake door motor | | — | |
| Connector | Terminal | | |
| M206 | 3 | Ground |  |



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Is the inspection result normal?

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

### 3. CHECK INTAKE DOOR MOTOR GROUND CIRCUIT

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

| Intake door motor | | — | Continuity |
|---|---|---|---|
| Connector | Terminal | | |
| M206 | 2 | Ground | Existed |

Is the inspection result normal?

YES >> Replace the Intake door motor.
NO >> Repair the harnesses or connectors.

# POWER SUPPLY AND GROUND CIRCUIT

## A/C AUTO AMP.

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

INFOID:0000000004471868

#### 1.CHECK FUSE

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

**NOTE:**

Refer to PG-84, "Fuse, Connector and Terminal Arrangement".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace the fuse after repairing the applicable circuit.

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

1. Turn the ignition switch OFF.
2. Disconnect the A/C auto amp. connector.
3. Check voltage between A/C auto amp. harness connector and ground.

| (+) | | (–) | Voltage | | |
|---|---|---|---|---|---|
| A/C auto amp. | | — | Ignition switch position | | |
| Connector | Terminal | | OFF | ACC | ON |
| M66 | 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 >> Repair the harnesses or connectors.

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

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

| A/C auto amp. | | — | Continuity |
|---|---|---|---|
| Connector | Terminal | | |
| M66 | 19 | Ground | Existed |
| | 39 | | |

Is the inspection result normal?

YES >> INSPECTION END

NO >> Repair the harnesses or connectors.

## A/C CONTROL

### A/C CONTROL : Diagnosis Procedure

INFOID:0000000004471869

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

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

| (+) | | (–) | Voltage |
|---|---|---|---|
| A/C control | | — | |
| Connector | Terminal | | |
| M67 | 1 | Ground | Battery voltage |

Is the inspection result normal?

YES >> GO TO 2.
NO >> Check 10A fuse (No. 3, located in the fuse block). Refer to PG-84, "Fuse, Connector and Terminal Arrangement".
- If fuse is OK, check harness for open circuit. Repair or replace if necessary.
- If fuse is NG, replace fuse and check for short circuit. Repair or replace if necessary.

## 2. CHECK A/C CONTROL CIRCUIT CONTINUITY

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

| A/C control | | — | Continuity |
|---|---|---|---|
| Connector | Terminal | | |
| M67 | 6 | Ground | Existed |

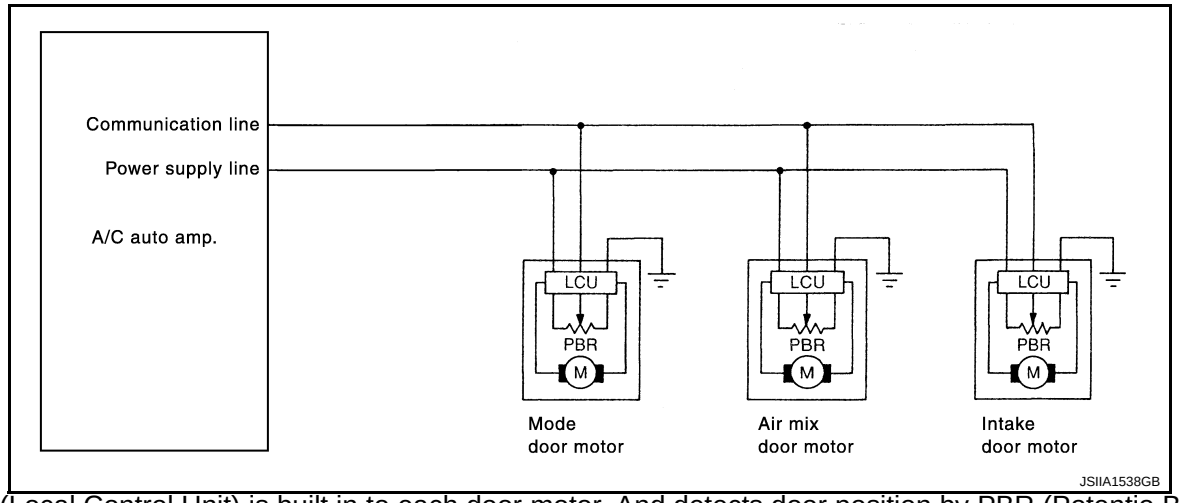
Is the inspection result normal?

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

# DOOR MOTOR COMMUNICATION CIRCUIT

## Description

INFOID:0000000004533913




- LCU (Local Control Unit) is built in to each door motor. And detects door position by PBR (Potentio Balance Resistor).
- A/C auto amp. communicates with each LCU via communication line. And receives each door position feedback signal from each LCU.
- Each LCU control each door to the appropriate position depending on the control signal from A/C auto amp. When the door movement was completed, transmits the signal of door movement completion to A/C auto amp.

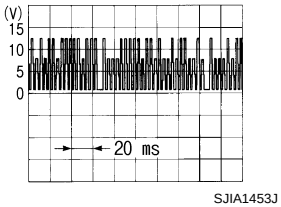
## Diagnosis Procedure

INFOID:0000000004533914

**NOTE:**
If all of door motors DTC are detected, check this circuit.

### 1.CHECK COMMUNICATION SIGNAL

1. Turn the ignition switch ON.
2. Check output waveform between A/C auto amp. harness connector and ground with the oscilloscope.

| (+) | | (–) | Output waveform |
|---|---|---|---|
| A/C auto amp. | | — | |
| Connector | Terminal | | |
| M66 | 10 | Ground |  |



Is the inspection result normal?

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

### 2.CHECK COMMUNICATION SIGNAL CIRCUIT FOR SHORT

1. Turn the ignition switch OFF.
2. Disconnect the following connectors:
- A/C auto amp.
- Mode door motor
- Intake door motor
- Air mix door motor
3. Check continuity between A/C auto amp. harness connector and ground.

| A/C auto amp. | | — | Continuity |
|---|---|---|---|
| Connector | Terminal | | |
| M66 | 10 | Ground | Not existed |

Is the inspection result normal?

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

## 3. CHECK COMMUNICATION SIGNAL CIRCUIT FOR OPEN

1. Turn the ignition switch OFF.
2. Disconnect the A/C auto amp. and the mode door motor connectors.
3. Check continuity between A/C auto amp. harness connector and the mode door motor harness connector.

| A/C auto amp. | | Mode door motor | | Continuity |
|---|---|---|---|---|
| Connector | Terminal | Connector | Terminal | |
| M66 | 10 | M203 | 3 | Existed |

Is the inspection result normal?

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

# A/C CONTROL SIGNAL CIRCUIT

## Diagnosis Procedure

INFOID:0000000004515619

### 1. SELF-DIAGNOSIS RESULT CHECK

With CONSULT-III
1. Perform the “SELF-DIAGNOSIS RESULTS” of HVAC.
2. Check if any DTC 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-26, "DTC Logic" or HAC-27, "DTC Logic".

Is any DTC displayed?

YES >> Perform the diagnosis that is applicable to the sensor and actuator. Refer to HAC-70, "DTC Index".
NO >> GO TO 2.

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

1. Turn the ignition switch OFF.
2. Disconnect the A/C control and the A/C auto amp. connector.
3. 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 | |
| M67 | 5 | M66 | 6 | Existed |

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

| A/C control | | — | Continuity |
|---|---|---|---|
| Connector | Terminal | | |
| M67 | 5 | 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 | |
| M67 | 4 | M66 | 7 | Existed |

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

| A/C control | | — | Continuity |
|---|---|---|---|
| Connector | Terminal | | |
| M67 | 4 | Ground | Not existed |

Is the inspection result normal?

YES >> Perform trouble diagnosis for the A/C control. Refer to HAC-46, "A/C CONTROL : Diagnosis Procedure".
NO >> Repair harness or connector.

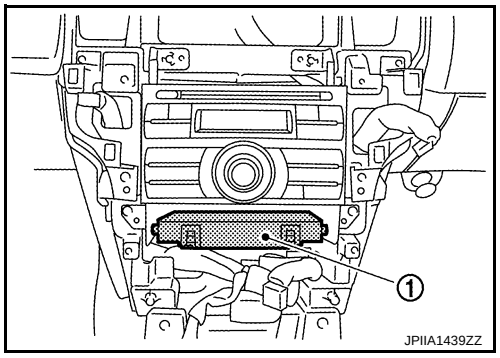
# A/C AUTO AMP.

## Description

INFOID:0000000004443238

A/C AUTO AMP. (AIR CONDITIONER AUTOMATIC AMPLIFIER)

- The A/C auto amp. (1) has a built-in microcomputer which processes information sent from various sensors needed for air conditioner operation.
- The air mix door motor, mode door motor, intake door motor, blower motor and the compressor are then controlled.
- When the various switches and dials are operated, data is input to the A/C auto amp. from the A/C control via communication line.
- Self-diagnosis functions are also built into A/C auto amp. to provide quick check of malfunctions in the auto air conditioner system.




## Component Function Check

INFOID:0000000004443239

### 1.CHECK OPERATION

1. Operate the fan control dial to AUTO position.
2. Operate the temperature control dial. Check that the fan speed or discharge air changes (the discharge air temperature or fan speed varies depending on the ambient temperature, in-vehicle temperature, and set temperature).

Does it operate normally?

YES >> INSPECTION END
NO >> Perform the diagnosis for the A/C auto amp. Refer to HAC-51, "Diagnosis Procedure".

## Diagnosis Procedure

INFOID:0000000004443240

### 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. Refer to HAC-69, "Fail-safe".

Is the fail-safe function operated?

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

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

Check A/C auto amp. power supply circuit and ground circuit. Refer to HAC-46, "A/C AUTO AMP. : Diagnosis Procedure".

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair or replace parts depending on the inspection results.

### 3.CHECK A/C CONTROL SIGNAL CIRCUIT

Check the A/C control signal circuit. Refer to HAC-50, "Diagnosis Procedure".

Is the inspection result normal?

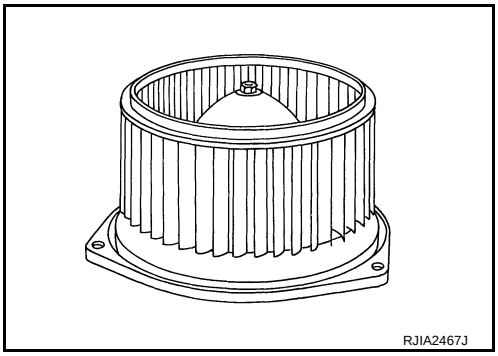
YES >> Replace A/C auto amp.
NO >> Repair or replace parts according to the inspection results.

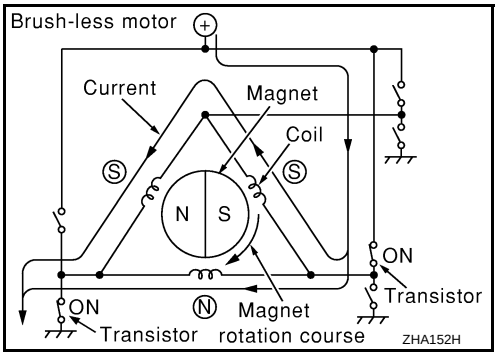
# BLOWER MOTOR

## Description

INFOID:0000000004443241

- 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.




## Component Function Check

INFOID:0000000004443242

### 1.CHECK OPERATION

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

Does it operate normally?

YES >> INSPECTION END
NO >> Perform the diagnosis for the blower motor. Refer to HAC-52, "Diagnosis Procedure".

## Diagnosis Procedure

INFOID:0000000004443243

### 1.SELF-DIAGNOSIS RESULT CHECK

With CONSULT-III
1. Perform the “SELF-DIAGNOSIS”.
2. Check if any DTC is detected in the self-diagnostic results.

**NOTE:**
If DTC is displayed along with DTC “U1000” or “U1010”, first diagnose the DTC “U1000” or “U1010”. Refer to HAC-26, "DTC Logic" or HAC-27, "DTC Logic".

Is any DTC displayed?

YES >> Perform the diagnosis that is applicable to the sensor and actuator. Refer to HAC-70, "DTC Index".
NO >> GO TO 2.

### 2.PERFORM ACTIVE TEST

With CONSULT-III
1. Perform the “HVAC TEST” of HVAC active test item.
2. Check that the blower motor control signal changes according to each indicator number.

| | Test item | | | | | | |
|---|---|---|---|---|---|---|---|
| | MODE 1 | MODE 2 | MODE 3 | MODE 4 | MODE 5 | MODE 6 | MODE 7 |
| Blower fan motor control signal duty ratio | 37% | 91% | 65% | 65% | 65% | 91% | — |

**NOTE:**

- Perform the inspection of each output device after starting the engine because the compressor is operated.
- If the Mode 7 is selected, the malfunction is displayed but it is normal.

Does it operate normally?

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

## 3.CHECK BLOWER MOTOR POWER SUPPLY CIRCUIT

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

| (+) | | (–) | Voltage |
|---|---|---|---|
| Blower motor | | — | |
| Connector | Terminal | | |
| M109 | 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 the ignition switch OFF.
2. Check for continuity between blower motor harness connector and ground.

| Blower motor | | — | Continuity |
|---|---|---|---|
| Connector | Terminal | | |
| M109 | 3 | Ground | Existed |

Is the inspection result normal?

YES >> GO TO 5.
NO >> Repair the harnesses or connectors.

## 5.CHECK BLOWER MOTOR CIRCUIT CONTINUITY

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

| Blower motor | | A/C auto amp. | | Continuity |
|---|---|---|---|---|
| Connector | Terminal | Connector | Terminal | |
| M109 | 2 | M66 | 32 | Existed |

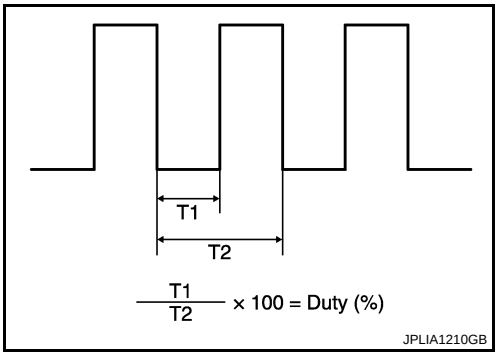
Is the inspection result normal?

YES >> GO TO 6.
NO >> Repair the harnesses or connectors.

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

1. Reconnect blower motor connector and A/C auto amp. connector.
2. Turn the ignition switch ON.
3. Set the mode control dial to VENT position.

4. Change fan speed from Lo to Hi, and check duty ratios between blower motor harness connector and ground by using an oscilloscope.
**NOTE:**
Calculate the drive signal duty ratio as shown in the figure.
T2 = Approx. 1.6 ms




| Blower motor | | Condition | Duty ratio (Approx.) |
|---|---|---|---|
| Connector | Terminal | Fan speed (manual) VENT mode | |
| M109 | 2 | 1st | 25 % |
| | | 5th | 33 % |
| | | 10th | 43 % |
| | | 15th | 53 % |
| | | 20th | 63 % |
| | | 25th | 81 % |

Is the inspection result normal?

YES >> Replace blower motor after confirming the fan air flow does not change.
NO >> Replace the A/C auto amp.

## 7.CHECK BLOWER MOTOR CIRCUIT CONTINUITY

1. Turn the ignition switch OFF.
2. Disconnect the blower motor connector and fuse block (J/B) connector.
3. Check the continuity between the blower motor harness connector and fuse block (J/B) harness connector.

| Blower motor | | Fuse block (J/B) | | Continuity |
|---|---|---|---|---|
| Connector | Terminal | Connector | Terminal | |
| M109 | 1 | M1 | 3A | Existed |
| | | | 8A | |

4. Check for continuity between blower motor harness connector and ground.

| Blower motor | | — | Continuity |
|---|---|---|---|
| Connector | Terminal | | |
| M109 | 1 | Ground | Not existed |

Is the inspection result normal?

YES >> GO TO 8.
NO >> Repair the harnesses or connectors.

## 8.CHECK FUSE

Check 15A fuses [Nos. 21 and 22, located in the fuse block (J/B)].
**NOTE:**
Refer to PG-84, "Fuse, Connector and Terminal Arrangement".

Is the inspection result normal?

YES >> Inspection the power supply circuit. Refer to PG-42, "Wiring Diagram - IGNITION POWER SUPPLY -".
NO >> Replace the fuse after repairing the applicable circuit.

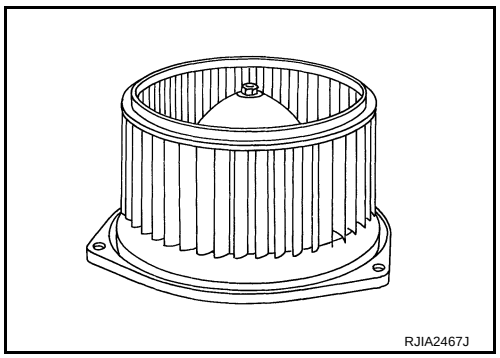
# Component Inspection

INFOID:0000000004443244

## 1.CHECK BLOWER MOTOR

1. Remove the blower motor. Refer to VTL-11, "Exploded View".

2. Check that the blower motor turns smoothly.




Is the inspection result normal?

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

# MAGNET CLUTCH

## Description

INFOID:0000000004443245

The magnet clutch is the device that drives the compressor with the signal from IPDM E/R.

## Component Function Check

INFOID:0000000004443246

### 1.CHECK OPERATION

1. Turn the fan control dial ON.
2. Press the A/C switch.
3. Check that the indicator of the A/C switch turns ON. Check visually and by sound that the compressor operates.
4. Press the A/C switch again.
5. 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 >> Go to diagnosis procedure. Refer to HAC-56, "Diagnosis Procedure".

## Diagnosis Procedure

INFOID:0000000004443247

### 1.CHECK CHARGED REFRIGERANT

Connect the recovery/recycling recharging equipment to the vehicle and perform the pressure inspection with the gauge. Refer to HA-31, "Inspection".

Is there refrigerant?

YES >> GO TO 2.
NO >> Check for refrigerant leakages detecting fluorescent leak detector. Refer to HA-23, "Leak Test".

### 2.CHECK MAGNET CLUTCH OPERATION

Perform auto active test of IPDM E/R. Refer to PCS-10, "Diagnosis Description".

Does it operate normally?

YES >> GO TO 6.
NO >> GO TO 3.

### 3.CHECK MAGNET CLUTCH

1. Turn the ignition switch OFF.
2. Disconnect the magnet clutch connector.
3. Directly apply the battery voltage to the magnet clutch. Check for operation visually and by sound.

Does it operate normally?

YES >> GO TO 4.
NO >> Replace the compressor.

### 4.CHECK MAGNET CLUTCH CIRCUIT CONTINUITY

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

| IPDM E/R | | Magnet clutch | | Continuity |
|---|---|---|---|---|
| Connector | Terminal | Connector | Terminal | |
| E7 | 48 | F43 | 1 | Existed |

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

| IPDM E/R | | — | Continuity |
|---|---|---|---|
| Connector | Terminal | | |
| E7 | 48 | Ground | Not existed |

Is the inspection result normal?

YES >> GO TO 5.
NO >> Repair the harnesses and connectors.

## 5. CHECK FUSE

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

**NOTE:**
Refer to PG-86, "Fuse, Connector and Terminal Arrangement".

Is the inspection result normal?

YES >> Replace IPDM E/R.
NO >> Replace the fuse after repairing the applicable circuit.

## 6. CHECK SELF-DIAGNOSIS RESULT CHECK

With CONSULT-III
1. Perform the “SELF-DIAGNOSIS”.
2. Check if any DTC is detected in the self-diagnostic results.

**NOTE:**
If DTC is displayed along with DTC “U1000” or “U1010”, first diagnose the DTC “U1000” or “U1010”. Refer to HAC-26, "DTC Logic" or HAC-27, "DTC Logic".

Is any DTC displayed?

YES >> Perform the diagnosis that is applicable to the sensor and actuator. Refer to HAC-70, "DTC Index".
NO >> GO TO 7.

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

With CONSULT-III
1. Perform the “DATA MONITOR” of HVAC. Refer to HAC-60, "Reference Value".
2. Check A/C ON signal and blower fan ON switch signal.

| Monitor item | Condition | Status |
|---|---|---|
| COMP REQ SIG | A/C switch: OFF | Off |
| | A/C switch: ON | On |
| FAN REQ SW | Fan control dial: OFF | Off |
| | Fan control dial: ON | On |

Is the inspection result normal?

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

## 8. CHECK REFRIGERANT PRESSURE SENSOR

Check the refrigerant pressure sensor. Refer to EC-506, "Diagnosis Procedure".

Is the inspection result normal?

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

# ECV (ELECTRICAL CONTROL VALVE)

## Description

INFOID:0000000004443248

The ECV (electrical control valve) is installed on the compressor and controls it for emitting appropriate amount of refrigerant when necessary.

## Diagnosis Procedure

INFOID:0000000004443249

### 1.CHECK FUSE

Check 10A fuse [No. 3, located in the fuse block (J/B)].

**NOTE:**

Refer to PG-84, "Fuse, Connector and Terminal Arrangement".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace the fuse after repairing the applicable circuit.

### 2.CHECK ECV POWER SUPPLY CIRCUIT

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

| (+) | | (–) | Voltage |
|---|---|---|---|
| ECV | | — | |
| Connector | Terminal | | |
| F44 | 2 | Ground | Battery voltage |

Is the inspection result normal?

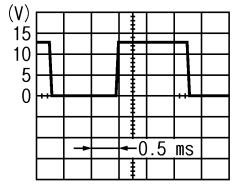
YES >> GO TO 3.

NO >> Repair the harnesses or connectors.

### 3.CHECK ECV CONTROL SIGNAL

With CONSULT-III

1. Turn the ignition switch OFF.
2. Connect the ECV connector.
3. Perform the “HVAC TEST”: MODE 5 of HVAC active test mode.
4. Check output waveform between the A/C auto amp. harness connector and ground with the oscilloscope.

| (+) | | (–) | Condition | Output waveform |
|---|---|---|---|---|
| A/C auto amp. | | — | | |
| Connector | Terminal | | | |
| M66 | 24 | Ground | HVAC TEST: MODE 5 | Duty ratio: approx. 50 %  |



SJIA1607E

Is the inspection result normal?

YES >> Replace the compressor.

NO >> GO TO 4.

### 4.CHECK CONTINUITY BETWEEN ECV AND A/C AUTO AMP.

1. Turn the ignition switch OFF.
2. Disconnect the ECV connector.

3. Disconnect the A/C auto amp. connector.
4. Check continuity between the ECV harness connector and A/C auto amp. harness connector.

| ECV | | A/C auto amp. | | Continuity |
|---|---|---|---|---|
| Connector | Terminal | Connector | Terminal | |
| F44 | 3 | M66 | 24 | Existed |

5. Check for continuity between the ECV harness connector and ground.

| ECV | | — | Continuity |
|---|---|---|---|
| Connector | Terminal | | |
| F44 | 3 | Ground | Not existed |

Is the inspection result normal?

YES >> GO TO 5.
NO >> Repair the harnesses or connectors.

## 5.CHECK ECV

Check continuity between the ECV connector terminals.

| ECV | | | | Continuity |
|---|---|---|---|---|
| Connector | Terminal | Connector | Terminal | |
| F44 | 2 | F44 | 3 | Existed |

Is the inspection result normal?

YES >> Replace the A/C auto amp.
NO >> Replace the compressor.

# ECU DIAGNOSIS INFORMATION

## A/C AUTO AMP.

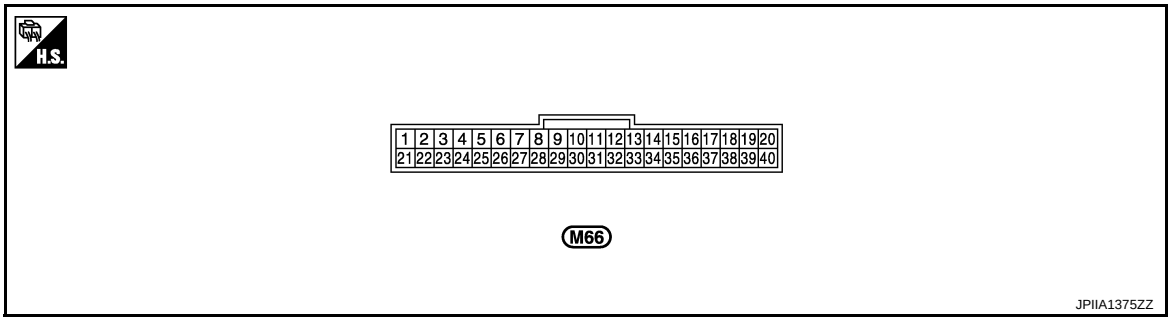
### Reference Value

INFOID:0000000004443250

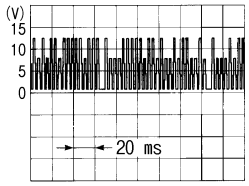
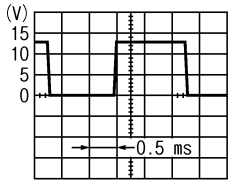
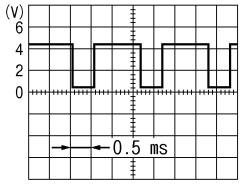
#### CONSULT-III DATA MONITOR REFERENCE VALUES

| 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 motor: ON | On |
| | | Blower motor: 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 motor: ON | 25 – 81 |
| | | Blower motor: OFF | 0 |
| XM | Ignition switch ON | — | –100 – 155 |
| ENG COOL TEMP | Ignition switch ON | — | Values depending on coolant temperature |
| VEHICLE SPEED | Driving | — | Equivalent to speedometer reading |

#### TERMINAL LAYOUT



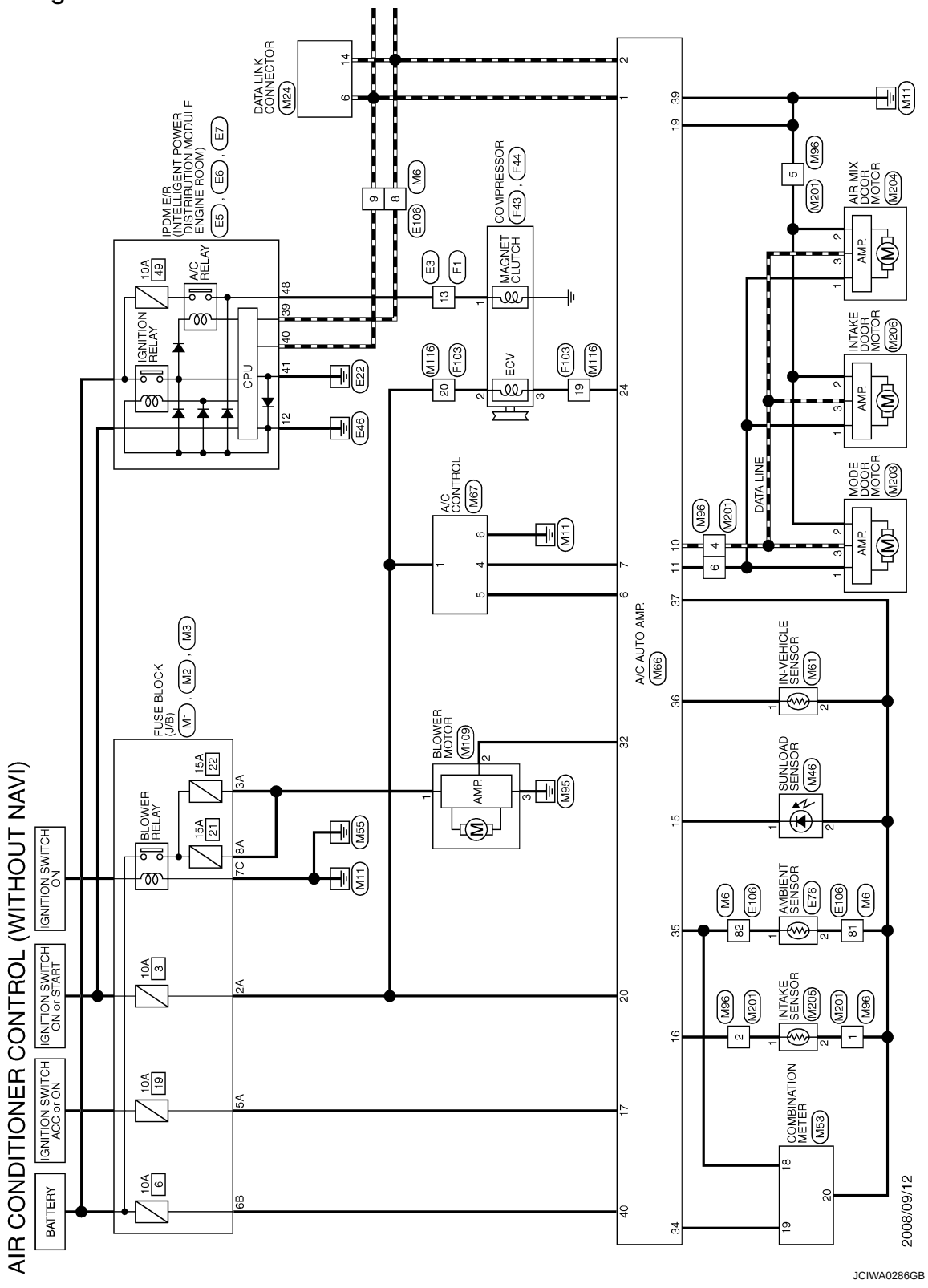

#### PHYSICAL VALUES

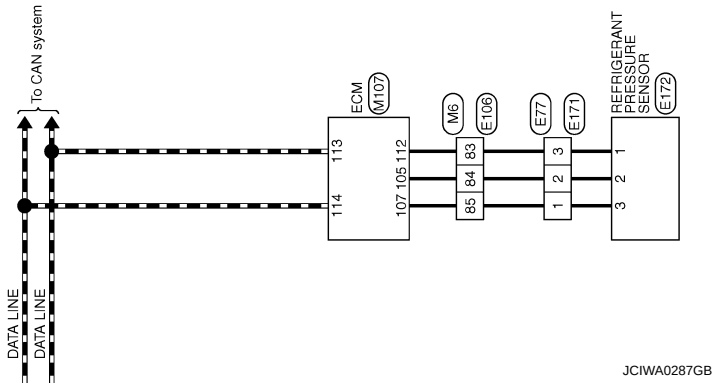
| Terminal No. (Wire color) | | Description | | Condition | Value (Approx.) |
|---|---|---|---|---|---|
| + | – | Signal name | Input/ Output | | |
| 1 (L) | Ground | CAN - H | Input/ Output | — | — |
| 2 (P) | Ground | CAN - L | Input/ Output | — | — |
| 6 (L) | Ground | Communication signal (AMP-SW) | Input | — | — |
| 7 (P) | Ground | Communication signal (SW - AMP) | Output | — | — |
| 10 (L) | Ground | A/C LAN signal | Input/ Output | Ignition switch ON |  SJIA1453J |
| 11 (R) | Ground | Each door motor power supply | — | Ignition switch ON | 12 V |
| 15 (O) | Ground | Sunload sensor signal | Input | — | 0 – 4.8 V<br>Output voltage varies with sunload amount |
| 16 (R) | Ground | Intake sensor signal | Input | — | 0 – 4.8 V<br>Output voltage varies with intake temperature |
| 17 (L) | Ground | ACC power supply | — | Ignition switch ACC | Battery voltage |
| 19 (B) | Ground | Ground | — | Ignition switch ON | 0 V |
| 20 (W) | Ground | Ignition power supply | — | Ignition switch ON | Battery voltage |
| 24 (O) | Ground | ECV signal | Output | • Ignition switch ON<br>• Active test: MODE 5 |  SJIA1607E |
| 32 (P) | Ground | Blower motor control signal | Output | • Ignition switch ON<br>• Fan speed: 1st speed (manual) |  JSIIA0096ZZ |
| 34 (R) | Ground | A/C auto amp. connecting recognition signal | Output | Ignition switch ON | 5 V |
| 35 (V) | Ground | Ambient sensor signal | Input | — | 0 – 4.8 V<br>Output voltage varies with ambient temperature |

| Terminal No. (Wire color) | | Description | | Condition | Value (Approx.) |
|---|---|---|---|---|---|
| + | – | Signal name | Input/ Output | | |
| 36 (LG) | Ground | In-vehicle sensor signal | Input | — | 0 – 4.8 V<br>Output voltage varies with in-vehicle temperature |
| 37 (GR) | Ground | Sensor ground | — | Ignition switch ON | 0 V |
| 39 (B) | Ground | Ground | — | Ignition switch ON | 0 V |
| 40 (Y) | Ground | Battery power supply | — | Ignition switch OFF | Battery voltage |

## Wiring Diagram - AIR CONDITIONER CONTROL SYSTEM -

INFOID:0000000004443251




To CAN system
DATA LINE
DATA LINE
ECM
M107
113
114
107 105 112
M6
E106
83
84
85
E77
E171
3
2
1
REFRIGERANT
PRESSURE
SENSOR
E172
1
2
3
JCIWA0287GB

AIR CONDITIONER CONTROL (WITHOUT NAVI)

| Connector No. | E3 |
|---|---|
| Connector Name | WIRE TO WIRE |
| Connector Type | SAA36MB-RS8-SHZ8 |

H.S.

| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| I3 | L | – |

| Connector No. | E5 |
|---|---|
| Connector Name | IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM) |
| Connector Type | TH20FW-CS12-M4-1V |

H.S.

| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| I2 | B/W | – |

| Connector No. | E6 |
|---|---|
| Connector Name | IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM) |
| Connector Type | TH08FW-NH |

H.S.

| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 39 | P | – |
| 40 | L | – |
| 41 | B/W | – |

| Connector No. | E7 |
|---|---|
| Connector Name | IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM) |
| Connector Type | TH20FW-CS12-M4 |

H.S.

| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 48 | L | – |

| Connector No. | E76 |
|---|---|
| Connector Name | AMBIENT SENSOR |
| Connector Type | RS02FB |

H.S.

| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 1 | G | AMBIENT SENSOR SIGNAL |
| 2 | P | SENSOR GROUND |

| Connector No. | E77 |
|---|---|
| Connector Name | WIRE TO WIRE |
| Connector Type | RK03FB |

H.S.

| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 1 | V | – |
| 2 | L | – |
| 3 | O | – |

| Connector No. | E106 |
|---|---|
| Connector Name | WIRE TO WIRE |
| Connector Type | TH80FW-CS16-TM4 |

H.S.

| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 8 | P | – |
| 9 | L | – |
| 81 | P | – |
| 82 | G | – |
| 83 | V | – |
| 84 | L | – |
| 85 | O | – |

| Connector No. | E171 |
|---|---|
| Connector Name | WIRE TO WIRE |
| Connector Type | RK03MB |

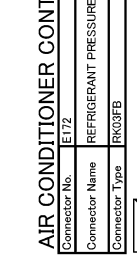
H.S.

| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 1 | – | – |
| 2 | – | – |
| 3 | – | – |

JCIWA0288GB

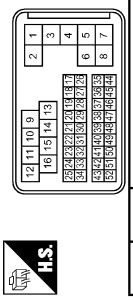
AIR CONDITIONER CONTROL (WITHOUT NAVI)

| Connector No. | E172 |
|---|---|
| Connector Name | REFRIGERANT PRESSURE SENSOR |
| Connector Type | RK03FB |



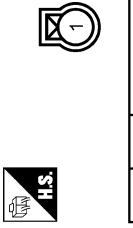
| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 1 | – | – |
| 2 | – | – |
| 3 | – | – |

| Connector No. | F1 |
|---|---|
| Connector Name | WIRE TO WIRE |
| Connector Type | SAA36FB-RS8-SHZ8 |



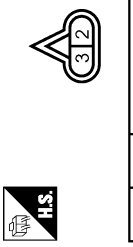
| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 13 | O | – |

| Connector No. | F43 |
|---|---|
| Connector Name | COMPRESSOR |
| Connector Type | RS01FB |



| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 1 | O | MAGNET CLUTCH POWER SUPPLY |

| Connector No. | F44 |
|---|---|
| Connector Name | COMPRESSOR |
| Connector Type | RK02FGY |



| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 2 | Y | ECV POWER SUPPLY |
| 3 | O | ECV SIGNAL |

| Connector No. | F103 |
|---|---|
| Connector Name | WIRE TO WIRE |
| Connector Type | TK36FW-NS10 |



| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 19 | O | – |
| 20 | Y | – |

| Connector No. | M1 |
|---|---|
| Connector Name | FUSE BLOCK (J/B) |
| Connector Type | NS06FW-M2 |



| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 2A | G | – |
| 3A | L | – |
| 5A | L | – |
| 8A | L | – |

| Connector No. | M2 |
|---|---|
| Connector Name | FUSE BLOCK (J/B) |
| Connector Type | NS10FW-CS |



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

| Connector No. | M3 |
|---|---|
| Connector Name | FUSE BLOCK (J/B) |
| Connector Type | NS12FW-CS |



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

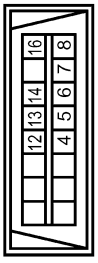
JCIWA0289GB

AIR CONDITIONER CONTROL (WITHOUT NAVI)

| Connector No. | M6 |
|---|---|
| Connector Name | WIRE TO WIRE |
| Connector Type | TH80MW-CS16-TM4 |

| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 8 | P | – |
| 9 | L | – |
| 81 | GR | – |
| 82 | V | – |
| 83 | V | – |
| 84 | L | – |
| 85 | BR | – |

| Connector No. | M24 |
|---|---|
| Connector Name | DATA LINK CONNECTOR |
| Connector Type | BD16FW |

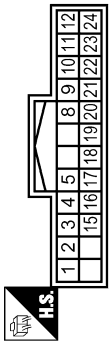


| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 6 | L | – |
| 14 | P | – |

| Connector No. | M46 |
|---|---|
| Connector Name | SUNLOAD SENSOR |
| Connector Type | K02FB |

| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 1 | O | SUNLOAD SENSOR SIGNAL |
| 2 | GR | SENSOR GROUND |

| Connector No. | M53 |
|---|---|
| Connector Name | COMBINATION METER |
| Connector Type | TH24FW-NH |

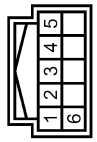


| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 18 | V | AMBIENT SENSOR SIGNAL |
| 19 | G | A/C AUTO AMP. CONNECTION RECOGNITION SIGNAL |
| 20 | GR | AMBIENT SENSOR GROUND |

| Connector No. | M66 |
|---|---|
| Connector Name | A/C AUTO AMP. |
| Connector Type | SAB40FW |

| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 1 | L | CAN-H |
| 2 | P | CAN-L |
| 6 | L | TX(AMP>CONT) |
| 7 | P | RX(CONT>AMP) |
| 10 | BR | LAN SIGNAL |
| 11 | Y | EACH DOOR MOTOR POWER SUPPLY |
| 15 | O | SUNLOAD SENSOR SIGNAL |
| 16 | R | INTAKE SENSOR SIGNAL |
| 17 | L | ACC POWER SUPPLY |
| 19 | B | GROUND |
| 20 | G | IGNITION POWER SUPPLY |
| 24 | O | ECV SIGNAL |
| 32 | P | BLOWER MOTOR CONTROL SIGNAL |
| 34 | G | A/C AUTO AMP. CONNECTION RECOGNITION SIGNAL |
| 35 | V | AMBIENT SENSOR SIGNAL |
| 36 | LG | IN-VEHICLE SENSOR SIGNAL |
| 37 | GR | SENSOR GROUND |
| 39 | B | GROUND |
| 40 | Y | BATTERY POWER SUPPLY |

| Connector No. | M67 |
|---|---|
| Connector Name | A/C CONTROL |
| Connector Type | TH10FB-NH |



| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 1 | G | IGNITION POWER SUPPLY |
| 4 | P | TX(SW>AMP) |
| 5 | L | RX(AMP>SW) |
| 6 | B | GROUND |

| Connector No. | M61 |
|---|---|
| Connector Name | IN-VEHICLE SENSOR |
| Connector Type | A02FW |



| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 1 | LG | IN-VEHICLE SENSOR SIGNAL |
| 2 | GR | SENSOR GROUND |

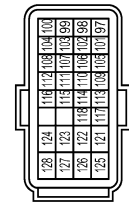
JCIWA0290GB

AIR CONDITIONER CONTROL (WITHOUT NAVI)

| Connector No. | M96 |
|---|---|
| Connector Name | WIRE TO WIRE |
| Connector Type | A06FW |

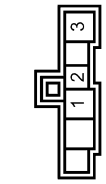
| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 1 | GR | – |
| 2 | R | – |
| 4 | BR | – |
| 5 | B | – |
| 6 | Y | – |

| Connector No. | M107 |
|---|---|
| Connector Name | ECM |
| Connector Type | RH24FGY-R28-R-LH-Z |



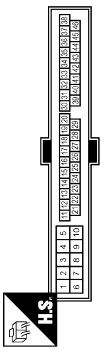
| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 105 | L | PDPRESS |
| 107 | BR | AVCC2-FTPRS |
| 112 | SB | GNDA-FTPRES |
| 113 | P | VEHCAN-L1 |
| 114 | L | VEHCAN-H1 |

| Connector No. | M109 |
|---|---|
| Connector Name | BLOWER MOTOR |
| Connector Type | NS03FW-M3 |



| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 1 | L | BLOWER MOTOR POWER SUPPLY |
| 2 | P | BLOWER MOTOR CONTROL SIGNAL |
| 3 | B | SENSOR GROUND |

| Connector No. | M116 |
|---|---|
| Connector Name | WIRE TO WIRE |
| Connector Type | TK36MW-NS10 |



| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 19 | O | – |
| 20 | G | – |

| Connector No. | M201 |
|---|---|
| Connector Name | WIRE TO WIRE |
| Connector Type | A06MW |



| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 1 | GR | – |
| 2 | R | – |
| 4 | L | – |
| 5 | B | – |
| 6 | R | – |

| Connector No. | M203 |
|---|---|
| Connector Name | MODE DOOR MOTOR |
| Connector Type | A03FW |



| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 1 | L | DOOR MOTOR POWER SUPPLY |
| 2 | B | GROUND |
| 3 | L | A/C LAN SIGNAL |

| Connector No. | M204 |
|---|---|
| Connector Name | AIR MIX DOOR MOTOR |
| Connector Type | A03FW |



| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 1 | L | DOOR MOTOR POWER SUPPLY |
| 2 | B | GROUND |
| 3 | L | A/C LAN SIGNAL |

| Connector No. | M205 |
|---|---|
| Connector Name | INTAKE SENSOR |
| Connector Type | TK04FW |



| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 1 | R | INTAKE SENSOR SIGNAL |
| 2 | GR | SENSOR GROUND |

JCIWA0291GB

AIR CONDITIONER CONTROL (WITHOUT NAVI)

| Connector No. | M206 |
|---|---|
| Connector Name | INTAKE DOOR MOTOR |
| Connector Type | A03FW |

H.S.

1 2 3

| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 1 | L | DOOR MOTOR POWER SUPPLY |
| 2 | B | GROUND |
| 3 | L | A/C LAN SIGNAL |

JCIWA0292GB

## Fail-safe

*INFOID:0000000004443252*

### FAIL-SAFE FUNCTION

When a communication malfunction between A/C auto amp. and A/C control continued for approximately 30 seconds or more, control the air conditioner under the following conditions.

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

## DTC Inspection Priority Chart

INFOID:0000000004443253

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 | • B257B: AMB TEMP SEN SHORT<br>• B257C: AMB TEMP SEN OPEN<br>• B2578: IN CAR SEN SHORT<br>• B2579: IN CAR SEN OPEN<br>• B2581: EVAP TEMP SEN SHORT<br>• B2582: EVAP TEMP SEN OPEN<br>• B2630: SUNLOAD SEN SHORT<br>• B2631: SUNLOAD SEN OPEN<br>• B2632: DR AIRMIX ACTR SHORT<br>• B2633: DR AIRMIX ACTR OPEN<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 |

## DTC Index

INFOID:0000000004443254

| DTC | Items (CONSULT-III screen terms) | Reference |
|---|---|---|
| U1000 | CAN COMM CIRCUIT | HAC-26, "DTC Logic" |
| U1010 | CONTROL UNIT (CAN) | HAC-27, "DTC Logic" |
| B257B | AMB TEMP SEN SHORT | HAC-28, "DTC Logic" |
| B257C | AMB TEMP SEN OPEN | HAC-28, "DTC Logic" |
| B2578 | IN CAR SEN SHORT | HAC-31, "DTC Logic" |
| B2579 | IN CAR SEN OPEN | HAC-31, "DTC Logic" |
| B2581 | EVAP TEMP SEN SHORT | HAC-34, "DTC Logic" |
| B2582 | EVAP TEMP SEN OPEN | HAC-34, "DTC Logic" |
| B2630* | SUNLOAD SEN SHORT | HAC-37, "DTC Logic" |
| B2631* | SUNLOAD SEN OPEN | HAC-37, "DTC Logic" |
| B2632 | DR AIRMIX ACTR SHORT | HAC-40, "DTC Logic" |
| B2633 | DR AIRMIX ACTR OPEN | HAC-40, "DTC Logic" |
| B2636 | DR VENT DOOR FAIL | HAC-42, "DTC Logic" |
| B2637 | DR B/L DOOR FAIL | HAC-42, "DTC Logic" |
| B2638 | DR D/F1 DOOR FAIL | HAC-42, "DTC Logic" |

| DTC | Items (CONSULT-III screen terms) | Reference |
|---|---|---|
| B2639 | DR DEF DOOR FAIL | HAC-42, "DTC Logic" |
| B263D | FRE DOOR FAIL | HAC-44, "DTC Logic" |
| B263E | 20P FRE DOOR FAIL | HAC-44, "DTC Logic" |
| B263F | REC DOOR FAIL | HAC-44, "DTC Logic" |
| B2654 | D/F2 DOOR FAIL | HAC-42, "DTC Logic" |
| B2655 | B/L2 DOOR FAIL | HAC-42, "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.

**NOTE:**

If all of door motors DTC (B2632, B2633, B2636, B2637, B2638, B2639, B263D, B263E, B263F, B2654 and B2655) are detected, check door motor communication circuit. Refer to HAC-48, "Description".

# SYMPTOM DIAGNOSIS

## AUTOMATIC AIR CONDITIONER SYSTEM

### Diagnosis Chart By Symptom

INFOID:0000000004443255

| Symptom | Check item | Reference |
|---|---|---|
| A/C system does not activate. | Power supply and ground circuit | • HAC-46, "A/C AUTO AMP. : Diagnosis Procedure" (A/C auto amp.)<br>• HAC-46, "A/C CONTROL : Diagnosis Procedure" (A/C control) |
| | A/C control signal circuit | HAC-50, "Diagnosis Procedure" |
| A/C system cannot be controlled. | A/C auto amp. | HAC-51, "Diagnosis Procedure" |
| • Air outlet does not change.<br>• Mode door motor does not operate normally. | Mode door motor | HAC-43, "Diagnosis Procedure" |
| • Discharge air temperature does not change.<br>• The air mix door motor does not operate normally. | Air mix door motor | HAC-41, "Diagnosis Procedure" |
| • Intake door does not change.<br>• Intake door motor does not operate normally. | Intake door motor | HAC-45, "Diagnosis Procedure" |
| Blower motor operation is malfunctioning. | Blower motor | HAC-52, "Diagnosis Procedure" |
| Magnet clutch does not operate. | Magnet clutch | HAC-56, "Diagnosis Procedure" |
| • Insufficient cooling<br>• No cool air comes out. (Air flow volume is normal.) | ECV | HAC-58, "Diagnosis Procedure" |
| | Insufficient cooling | HAC-73, "Diagnosis Procedure" |
| • Insufficient heating<br>• No warm air comes out. (Air flow volume is normal.) | Insufficient heating | HAC-75, "Diagnosis Procedure" |
| • Noise<br>• Noise is heard when the A/C system operates. | Noise | HAC-78, "Diagnosis Procedure" |

# INSUFFICIENT COOLING

## Description

INFOID:0000000004443256

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

## Diagnosis Procedure

INFOID:0000000004443257

### 1.CHECK MAGNET CLUTCH OPERATION

1. Turn the ignition switch ON.
2. Turn the fan control dial ON.
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 operates.
5. Press the A/C switch again.
6. Check that the indicator of the A/C switch turns OFF. Check that the compressor stops.

Is the inspection result normal?

YES >> GO TO 2.
NO >> Magnet clutch system malfunction. Refer to HAC-56, "Diagnosis Procedure".

### 2.CHECK DRIVE BELT

Check tension of the drive belt. Refer to EM-13, "Checking".

Is the inspection result normal?

YES >> GO TO 3.
NO >> Adjust or replace drive belt depending on the inspection results.

### 3.CHECK REFRIGERANT CYCLE PRESSURE

Connect the recovery/recycling recharging equipment to the vehicle and perform the pressure inspection with the gauge. Refer to HA-7, "Symptom Table".

Is the inspection result normal?

YES >> GO TO 4.
NO >> Repair or replace the parts depending on the inspection results.

### 4.CHECK PERFORMANCE CHART

Connect recovery/recycling recharging equipment to the vehicle and perform the performance test. Refer to HA-31, "Inspection".

Is the inspection result normal?

YES >> GO TO 5.
NO >> GO TO 7.

### 5.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 6.
NO >> Perform the diagnosis for the A/C auto amp. connection recognition signal. Refer to MWI-55, "Diagnosis Procedure".

### 6.CHECK SETTING OF TEMPERATURE SETTING TRIMMER

With CONSULT-III

1. Select “TEMP SET CORRECT” of HVAC work support item. Refer to HAC-8, "Temperature Setting Trimmer".
2. 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.

3. Set the difference between the set temperature and control temperature to “0”.

>> INSPECTION END

## 7. 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.

Are the symptoms solved?

YES >> INSPECTION END
NO >> Refer to HAC-72, "Diagnosis Chart By Symptom" and perform the appropriate diagnosis.

# INSUFFICIENT HEATING

## Description

INFOID:0000000004443258

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

## Diagnosis Procedure

INFOID:0000000004443259

### 1.CHECK COOLING SYSTEM

1. Check the engine coolant level and check for leakage. Refer to CO-7, "Inspection".
2. Check radiator cap. Refer to CO-11, "RADIATOR CAP : Inspection".
3. Check water flow sounds of the engine coolant. Refer to CO-8, "Refilling".

Is the inspection result normal?

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

### 2.CHECK OPERATION

1. Turn temperature dial and raise temperature setting to 32.0°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

With CONSULT-III
1. Select “TEMP SET CORRECT” of HVAC work support item. Refer to HAC-8, "Temperature Setting Trimmer".
2. Check that the temperature setting trimmer is set to “– direction”.
   **NOTE:**
   The control temperature can be set by the temperature setting trimmer.
3. Set the difference between the set temperature and control temperature to “0”.

Are the symptoms solved?

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

### 4.CHECK SELF-DIAGNOSIS RESULT CHECK

With CONSULT-III
1. Perform the “SELF-DIAGNOSIS”.
2. Check if any DTC is detected in the self-diagnostic results.
   **NOTE:**
   If DTC is displayed along with DTC “U1000” or “U1010”, first diagnose the DTC “U1000” or “U1010”. Refer to HAC-26, "DTC Logic" or HAC-27, "DTC Logic".

Is any DTC displayed?

YES >> Perform the diagnosis that is applicable to the sensor and the door motor. Refer to HAC-70, "DTC Index".
NO >> GO TO 5.

### 5.CHECK EACH OUTPUT DEVICE

With CONSULT-III
1. Select “HVAC TEST” of HVAC active test item. Refer to HAC-24, "CONSULT-III 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 | VENT | B/L 1 | B/L 2 | FOOT | D/F | DEF | — |
| Intake door position | REC | REC | 20% FRE | FRE | FRE | FRE | — |
| Air mix door position | FULL COLD | FULL COLD | FULL HOT | FULL HOT | FULL HOT | FULL HOT | — |
| Blower fan motor control signal duty ratio | 37% | 91% | 65% | 65% | 65% | 91% | — |
| Magnet clutch | ON | ON | OFF | OFF | ON | ON | — |
| ECV duty ratio | 100% | 100% | 0% | 0% | 50% | 100% | — |

**NOTE:**

- Perform the inspection of each output device after starting the engine because the compressor is operated.
- If the MODE 7 is selected, the malfunction is displayed but it is normal.

| Discharge air flow | | | |
|---|---|---|---|
| Mode position indication | Air outlet/distribution | | |
| | VENT | FOOT | DEF |
|  | 100% | — | — |
|  | 60% | 40% | — |
|  | 12% | 62% | 26% |
|  | 10% | 52% | 38% |
|  | — | — | 100% |

Does it operate normally?

YES >> GO TO 6.
NO-1 >> Air outlet does not change. Refer to HAC-43, "Diagnosis Procedure".
NO-2 >> Air inlet does not change. Refer to HAC-45, "Diagnosis Procedure".
NO-3 >> Discharge air temperature does not change. Refer to HAC-41, "Diagnosis Procedure".
NO-4 >> Blower motor does not operate normally. Refer to HAC-52, "Diagnosis Procedure".
NO-5 >> Magnet clutch does not operate. Refer to HAC-56, "Diagnosis Procedure".

## 6. CHECK AIR LEAKAGE FROM DUCT

Check duct and nozzle, etc. of the air conditioner system for air leakage.

Is the inspection result normal?

YES >> GO TO 7.
NO >> Repair or replace parts depending on 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 depending on 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 HA-43, "Exploded View".

Are symptoms solved?

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

# NOISE

## Description

INFOID:0000000004443260

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

## Diagnosis Procedure

INFOID:0000000004443261

### 1.CHECK OPERATION

1. Operate the A/C system and check the operation. Refer to HAC-7, "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 cooler 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-9, "Symptom Table".

Is the inspection result normal?

YES >> INSPECTION END
NO >> Refill the refrigerant or replace the compressor depending on the inspection results.

### 4.CHECK WITH GAUGE PRESSURE

Perform the diagnosis with the gauge pressure. Refer to HA-7, "Trouble Diagnosis For Unusual Pressure".

Is the inspection result normal?

YES >> GO TO 5.
NO >> Repair or replace parts depending on 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 COOLER PIPING (PIPE, FLEXIBLE HOSE)

1. Check the cooler piping (pipes, flexible hoses) (for deformation and damage, etc.).
2. Check the installation condition of clips and brackets, etc. of the cooler 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 depending on the inspection results.

### 7.CHECK DRIVE BELT

Check tension of the drive belt. Refer to EM-13, "Checking".

Is the inspection result normal?

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

# PRECAUTION

## PRECAUTIONS

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

INFOID:0000000004781585

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:**

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the “SRS AIR BAG”.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

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

**WARNING:**

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

### Precaution Necessary for Steering Wheel Rotation after Battery Disconnect

INFOID:0000000004781586

**NOTE:**

- Before removing and installing any control units, first turn the push-button ignition switch to the LOCK position, then disconnect both battery cables.
- After finishing work, confirm that all control unit connectors are connected properly, then re-connect both battery cables.
- Always use CONSULT-III to perform self-diagnosis as a part of each function inspection after finishing work. If a DTC is detected, perform trouble diagnosis according to self-diagnosis results.

For vehicle with steering lock unit, if the battery is disconnected or discharged, the steering wheel will lock and cannot be turned.
If turning the steering wheel is required with the battery disconnected or discharged, follow the operation procedure below before starting the repair operation.

#### OPERATION PROCEDURE

1. Connect both battery cables.
   **NOTE:**
   Supply power using jumper cables if battery is discharged.
2. Turn the push-button ignition switch to ACC position.
   (At this time, the steering lock will be released.)
3. Disconnect both battery cables. The steering lock will remain released with both battery cables disconnected and the steering wheel can be turned.
4. Perform the necessary repair operation.

5. When the repair work is completed, re-connect both battery cables. With the brake pedal released, turn the push-button ignition switch from ACC position to ON position, then to LOCK position. (The steering wheel will lock when the push-button ignition switch is turned to LOCK position.)
6. Perform self-diagnosis check of all control units using CONSULT-III.

## Precaution for Battery Service

INFOID:0000000004781587

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

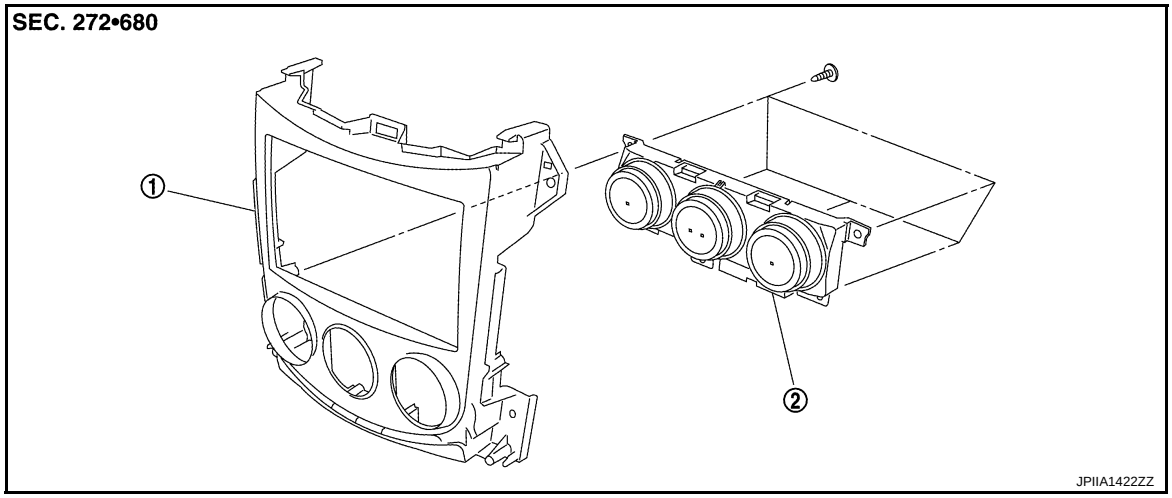
# REMOVAL AND INSTALLATION

## A/C CONTROL

### BASE AUDIO

#### BASE AUDIO : Exploded View

INFOID:0000000004472024



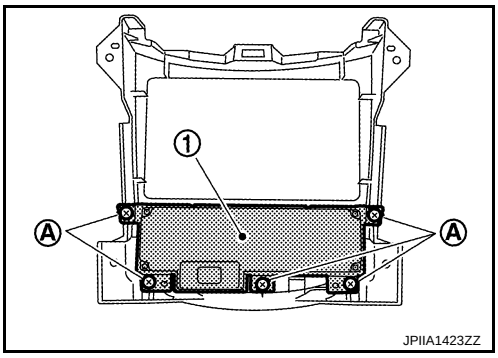

1. Cluster lid C finisher
2. A/C control

#### BASE AUDIO : Removal and Installation

INFOID:0000000004472025

REMOVAL

1. Remove cluster lid C finisher. Refer to IP-12, "Exploded View".
2. Remove mounting screws (A), and then remove A/C control (1).



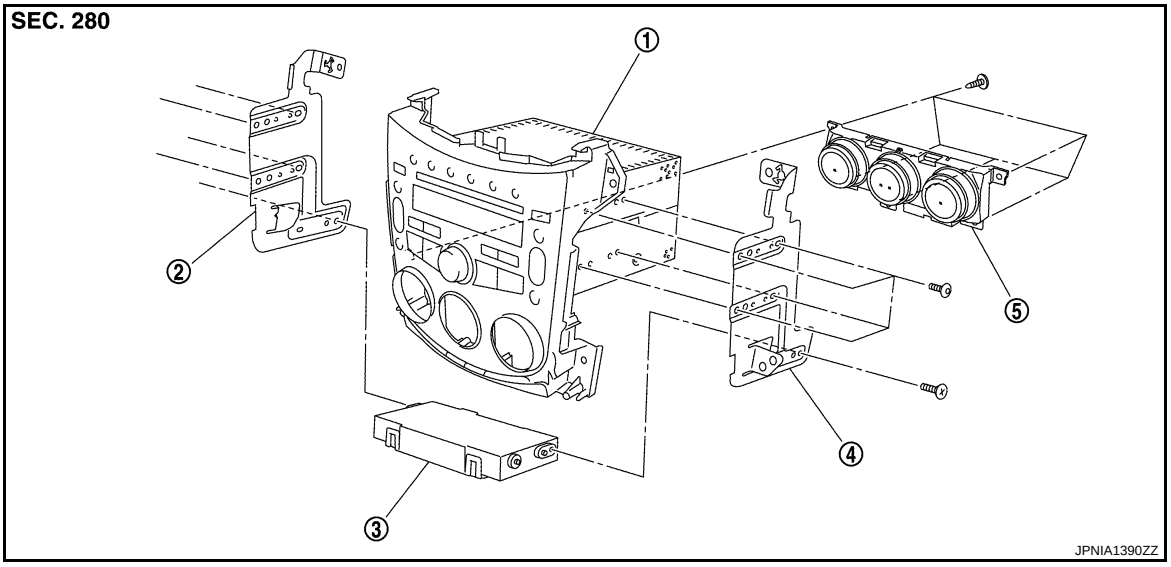

INSTALLATION

Installation is basically the reverse order of removal.

### BOSE AUDIO WITHOUT NAVIGATION

## BOSE AUDIO WITHOUT NAVIGATION : Exploded View

INFOID:0000000004501089



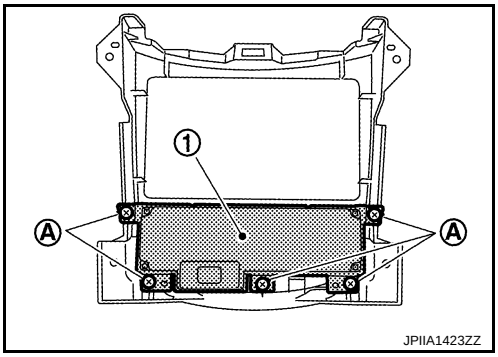

1. Audio unit
2. Bracket LH
3. A/C auto amp.
4. Bracket RH
5. A/C control

## BOSE AUDIO WITHOUT NAVIGATION : Removal and Installation

INFOID:0000000004500986

### REMOVAL

1. Remove A/C auto amp. Refer to HAC-85, "BOSE AUDIO WITHOUT NAVIGATION : Exploded View".
2. Remove mounting screws (A), and then remove A/C control (1).




### INSTALLATION

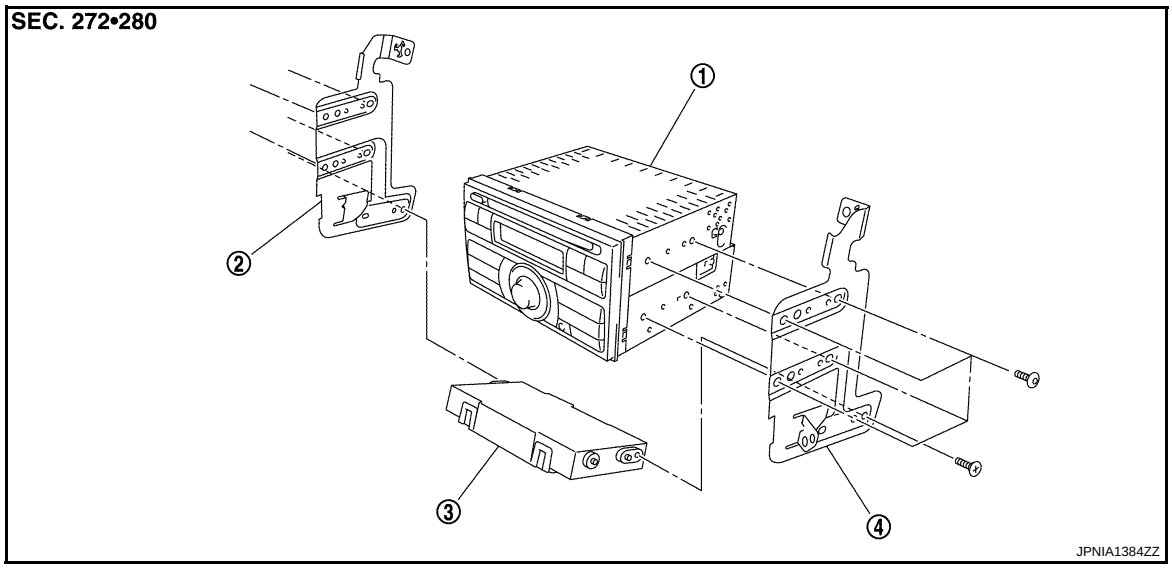
Installation is basically the reverse order of removal.

# A/C AUTO AMP.

## BASE AUDIO

### BASE AUDIO : Exploded View

INFOID:0000000004472028



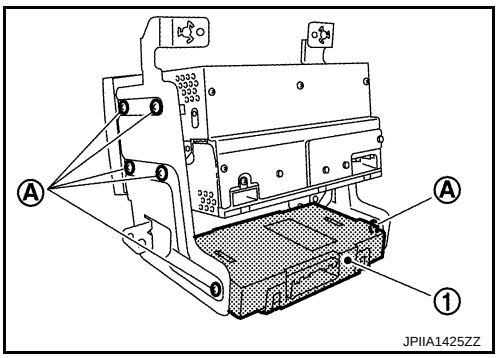

1. Audio unit
2. Bracket LH
3. A/C auto amp.
4. Bracket RH

### BASE AUDIO : Removal and Installation

INFOID:0000000004472029

REMOVAL

1. Remove audio unit. Refer to AV-29, "Exploded View".
2. Remove mounting screws (A), and then remove A/C auto amp. (1).



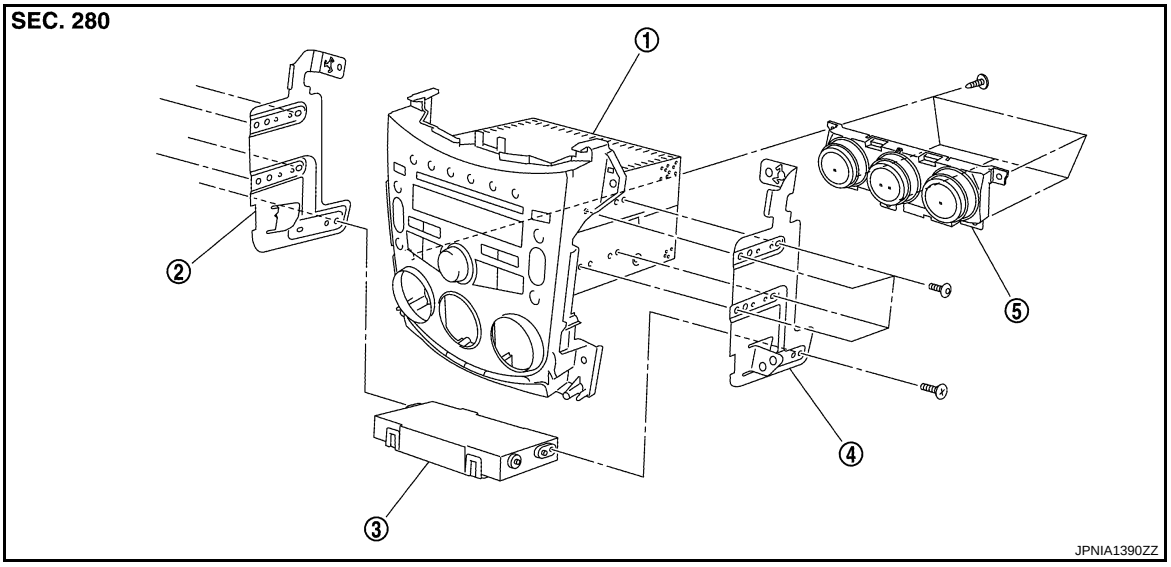

INSTALLATION

Installation is basically the reverse order of removal.

## BOSE AUDIO WITHOUT NAVIGATION

## BOSE AUDIO WITHOUT NAVIGATION : Exploded View

INFOID:0000000004507304




1. Audio unit
2. Bracket LH
3. A/C auto amp.
4. Bracket RH
5. A/C control

## BOSE AUDIO WITHOUT NAVIGATION : Removal and Installation

INFOID:0000000004501088

### REMOVAL

1. Remove audio unit. Refer to AV-140, "Exploded View".
2. Remove mounting screws, and then remove A/C auto amp.

### INSTALLATION

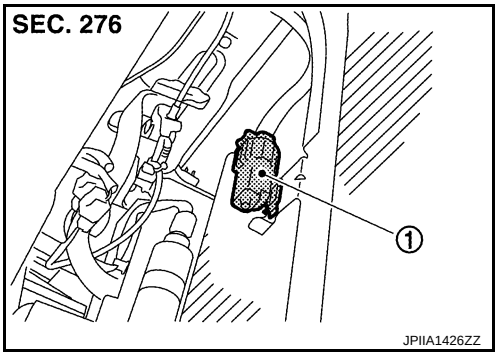
Installation is basically the reverse order of removal.

# AMBIENT SENSOR

## Exploded View

INFOID:0000000004472030

1. Ambient sensor

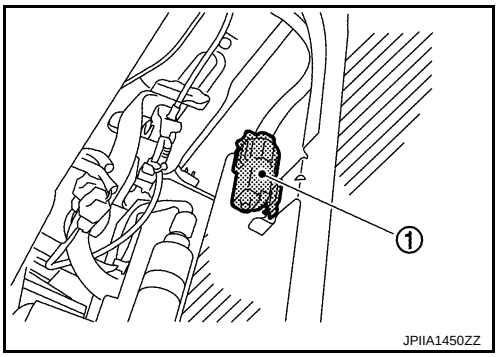



## Removal and Installation

INFOID:0000000004472031

### REMOVAL

1. Remove the engine under cover. Refer to EXT-28, "ENGINE UNDER COVER : Exploded View".
2. Disconnect ambient sensor connector, and then remove ambient sensor (1) from bracket.



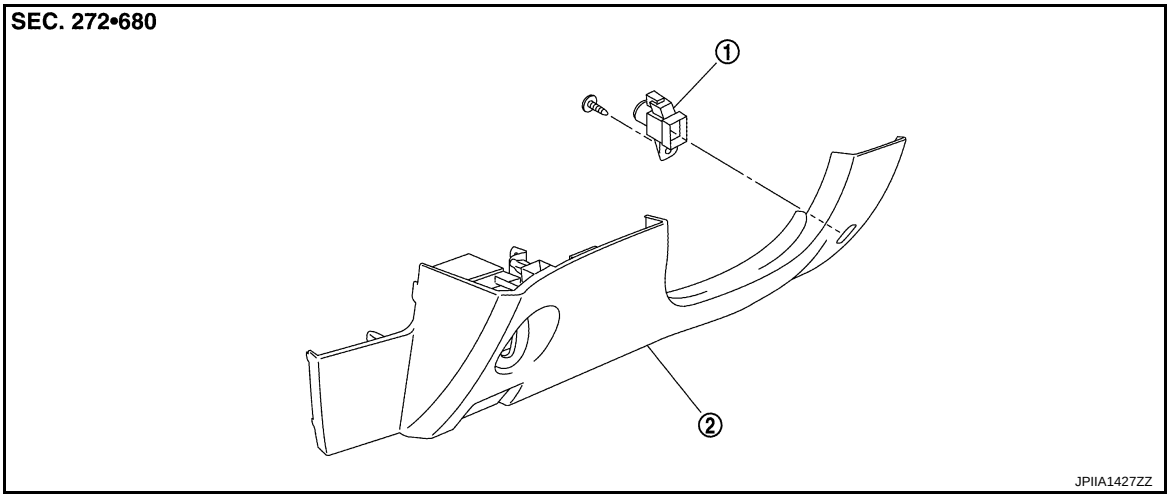

### INSTALLATION

Installation is basically the reverse order of removal.

# IN-VEHICLE SENSOR

## Exploded View

INFOID:0000000004472032



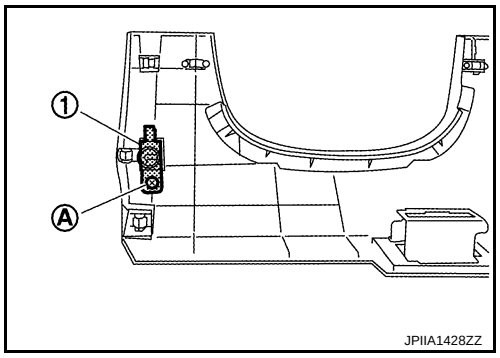

1. In-vehicle sensor
2. Instrument lower panel LH

## Removal and Installation

INFOID:0000000004472033

### REMOVAL

1. Remove instrument lower panel LH. Refer to IP-12, "Exploded View".
2. Remove mounting screw (A), and then remove in-vehicle sensor (1).




### INSTALLATION

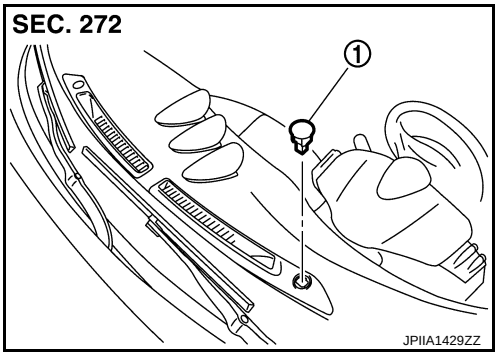
Installation is basically the reverse order of removal.

# SUNLOAD SENSOR

## Exploded View

INFOID:0000000004472034

1. Sunload sensor




## Removal and Installation

INFOID:0000000004472035

### REMOVAL

Disconnect sunload sensor connector, and then remove sunload sensor.

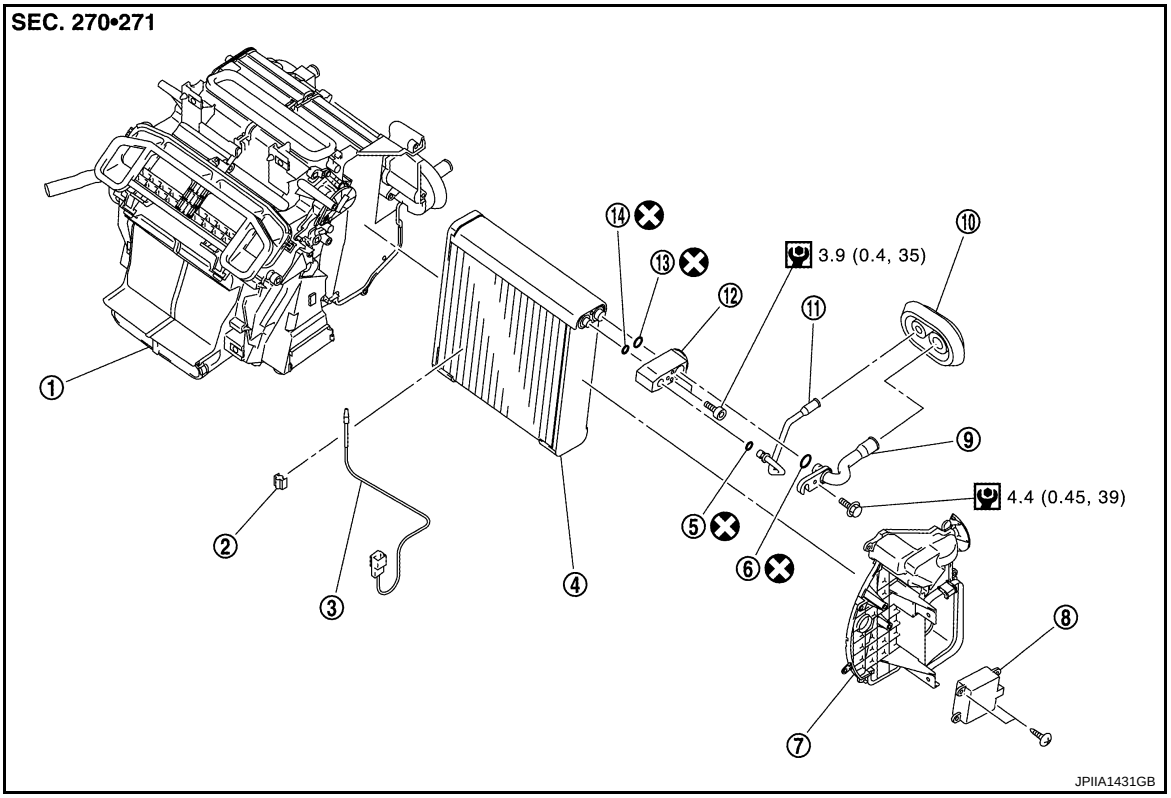
### INSTALLATION

Installation is basically the reverse order of removal.

# INTAKE SENSOR

## Exploded View

INFOID:0000000004472036




1. Heater & cooling unit assembly
2. Intake sensor bracket
3. Intake sensor
4. Evaporator
5. O-ring
6. O-ring
7. Evaporator cover
8. Air mix door motor
9. Low-pressure evaporator pipe
10. Cooler pipe grommet
11. High-pressure evaporator pipe
12. Expansion valve
13. O-ring
14. O-ring

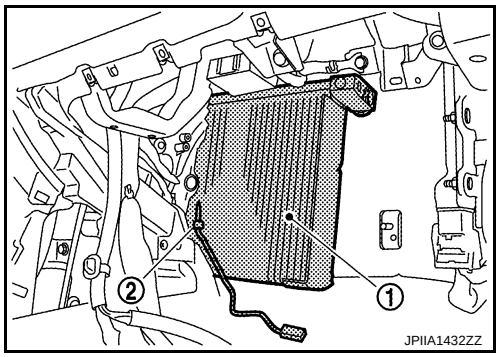
Refer to GI-4, "Components" for symbols in the figure.

## Removal and Installation

INFOID:0000000004472037

### REMOVAL

1. Remove high-pressure evaporator pipe and low-pressure evaporator pipe. Refer to HA-48, "Exploded View".
2. Disconnect intake sensor connector.
3. Slide evaporator (1) toward the right side of the vehicle (as shown in the figure), and then remove intake sensor (2).




### INSTALLATION

Installation is basically the reverse order of removal.

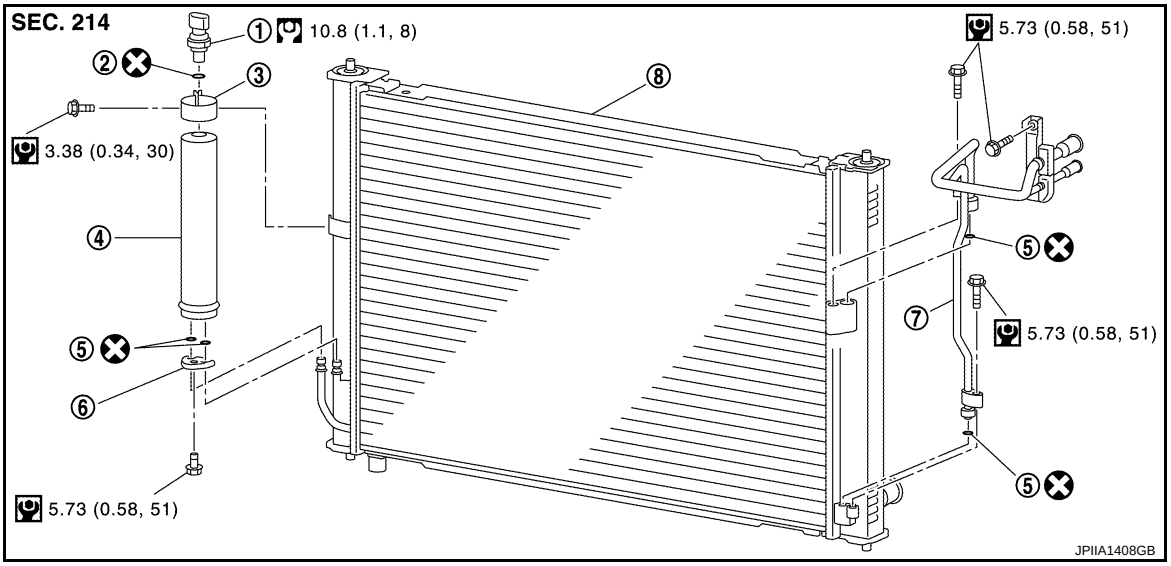
**CAUTION:**

- **Replace O-rings with new ones. Then apply the compressor oil to them when installing.**
- **Mark the mounting position of intake sensor bracket prior to removal so that the reinstalled sensor can be located in the same position.**
- **Never rotate the bracket insertion part when removing and installing the intake sensor.**
- **Check for leakages when recharging refrigerant. Refer to HA-23, "Leak Test".**

# REFRIGERANT PRESSURE SENSOR

## Exploded View

INFOID:0000000004501235




1. Refrigerant pressure sensor
2. O-ring
3. Liquid tank bracket
4. Liquid tank
5. O-ring
6. Bracket
7. Condenser pipe assembly
8. Radiator & condenser assembly

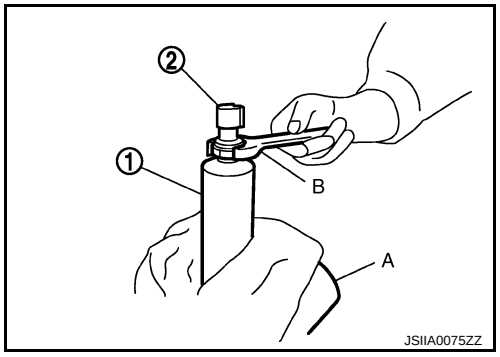
Refer to GI-4, "Components" for symbols in the figure.

## Removal and Installation

INFOID:0000000004534601

### REMOVAL

1. Remove liquid tank. Refer to HA-39, "Exploded View".
2. Fix the liquid tank (1) with a vise (A). Remove the refrigerant pressure sensor (2) with a wrench (B).
   **CAUTION:**
   **Be careful not to damage liquid tank.**




### INSTALLATION

Installation is basically the reverse order of removal.

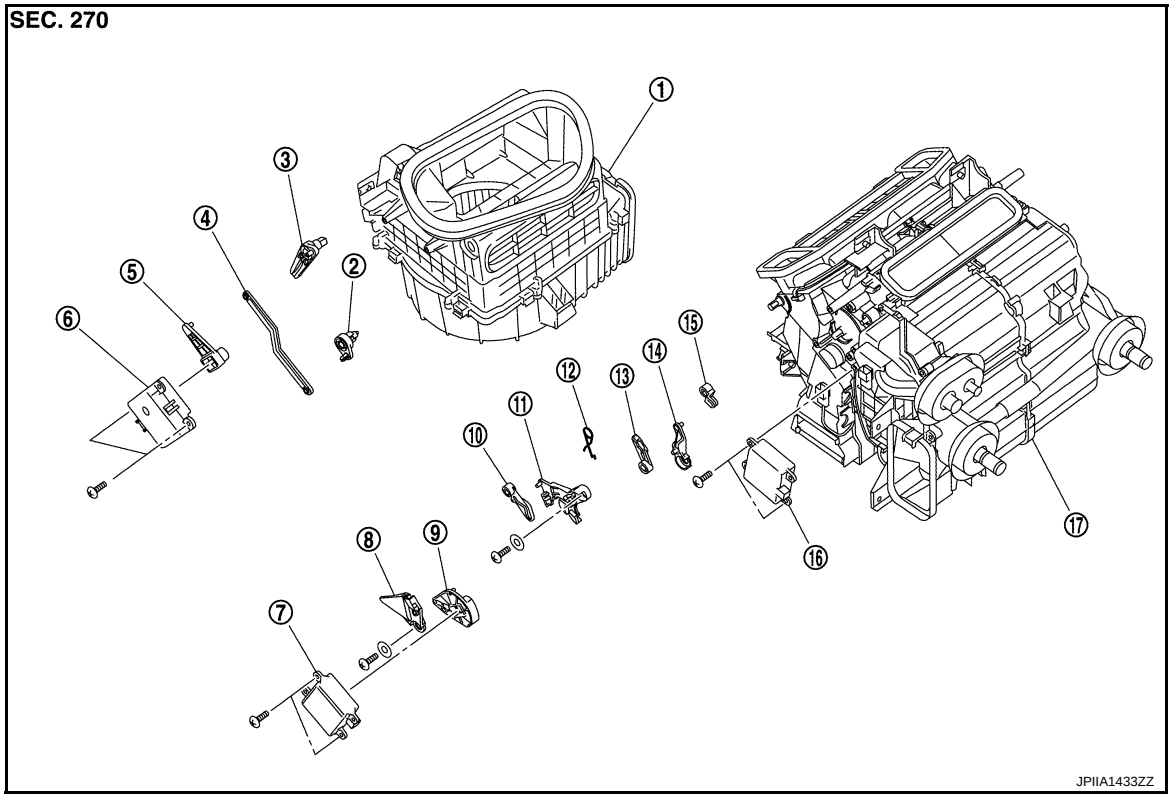
**CAUTION:**

- **Replace O-ring with new one. Then apply compressor oil to them when installing.**
- **Check for leakages when recharging refrigerant. Refer to HA-23, "Leak Test".**

# DOOR MOTOR

## Exploded View

INFOID:0000000004472040




1. Bower unit
2. Intake door lever 3
3. Intake door lever 1
4. Intake door link
5. Intake door lever 2
6. Intake door motor
7. Mode door motor
8. Ventilator door link
9. Main link
10. Ventilator door lever
11. Main link sub
12. Ventilator door lever spring
13. Max. cool door lever
14. Defroster door link
15. Defroster door lever
16. Air mix door motor
17. Heater & cooling unit assembly

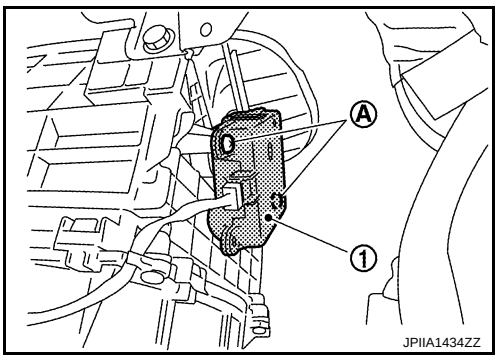
# INTAKE DOOR MOTOR

## INTAKE DOOR MOTOR : Removal and Installation

INFOID:0000000004472041

### REMOVAL

1. Remove instrument lower panel RH. Refer to IP-12, "Exploded View".
2. Remove ECM.
3. Remove mounting screws (A), and then remove intake door motor (1).
4. Disconnect intake door motor connector.




### INSTALLATION

Installation is basically the reverse order of removal.

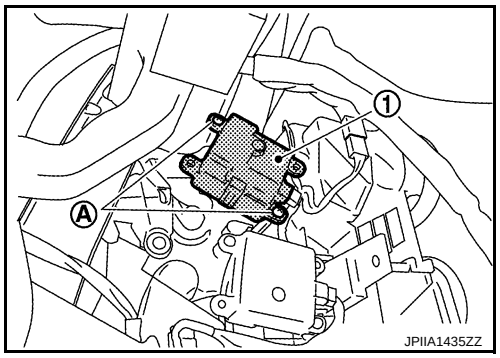
## MODE DOOR MOTOR

### MODE DOOR MOTOR : Removal and Installation

INFOID:0000000004472042

REMOVAL

1. Remove blower unit. Refer to VTL-11, "Exploded View".
2. Remove mounting screws (A), and then remove mode door motor (1).
3. Disconnect mode door motor connector.




INSTALLATION

Installation is basically the reverse order of removal.

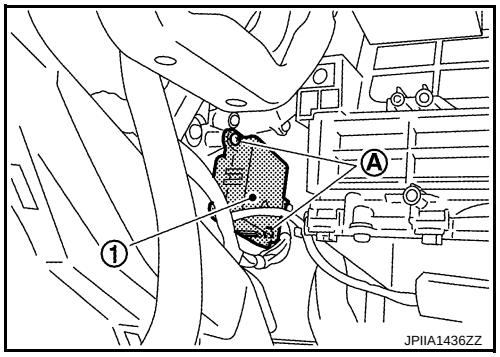
## AIR MIX DOOR MOTOR

### AIR MIX DOOR MOTOR : Removal and Installation

INFOID:0000000004472044

REMOVAL

1. Set the temperature at 18.0°C (60°F).
   **CAUTION:**
   **The angle may be out, when installing the air mix door motor to the air mix door, unless the above procedure is performed.**
2. Disconnect the battery cable from the negative terminal.
3. Remove instrument lower panel RH. Refer to IP-12, "Exploded View".
4. Remove mounting screws (A), and then remove air mix door motor (1).
5. Disconnect air mix door motor connector.




INSTALLATION

Installation is basically the reverse order of removal.

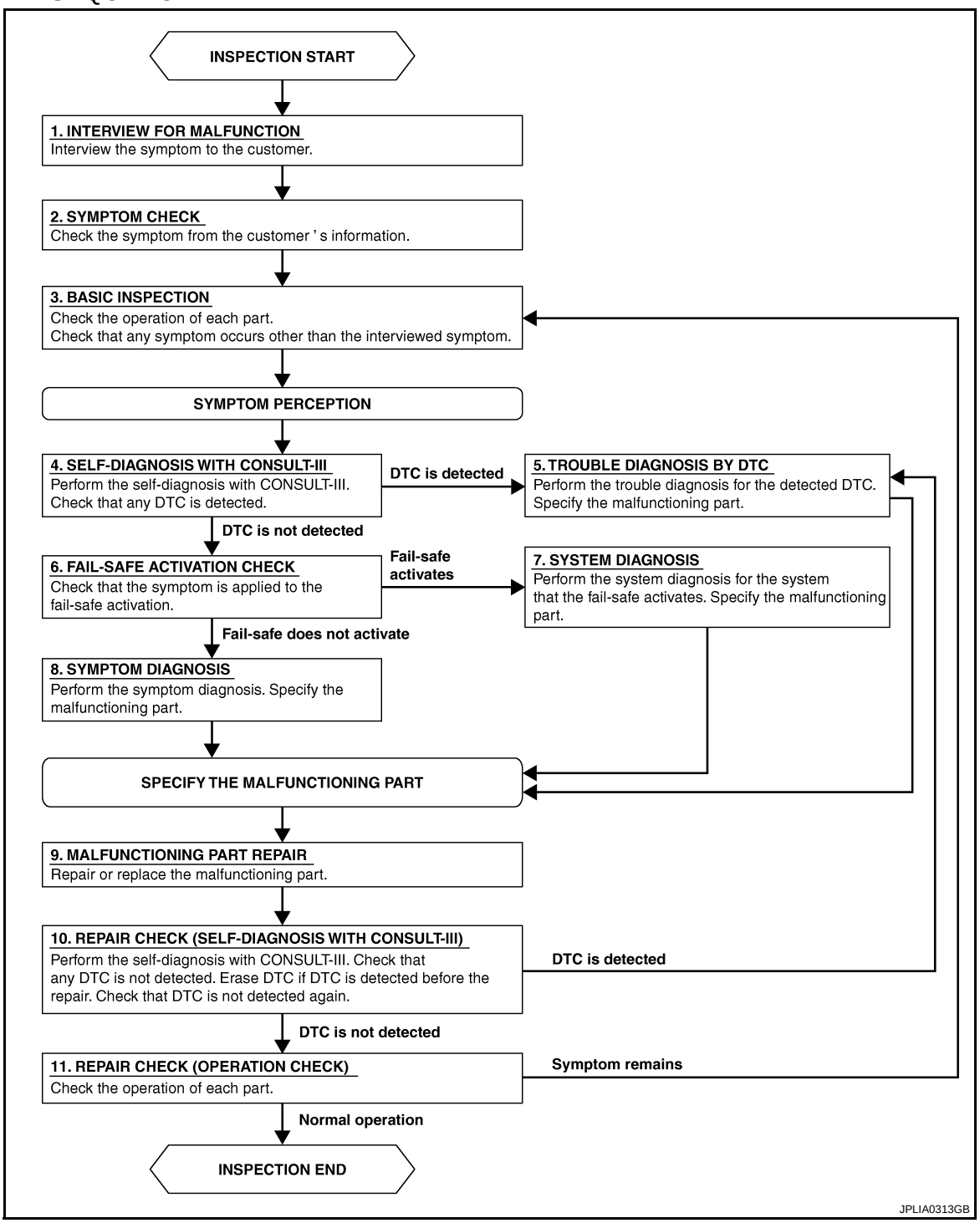
# BASIC INSPECTION

## DIAGNOSIS AND REPAIR WORK FLOW

### Work Flow

INFOID:0000000004517182

#### OVERALL SEQUENCE




#### DETAILED FLOW

### 1.INTERVIEW FOR MALFUNCTION

Interview the symptom to the customer.

>> GO TO 2.

## 2.SYMPTOM CHECK

Check the symptom from the customer's information.

>> GO TO 3.

## 3.BASIC INSPECTION

Check the operation of each part. Check that any symptom occurs other than the interviewed symptom.

>> GO TO 4.

## 4.SELF-DIAGNOSIS WITH CONSULT-III

Perform the self-diagnosis with CONSULT-III. Check that any DTC is detected.

Is any DTC detected?

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

## 5.TROUBLE DIAGNOSIS BY DTC

Perform the trouble diagnosis for the detected DTC. Specify the malfunctioning part.

>> GO TO 9.

## 6.FAIL-SAFE ACTIVATION CHECK

Check that the symptom is applied to the fail-safe activation.

Does the fail-safe activate?

YES >> GO TO 7.
NO >> GO TO 8.

## 7.SYSTEM DIAGNOSIS

Perform the system diagnosis for the system that the fail-safe activates. Specify the malfunctioning part.

>> GO TO 9.

## 8.SYMPTOM DIAGNOSIS

Perform the symptom diagnosis. Specify the malfunctioning part.

>> GO TO 9.

## 9.MALFUNCTION PART REPAIR

Repair or replace the malfunctioning part.

>> GO TO 10.

## 10.REPAIR CHECK (SELF-DIAGNOSIS WITH CONSULT-III)

Perform the self-diagnosis with CONSULT-III. Check that any DTC is not detected. Erase DTC if DTC is detected before the repair. Check that DTC is not detected again.

Is any DTC detected?

YES >> GO TO 5.
NO >> GO TO 11.

## 11.REPAIR CHECK (OPERATION CHECK)

Check the operation of each part.

Does it operate normally?

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

# INSPECTION AND ADJUSTMENT

## Description & Inspection

INFOID:0000000004471905

### DESCRIPTION

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

**Check condition : Engine running at normal operating temperature.**

### 1.CHECK MEMORY FUNCTION

1. Turn the ignition switch ON.
2. Set temperature control dial to 32.0°C (90°F).
3. Press the OFF switch.
4. Turn the ignition switch OFF.
5. Turn the ignition switch ON.
6. Press the AUTO switch.
7. Check that the set temperature is maintained.

Is the inspection result normal?

YES >> GO TO 2.
NO >> Memory function malfunction. Refer to HAC-168, "Diagnosis Procedure".

### 2.CHECK BLOWER MOTOR

1. Start the engine.
2. Operate the fan control dial. Check that the fan speed changes. Check the operation for all fan speeds.
3. Leave blower on maximum speed.

Is the inspection result normal?

YES >> GO TO 3.
NO >> Blower motor system malfunction. Refer to HAC-140, "Diagnosis Procedure".

### 3.CHECK DISCHARGE AIR

1. Operate MODE switch and 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 VTL-2, "System Description".

Is the inspection result normal?

YES >> GO TO 4.
NO >> Mode door system malfunction. Refer to HAC-133, "Diagnosis Procedure".

### 4.CHECK INTAKE AIR

1. Press intake switch to set the air outlet to recirculation.
2. The REC indicator turns ON.
3. Listen to intake sound and confirm air inlets change.
4. Press intake switch again to set the air outlet to fresh air intake.
5. The FRE indicator turns ON.
6. Listen to intake sound and confirm air inlets change.

Is the inspection result normal?

YES >> GO TO 5.
NO >> Intake door system malfunction. Refer to HAC-135, "Diagnosis Procedure".

### 5.CHECK A/C SWITCH

1. Press the A/C switch.
2. Check that the indicator of the A/C switch turns ON. Check visually and by sound that the compressor operates.
3. Press the A/C switch again.
4. Check that the indicator of the A/C switch turns OFF. Check that the compressor stops.

Is the inspection result normal?

YES >> GO TO 6.
NO >> Magnet clutch system malfunction. Refer to HAC-144, "Diagnosis Procedure".

## 6.CHECK DISCHARGE AIR TEMPERATURE

Operate the temperature control dial. Check that the discharge air temperature changes.

Is the inspection result normal?

YES >> GO TO 7.
NO >> Air mix door malfunction. Refer to HAC-131, "Diagnosis Procedure".

## 7.CHECK TEMPERATURE DECREASE

1. Operate the compressor.
2. Operate the temperature control dial and lower the set temperature to 18.0°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. Refer to HAC-161, "Diagnosis Procedure".

## 8.CHECK TEMPERATURE INCREASE

1. Turn temperature control dial and raise temperature setting to 32.0°C (90°F) after warming up the engine.
2. Check that warm air blows from outlets.

Is the inspection result normal?

YES >> GO TO 9.
NO >> Insufficient heating. Refer to HAC-163, "Diagnosis Procedure".

## 9.CHECK AUTO MODE

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

Is the inspection result normal?

YES >> INSPECTION END
NO >> Refer to HAC-160, "Diagnosis Chart By Symptom" and perform the appropriate diagnosis.

# Temperature Setting Trimmer

INFOID:0000000004517530

## DESCRIPTION

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

## HOW TO SET

With CONSULT-III
Perform “TEMP SET CORRECT” of HVAC work support item.

| 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 –3.0°C (–6°F) is corrected on the temperature setting set as 25.0°C (77°F), the temperature controlled by A/C auto amp. is 25.0°C (77°F) – 3.0°C (–6°F) = 22.0°C (72°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 set temperature and control temperature may be cancelled.

## Foot Position Setting Trimmer

INFOID:0000000004517531

### DESCRIPTION
In FOOT mode, the air blowing to DEF can change ON/OFF.

### HOW TO SET
With CONSULT-III
Perform the “BLOW SET” of HVAC work support item.

| Work support items | Display | Defroster 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:0000000004517532

### DESCRIPTION
- If the ignition switch is turned to the OFF position while the FRE indicator is set to ON (fresh air intake), “Perform the memory” or “Do not perform the memory” of FRE indicator ON (fresh air intake) condition can be selected.
- If “Perform the memory” was set, the FRE indicator 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

With CONSULT-III
Perform the “FRE MEMORY SET” of HVAC work support item.

| 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 memory function may be cancelled.

## Inlet Port Memory Function (REC)

INFOID:0000000004517533

### DESCRIPTION

- If the ignition switch is turned to the OFF position while the REC indicator is set to ON (recirculation), “Perform the memory” or “Do not perform the memory” of REC indicator ON (recirculation) condition can be selected.
- If “Perform the memory” was set, the REC indicator 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

With CONSULT-III
Perform the “REC MEMORY SET” of HVAC work support item.

| 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 memory function may be cancelled.

# SYSTEM DESCRIPTION

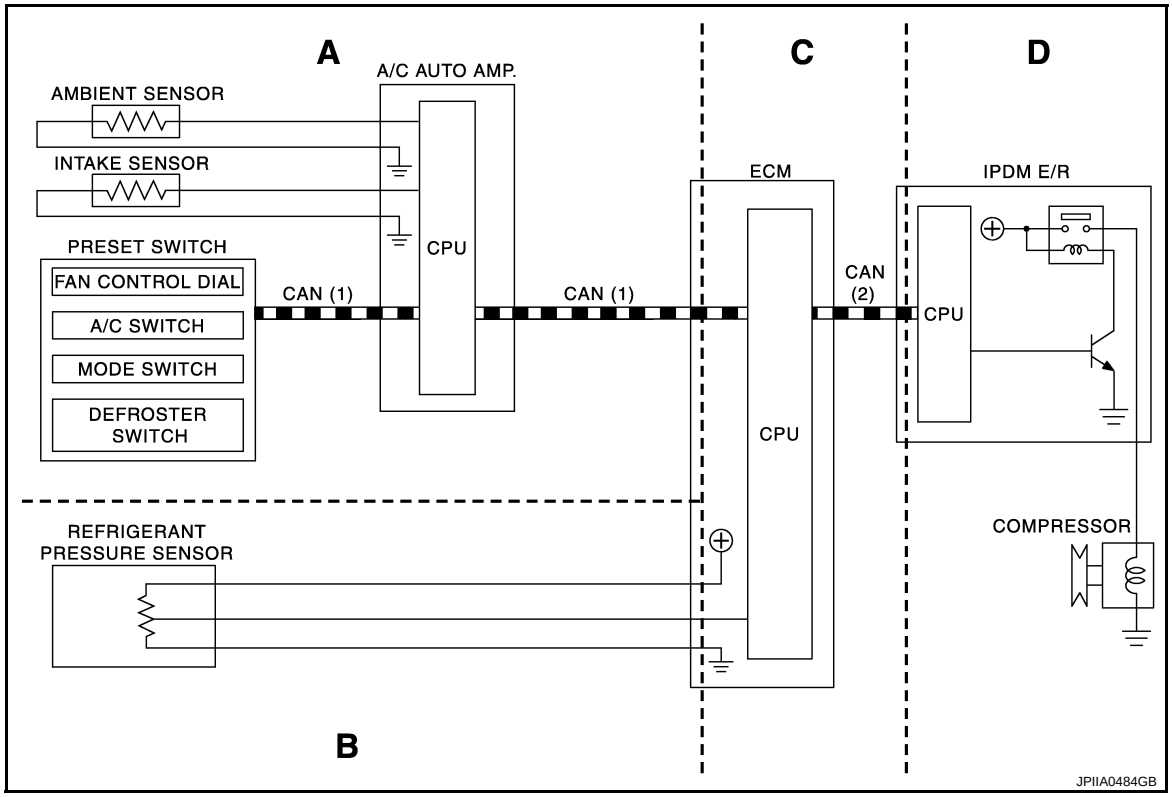
## COMPRESSOR CONTROL FUNCTION

### Description

INFOID:0000000004780981

#### PRINCIPLE OF OPERATION

Functional circuit diagram




CAN (1) : A/C ON switch signal
: Blower fan ON 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:0000000004780984

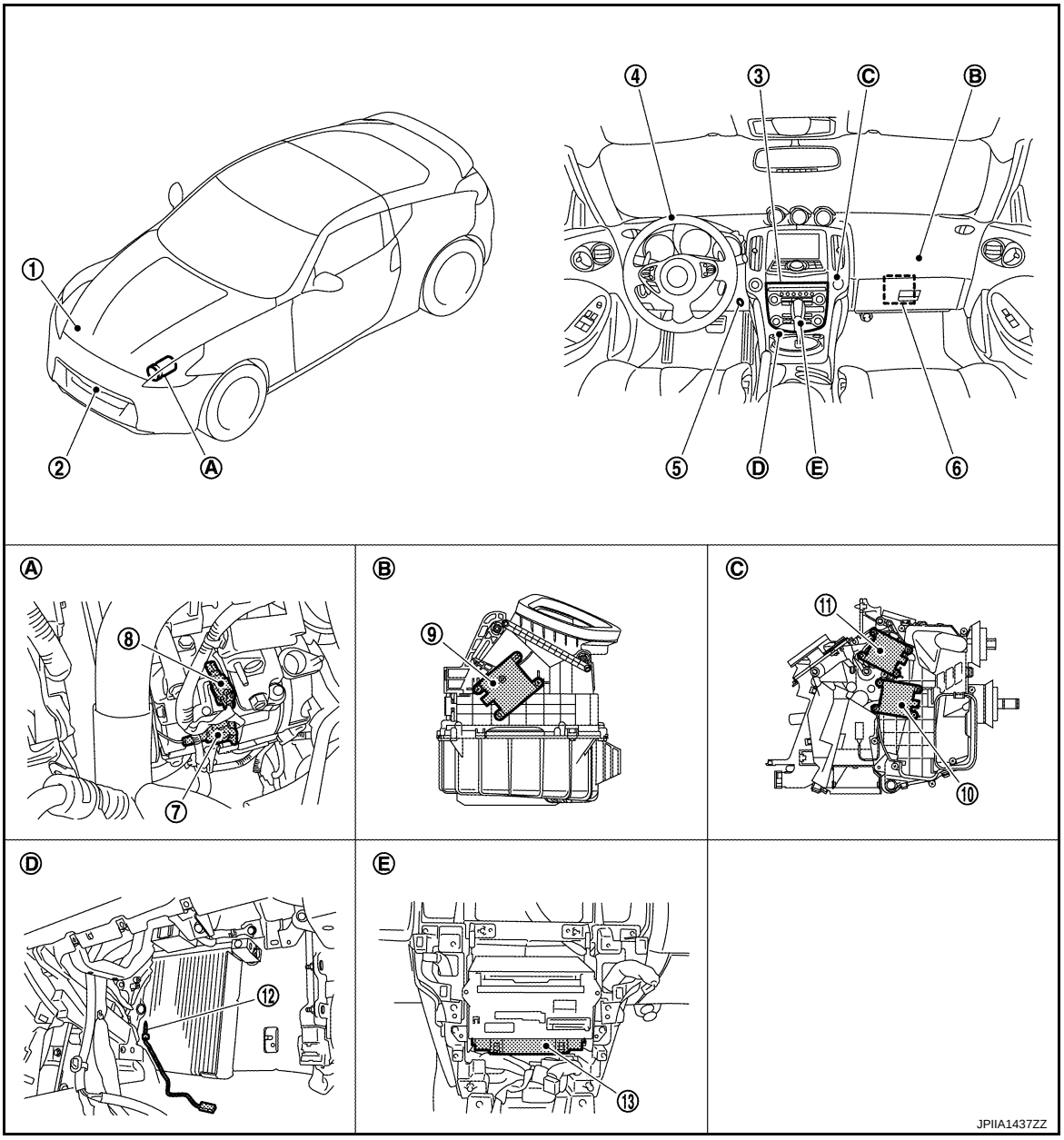
#### FAIL-SAFE FUNCTION

When a communication malfunction between A/C auto amp. and AV control unit and preset switch continued for approximately 30 seconds or more, control the air conditioner under the following conditions.

| | |
|---|---|
| **Compressor** | **: ON** |
| **Air outlet** | **: AUTO** |
| **Air inlet** | **: FRE (Fresh air intake)** |
| **Fan speed** | **: AUTO** |
| **Preset temperature** | **: Setting before communication malfunction** |

## Component Parts Location

INFOID:0000000004780982




1. Refrigerant pressure sensor
2. Ambient sensor
3. Preset switch
4. Sunload sensor
5. In-vehicle sensor
6. Blower motor
7. Magnet clutch
8. ECV
9. Intake door motor
10. Air mix door motor
11. Mode door motor
12. Intake sensor
13. A/C auto amp.

A. Installed on the compressor
B. Installed to the blower unit assembly (RH)
C. Installed to the heater & cooling unit assembly (RH)
D. Located on the evaporator
E. Behind of the cluster lid C

## Component Description

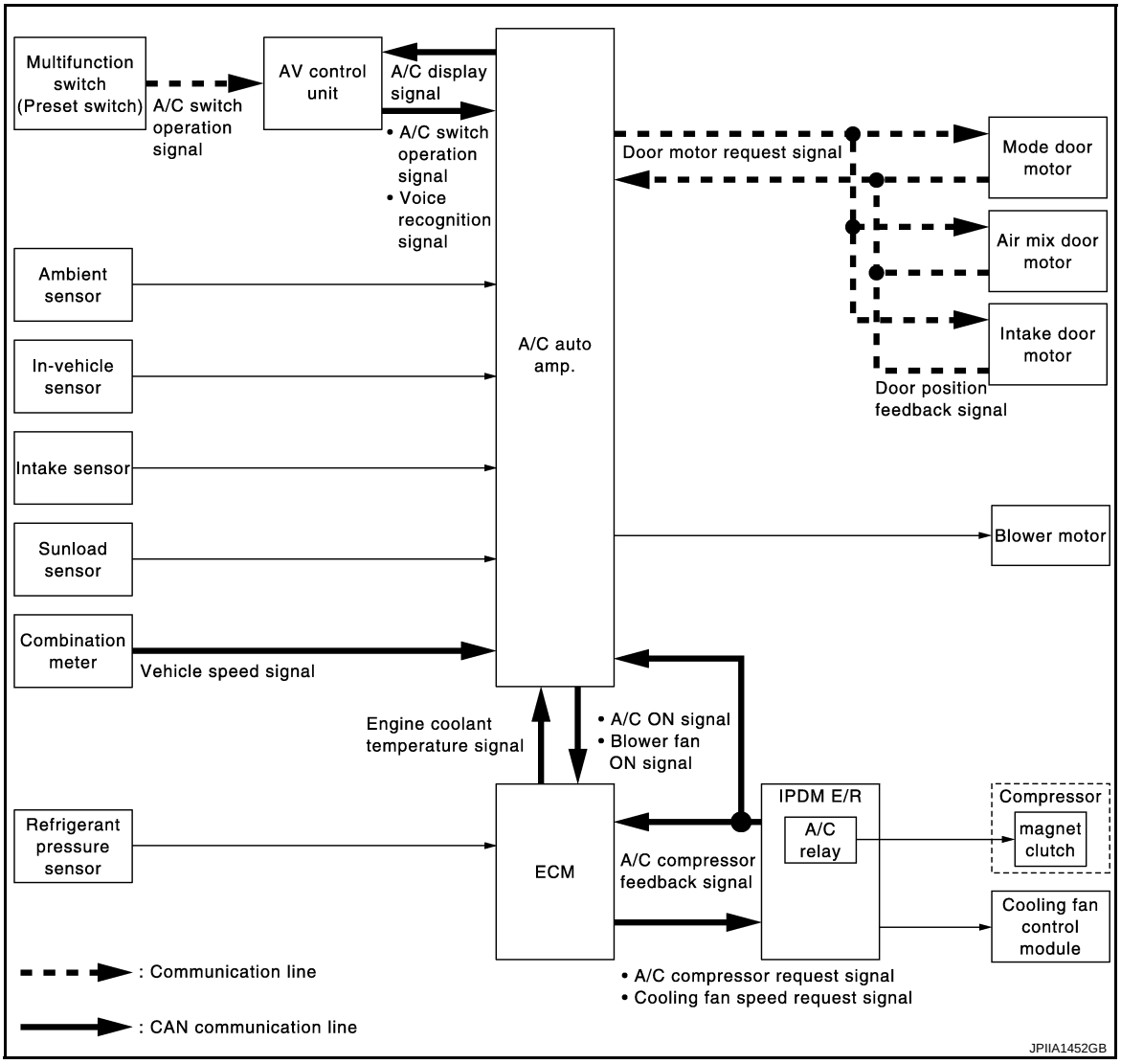
INFOID:0000000004780983

| Component | Description |
|---|---|
| Ambient sensor | HAC-118, "Description" |
| In-vehicle sensor | HAC-121, "Description" |
| Intake sensor | HAC-124, "Description" |
| Sunload sensor | HAC-127, "Description" |
| Air mix door motor | HAC-130, "Description" |
| Mode door motor | HAC-132, "Description" |
| Intake door motor | HAC-134, "Description" |
| A/C auto amp. | HAC-139, "Description" |
| Blower motor | HAC-140, "Description" |
| Magnet clutch | HAC-144, "Description" |
| ECV | HAC-146, "Description" |
| Refrigerant pressure sensor | EC-506, "Description" |
| Preset switch | The preset switch integrated with the controller for A/C operation and AV switch is installed to the center of the instrument panel. The operation and display data of the preset switch are communicated with the A/C auto amp. through AV control unit via CAN communication. |

# AUTOMATIC AIR CONDITIONER SYSTEM

## System Diagram

INFOID:0000000004517725




## System Description

INFOID:0000000004697784

### OUTLINE

• Automatic air conditioner system is controlled by each function of A/C auto amp., ECM and IPDM E/R.

Control by A/C auto amp.
- Air outlet control
- Temperature control
- Air inlet control
- Air flow control
- Compressor control
- Door motor control (LCU communication control)

Control by ECM
- Cooling fan control. (Refer to EC-72, "System Description".)
- Air conditioning cut control. (Refer to EC-54, "System Description".)

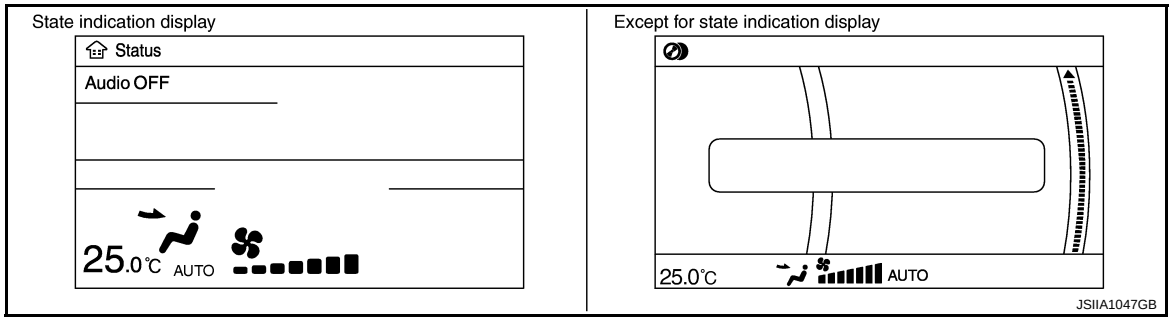
Control by IPDM E/R
- Relay control. (Refer to PCS-3, "System Description".)
- Cooling fan control. (Refer to PCS-6, "System Description".)

- Controller (preset switch) transmits the commands for air conditioner system operation to AV control unit via communication line, then AV control unit transmits the commands to A/C auto amp. via CAN communication. A/C auto amp. transmits each indication information to AV control unit via CAN communication. AV control unit displays each indication information that is received.

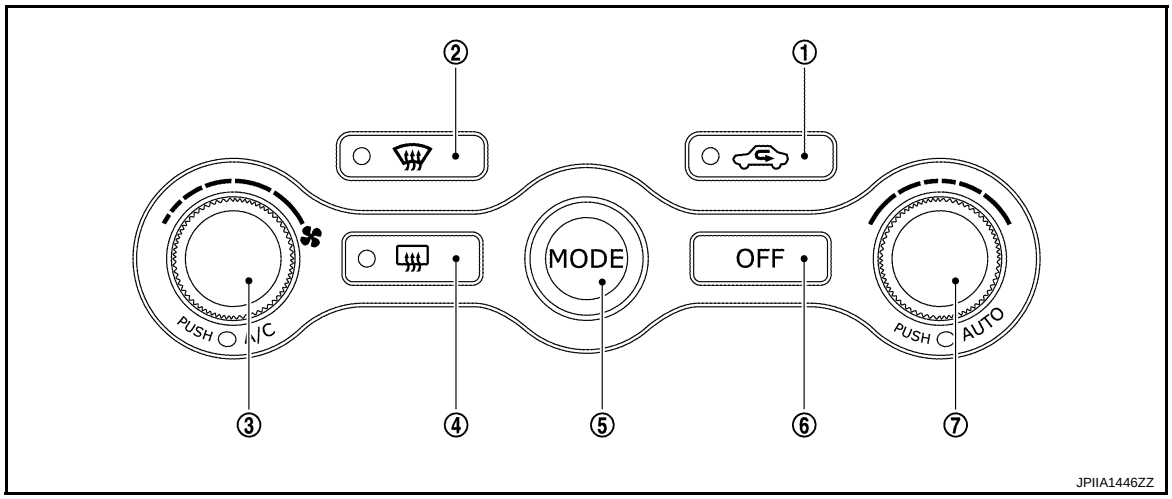
## OPERATION AND DISPLAY

A/C Display

- Air conditioner system state is indicated on the display.
- When “Status” on multifunction switch is pressed while air conditioner system is in the ON position, the display changes to state indication display of air conditioner system. When air conditioner is operated while navigation system or audio system is displayed, air conditioner system state is indicated in the lower portion of display for several seconds.
- When MODE switch is pressed while air conditioner system is in the OFF position, state indication display is indicated for several seconds.




Controller (Preset Switch)




1. Intake switch
2. DEF switch
3. A/C switch / Fan control dial
4. Rear window defogger switch
5. MODE switch
6. OFF switch
7. AUTO switch / Temperature control dial

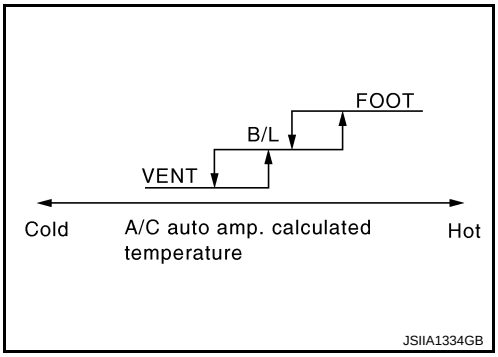
Switch Operation

| | |
|---|---|
| Intake switch | • Selects air inlet between recirculation (REC) ⇔ fresh air intake (FRE) each time.<br>- REC indicator OFF: Fresh air intake<br>- REC indicator ON: Recirculation<br>• Press and held for 2 seconds or more, intake switch indicator blinks 2 times and air inlet is set to automatic control.<br>**NOTE:**<br>• When air conditioner system is in the OFF position, air inlet can be selected.<br>• When MODE switch and DEF switch is in the D/F or DEF position, air inlet cannot be selected to REC. |
| DEF switch | Turns DEF mode (switch indicator) between ON ⇔ OFF each time while air conditioner system is in the ON position.<br>• When DEF mode is turned ON, air conditioner system becomes the following state.<br>- Air outlet: DEF<br>- Compressor: ON<br>- Air inlet: FRE<br>- Blower fan: Automatic control (If fan speed other than AUTO is selected before pressing DEF switch, fan speed is manual control.)<br>• When DEF mode is turned OFF, air conditioner system state returns to the previous state before DEF mode is selected. But, the following state is continued.<br>- A/C switch: ON<br>- Intake switch: FRE<br>When DEF switch is pressed while air conditioner system is in the OFF position.<br>• Air conditioner system is turned ON and becomes the following state.<br>- Air outlet: DEF<br>- Compressor: ON<br>- Air inlet: FRE<br>- Blower fan: Automatic control<br>• When DEF mode is turned OFF, entire air conditioner system is set to auto mode.<br>**NOTE:**<br>When DEF mode turns ON while air conditioner system is in automatic control (“AUTO” is indicated), automatic control is released “AUTO” turns OFF) |
| A/C switch | • Turns the compressor control (A/C switch indicator) between ⇔ OFF each time.<br>• When A/C switch turns OFF, air conditioner system becomes the following state.<br>**NOTE:**<br>• When the compressor control (A/C switch indicator) is in the OFF position, air inlet is fresh air intake (FRE).<br>• When blower motor is in the OFF position, the compressor control cannot be activated. |
| Fan control dial | Selects blower speed is within a range of 1st – 7th speed.<br>**NOTE:**<br>• When fan control dial is rotated while air conditioner system is in the OFF position, air conditioner system is activated.<br>• When fan control dial is operated while air conditioner system is in automatic control (AUTO is indicated), automatic control is released (AUTO turns OFF). |
| Rear window defogger switch | Turns rear window defogger (switch indicator) between ON ⇔ OFF each time.<br>Rear window defogger system details. Refer to DEF-4, "WITH NAVIGATION : System Description". |
| MODE switch | Selects air outlet sequentially from VENT⇒B/L⇒FOOT⇒D/F⇒VENT each time.<br>**NOTE:**<br>• When air conditioner system is in the OFF position, air outlet can be selected<br>• When MODE switch is pressed while air conditioner system is in automatic control (“AUTO” is indicated), automatic control is released (“AUTO” turns OFF). |
| OFF switch | • Turns air conditioner system OFF.<br>• When air conditioner system turns OFF, air inlet and air outlet become the following state.<br>- Air inlet: FRE (except REC is manually selected.)<br>- Air outlet: FOOT |

| | |
|---|---|
| AUTO switch | Turns the switch indicator lamp and "AUTO" indicator on the display ON, and then air conditioner system starts automatic control.<br>**NOTE:**<br>When air outlet is not selected manually, air outlet changes to automatic control. |
| Temperature control dial | Selects set temperature within a range between 18.0° (60°F) – 32.0°C (90°F) at a rate of 0.5°C (1.0°F) each time the dial is rotated.<br>• Clockwise rotation: Set temperature increases.<br>• Counterclockwise rotation: Set temperature decreases.<br>**NOTE:**<br>When air conditioner system is in the OFF position, set temperature can be selected only while air conditioner system state (when MODE switch is pressed) is indicated on the display. |

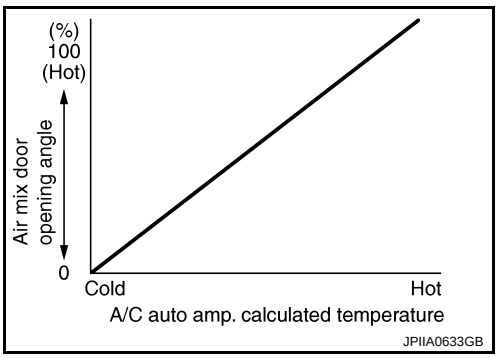
## AIR OUTLET CONTROL

- While air outlet is in automatic control, A/C auto amp. selects the mode door position depending on a target air mix door angle and outlet air temperature calculated from sunload.
- If ambient temperature is excessively low, D/F is selected to prevent windshield fogging when air outlet is set to FOOT.



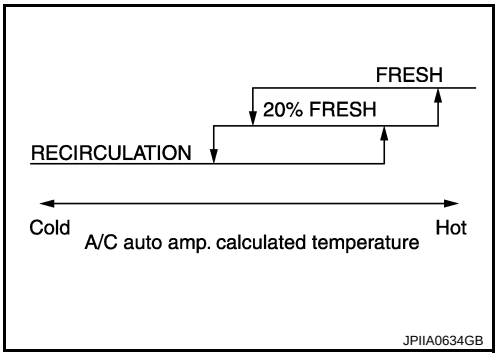

## TEMPERATURE CONTROL

- When ignition switch is in the ON position, A/C auto amp. always automatically controls temperature regardless of air conditioner operational state.
- A/C auto amp. calculates the target air mix door opening angle depending on set temperature, in-vehicle temperature, ambient temperature, and sunload.
- Air mix door is controlled depending on the comparison of current air mix door opening angle and target air mix door opening angle.
- Regardless of in-vehicle temperature, ambient temperature, and sunload, air mix door is fixed at the fully cold position when set temperature is 18.0°C (60°F), and at the fully hot position when set temperature is 32.0°C (90°F).




## AIR INLET FUNCTION

While air inlet is in automatic control, A/C auto amp. selects air inlet (fresh air intake, 20% fresh air intake, or recirculation) depending on set temperature, in-vehicle temperature, and ambient temperature.



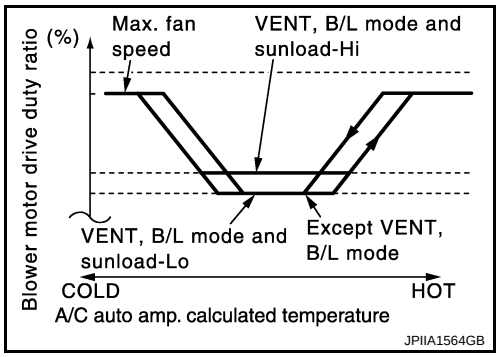

## AIR FLOW CONTROL

Description

- A/C auto amp. changes duty ratio of blower motor drive signal and controls air flow continuously. When air flow is increased, duty ratio of blower motor drive signal gradually increases to prevent a sudden increase in air flow.
- In addition to manual control and automatic control, air flow control is compose of starting fan speed control, low coolant temperature starting control, high in-vehicle temperature starting control, fan speed control at door motor operation, and fan speed control at voice recognition.

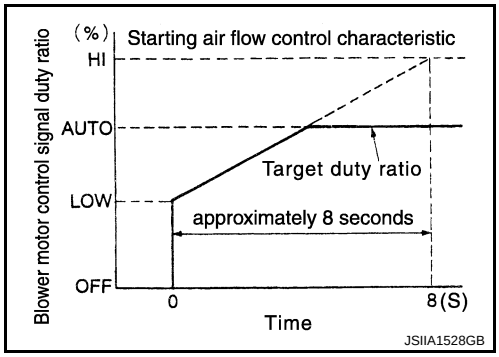
Automatic Air Flow Control

- A/C auto amp. decides target air flow depending on target air mix door opening angle.
- A/C auto amp. changes duty ratio of blower motor drive signal and controls air flow continuously so that air flow matches to target air flow.
- When air outlet is VENT or B/L, the minimum air flow is changed depending on sunload.



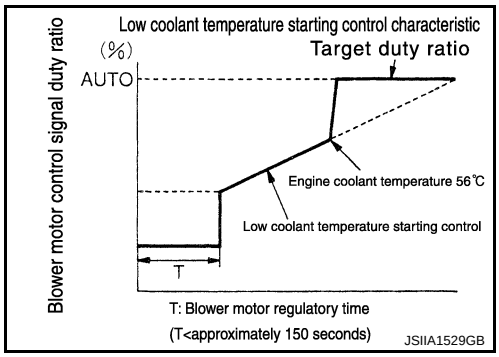

Starting Fan Speed Control

When blower motor is activated, A/C auto amp. gradually increases duty ratio of blower fan drive signal to prevent a sudden increase in discharge air flow. (It takes approximately 8 seconds for air flow to reach HI from LOW)




Low Coolant Temperature Starting Control

If the engine coolant temperature is 56°C (133°F) or less, to prevent a cold discharged air flow, A/C auto amp. suspends blower motor activation for the maximum 150 seconds depending on target air mix door opening angle. After this, blower fan drive signal is increased gradually, and blower motor is activated.




High In-vehicle Temperature Starting Control

When evaporator temperature is high [intake air temperature sensor value is 35°C (95°F) or more], to prevent a hot discharged air flow, A/C auto amp. suspends blower motor activation for approximately 3 seconds so that evaporator is cooled by refrigerant.

Fan speed Control at Door Motor Operation

When mode door motor is activated while air flow is more than the specified value, A/C auto amp. reduces temporarily fan speed so that mode door moves smoothly.

Fan speed Control at Voice Recognition

When the voice control (voice command) switch is operated during air flow automatic control, A/C auto amp. decreases the air flow of the blower motor once and controls the air flow so as not to disturb the voice recognition function. This control continues while voice recognition function is operating.

## COMPRESSOR CONTROL

Description

- When the compressor activation condition is satisfied while blower motor is activated, A/C auto amp. transmits A/C ON signal and blower fan ON signal to ECM via CAN communication.

- ECM judges that the compressor can be activated depending on each sensors state (refrigerant pressure sensor signal, throttle opening angle sensor signal, and others). And transmits air conditioner relay control signal to IPDM E/R via CAN communication.
- IPDM E/R turns air conditioner relay ON and activates the compressor depending on request from ECM.

Compressor Protection Control at Pressure Malfunction

When high-pressure side value that is detected by refrigerant pressure sensor is as per the following state, ECM requests IPDM E/R to turn air conditioner relay OFF and stops the compressor.

- 3.12 MPa (31.8 kg/cm$^2$·G) or more (When the engine speed is less than 1,500 rpm)
- 2.74 MPa (27.9 kg/cm$^2$·G) or more (When the engine speed is 1,500 rpm or more)
- 0.14 MPa (1.4 kg/cm$^2$·G) or less

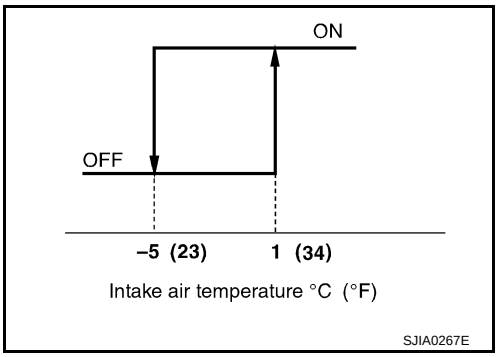
Compressor Oil Circulation Control

When the engine starts while the engine coolant temperature is 56°C (133°F) or less, ECM activates the compressor for approximately 6 seconds and circulates the compressor lubricant once.

Low Temperature Protection Control

When intake air temperature sensor detects that air temperature after passing through evaporator is –5°C (23°F) or less, A/C auto amp. requests ECM to turn the compressor OFF, and stops the compressor.

When the air temperature returns to 1°C (34°F) or more, the compressor is activated.



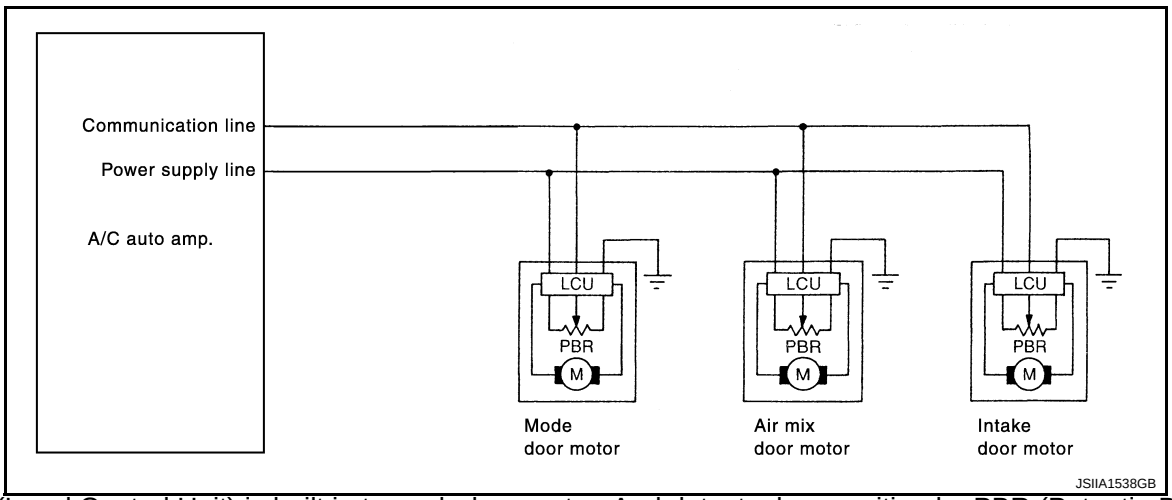

Operating Rate Control

When set temperature is other than fully cold or air outlet is “VENT”, “B/L” or “FOOT” A/C auto amp. controls the compressor activation depending on ambient temperature.

Air Conditioner Cut Control

When the engine is running in excessively high load condition, ECM requests IPDM E/R to turn air conditioner relay OFF, and stops the compressor. Refer to EC-54, "System Description" for details.

## DOOR MOTOR CONTROL



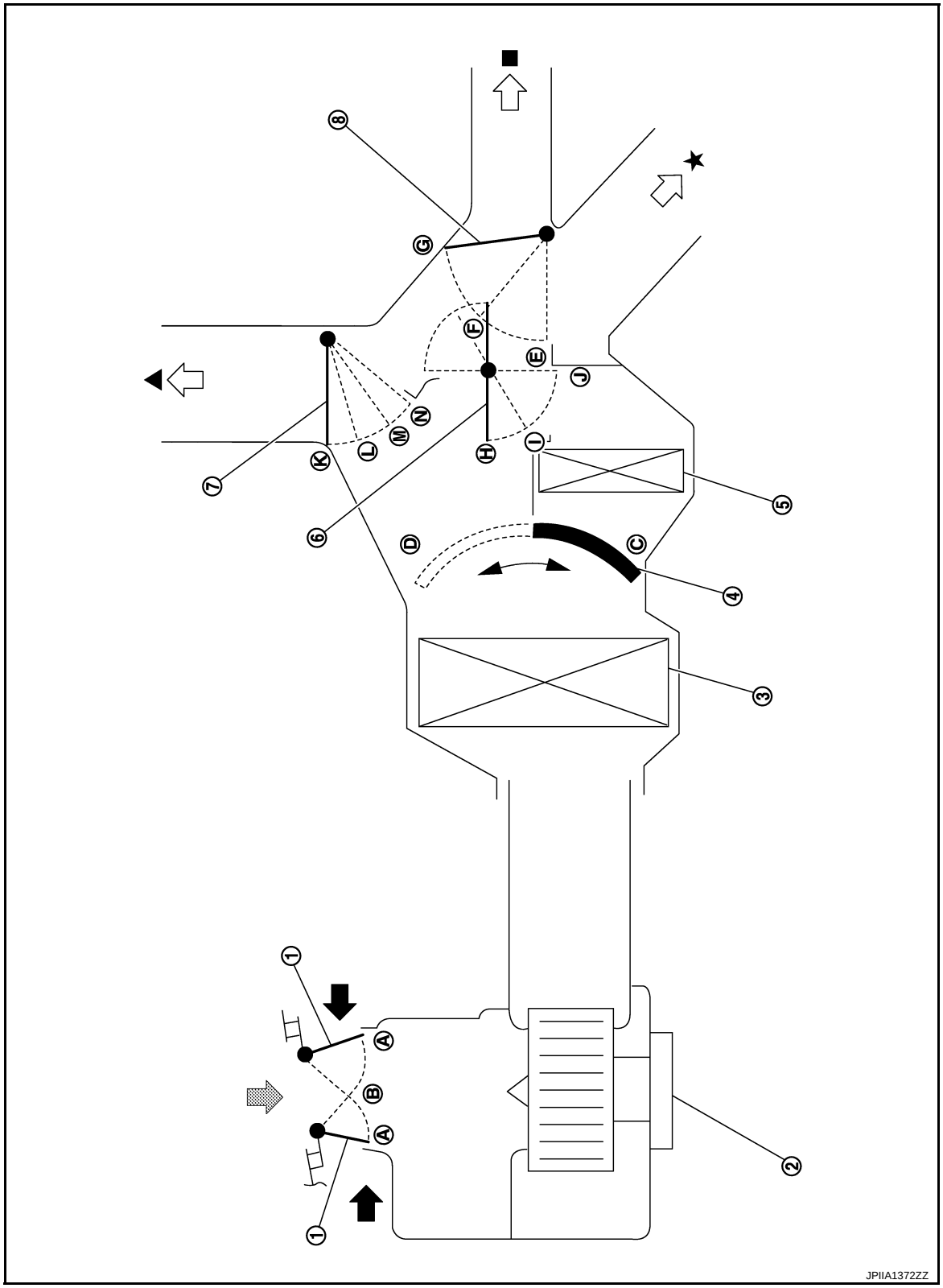

- LCU (Local Control Unit) is built in to each door motor. And detects door position by PBR (Potentio Balance Resistor).
- A/C auto amp. communicates with each LCU via communication line. And receives each door position signal from each LCU.
- Each LCU controls each door to the appropriate position depending on the control signal from A/C auto amp. when the door movement is complete, transmits the signal of door movement completion to A/C auto amp.

## FAIL-SAFE CONTROL

When a communication malfunction occurs between A/C auto amp. and AV control unit or preset switch for 30 seconds or more, A/C auto amp. automatically controls air outlet and fan speed, fixes air inlet to fresh air intake, maintains set temperature data before the communication malfunction, and activates the compressor. Even if the condition before the communication error occurs is A/C OFF, A/C auto amp. turns the compressor ON with following conditions.

| | |
|---|---|
| **Compressor** | **: ON** |
| **Air outlet** | **: AUTO** |
| **Air inlet** | **: FRE (Fresh air intake)** |
| **Fan speed** | **: AUTO** |
| **Preset temperature** | **: Setting before communication malfunction** |

SWITCHES AND THEIR CONTROL FUNCTIONS




1. Intake door
2. Blower motor
3. Evaporator
4. Air mix door
5. Heater core
6. Max. cool door
7. Defroster door
8. Ventilator door

⇦ Fresh air intake
⬅ Recirculation air
▲ Defroster
■ Ventilator
★ Foot

| Switch /Dial position | | | DOOR position | | | | |
|---|---|---|---|---|---|---|---|
| | | | Ventilator door | Max. cool door | Defroster door | Intake door | Air mix door |
| AUTO switch | ON | | AUTO | | | | |
| Mode switch | | | E | H | K | — | — |
| | | | F | I | | | |
| | | | G | J | L | | |
| | | | | | M | A | |
| DEF switch | | ON | | | N | A | |
| Intake switch | | ON | | | | B* | |
| | | OFF | | | | A* | |
| Temperature control dial | Full cold 18.0°C (60°F) | | — | — | — | — | C |
| | 18.5°C -31.5°C (61°F - 89°F) | | | | | | AUTO |
| | Full hot 32.0°C (90°F) | | | | | | D |
| OFF switch | | | G | J | L | A | — |

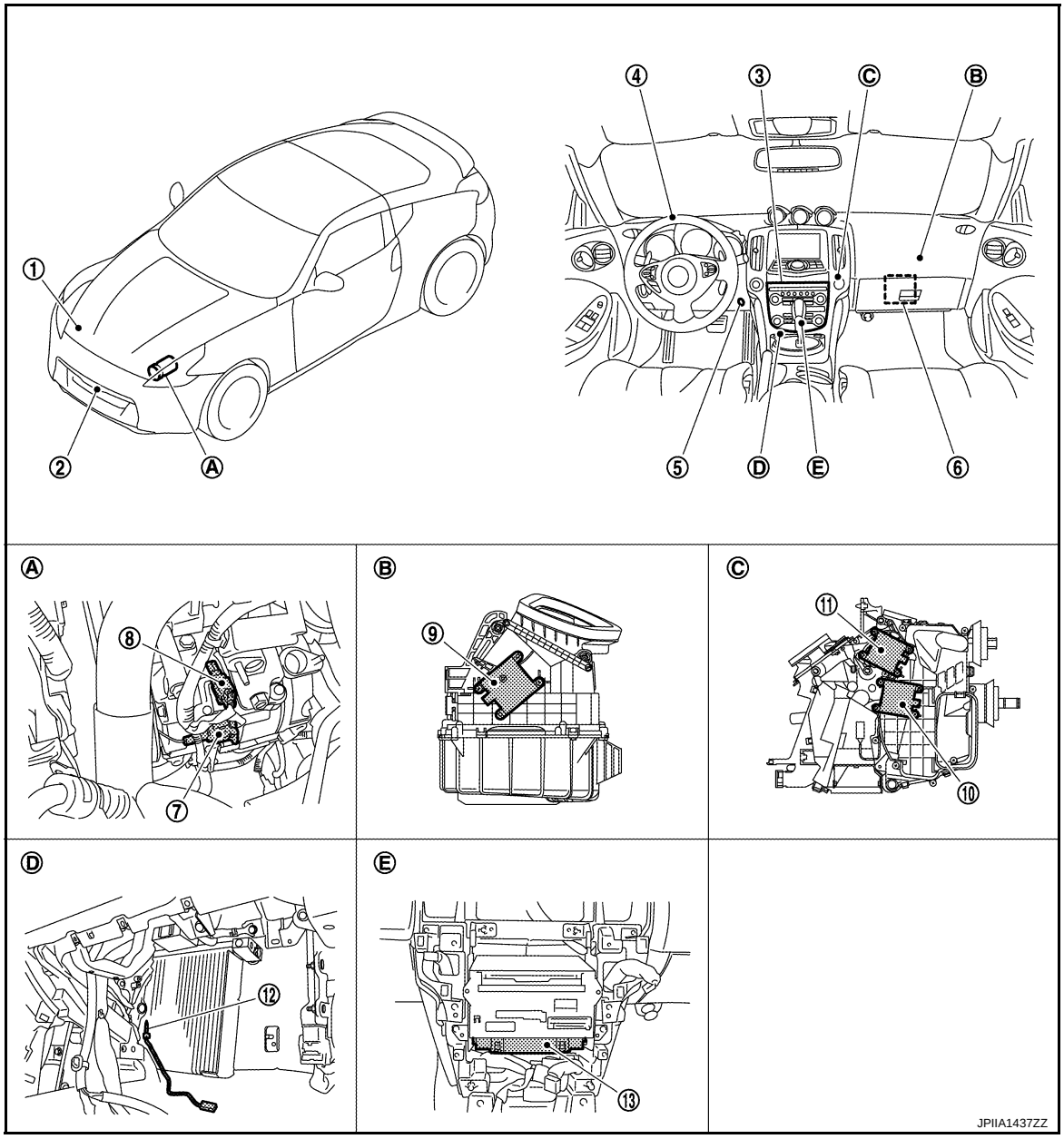
*: Inlet status is displayed by indicator when activating automatic control

## AIR DISTRIBUTION

| Discharge air flow | | | |
|---|---|---|---|
| Mode position indication | Air outlet/distribution | | |
| | VENT | FOOT | DEF |
| | 100% | — | — |
| | 60% | 40% | — |
| | 12% | 62% | 26% |
| | 10% | 52% | 38% |
| | — | — | 100% |

## Component Parts Location

INFOID:0000000004517727




1. Refrigerant pressure sensor
2. Ambient sensor
3. Preset switch
4. Sunload sensor
5. In-vehicle sensor
6. Blower motor
7. Magnet clutch
8. ECV
9. Intake door motor
10. Air mix door motor
11. Mode door motor
12. Intake sensor
13. A/C auto amp.

A. Installed on the compressor
B. Installed to the blower unit assembly (RH)
C. Installed to the heater & cooling unit assembly (RH)
D. Located on the evaporator
E. Behind of the cluster lid C

## Component Description

INFOID:0000000004517886

| Component | Description |
|---|---|
| Ambient sensor | HAC-118, "Description" |
| In-vehicle sensor | HAC-121, "Description" |

| Component | Description |
|---|---|
| Intake sensor | HAC-124, "Description" |
| Sunload sensor | HAC-127, "Description" |
| Air mix door motor | HAC-130, "Description" |
| Mode door motor | HAC-132, "Description" |
| Intake door motor | HAC-134, "Description" |
| A/C auto amp. | HAC-139, "Description" |
| Blower motor | HAC-140, "Description" |
| Magnet clutch | HAC-144, "Description" |
| ECV | HAC-146, "Description" |
| Refrigerant pressure sensor | EC-506, "Description" |
| Preset switch | The preset switch integrated with the controller for A/C operation and AV switch is installed to the center of the instrument panel. The operation and display data of the preset switch are communicated with the A/C auto amp. through AV control unit via CAN communication. |

# DIAGNOSIS SYSTEM (HVAC)

## CONSULT-III Function

INFOID:0000000004539497

CONSULT-III performs the following functions via CAN communication with A/C auto amp.

| Diagnostic mode | Description |
|---|---|
| Self diagnostic result | Displays the diagnosis results judged by A/C auto amp. |
| Data monitor | Displays the input/output signal of A/C auto amp. |
| Active test | The signals used to activate each device are forcibly supplied from A/C auto amp. |
| Work support | Changes the setting for each setting function. |
| ECU identification | Displays the part number of A/C auto amp. |

**NOTE:**
Diagnosis should be performed with engine running. Door motor operation speeds become slower and NO results may be returned even for normal operation if battery voltage drops below 12 V during self-diagnosis.

### SELF-DIAGNOSIS RESULTS

Refer to HAC-70, "DTC Index".

### DATA MONITOR

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 fan 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 |
| 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. depending on 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 |
|---|---|
| HVAC TEST | The operation check of air conditioner system can be performed by selecting the mode. Refer to the following table for the conditions of each mode. |

Check each output device

| | Test item | | | | | | |
|---|---|---|---|---|---|---|---|
| | MODE 1 | MODE 2 | MODE 3 | MODE 4 | MODE 5 | MODE 6 | MODE 7 |
| Mode door position | VENT | B/L 1 | B/L 2 | FOOT | D/F | DEF | — |
| Intake door position | REC | REC | 20% FRE | FRE | FRE | FRE | — |
| Air mix door position | FULL COLD | FULL COLD | FULL HOT | FULL HOT | FULL HOT | FULL HOT | — |
| Blower motor control signal duty ratio | 37% | 91% | 65% | 65% | 65% | 91% | — |
| Magnet clutch | ON | ON | OFF | OFF | ON | ON | — |
| ECV duty ratio | 100% | 100% | 0% | 0% | 50% | 100% | — |

**NOTE:**
- Perform the inspection of each output device after starting the engine because the compressor is operated.
- If the Mode 7 is selected, the malfunction is displayed but it is normal.

## WORK SUPPORT

| Work item | Description | Refer to |
|---|---|---|
| TEMP SET CORRECT<br>(Temperature setting trimmer) | If the temperature felt by the customer is different than the air flow temperature controlled by the temperature setting, the A/C auto amp. control temperature can be adjusted to compensate for the temperature setting. | HAC-8, "Temperature Setting Trimmer" |
| FRE MEMORY SET<br>[Inlet port memory function (FRE)] | • If the ignition switch is turned to the OFF position while the FRE indicator is set to ON (fresh air intake), “Perform the memory” or “Do not perform the memory” of FRE indicator ON (fresh air intake) condition can be selected.<br>• If “Perform the memory” was set, the FRE indicator 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-9, "Inlet Port Memory Function (FRE)" |
| REC MEMORY SET<br>[Inlet port memory function (REC)] | • If the ignition switch is turned to the OFF position while the REC indicator is set to ON (recirculation), “Perform the memory” or “Do not perform the memory” of REC indicator ON (recirculation) condition can be selected.<br>• If “Perform the memory” was set, the REC indicator 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-9, "Inlet Port Memory Function (REC)" |
| BLOWER SET<br>(Foot position setting trimmer) | In FOOT mode, the air blowing to DEF can change ON/OFF. | HAC-8, "Foot Position Setting Trimmer" |

**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:0000000004513732

CAN (Controller Area Network) is a serial communication line for real time applications. It is an on-board multiplex communication line with high data communication speed and excellent error detection ability. A modern vehicle is equipped with many ECMs, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, 2 control units are connected with 2 communication lines (CAN-L-line and CAN-H-line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.
Refer to LAN-23, "CAN Communication Signal Chart" for details of the communication signal.

### DTC Logic

INFOID:0000000004513733

#### DTC DETECTION LOGIC

| DTC | Items (CONSULT-III 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:0000000004513734

#### 1. PERFORM SELF-DIAGNOSIS

With CONSULT-III
1. Turn the ignition switch ON and wait for 2 seconds or more.
2. Perform the “SELF-DIAGNOSIS”.
3. Check if any DTC is detected in the self-diagnostic results.

Is DTC “U1000” displayed?

YES >> Perform the diagnosis for the CAN communication system. Refer to LAN-14, "Trouble Diagnosis Flow Chart".
NO >> Perform the intermittent malfunction diagnosis. Refer to GI-39, "Intermittent Incident".

# U1010 CONTROL UNIT (CAN)

## Description

INFOID:0000000004513735

Initial diagnosis of A/C auto amp.

## DTC Logic

INFOID:0000000004513736

### DTC DETECTION LOGIC

| DTC | Items (CONSULT-III 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:0000000004513737

### 1.REPLACE A/C AUTO AMP.

When DTC “U1010” is detected, replace A/C auto amp.

>> INSPECTION END

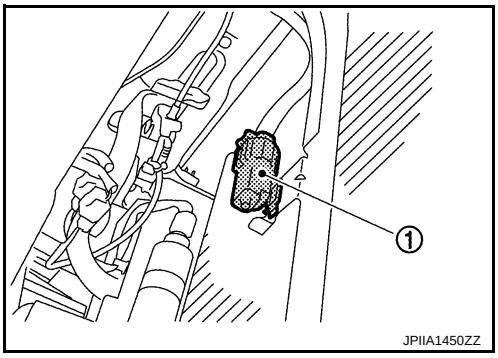
# B257B, B257C AMBIENT SENSOR

## Description

INFOID:0000000004513748

### AMBIENT SENSOR

- The ambient sensor (1) is installed to the hood lock stay.
- The ambient sensor converts the ambient temperature detected with thermistor into the voltage, and the A/C auto amp. inputs this voltage.




### AMBIENT TEMPERATURE CORRECTION

- The A/C auto amp. inputs the temperature detected with the ambient sensor as the ambient temperature.
- Perform the correction of the temperature detected with the ambient sensor for air conditioner control and for ambient temperature display.
- Since the engine heat influences on the ambient sensor during idling condition, the A/C auto amp. retards the ambient temperature indication of the combination meter to avoid the effect of steep temperature change.
- Select and use the initial value of ambient temperature data depending on the coolant temperature when turning the ignition switch from OFF to ON. Use the detection temperature of the ambient sensor at low coolant temperature [less than approximately 56°C (133°F)]. Use the memory data (before the ignition switch is OFF) when the engine is warming up [approximately 56°C (133°F) or more].
- Do not perform the correction of the ambient temperature when the detection temperature of the ambient temperature is less than approximately –29°C (–20°F) (for ambient temperature display) or less than approximately –20°C (–4°F) (for air conditioner control).

### SET TEMPERATURE CORRECTION

The A/C auto amp. performs the correction to the target temperature set by the temperature control dial so as to match the temperature felt by the passengers depending on the ambient temperature detected with the ambient sensor and controls it so that the interior air temperature is always the most suitable.

## DTC Logic

INFOID:0000000004513749

### DTC DETECTION LOGIC

| DTC | Items (CONSULT-III screen terms) | Diagnostic item is detected when... | Possible causes |
|---|---|---|---|
| B257B | AMB TEMP SEN SHORT | The ambient sensor recognition temperature is too high. | • Ambient sensor<br>• A/C auto amp.<br>• Harness and connector (Short in the ambient sensor circuit) |
| B257C | AMB TEMP SEN OPEN | The ambient sensor recognition temperature is too low. | • Ambient sensor<br>• A/C auto amp.<br>• Harness and connector (Open in the ambient sensor circuit) |

### DTC CONFIRMATION PROCEDURE

#### 1.PERFORM SELF-DIAGNOSIS

With CONSULT-III

1. Perform the “SELF-DIAGNOSIS”.
2. Check if any DTC is detected in the self-diagnostic results.

**NOTE:**

- If DTC is displayed along with DTC “U1000” or “U1010”, first diagnose the DTC “U1000” or “U1010”. Refer to HAC-116, "DTC Logic" or HAC-117, "DTC Logic".

- If there is an open circuit in the ambient sensor, A/C auto amp registers extreme cold [–30°C (–22°F)] and adjusts the temperature control warmer.

Is DTC “B257B” or “B257C” displayed?

YES >> Perform the diagnosis for the ambient sensor. Refer to HAC-119, "Diagnosis Procedure".
NO >> INSPECTION END

## Diagnosis Procedure

INFOID:0000000004513750

### 1.CHECK AMBIENT SENSOR POWER SUPPLY CIRCUIT

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

| (+) | | (–) | Voltage (Approx.) |
|---|---|---|---|
| Ambient sensor | | — | |
| Connector | Terminal | | |
| E76 | 1 | Ground | 5 V |

Is the inspection result normal?

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

### 2.CHECK AMBIENT SENSOR CIRCUIT CONTINUITY

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

| Ambient sensor | | A/C auto amp. | | Continuity |
|---|---|---|---|---|
| Connector | Terminal | Connector | Terminal | |
| E76 | 2 | M66 | 37 | Existed |

Is the inspection result normal?

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

### 3.CHECK AMBIENT SENSOR

Check the ambient sensor components. Refer to HAC-120, "Component Inspection".

Is the inspection result normal?

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

### 4.CHECK AMBIENT SENSOR CIRCUIT CONTINUITY

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

| Ambient sensor | | A/C auto amp. | | Continuity |
|---|---|---|---|---|
| Connector | Terminal | Connector | Terminal | |
| E76 | 1 | M66 | 35 | Existed |

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

| Ambient sensor | | — | Continuity |
|---|---|---|---|
| Connector | Terminal | | |
| E76 | 1 | Ground | Not existed |

Is the inspection result normal?

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

## Component Inspection

INFOID:0000000004513751

### 1. CHECK AMBIENT SENSOR

1. Turn the ignition switch OFF.
2. Remove the ambient sensor. Refer to HAC-173, "Exploded View".
3. Check the resistance between the ambient sensor terminals. Refer to the applicable table for the normal value.

| 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 the ambient sensor.

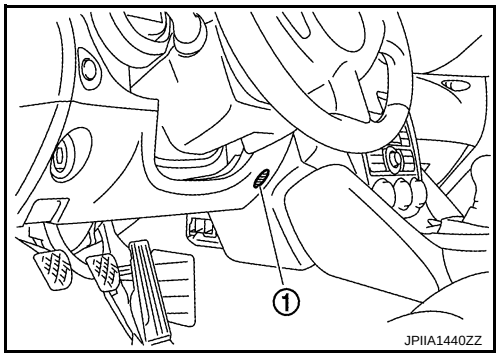
# B2578, B2579 IN-VEHICLE SENSOR

## Description

INFOID:0000000004514134

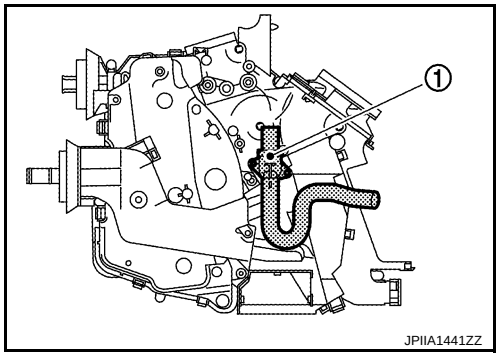
### IN-VEHICLE SENSOR

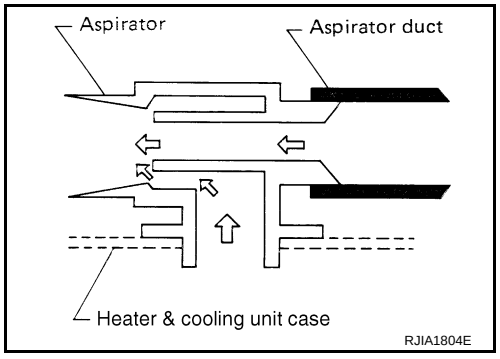
- The in-vehicle sensor (1) is installed to the instrument lower panel LH.
- The in-vehicle sensor converts the interior air temperature of the passenger room sucked by the aspirator detected with the thermistor into the voltage, and the A/C auto amp. inputs this voltage.




### ASPIRATOR

The aspirator (1) generates the vacuum by the air blown from the heater & cooling unit and draws the air of the passenger room to the in-vehicle sensor area via the aspirator duct.




### INTERIOR AIR TEMPERATURE CORRECTION

- The A/C auto amp. inputs the temperature detected with the in-vehicle sensor as the interior air temperature.
- Perform the correction of the temperature detected with the in-vehicle sensor for each air conditioner control.

## DTC Logic

INFOID:0000000004514135

### DTC DETECTION LOGIC

| DTC | Items (CONSULT-III screen terms) | Diagnostic item is detected when... | Possible causes |
|---|---|---|---|
| B2578 | IN CAR SEN SHORT | The in-vehicle sensor recognition temperature is too high. | • In-vehicle sensor<br>• A/C auto amp.<br>• Harness and connector (Short in the in-vehicle sensor circuit) |
| B2579 | IN CAR SEN OPEN | The in-vehicle sensor recognition temperature is too low. | • In-vehicle sensor<br>• A/C auto amp.<br>• Harness and connector (Open in the in-vehicle sensor circuit) |

## DTC CONFIRMATION PROCEDURE

### 1.PERFORM SELF-DIAGNOSIS

With CONSULT-III
1. Perform the “SELF-DIAGNOSIS”.
2. Check if any DTC is detected in the self-diagnostic results.

**NOTE:**
If DTC is displayed along with DTC “U1000” or “U1010”, first diagnose the DTC “U1000” or “U1010”. Refer to HAC-116, "DTC Logic" or HAC-117, "DTC Logic".

Is DTC “B2578” or “B2579” displayed?

YES >> Perform the diagnosis for the in-vehicle sensor. Refer to HAC-122, "Diagnosis Procedure".
NO >> INSPECTION END

## Diagnosis Procedure

INFOID:0000000004514136

### 1.CHECK IN-VEHICLE SENSOR POWER SUPPLY CIRCUIT

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

| (+) | | (–) | Voltage (Approx.) |
|---|---|---|---|
| In-vehicle sensor | | — | |
| Connector | Terminal | | |
| M61 | 1 | Ground | 5 V |

Is the inspection result normal?

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

### 2.CHECK IN-VEHICLE SENSOR CIRCUIT CONTINUITY-

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

| In-vehicle sensor | | A/C auto amp. | | Continuity |
|---|---|---|---|---|
| Connector | Terminal | Connector | Terminal | |
| M61 | 2 | M66 | 37 | Existed |

Is the inspection result normal?

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

### 3.CHECK IN-VEHICLE SENSOR

Check the in-vehicle sensor components. Refer to HAC-123, "Component Inspection".

Is the inspection result normal?

YES >> Replace the A/C auto amp.
NO >> Replace the in-vehicle sensor.

## 4. CHECK IN-VEHICLE SENSOR CIRCUIT CONTINUITY

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

| In-vehicle sensor | | A/C auto amp. | | Continuity |
|---|---|---|---|---|
| Connector | Terminal | Connector | Terminal | |
| M61 | 1 | M66 | 36 | Existed |

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

| In-vehicle sensor | | — | Continuity |
|---|---|---|---|
| Connector | Terminal | | |
| M61 | 1 | Ground | Not existed |

Is the inspection result normal?

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

# Component Inspection

INFOID:0000000004514137

## 1. CHECK IN-VEHICLE SENSOR

1. Turn the ignition switch OFF.
2. Remove the in-vehicle sensor. Refer to HAC-174, "Exploded View".
3. Check the resistance between the in-vehicle sensor terminals. Refer to the applicable table for the normal value.

| 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 the in-vehicle sensor.

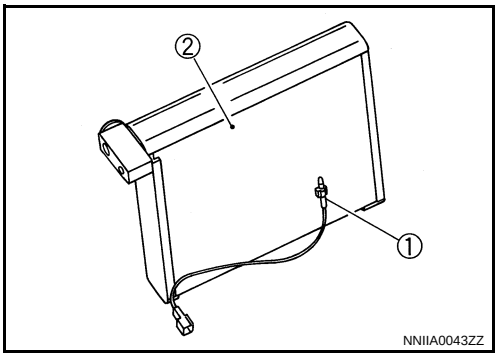
# B2581, B2582 INTAKE SENSOR

## Description

INFOID:0000000004514303

### INTAKE SENSOR

- Intake sensor (1) is located on the evaporator (2).
- The intake sensor converts the evaporator passing air temperature detected with thermistor into the voltage, and the A/C auto amp. inputs this voltage.




### INTAKE TEMPERATURE CORRECTION

- The A/C auto amp. inputs the temperature detected with the intake sensor as the evaporator passing air temperature.
- Perform the correction of the temperature detected with the intake sensor for air conditioner control.
- The A/C auto amp. performs the correction so that the recognition intake temperature changes depending on the difference between the detected intake temperature and the recognition intake temperature. If the difference is large, the changing is early. The changing becomes slow as the difference becomes small.

## DTC Logic

INFOID:0000000004514304

### DTC DETECTION LOGIC

| DTC | Items (CONSULT-III screen terms) | Diagnostic item is detected when... | Possible causes |
|---|---|---|---|
| B2581 | EVAP TEMP SEN SHORT | The intake sensor recognition temperature is too high. | • Intake sensor<br>• A/C auto amp.<br>• Harness and connector (Short in the intake sensor circuit) |
| B2582 | EVAP TEMP SEN OPEN | The intake sensor recognition temperature is too low. | • Intake sensor<br>• A/C auto amp.<br>• Harness and connector (Open in the intake sensor circuit) |

### DTC CONFIRMATION PROCEDURE

#### 1.PERFORM SELF-DIAGNOSIS

With CONSULT-III

1. Perform the “SELF-DIAGNOSIS”.
2. Check if any DTC is detected in the self-diagnostic results.

**NOTE:**

If DTC is displayed along with DTC “U1000” or “U1010”, first diagnose the DTC “U1000” or “U1010”. Refer to HAC-116, "DTC Logic" or HAC-117, "DTC Logic".

Is DTC “B2581” or “B2582” displayed?

YES >> Perform the diagnosis for the intake sensor. Refer to HAC-124, "Diagnosis Procedure".
NO >> INSPECTION END

## Diagnosis Procedure

INFOID:0000000004514305

#### 1.CHECK INTAKE SENSOR POWER SUPPLY CIRCUIT

1. Turn the ignition switch OFF.
2. Disconnect the intake sensor connector.
3. Turn the ignition switch ON.

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

| (+) | | (–) | Voltage (Approx.) |
|---|---|---|---|
| Intake sensor | | — | |
| Connector | Terminal | | |
| M205 | 1 | Ground | 5 V |

Is the inspection result normal?

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

## 2.CHECK INTAKE SENSOR CIRCUIT CONTINUITY

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

| Intake sensor | | A/C auto amp. | | Continuity |
|---|---|---|---|---|
| Connector | Terminal | Connector | Terminal | |
| M205 | 2 | M66 | 37 | Existed |

Is the inspection result normal?

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

## 3.CHECK INTAKE SENSOR

Check the intake sensor components. Refer to HAC-125, "Component Inspection".

Is the inspection result normal?

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

## 4.CHECK INTAKE SENSOR CIRCUIT CONTINUITY

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

| Intake sensor | | A/C auto amp. | | Continuity |
|---|---|---|---|---|
| Connector | Terminal | Connector | Terminal | |
| M205 | 1 | M66 | 16 | Existed |

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

| Intake sensor | | — | Continuity |
|---|---|---|---|
| Connector | Terminal | | |
| M205 | 1 | Ground | Not existed. |

Is the inspection result normal?

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

# Component Inspection

INFOID:0000000004514306

## 1.CHECK INTAKE SENSOR

1. Turn the ignition switch OFF.
2. Disconnect the intake sensor connector. Refer to HAC-176, "Exploded View".
3. Check the resistance between the intake sensor terminals. Refer to the applicable table for the normal value.

| Terminal | | Condition | Resistance: kΩ |
|---|---|---|---|
| | | Temperature: °C (°F) | |
| 1 | 2 | –15 (5) | 12.28 |
| | | –10 (14) | 9.58 |
| | | –5 (23) | 7.55 |
| | | 0 (32) | 6.00 |
| | | 5 (41) | 4.81 |
| | | 10 (50) | 3.88 |
| | | 15 (59) | 3.16 |
| | | 20 (68) | 2.59 |
| | | 25 (77) | 2.14 |
| | | 30 (86) | 1.77 |
| | | 35 (95) | 1.48 |
| | | 40 (104) | 1.24 |
| | | 45 (113) | 1.05 |

Is the inspection result normal?

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

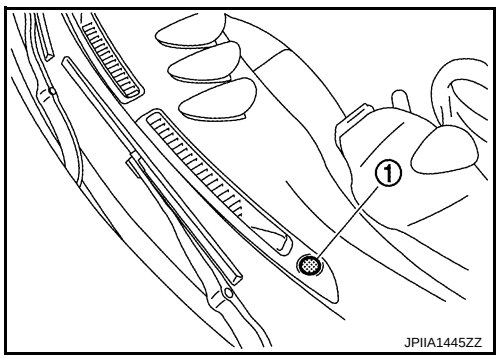
# B2630, B2631 SUNLOAD SENSOR

## Description

INFOID:0000000004514643

### SUNLOAD SENSOR

- The sunload sensor (1) is installed to the front defroster grille LH.
- The sunload sensor converts the sunload amount (illuminance) into the current value with the photodiode. The A/C auto amp. calculates this current value to the voltage and inputs it.




### SUNLOAD AMOUNT CORRECTION

- The A/C auto amp. inputs the sunload amount detected with the sunload sensor.
- Perform the correction of the sunload amount detected with the sunload sensor for each air conditioner control.
- When the sunload amount suddenly changes, for example when entering a tunnel, perform the correction so that the recognition sunload amount of the A/C auto amp. changes slowly.

## DTC Logic

INFOID:0000000004514644

### DTC DETECTION LOGIC

| DTC | Items (CONSULT-III screen terms) | Diagnostic item is detected when... | Possible causes |
|---|---|---|---|
| B2630 | SUNLOAD SEN SHORT | Detected calorie at sunload sensor 2832 $W/m^2$ (2436 $kcal/m^2 \cdot h$) or more | • Sunload sensor<br>• A/C auto amp.<br>• Harness and connector (Short in the sunload sensor circuit) |
| B2631 | SUNLOAD SEN OPEN | Detected calorie at sunload sensor 64.7 $W/m^2$ (56 $kcal/m^2 \cdot h$) or less | • Sunload sensor<br>• A/C auto amp.<br>• Harness and connector (Open in the sunload sensor circuit) |

### DTC REPRODUCTION PROCEDURE

#### 1. PERFORM SELF-DIAGNOSIS

With CONSULT-III

1. Perform the “SELF-DIAGNOSIS”.
2. Check if any DTC is detected in the self-diagnostic results.

**NOTE:**

- If DTC is displayed along with DTC “U1000” or “U1010”, first diagnose the DTC “U1000” or “U1010”. Refer to HAC-116, "DTC Logic" or HAC-117, "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, use a lamp (60 W or more) that is pointed at the sunload sensor.

Is DTC “B2630” or “B2631” displayed?

YES >> Perform the diagnosis for the sunload sensor. Refer to HAC-127, "Diagnosis Procedure".
NO >> INSPECTION END

## Diagnosis Procedure

INFOID:0000000004514645

#### 1. CHECK SUNLOAD SENSOR POWER SUPPLY CIRCUIT

1. Turn the ignition switch OFF.
2. Disconnect the sunload sensor connector.

3. Turn the ignition switch ON.
4. Check voltage between sunload sensor harness connector and ground.

| (+) | | (–) | Voltage (Approx.) |
|---|---|---|---|
| Sunload sensor | | — | |
| Connector | Terminal | | |
| M46 | 1 | Ground | 5 V |

Is the inspection result normal?

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

## 2.CHECK SUNLOAD SENSOR CIRCUIT CONTINUITY

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

| Sunload sensor | | A/C auto amp. | | Continuity |
|---|---|---|---|---|
| Connector | Terminal | Connector | Terminal | |
| M46 | 2 | M66 | 37 | Existed |

Is the inspection result normal?

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

## 3.CHECK SUNLOAD SENSOR

1. Connect the sunload sensor connector.
2. Connect the A/C auto amp. connector.
3. Check the sunload sensor components. Refer to HAC-128, "Component Inspection".

Is the inspection result normal?

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

## 4.CHECK SUNLOAD SENSOR CIRCUIT CONTINUITY

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

| Sunload sensor | | A/C auto amp. | | Continuity |
|---|---|---|---|---|
| Connector | Terminal | Connector | Terminal | |
| M46 | 1 | M66 | 15 | Existed |

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

| Sunload sensor | | — | Continuity |
|---|---|---|---|
| Connector | Terminal | | |
| M46 | 1 | Ground | Not existed |

Is the inspection result normal?

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

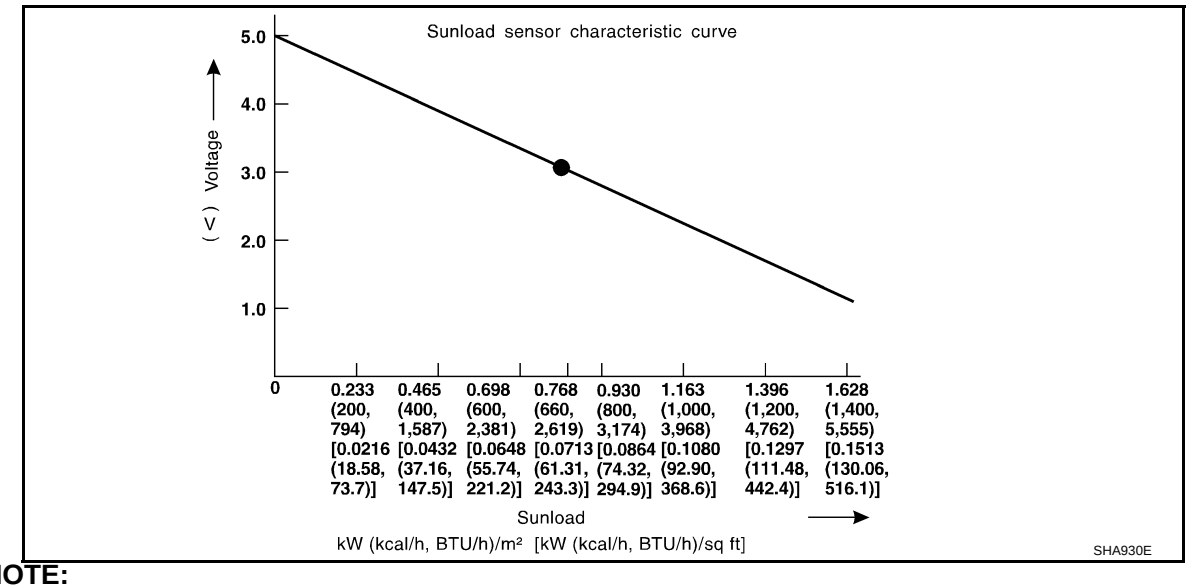
# Component Inspection

INFOID:0000000004514646

## 1.CHECK SUNLOAD SENSOR

1. Turn the ignition switch ON.
2. Check the input voltage from the sunload sensor between the A/C auto amp. harness connector and ground. Refer to the applicable table for the normal value.

| (+) | | (–) |
|---|---|---|
| A/C auto amp. | | — |
| Connector | Terminal | |
| M66 | 15 | Ground |




**NOTE:**

- When checking indoors, use a lamp of approximately 60 W. Move the lamp towards and away from the sensor to check.
- The sunload amount produced by direct sunshine in fair weather is equivalent to approximately 0.77 $kW/m^2$ (662 $kcal/m^2 \cdot h$).

Is the inspection result normal?

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

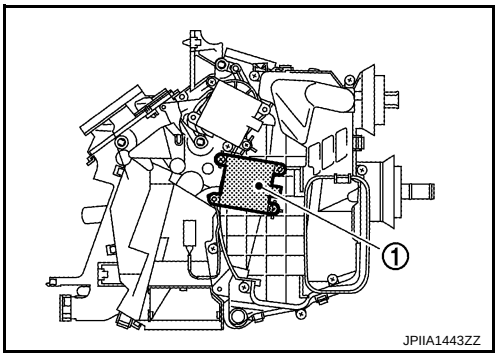
# B2632, B2633 AIR MIX DOOR MOTOR PBR

## Description

INFOID:0000000004515025

### AIR MIX DOOR MOTOR

- The air mix door motor (1) is installed to the heater & cooling unit assembly.
- The LCU (Local Control Unit) is installed to each door motor so as to perform the multiplex communication control (LAN) between each door motor of the mode door motor, air mix door motor and intake door motor in one communication line.
- When each LCU receives the control signal (combination of the pulse wave with two types of amplitude) from the A/C auto amp., it moves each door to the appropriate position based on the door position detection signal of each PBR (Potentio Balance Resistor). When the movement was completed, each LCU transmits the signal that reports the movement completion to the A/C auto amp.




## DTC Logic

INFOID:0000000004515026

### DTC DETECTION LOGIC

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

### DTC CONFIRMATION PROCEDURE

#### 1.PERFORM SELF-DIAGNOSIS

With CONSULT-III
1. Perform the “SELF-DIAGNOSIS”.
2. Check if any DTC is detected in the self-diagnostic results.

**NOTE:**
- If DTC is displayed along with DTC “U1000” or “U1010”, first diagnose the DTC “U1000” or “U1010”. Refer to HAC-116, "DTC Logic" or HAC-117, "DTC Logic".
- If all of door motors DTC (B2632 - B2655) are detected, check door motor communication circuit. Refer to HAC-137, "Diagnosis Procedure".

Is DTC “B2632” or “B2633” displayed?

YES >> Perform the diagnosis of air mix door motor system. Refer to HAC-131, "Diagnosis Procedure".
NO >> GO TO 2.

#### 2.FUNCTION INSPECTION

1. Turn temperature dial and raise temperature setting to 32.0°C (90°F) after warming up the engine.
2. Check that warm air blows from outlets.
3. Operate the compressor.
4. Operate the temperature control dial and lower the set temperature to 18.0°C (60°F).
5. Check that the cool air blows from the outlets.

Does it operate normally?

YES >> INSPECTION END
NO >> Check the air mix door motor system installation condition. Repair or replace the malfunctioning parts.

## Diagnosis Procedure

INFOID:0000000004515027

### 1.CHECK BATTERY VOLTAGE OF AIR MIX DOOR MOTOR

1. Turn the ignition switch ON.
2. Check voltage between the air mix door motor harness connector and ground.

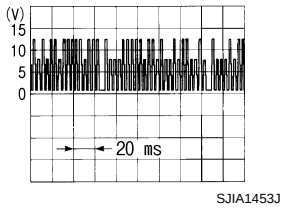
| (+) | | (–) | Voltage (Approx.) |
|---|---|---|---|
| Air mix door motor | | — | |
| Connector | Terminal | | |
| M204 | 1 | Ground | 12 V |

Is the inspection result normal?

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

### 2.CHECK SIGNAL OF AIR MIX DOOR MOTOR

Check output waveform between the air mix door motor harness connector and ground with the oscilloscope.

| (+) | | (–) | Output waveform |
|---|---|---|---|
| Air mix door motor | | — | |
| Connector | Terminal | | |
| M204 | 3 | Ground |  |



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Is the inspection result normal?

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

### 3.CHECK GROUND CIRCUIT OF AIR MIX DOOR MOTOR

1. Turn the ignition switch OFF.
2. Disconnect the air mix door motor connector.
3. Check for continuity between the air mix door motor harness connector and ground.

| Air mix door motor | | — | Continuity |
|---|---|---|---|
| Connector | Terminal | | |
| M204 | 2 | Ground | Existed |

Is the inspection result normal?

YES >> Replace the air mix door motor.
NO >> Repair the harnesses or connectors.

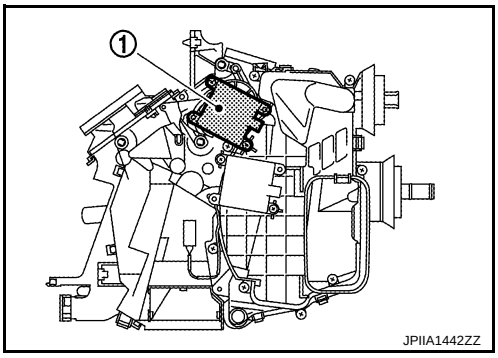
# B2636, B2637, B2638, B2639, B2654, B2655 MODE DOOR MOTOR

## Description

INFOID:0000000004515357

### MODE DOOR MOTOR

- The mode door motor (1) is installed to the heater & cooling unit assembly.
- The LCU (Local Control Unit) is installed to each door motor so as to perform the multiplex communication control (LAN) between each door motor of the mode door motor, air mix door motor and intake door motor in one communication line.
- When each LCU receives the control signal (combination of the pulse wave with two type of amplitude) from the A/C auto amp., it moves each door to the appropriate position based on the door position detection signal of each PBR (Potentio Balance Resistor). When the movement was completed, each LCU transmits the signal that reports the movement completion to the A/C auto amp.




## DTC Logic

INFOID:0000000004515358

### DTC DETECTION LOGIC

| DTC | Items (CONSULT-III 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.PERFORM SELF-DIAGNOSIS

1. Perform the “SELF-DIAGNOSIS”.
2. Check if any DTC is detected in the self-diagnostic results.

**NOTE:**

- If DTC is displayed along with DTC “U1000” or “U1010”, first diagnose the DTC “U1000” or “U1010”. Refer to HAC-116, "DTC Logic" or HAC-117, "DTC Logic".
- If all of door motors DTC (B2632 - B2655) are detected, check door motor communication circuit. Refer to HAC-137, "Diagnosis Procedure".

Is DTC “ B2636 ”, “ B2637 ”, “B2638 ”, “B2639 ”, “B2654 ” or “B2655 ” displayed?

YES >> Perform the diagnosis of mode door motor system. Refer to HAC-133, "Diagnosis Procedure".
NO >> GO TO 2.

#### 2.FUNCTION INSPECTION

1. Turn mode control dial to each position.
2. Check that the air outlets change according to each indicated air outlet by placing a hand in front of the outlets. Refer to VTL-2, "System Description".

Does it operate normally?

YES >> INSPECTION END
NO >> Check the mode door system installation condition. Repair or replace the malfunctioning parts.

## Diagnosis Procedure

INFOID:0000000004515359

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

1. Turn the ignition switch ON.
2. Check voltage between the mode door motor harness connector and ground.

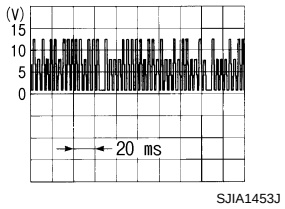
| (+) | | (–) | Voltage (Approx.) |
|---|---|---|---|
| Mode door motor | | — | |
| Connector | Terminal | | |
| M203 | 1 | Ground | 12 V |

Is the inspection result normal?

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

### 2. CHECK MODE DOOR MOTOR SIGNAL

Check output waveform between the mode door motor harness connector and ground with the oscilloscope.

| (+) | | (–) | Output waveform |
|---|---|---|---|
| Mode door motor | | — | |
| Connector | Terminal | | |
| M203 | 3 | Ground |  |



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Is the inspection result normal?

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

### 3. CHECK MODE DOOR MOTOR GROUND CIRCUIT

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

| Mode door motor | | — | Continuity |
|---|---|---|---|
| Connector | Terminal | | |
| M203 | 2 | Ground | Existed |

Is the inspection result normal?

YES >> Replace the Mode door motor.
NO >> Repair the harnesses or connectors.

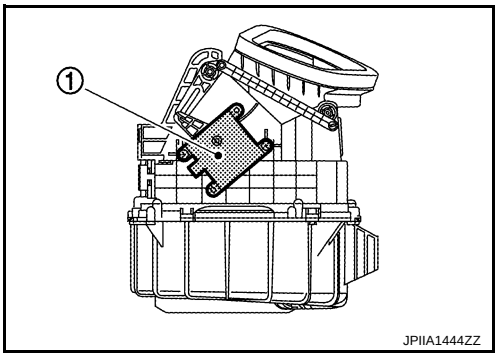
# B263D, B263E, B263F INTAKE DOOR MOTOR

## Description

INFOID:0000000004515365

### INTAKE DOOR MOTOR

- The intake door motor (1) is installed to the blower unit.
- The LCU (Local Control Unit) is installed to each door motor so as to perform the multiplex communication control (LAN) between each door motor of the mode door motor, air mix door motor and intake door motor in one communication line.
- When each LCU receives the control signal (combination of the pulse wave with two type of amplitude) from the A/C auto amp., it moves each door to the appropriate position based on the door position detection signal of each PBR (Potentio Balance Resistor). When the movement was completed, each LCU transmits the signal that reports the movement completion to the A/C auto amp.




## DTC Logic

INFOID:0000000004515366

### DTC DETECTION LOGIC

| DTC | Items (CONSULT-III 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.PERFORM SELF-DIAGNOSIS

With CONSULT-III

1. Perform the “SELF-DIAGNOSIS”.
2. Check if any DTC is detected in the self-diagnostic results.

**NOTE:**

- If DTC is displayed along with DTC “U1000” or “U1010”, first diagnose the DTC “U1000” or “U1010”. Refer to HAC-116, "DTC Logic" or HAC-117, "DTC Logic".
- If all of door motors DTC (B2632 - B2655) are detected, check door motor communication circuit. Refer to HAC-137, "Diagnosis Procedure".

Is DTC “ B263D ”, “ B263E ” or “B263F ” displayed?

YES >> Perform the diagnosis of intake door motor system. Refer to HAC-135, "Diagnosis Procedure".
NO >> GO TO 2.

#### 2.FUNCTION INSPECTION

1. Press intake switch to set the air outlet to recirculation.
2. The intake switch indicator is turned ON.
3. Listen to intake sound and confirm air inlets change.
4. Press intake switch again to set the air outlet to fresh air intake.
5. The intake switch indicator is turned OFF.
6. Listen to intake sound and confirm air inlets change.

Does it operate normally?

YES >> INSPECTION END
NO >> Check the intake door system installation condition. Repair or replace the malfunctioning parts.

## Diagnosis Procedure

INFOID:0000000004515367

### 1. CHECK BATTERY VOLTAGE OF INTAKE DOOR MOTOR

1. Turn the ignition switch ON.
2. Check voltage between the intake door motor harness connector and ground.

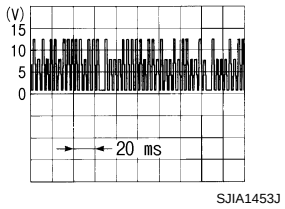
| (+) | | (–) | Voltage (Approx.) |
|---|---|---|---|
| Intake door motor | | — | |
| Connector | Terminal | | |
| M206 | 1 | Ground | 12 V |

Is the inspection result normal?

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

### 2. CHECK INTAKE DOOR MOTOR SIGNAL

Check output waveform between the intake door motor harness connector and ground with the oscilloscope.

| (+) | | (–) | Output waveform |
|---|---|---|---|
| Intake door motor | | — | |
| Connector | Terminal | | |
| M206 | 3 | Ground |  |



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Is the inspection result normal?

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

### 3. CHECK INTAKE DOOR MOTOR GROUND CIRCUIT

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

| Intake door motor | | — | Continuity |
|---|---|---|---|
| Connector | Terminal | | |
| M206 | 2 | Ground | Existed |

Is the inspection result normal?

YES >> Replace the Intake door motor.
NO >> Repair the harnesses or connectors.

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

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

INFOID:0000000004515620

#### 1.CHECK FUSE

Check 10A fuses [Nos. 3, 6 and 19, located in the fuse block (J/B)].
**NOTE:**
Refer to PG-84, "Fuse, Connector and Terminal Arrangement".

Is the inspection result normal?

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

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

1. Turn the ignition switch OFF.
2. Disconnect the A/C auto amp. connector.
3. Check voltage between A/C auto amp. harness connector and ground.

| (+) | | (–) | Voltage | | |
|---|---|---|---|---|---|
| A/C auto amp. | | — | Ignition switch position | | |
| Connector | Terminal | | OFF | ACC | ON |
| M66 | 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 >> Repair the harnesses or connectors.

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

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

| A/C auto amp. | | — | Continuity |
|---|---|---|---|
| Connector | Terminal | | |
| M66 | 19 | Ground | Existed |
| | 39 | | |

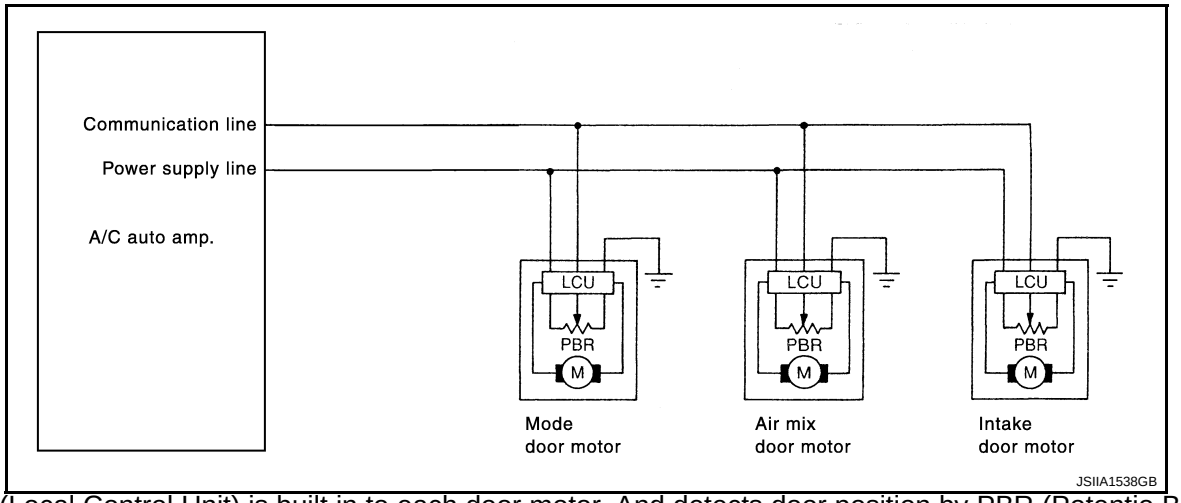
Is the inspection result normal?

YES >> INSPECTION END
NO >> Repair the harnesses or connectors.

# DOOR MOTOR COMMUNICATION CIRCUIT

## Description

INFOID:0000000004535144




- LCU (Local Control Unit) is built in to each door motor. And detects door position by PBR (Potentio Balance Resistor).
- A/C auto amp. communicates with each LCU via communication line. And receives each door position feedback signal from each LCU.
- Each LCU control each door to the appropriate position depending on the control signal from A/C auto amp. When the door movement was completed, transmits the signal of door movement completion to A/C auto amp.

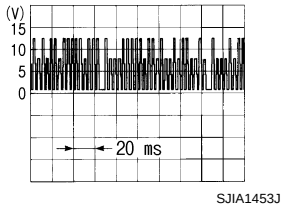
## Diagnosis Procedure

INFOID:0000000004535145

**NOTE:**
If all of door motors DTC are detected, check this circuit.

### 1.CHECK COMMUNICATION SIGNAL

1. Turn the ignition switch ON.
2. Check output waveform between A/C auto amp. harness connector and ground with the oscilloscope.

| (+) | | (–) | Output waveform |
|---|---|---|---|
| A/C auto amp. | | — | |
| Connector | Terminal | | |
| M66 | 10 | Ground |  |



Is the inspection result normal?

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

### 2.CHECK COMMUNICATION SIGNAL CIRCUIT FOR SHORT

1. Turn the ignition switch OFF.
2. Disconnect the following connectors:
- A/C auto amp.
- Mode door motor
- Intake door motor
- Air mix door motor
3. Check continuity between A/C auto amp. harness connector and ground.

| A/C auto amp. | | — | Continuity |
|---|---|---|---|
| Connector | Terminal | | |
| M66 | 10 | Ground | Not existed |

Is the inspection result normal?

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

## 3. CHECK COMMUNICATION SIGNAL CIRCUIT FOR OPEN

1. Turn the ignition switch OFF.
2. Disconnect the A/C auto amp. and the mode door motor connectors.
3. Check continuity between A/C auto amp. harness connector and the mode door motor harness connector.

| A/C auto amp. | | Mode door motor | | Continuity |
|---|---|---|---|---|
| Connector | Terminal | Connector | Terminal | |
| M66 | 10 | M203 | 3 | Existed |

Is the inspection result normal?

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

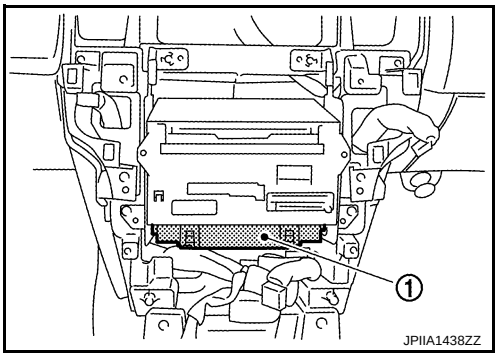
# A/C AUTO AMP.

## Description

INFOID:0000000004515621

A/C AUTO AMP. (AIR CONDITIONER AUTOMATIC AMPLIFIER)

- The A/C auto amp. (1) has a built-in microcomputer which processes information sent from various sensors needed for air conditioner operation.
- The air mix door motor, mode door motor, intake door motor, 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.
- Self-diagnosis functions are also built into A/C auto amp. to provide quick check of malfunctions in the auto air conditioner system.




## Component Function Check

INFOID:0000000004471965

### 1.CHECK OPERATION

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

Does it operate normally?

YES >> INSPECTION END
NO >> Perform the diagnosis for the A/C auto amp. Refer to HAC-139, "Diagnosis Procedure".

## Diagnosis Procedure

INFOID:0000000004471966

### 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-157, "Fail-safe".

Is the fail-safe function operated?

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

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

Check A/C auto amp. power supply circuit and ground circuit. Refer to HAC-136, "A/C AUTO AMP. : Diagnosis Procedure".

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair or replace parts depending on the inspection results.

### 3.CHECK PRESET SWITCH

Check the preset switch. Refer to AV-319, "Symptom Table".

Is the inspection result normal?

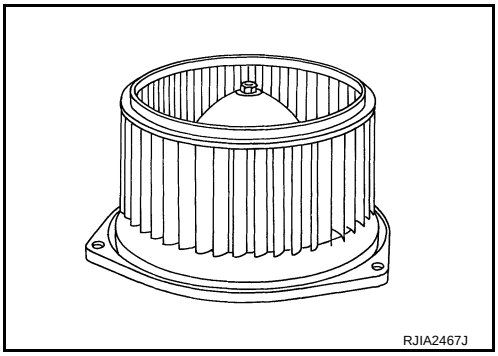
YES >> Replace A/C auto amp.
NO >> Repair or replace parts according to the inspection results.

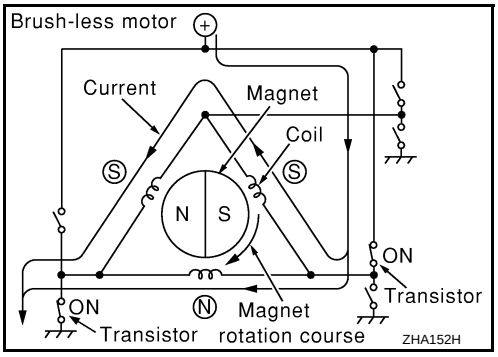
# BLOWER MOTOR

## Description

INFOID:0000000004517228

- 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.




## Component Function Check

INFOID:0000000004517229

### 1.CHECK OPERATION

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

Does it operate normally?

YES >> INSPECTION END
NO >> Perform the diagnosis for the blower motor. Refer to HAC-144, "Diagnosis Procedure".

## Diagnosis Procedure

INFOID:0000000004553661

### 1.SELF-DIAGNOSIS RESULT CHECK

With CONSULT-III
1. Perform the “SELF-DIAGNOSIS”.
2. Check if any DTC is detected in the self-diagnostic results.

**NOTE:**
If DTC is displayed along with DTC “U1000” or “U1010”, first diagnose the DTC “U1000” or “U1010”. Refer to HAC-26, "DTC Logic" or HAC-27, "DTC Logic".

Is any DTC displayed?

YES >> Perform the diagnosis that is applicable to the sensor and actuator. Refer to HAC-70, "DTC Index".
NO >> GO TO 2.

### 2.PERFORM ACTIVE TEST

With CONSULT-III
1. Perform the “HVAC TEST” of HVAC active test item.
2. Check that the blower motor control signal changes according to each indicator number.

| | Test item | | | | | | |
|---|---|---|---|---|---|---|---|
| | MODE 1 | MODE 2 | MODE 3 | MODE 4 | MODE 5 | MODE 6 | MODE 7 |
| Blower fan motor control signal duty ratio | 37% | 91% | 65% | 65% | 65% | 91% | — |

**NOTE:**

- Perform the inspection of each output device after starting the engine because the compressor is operated.
- If the Mode 7 is selected, the malfunction is displayed but it is normal.

Does it operate normally?

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

## 3. CHECK BLOWER MOTOR POWER SUPPLY CIRCUIT

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

| (+) | | (–) | Voltage |
|---|---|---|---|
| Blower motor | | — | |
| Connector | Terminal | | |
| M109 | 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 the ignition switch OFF.
2. Check for continuity between blower motor harness connector and ground.

| Blower motor | | — | Continuity |
|---|---|---|---|
| Connector | Terminal | | |
| M109 | 3 | Ground | Existed |

Is the inspection result normal?

YES >> GO TO 5.
NO >> Repair the harnesses or connectors.

## 5. CHECK BLOWER MOTOR CIRCUIT CONTINUITY

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

| Blower motor | | A/C auto amp. | | Continuity |
|---|---|---|---|---|
| Connector | Terminal | Connector | Terminal | |
| M109 | 2 | M66 | 32 | Existed |

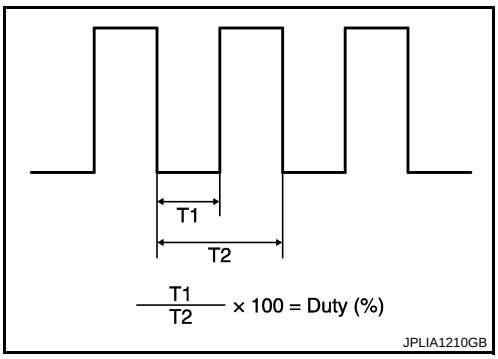
Is the inspection result normal?

YES >> GO TO 6.
NO >> Repair the harnesses or connectors.

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

1. Reconnect blower motor connector and A/C auto amp. connector.
2. Turn the ignition switch ON.
3. Set the MODE control dial to VENT position.
4. Change fan speed from Lo to Hi, and check duty ratios between blower motor harness connector and ground by using an oscilloscope.

**NOTE:**
Calculate the drive signal duty ratio as shown in the figure.
T2 = Approx. 1.6 ms




| Blower motor | | Condition | Duty ratio (Approx.) |
|---|---|---|---|
| Connector | Terminal | Fan speed (manual) VENT mode | |
| M109 | 2 | 1st | 25 % |
| | | 2nd | 33 % |
| | | 3rd | 41 % |
| | | 4th | 51 % |
| | | 5th | 61 % |
| | | 6th | 69 % |
| | | 7th | 81 % |

Is the inspection result normal?

YES >> Replace blower motor after confirming the fan air flow does not change.
NO >> Replace the A/C auto amp.

## 7. CHECK BLOWER MOTOR CIRCUIT CONTINUITY

1. Turn the ignition switch OFF.
2. Disconnect the blower motor connector and fuse block (J/B) connector.
3. Check the continuity between the blower motor harness connector and fuse block (J/B) harness connector.

| Blower motor | | Fuse block (J/B) | | Continuity |
|---|---|---|---|---|
| Connector | Terminal | Connector | Terminal | |
| M109 | 1 | M1 | 3A | Existed |
| | | | 8A | |

4. Check for continuity between blower motor harness connector and ground.

| Blower motor | | — | Continuity |
|---|---|---|---|
| Connector | Terminal | | |
| M109 | 1 | Ground | Not existed |

Is the inspection result normal?

YES >> GO TO 8.
NO >> Repair the harnesses or connectors.

## 8. CHECK FUSE

Check 15A fuses [Nos. 21 and 22, located in the fuse block (J/B)].
**NOTE:**
Refer to PG-84, "Fuse, Connector and Terminal Arrangement".

Is the inspection result normal?

YES >> Inspection the power supply circuit. Refer to PG-42, "Wiring Diagram - IGNITION POWER SUPPLY -".
NO >> Replace the fuse after repairing the applicable circuit.

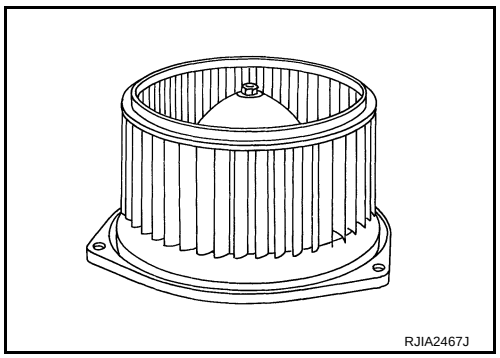
# Component Inspection

INFOID:0000000004517231

## 1. CHECK BLOWER MOTOR

1. Remove the blower motor. Refer to VTL-11, "Exploded View".

2. Check that the blower motor turns smoothly.




Is the inspection result normal?

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

# MAGNET CLUTCH

## Description

INFOID:0000000004519039

The magnet clutch is the device that drives the compressor with the signal from IPDM E/R.

## Component Function Check

INFOID:0000000004519040

### 1.CHECK OPERATION

1. Turn the fan control dial ON.
2. Press the A/C switch.
3. Check that the indicator of the A/C switch turns ON. Check visually and by sound that the compressor operates.
4. Press the A/C switch again.
5. 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 >> Go to diagnosis procedure. Refer to HAC-144, "Diagnosis Procedure".

## Diagnosis Procedure

INFOID:0000000004519041

### 1.CHECK CHARGED REFRIGERANT

Connect the recovery/recycling recharging equipment to the vehicle and perform the pressure inspection with the gauge. Refer to HA-31, "Inspection".

Is there refrigerant?

YES >> GO TO 2.
NO >> Check for refrigerant leakages detecting fluorescent leak detector. Refer to HA-23, "Leak Test".

### 2.CHECK MAGNET CLUTCH OPERATION

Perform auto active test of IPDM E/R. Refer to PCS-10, "Diagnosis Description".

Does it operate normally?

YES >> GO TO 6.
NO >> GO TO 3.

### 3.CHECK MAGNET CLUTCH

1. Turn the ignition switch OFF.
2. Disconnect the magnet clutch connector.
3. Directly apply the battery voltage to the magnet clutch. Check for operation visually and by sound.

Does it operate normally?

YES >> GO TO 4.
NO >> Replace the compressor.

### 4.CHECK MAGNET CLUTCH CIRCUIT CONTINUITY

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

| IPDM E/R | | Magnet clutch | | Continuity |
|---|---|---|---|---|
| Connector | Terminal | Connector | Terminal | |
| E7 | 48 | F43 | 1 | Existed |

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

| IPDM E/R | | — | Continuity |
|---|---|---|---|
| Connector | Terminal | | |
| E7 | 48 | Ground | Not existed |

Is the inspection result normal?

YES >> GO TO 5.
NO >> Repair the harnesses and connectors.

## 5.CHECK FUSE

Check 10A fuse (No. 49, located in the IPDM E/R).
**NOTE:**
Refer to PG-86, "Fuse, Connector and Terminal Arrangement".

Is the inspection result normal?

YES >> Replace IPDM E/R.
NO >> Replace the fuse after repairing the applicable circuit.

## 6.CHECK SELF-DIAGNOSIS RESULT CHECK

With CONSULT-III
1. Perform the “SELF-DIAGNOSIS”.
2. Check if any DTC is detected in the self-diagnostic results.

**NOTE:**
If DTC is displayed along with DTC “U1000” or “U1010”, first diagnose the DTC “U1000” or “U1010”. Refer to HAC-116, "DTC Logic" or HAC-117, "DTC Logic".

Is any DTC displayed?

YES >> Perform the diagnosis that is applicable to the sensor and actuator. Refer to HAC-158, "DTC Index".
NO >> GO TO 7.

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

With CONSULT-III
1. Perform the “DATA MONITOR” of HVAC. Refer to HAC-148, "Reference Value".
2. Check A/C ON signal and blower fan ON switch signal.

| Monitor item | Condition | Status |
|---|---|---|
| COMP REQ SIG | A/C switch: OFF | Off |
| | A/C switch: ON | On |
| FAN REQ SW | Fan control dial: OFF | Off |
| | Fan control dial: ON | On |

Is the inspection result normal?

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

## 8.CHECK REFRIGERANT PRESSURE SENSOR

Check the refrigerant pressure sensor. Refer to EC-506, "Diagnosis Procedure".

Is the inspection result normal?

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

# ECV (ELECTRICAL CONTROL VALVE)

## Description

INFOID:0000000004519271

The ECV (electrical control valve) is installed on the compressor and controls it for emitting appropriate amount of refrigerant when necessary.

## Diagnosis Procedure

INFOID:0000000004519272

### 1.CHECK FUSE

Check 10A fuse [No. 3, located in the fuse block (J/B)].

**NOTE:**

Refer to PG-84, "Fuse, Connector and Terminal Arrangement".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace the fuse after repairing the applicable circuit.

### 2.CHECK ECV POWER SUPPLY CIRCUIT

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

| (+) | | (–) | Voltage |
|---|---|---|---|
| ECV | | — | |
| Connector | Terminal | | |
| F44 | 2 | Ground | Battery voltage |

Is the inspection result normal?

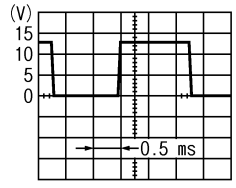
YES >> GO TO 3.

NO >> Repair the harnesses or connectors.

### 3.CHECK ECV CONTROL SIGNAL

With CONSULT-III

1. Turn the ignition switch OFF.
2. Connect the ECV connector.
3. Perform the “HVAC TEST”: MODE 5 of HVAC active test mode.
4. Check output waveform between the A/C auto amp. harness connector and ground with the oscilloscope.

| (+) | | (–) | Condition | Output waveform |
|---|---|---|---|---|
| A/C auto amp. | | — | | |
| Connector | Terminal | | | |
| M66 | 24 | Ground | HVAC TEST: MODE 5 | Duty ratio: approx. 50 %  |



SJIA1607E

Is the inspection result normal?

YES >> Replace the compressor.

NO >> GO TO 4.

### 4.CHECK CONTINUITY BETWEEN ECV AND A/C AUTO AMP.

1. Turn the ignition switch OFF.
2. Disconnect the ECV connector.

3. Disconnect the A/C auto amp. connector.
4. Check continuity between the ECV harness connector and A/C auto amp. harness connector.

| ECV | | A/C auto amp. | | Continuity |
|---|---|---|---|---|
| Connector | Terminal | Connector | Terminal | |
| F44 | 3 | M66 | 24 | Existed |

5. Check for continuity between the ECV harness connector and ground.

| ECV | | — | Continuity |
|---|---|---|---|
| Connector | Terminal | | |
| F44 | 3 | Ground | Not existed |

Is the inspection result normal?

YES >> GO TO 5.
NO >> Repair the harnesses or connectors.

## 5.CHECK ECV

Check continuity between the ECV connector terminals.

| ECV | | | | Continuity |
|---|---|---|---|---|
| Connector | Terminal | Connector | Terminal | |
| F44 | 2 | F44 | 3 | Existed |

Is the inspection result normal?

YES >> Replace the A/C auto amp.
NO >> Replace the compressor.

# ECU DIAGNOSIS INFORMATION

## A/C AUTO AMP.

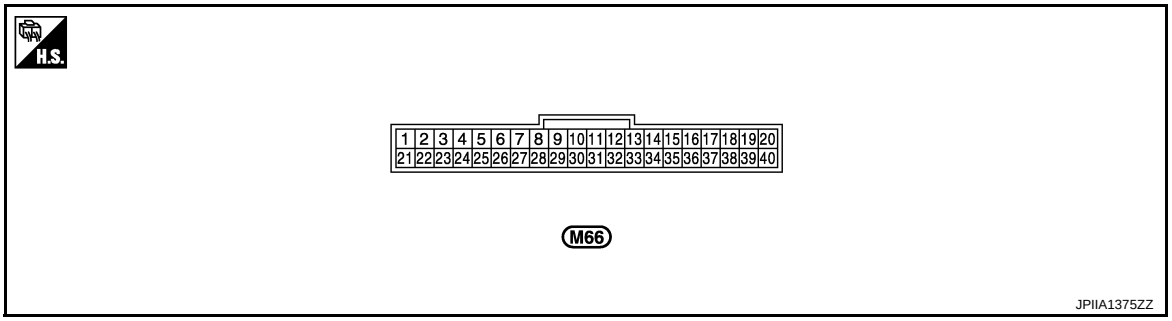
### Reference Value

INFOID:0000000004471976

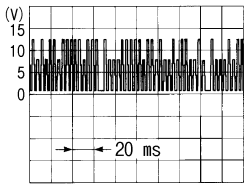
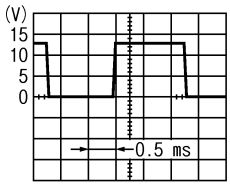
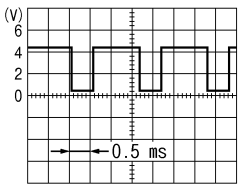
#### CONSULT-III DATA MONITOR REFERENCE VALUES

| 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 motor: ON | On |
| | | Blower motor: 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 motor: ON | 25 – 81 |
| | | Blower motor: OFF | 0 |
| XM | Ignition switch ON | — | –100 – 155 |
| ENG COOL TEMP | Ignition switch ON | — | Values depending on coolant temperature |
| VEHICLE SPEED | Driving | — | Equivalent to speedometer reading |

#### TERMINAL LAYOUT



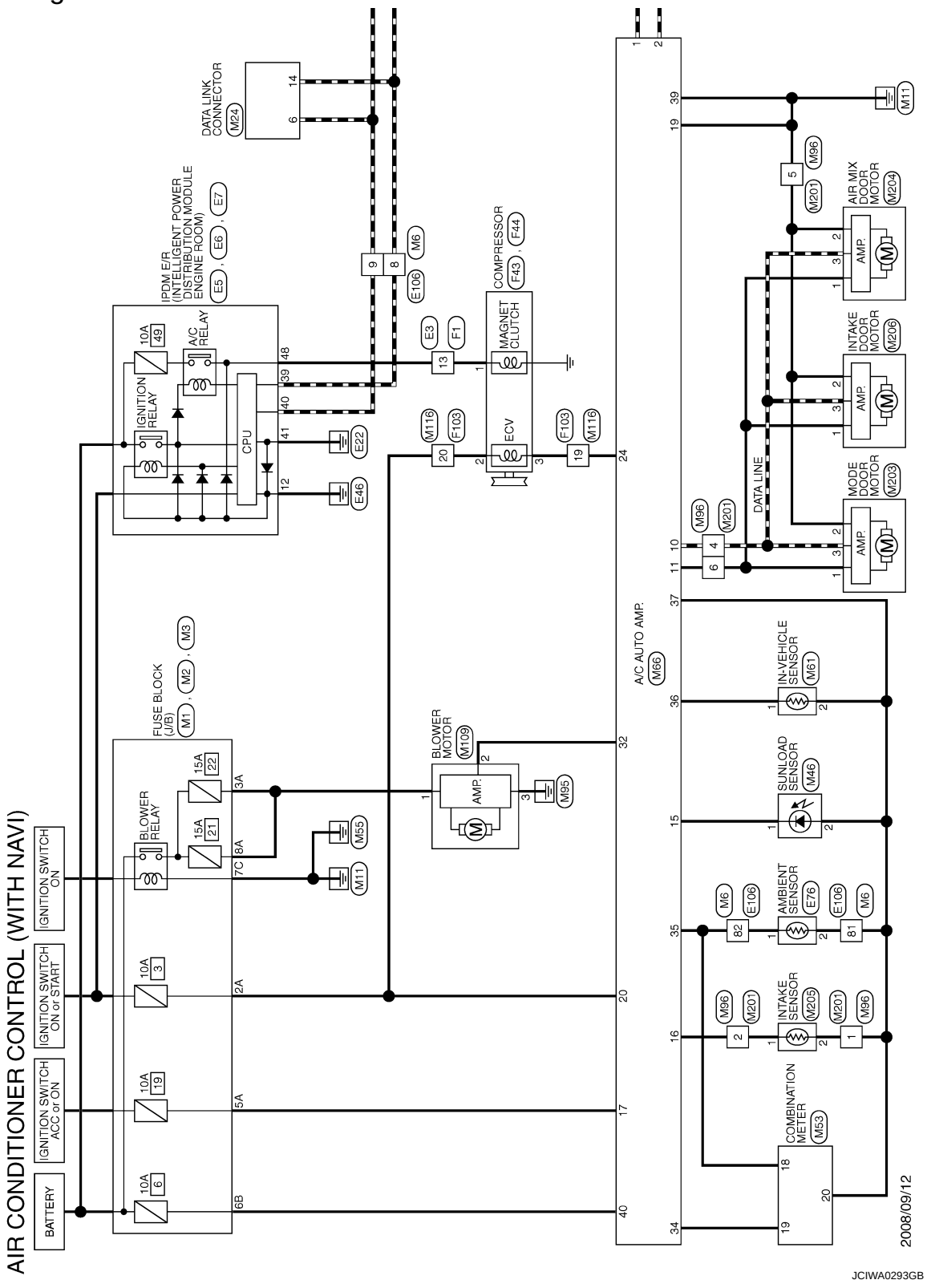

#### PHYSICAL VALUES

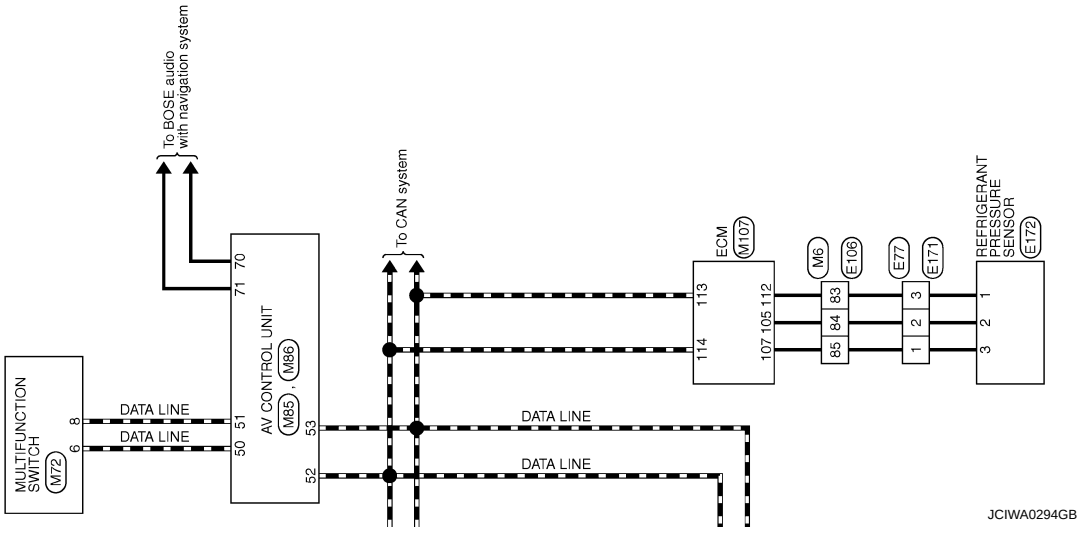
| Terminal No. (Wire color) | | Description | | Condition | Value (Approx.) |
|---|---|---|---|---|---|
| + | – | Signal name | Input/ Output | | |
| 1 (L) | Ground | CAN - H | Input/ Output | — | — |
| 2 (P) | Ground | CAN - L | Input/ Output | — | — |
| 10 (L) | Ground | A/C LAN signal | Input/ Output | Ignition switch ON |  SJIA1453J |
| 11 (R) | Ground | Each door motor power supply | — | Ignition switch ON | 12 V |
| 15 (O) | Ground | Sunload sensor signal | Input | — | 0 – 4.8 V<br>Output voltage varies with sunload amount |
| 16 (R) | Ground | Intake sensor signal | Input | — | 0 – 4.8 V<br>Output voltage varies with intake temperature |
| 17 (L) | Ground | ACC power supply | — | Ignition switch ACC | Battery voltage |
| 19 (B) | Ground | Ground | — | Ignition switch ON | 0 V |
| 20 (W) | Ground | Ignition power supply | — | Ignition switch ON | Battery voltage |
| 24 (O) | Ground | ECV signal | Output | • Ignition switch ON<br>• Active test: MODE 5 |  SJIA1607E |
| 32 (P) | Ground | Blower motor control signal | Output | • Ignition switch ON<br>• Fan speed: 1st speed (manual) |  JSIIA0096ZZ |
| 34 (R) | Ground | A/C auto amp. connecting recognition signal | Output | Ignition switch ON | 5 V |
| 35 (V) | Ground | Ambient sensor signal | Input | — | 0 – 4.8 V<br>Output voltage varies with ambient temperature |
| 36 (LG) | Ground | In-vehicle sensor signal | Input | — | 0 – 4.8 V<br>Output voltage varies with in-vehicle temperature |
| 37 (GR) | Ground | Sensor ground | — | Ignition switch ON | 0 V |

| Terminal No. (Wire color) | | Description | | Condition | Value (Approx.) |
|---|---|---|---|---|---|
| + | – | Signal name | Input/ Output | | |
| 39 (B) | Ground | Ground | — | Ignition switch ON | 0 V |
| 40 (Y) | Ground | Battery power supply | — | Ignition switch OFF | Battery voltage |

## Wiring Diagram - AIR CONDITIONER CONTROL SYSTEM -

INFOID:0000000004471977



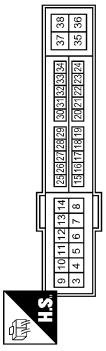

To BOSE audio with navigation system
To CAN system
MULTIFUNCTION SWITCH
M72
AV CONTROL UNIT
M85
M86
ECM
M107
M6
E106
E77
E171
REFRIGERANT PRESSURE SENSOR
E172
DATA LINE
DATA LINE
DATA LINE
DATA LINE
JCIWA0294GB

AIR CONDITIONER CONTROL (WITH NAVI)

| Connector No. | E3 |
|---|---|
| Connector Name | WIRE TO WIRE |
| Connector Type | SAA36MB-RS8-SHZ8 |

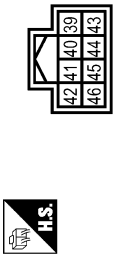
| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 13 | L | – |

| Connector No. | E5 |
|---|---|
| Connector Name | IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM) |
| Connector Type | TH20FW-CS12-M4-1V |



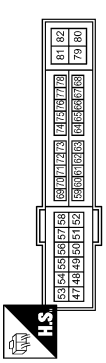
| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 12 | B/W | – |

| Connector No. | E6 |
|---|---|
| Connector Name | IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM) |
| Connector Type | TH08FW-NH |



| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 39 | P | – |
| 40 | L | – |
| 41 | B/W | – |

| Connector No. | E7 |
|---|---|
| Connector Name | IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM) |
| Connector Type | TH20FW-CS12-M4 |



| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 48 | L | – |

| Connector No. | E76 |
|---|---|
| Connector Name | AMBIENT SENSOR |
| Connector Type | RS02FB |

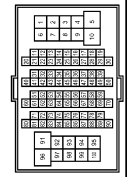


| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 1 | G | AMBIENT SENSOR SIGNAL |
| 2 | P | SENSOR GROUND |

| Connector No. | E77 |
|---|---|
| Connector Name | WIRE TO WIRE |
| Connector Type | RK03FB |

| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 1 | V | – |
| 2 | L | – |
| 3 | O | – |

| Connector No. | E106 |
|---|---|
| Connector Name | WIRE TO WIRE |
| Connector Type | TH80FW-CS16-TM4 |



| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 8 | P | – |
| 9 | L | – |
| 81 | P | – |
| 82 | G | – |
| 83 | V | – |
| 84 | L | – |
| 85 | O | – |

| Connector No. | E171 |
|---|---|
| Connector Name | WIRE TO WIRE |
| Connector Type | RK03MB |

| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 1 | – | – |
| 2 | – | – |
| 3 | – | – |

JCIWA0295GB

AIR CONDITIONER CONTROL (WITH NAVI)

| Connector No. | E172 |
|---|---|
| Connector Name | REFRIGERANT PRESSURE SENSOR |
| Connector Type | RK03FB |

H.S.

1 2 3

| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 1 | – | – |
| 2 | – | – |
| 3 | – | – |

| Connector No. | F1 |
|---|---|
| Connector Name | WIRE TO WIRE |
| Connector Type | SAA36FB-RS8-SHZ8 |

H.S.

12 11 10 9 16 15 14 13

23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52

2 1 3 4 6 5 8 7

| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 13 | O | – |

| Connector No. | F43 |
|---|---|
| Connector Name | COMPRESSOR |
| Connector Type | RS01FB |

H.S.

1

| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 1 | O | MAGNET CLUTCH POWER SUPPLY |

| Connector No. | F44 |
|---|---|
| Connector Name | COMPRESSOR |
| Connector Type | RK02FGY |

H.S.

3 2

| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 2 | Y | ECV POWER SUPPLY |
| 3 | O | ECV SIGNAL |

| Connector No. | F103 |
|---|---|
| Connector Name | WIRE TO WIRE |
| Connector Type | TK36FW-NS10 |

H.S.

36 35 34 33 32 31 30 29 28 27 26 25 24 23 22 21 20 19

40 39 38 37 36 35 34 33 32 31 30 29 28 27 26 25 24 23 22 21

5 4 3 2 1 10 9 8 7 6

| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 19 | O | – |
| 20 | Y | – |

| Connector No. | M1 |
|---|---|
| Connector Name | FUSE BLOCK (J/B) |
| Connector Type | NS06FW-M2 |

H.S.

3A 2A 1A 8A 7A 6A 5A 4A

| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 2A | G | – |
| 3A | L | – |
| 5A | L | – |
| 8A | L | – |

| Connector No. | M2 |
|---|---|
| Connector Name | FUSE BLOCK (J/B) |
| Connector Type | NS10FW-CS |

H.S.

4B 3B 2B 1B 10B 9B 8B 7B 6B 5B

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

| Connector No. | M3 |
|---|---|
| Connector Name | FUSE BLOCK (J/B) |
| Connector Type | NS12FW-CS |

H.S.

5C 4C 3C 2C 1C 12C 11C 10C 9C 8C 7C 6C

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

JCIWA0296GB

AIR CONDITIONER CONTROL (WITH NAVI)

| Connector No. | M6 |
|---|---|
| Connector Name | WIRE TO WIRE |
| Connector Type | TH80MW-CS16-TM4 |

H.S.

| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 8 | P | – |
| 9 | L | – |
| 81 | GR | – |
| 82 | V | – |
| 83 | V | – |
| 84 | L | – |
| 85 | BR | – |

| Connector No. | M24 |
|---|---|
| Connector Name | DATA LINK CONNECTOR |
| Connector Type | BD16FW |

H.S.

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

| Connector No. | M46 |
|---|---|
| Connector Name | SUNLOAD SENSOR |
| Connector Type | K02FB |

H.S.

| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 1 | O | SUNLOAD SENSOR SIGNAL |
| 2 | GR | SENSOR GROUND |

| Connector No. | M53 |
|---|---|
| Connector Name | COMBINATION METER |
| Connector Type | TH24FW-NH |

H.S.

| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 18 | V | AMBIENT SENSOR SIGNAL |
| 19 | G | A/C AUTO AMP. CONNECTION RECOGNITION SIGNAL |
| 20 | GR | AMBIENT SENSOR GROUND |

| Connector No. | M61 |
|---|---|
| Connector Name | IN-VEHICLE SENSOR |
| Connector Type | A02FW |

H.S.

| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 1 | LG | IN-VEHICLE SENSOR SIGNAL |
| 2 | GR | SENSOR GROUND |

| Connector No. | M66 |
|---|---|
| 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 |
| 10 | BR | LAN SIGNAL |
| 11 | Y | EACH DOOR MOTOR POWER SUPPLY |
| 15 | O | SUNLOAD SENSOR SIGNAL |
| 16 | R | INTAKE SENSOR SIGNAL |
| 17 | L | ACC POWER SUPPLY |
| 19 | B | GROUND |
| 20 | G | IGNITION POWER SUPPLY |
| 24 | O | ECV SIGNAL |
| 32 | P | BLOWER MOTOR CONTROL SIGNAL |
| 34 | G | A/C AUTO AMP. CONNECTION RECOGNITION SIGNAL |
| 35 | V | AMBIENT SENSOR SIGNAL |
| 36 | LG | IN-VEHICLE SENSOR SIGNAL |
| 37 | GR | SENSOR GROUND |
| 39 | B | GROUND |
| 40 | Y | BATTERY POWER SUPPLY |

| Connector No. | M72 |
|---|---|
| Connector Name | MULTIFUNCTION SWITCH |
| Connector Type | TH16FW-NH |

H.S.

| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 6 | LG | AV COMM (H) |
| 8 | V | AV COMM (L) |

JCIWA0297GB

AIR CONDITIONER CONTROL (WITH NAVI)

| Connector No. | M85 |
|---|---|
| Connector Name | AV CONTROL UNIT |
| Connector Type | TH40FW-NH |



| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 50 | LG | AV COMM (H) |
| 51 | V | AV COMM (L) |
| 52 | L | CAN-H |
| 53 | P | CAN-L |

| Connector No. | M86 |
|---|---|
| Connector Name | AV CONTROL UNIT |
| Connector Type | TH12FW-NH |



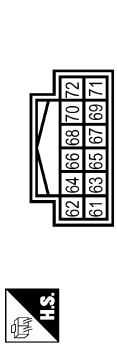
| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 70 | R | COMM (CONT->DISP) |
| 71 | G | COMM (DISP->CONT) |

| Connector No. | M109 |
|---|---|
| Connector Name | BLOWER MOTOR |
| Connector Type | NS03FW-M3 |



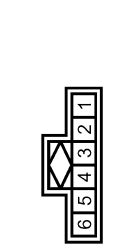
| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 1 | L | BLOWER MOTOR POWER SUPPLY |
| 2 | P | BLOWER MOTOR CONTROL SIGNAL |
| 3 | B | SENSOR GROUND |

| Connector No. | M116 |
|---|---|
| Connector Name | WIRE TO WIRE |
| Connector Type | TK36MW-NS10 |



| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 19 | O | – |
| 20 | G | – |

| Connector No. | M96 |
|---|---|
| Connector Name | WIRE TO WIRE |
| Connector Type | A06FW |



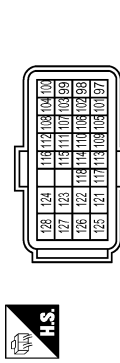
| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 1 | GR | – |
| 2 | R | – |
| 4 | BR | – |
| 5 | B | – |
| 6 | Y | – |

| Connector No. | M201 |
|---|---|
| Connector Name | WIRE TO WIRE |
| Connector Type | A06MW |



| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 1 | GR | – |
| 2 | R | – |
| 4 | L | – |
| 5 | B | – |
| 6 | R | – |

| Connector No. | M107 |
|---|---|
| Connector Name | ECM |
| Connector Type | RH24FGY-RZ8-R-LH-Z |



| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 105 | L | PDPRESS |
| 107 | BR | AVCC2-FTPRS |
| 112 | SB | GNDA-FTPRES |
| 113 | P | VEHCAN-L1 |
| 114 | L | VEHCAN-H1 |

| Connector No. | M203 |
|---|---|
| Connector Name | MODE DOOR MOTOR |
| Connector Type | A03FW |



| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 1 | L | DOOR MOTOR POWER SUPPLY |
| 2 | B | GROUND |
| 3 | L | A/C LAN SIGNAL |

JCIWA0298GB

AIR CONDITIONER CONTROL (WITH NAVI)

| Connector No. | M204 |
|---|---|
| Connector Name | AIR MIX DOOR MOTOR |
| Connector Type | A03FW |

H.S.

| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 1 | L | DOOR MOTOR POWER SUPPLY |
| 2 | B | GROUND |
| 3 | L | A/C LAN SIGNAL |

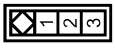
| Connector No. | M205 |
|---|---|
| Connector Name | INTAKE SENSOR |
| Connector Type | TK04FW |

H.S.

| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 1 | R | INTAKE SENSOR SIGNAL |
| 2 | GR | SENSOR GROUND |

| Connector No. | M206 |
|---|---|
| Connector Name | INTAKE DOOR MOTOR |
| Connector Type | A03FW |

H.S.



| Terminal No. | Color of Wire | Signal Name [Specification] |
|---|---|---|
| 1 | L | DOOR MOTOR POWER SUPPLY |
| 2 | B | GROUND |
| 3 | L | A/C LAN SIGNAL |

JCIWA0299GB

## Fail-safe

*INFOID:0000000004471978*

### FAIL-SAFE FUNCTION

When a communication malfunction between A/C auto amp. and AV control unit and preset switch continued for approximately 30 seconds or more, control the air conditioner under the following conditions.

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

## DTC Inspection Priority Chart

INFOID:0000000004520031

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 | • B257B: AMB TEMP SEN SHORT<br>• B257C: AMB TEMP SEN OPEN<br>• B2578: IN CAR SEN SHORT<br>• B2579: IN CAR SEN OPEN<br>• B2581: EVAP TEMP SEN SHORT<br>• B2582: EVAP TEMP SEN OPEN<br>• B2630: SUNLOAD SEN SHORT<br>• B2631: SUNLOAD SEN OPEN<br>• B2632: DR AIRMIX ACTR SHORT<br>• B2633: DR AIRMIX ACTR OPEN<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 |

## DTC Index

INFOID:0000000004520032

| DTC | Items (CONSULT-III screen terms) | Reference |
|---|---|---|
| U1000 | CAN COMM CIRCUIT | HAC-116, "DTC Logic" |
| U1010 | CONTROL UNIT (CAN) | HAC-117, "DTC Logic" |
| B257B | AMB TEMP SEN SHORT | HAC-118, "DTC Logic" |
| B257C | AMB TEMP SEN OPEN | HAC-118, "DTC Logic" |
| B2578 | IN CAR SEN SHORT | HAC-121, "DTC Logic" |
| B2579 | IN CAR SEN OPEN | HAC-121, "DTC Logic" |
| B2581 | EVAP TEMP SEN SHORT | HAC-124, "DTC Logic" |
| B2582 | EVAP TEMP SEN OPEN | HAC-124, "DTC Logic" |
| B2630* | SUNLOAD SEN SHORT | HAC-127, "DTC Logic" |
| B2631* | SUNLOAD SEN OPEN | HAC-127, "DTC Logic" |
| B2632 | DR AIRMIX ACTR SHORT | HAC-130, "DTC Logic" |
| B2633 | DR AIRMIX ACTR OPEN | HAC-130, "DTC Logic" |
| B2636 | DR VENT DOOR FAIL | HAC-132, "DTC Logic" |
| B2637 | DR B/L DOOR FAIL | HAC-132, "DTC Logic" |
| B2638 | DR D/F1 DOOR FAIL | HAC-132, "DTC Logic" |

| DTC | Items (CONSULT-III screen terms) | Reference |
|---|---|---|
| B2639 | DR DEF DOOR FAIL | HAC-132, "DTC Logic" |
| B263D | FRE DOOR FAIL | HAC-134, "DTC Logic" |
| B263E | 20P FRE DOOR FAIL | HAC-134, "DTC Logic" |
| B263F | REC DOOR FAIL | HAC-44, "DTC Logic" |
| B2654 | D/F2 DOOR FAIL | HAC-132, "DTC Logic" |
| B2655 | B/L2 DOOR FAIL | HAC-132, "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.

**NOTE:**

If all of door motors DTC (B2632, B2633, B2636, B2637, B2638, B2639, B263D, B263E, B263F, B2654 and B2655) are detected, check door motor communication circuit. Refer to HAC-137, "Description".

# SYMPTOM DIAGNOSIS

## AUTOMATIC AIR CONDITIONER SYSTEM

### Diagnosis Chart By Symptom

INFOID:0000000004471981

| Symptom | Check item | Reference |
|---|---|---|
| A/C system does not activate. | Power supply and ground circuit | HAC-136, "A/C AUTO AMP. : Diagnosis Procedure" |
| A/C system cannot be controlled. | A/C auto amp. | HAC-139, "Diagnosis Procedure" |
| • Air outlet does not change.<br>• Mode door motor does not operate normally. | Mode door motor | HAC-133, "Diagnosis Procedure" |
| • Discharge air temperature does not change.<br>• The air mix door motor does not operate normally. | Air mix door motor | HAC-131, "Diagnosis Procedure" |
| • Intake door does not change.<br>• Intake door motor does not operate normally. | Intake door motor | HAC-135, "Diagnosis Procedure" |
| Blower motor operation is malfunctioning. | Blower motor | HAC-140, "Diagnosis Procedure" |
| Magnet clutch does not operate. | Magnet clutch | HAC-144, "Diagnosis Procedure" |
| • Insufficient cooling<br>• No cool air comes out. (Air flow volume is normal.) | ECV | HAC-146, "Diagnosis Procedure" |
| | Insufficient cooling | HAC-161, "Diagnosis Procedure" |
| • Insufficient heating<br>• No warm air comes out. (Air flow volume is normal.) | Insufficient heating | HAC-163, "Diagnosis Procedure" |
| • Noise<br>• Noise is heard when the A/C system operates. | Noise | HAC-166, "Diagnosis Procedure" |
| • Memory function does not operate normally.<br>• The setting is not maintained. (It returns to the initial condition) | Memory function | HAC-168, "Diagnosis Procedure" |

# INSUFFICIENT COOLING

## Description

INFOID:0000000004520431

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

## Diagnosis Procedure

INFOID:0000000004520432

### 1.CHECK MAGNET CLUTCH OPERATION

1. Turn the ignition switch ON.
2. Turn the fan control dial ON.
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 operates.
5. Press the A/C switch again.
6. Check that the indicator of the A/C switch turns OFF. Check that the compressor stops.

Is the inspection result normal?

YES >> GO TO 2.
NO >> Magnet clutch system malfunction. Refer to HAC-144, "Diagnosis Procedure".

### 2.CHECK DRIVE BELT

Check tension of the drive belt. Refer to EM-13, "Checking".

Is the inspection result normal?

YES >> GO TO 3.
NO >> Adjust or replace drive belt depending on the inspection results.

### 3.CHECK REFRIGERANT CYCLE PRESSURE

Connect the recovery/recycling recharging equipment to the vehicle and perform the pressure inspection with the gauge. Refer to HA-7, "Symptom Table".

Is the inspection result normal?

YES >> GO TO 4.
NO >> Repair or replace the parts depending on the inspection results.

### 4.CHECK PERFORMANCE CHART

Connect recovery/recycling recharging equipment to the vehicle and perform the performance test. Refer to HA-31, "Inspection".

Is the inspection result normal?

YES >> GO TO 5.
NO >> GO TO 7.

### 5.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 6.
NO >> Perform the diagnosis for the A/C auto amp. connection recognition signal. Refer to MWI-55, "Diagnosis Procedure".

### 6.CHECK SETTING OF TEMPERATURE SETTING TRIMMER

With CONSULT-III

1. Select “TEMP SET CORRECT” of HVAC work support item. Refer to HAC-97, "Temperature Setting Trimmer".
2. 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.

3. Set the difference between the set temperature and control temperature to “0”.

>> INSPECTION END

## 7. 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.

Are the symptoms solved?

YES >> INSPECTION END
NO >> Refer to HAC-160, "Diagnosis Chart By Symptom" and perform the appropriate diagnosis.

# INSUFFICIENT HEATING

## Description

INFOID:0000000004523299

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

## Diagnosis Procedure

INFOID:0000000004523300

### 1. CHECK COOLING SYSTEM

1. Check the engine coolant level and check for leakage. Refer to CO-7, "Inspection".
2. Check radiator cap. Refer to CO-11, "RADIATOR CAP : Inspection".
3. Check water flow sounds of the engine coolant. Refer to CO-8, "Refilling".

Is the inspection result normal?

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

### 2. CHECK OPERATION

1. Turn temperature dial and raise temperature setting to 32.0°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

With CONSULT-III
1. Select “TEMP SET CORRECT” of HVAC work support item. Refer to HAC-97, "Temperature Setting Trimmer".
2. Check that the temperature setting trimmer is set to “– direction”.
   **NOTE:**
   The control temperature can be set by the temperature setting trimmer.
3. Set the difference between the set temperature and control temperature to “0”.

Are the symptoms solved?

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

### 4. CHECK SELF-DIAGNOSIS RESULT CHECK

With CONSULT-III
1. Perform the “SELF-DIAGNOSIS”.
2. Check if any DTC is detected in the self-diagnostic results.
   **NOTE:**
   If DTC is displayed along with DTC “U1000” or “U1010”, first diagnose the DTC “U1000” or “U1010”. Refer to HAC-116, "DTC Logic" or HAC-117, "DTC Logic".

Is any DTC displayed?

YES >> Perform the diagnosis that is applicable to the sensor and the door motor. Refer to HAC-158, "DTC Index".
NO >> GO TO 5.

### 5. CHECK EACH OUTPUT DEVICE

With CONSULT-III
1. Select “HVAC TEST” of HVAC active test item. Refer to HAC-114, "CONSULT-III 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 | VENT | B/L 1 | B/L 2 | FOOT | D/F | DEF | — |
| Intake door position | REC | REC | 20% FRE | FRE | FRE | FRE | — |
| Air mix door position | FULL COLD | FULL COLD | FULL HOT | FULL HOT | FULL HOT | FULL HOT | — |
| Blower fan motor control signal duty ratio | 37% | 91% | 65% | 65% | 65% | 91% | — |
| Magnet clutch | ON | ON | OFF | OFF | ON | ON | — |
| ECV duty ratio | 100% | 100% | 0% | 0% | 50% | 100% | — |

**NOTE:**

- Perform the inspection of each output device after starting the engine because the compressor is operated.
- If the MODE 7 is selected, the malfunction is displayed but it is normal.

| Discharge air flow | | | |
|---|---|---|---|
| Mode position indication | Air outlet/distribution | | |
| | VENT | FOOT | DEF |
|  | 100% | — | — |
|  | 60% | 40% | — |
|  | 12% | 62% | 26% |
|  | 10% | 52% | 38% |
|  | — | — | 100% |

Does it operate normally?

YES >> GO TO 6.
NO-1 >> Air outlet does not change. Refer to HAC-133, "Diagnosis Procedure".
NO-2 >> Air inlet does not change. Refer to HAC-135, "Diagnosis Procedure".
NO-3 >> Discharge air temperature does not change. Refer to HAC-131, "Diagnosis Procedure".
NO-4 >> Blower motor does not operate normally. Refer to HAC-140, "Diagnosis Procedure".
NO-5 >> Magnet clutch does not operate. Refer to HAC-144, "Diagnosis Procedure".

## 6. CHECK AIR LEAKAGE FROM DUCT

Check duct and nozzle, etc. of the air conditioner system for air leakage.

Is the inspection result normal?

YES >> GO TO 7.
NO >> Repair or replace parts depending on 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 depending on 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 HA-43, "Exploded View".

Are symptoms solved?

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

# NOISE

## Description

INFOID:0000000004523302

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

## Diagnosis Procedure

INFOID:0000000004523303

### 1.CHECK OPERATION

1. Operate the A/C system and check the operation. Refer to HAC-96, "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 cooler 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-9, "Symptom Table".

Is the inspection result normal?

YES >> INSPECTION END
NO >> Refill the refrigerant or replace the compressor depending on the inspection results.

### 4.CHECK WITH GAUGE PRESSURE

Perform the diagnosis with the gauge pressure. Refer to HA-7, "Trouble Diagnosis For Unusual Pressure".

Is the inspection result normal?

YES >> GO TO 5.
NO >> Repair or replace parts depending on 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 COOLER PIPING (PIPE, FLEXIBLE HOSE)

1. Check the cooler piping (pipes, flexible hoses) (for deformation and damage, etc.).
2. Check the installation condition of clips and brackets, etc. of the cooler 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 depending on the inspection results.

### 7.CHECK DRIVE BELT

Check tension of the drive belt. Refer to EM-13, "Checking".

Is the inspection result normal?

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

# MEMORY FUNCTION DOES NOT OPERATE

## Description

INFOID:0000000004540012

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

## Diagnosis Procedure

INFOID:0000000004540013

### 1.CHECK OPERATION

1. Turn the ignition switch ON.
2. Set temperature control dial to 32.0°C (90°F).
3. Press the OFF switch.
4. Turn the ignition switch OFF.
5. Turn the ignition switch ON.
6. Press the AUTO switch.
7. 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-136, "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

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

INFOID:0000000004781588

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:**

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the “SRS AIR BAG”.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

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

**WARNING:**

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

### Precaution Necessary for Steering Wheel Rotation after Battery Disconnect

INFOID:0000000004781589

**NOTE:**

- Before removing and installing any control units, first turn the push-button ignition switch to the LOCK position, then disconnect both battery cables.
- After finishing work, confirm that all control unit connectors are connected properly, then re-connect both battery cables.
- Always use CONSULT-III to perform self-diagnosis as a part of each function inspection after finishing work. If a DTC is detected, perform trouble diagnosis according to self-diagnosis results.

For vehicle with steering lock unit, if the battery is disconnected or discharged, the steering wheel will lock and cannot be turned.
If turning the steering wheel is required with the battery disconnected or discharged, follow the operation procedure below before starting the repair operation.

#### OPERATION PROCEDURE

1. Connect both battery cables.
   **NOTE:**
   Supply power using jumper cables if battery is discharged.
2. Turn the push-button ignition switch to ACC position.
   (At this time, the steering lock will be released.)
3. Disconnect both battery cables. The steering lock will remain released with both battery cables disconnected and the steering wheel can be turned.
4. Perform the necessary repair operation.

5. When the repair work is completed, re-connect both battery cables. With the brake pedal released, turn the push-button ignition switch from ACC position to ON position, then to LOCK position. (The steering wheel will lock when the push-button ignition switch is turned to LOCK position.)
6. Perform self-diagnosis check of all control units using CONSULT-III.

## Precaution for Battery Service

INFOID:0000000004781590

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

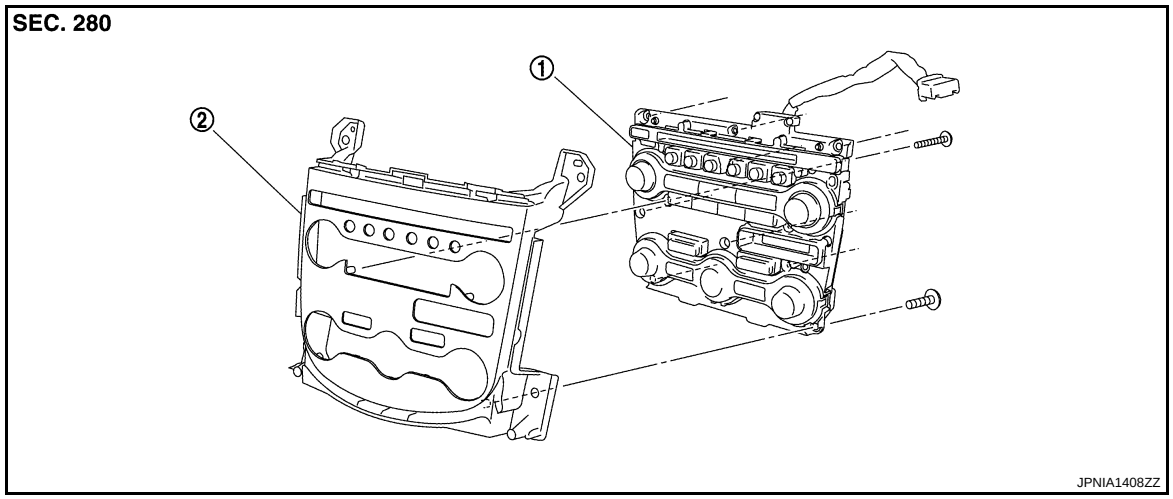
# REMOVAL AND INSTALLATION

## PRESET SWITCH

### Exploded View

INFOID:0000000004472070

DISASSEMBLY




1. Preset switch
2. Cluster lid C finisher

### Removal and Installation

INFOID:0000000004472071

REMOVAL

Refer to AV-339, "Exploded View".

INSTALLATION

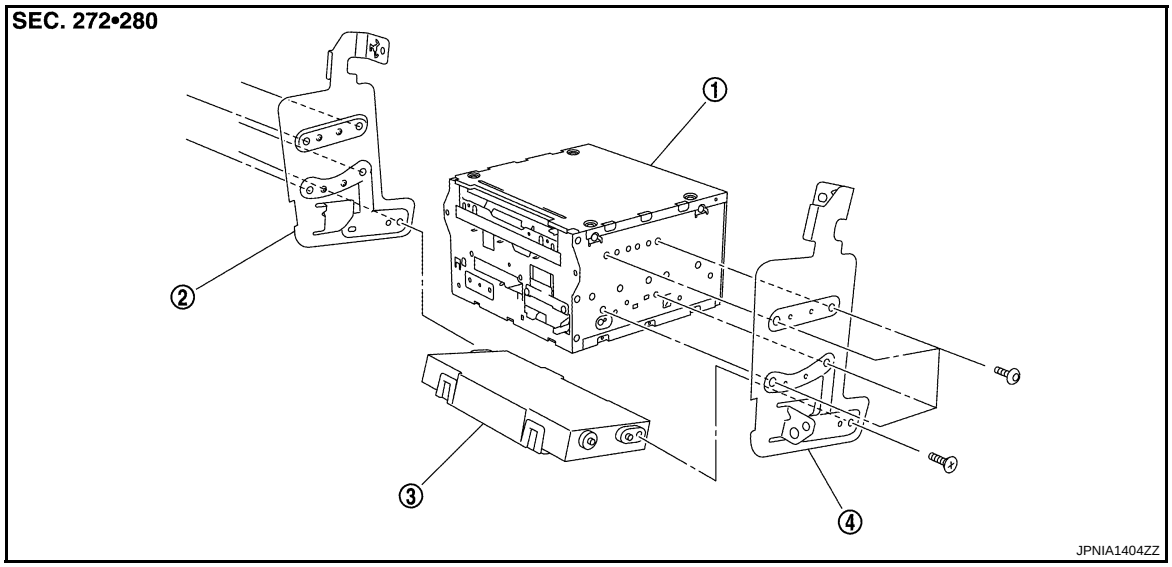
Installation is basically the reverse order of removal.

# A/C AUTO AMP.

## Exploded View

INFOID:0000000004472051

DISASSEMBLY



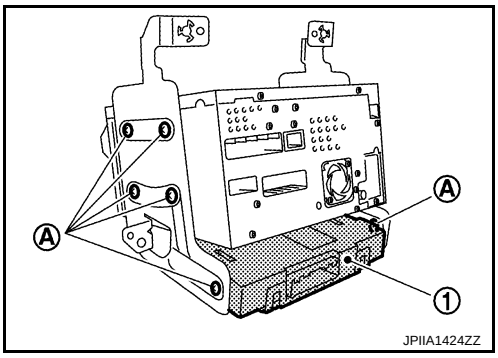

1. AV control unit
2. Bracket LH
3. A/C auto amp.
4. Bracket RH

## Removal and Installation

INFOID:0000000004472052

REMOVAL

1. Remove AV control unit. Refer to AV-331, "Exploded View".
2. Remove mounting screws (A), and then remove A/C auto amp. (1).




INSTALLATION

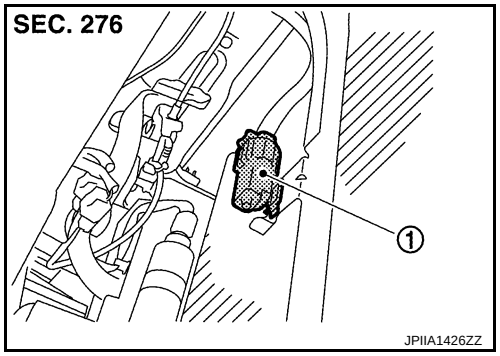
Installation is basically the reverse order of removal.

# AMBIENT SENSOR

## Exploded View

INFOID:0000000004511943

1. Ambient sensor

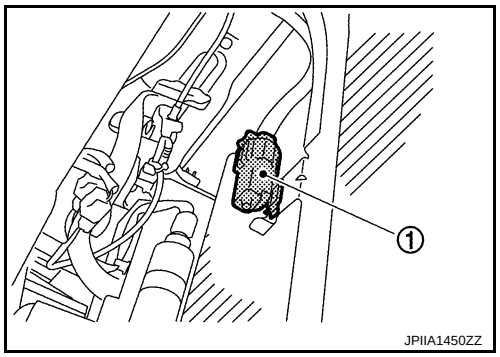



## Removal and Installation

INFOID:0000000004511944

### REMOVAL

1. Remove the engine under cover. Refer to EXT-28, "ENGINE UNDER COVER : Exploded View".
2. Disconnect ambient sensor connector, and then remove ambient sensor (1) from bracket.



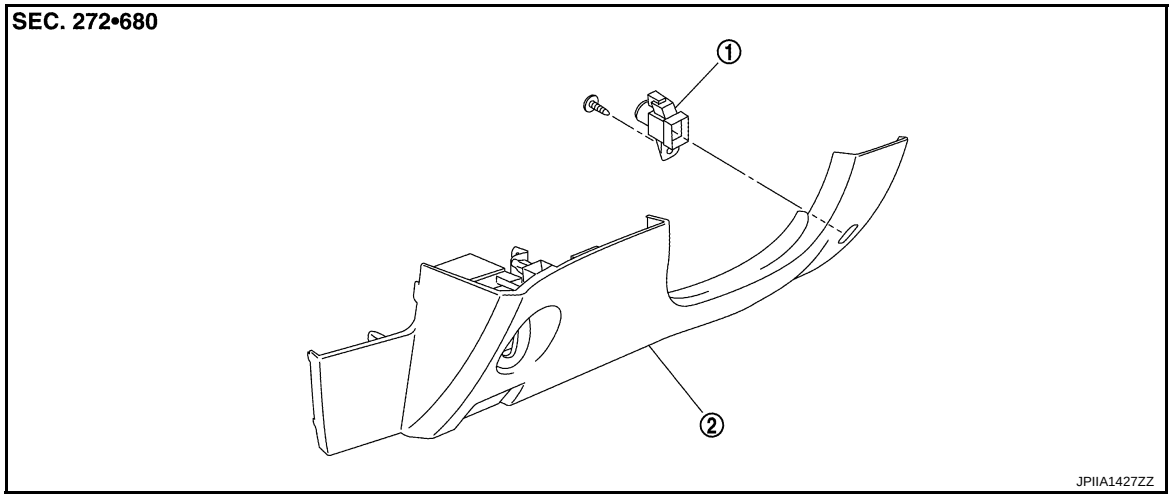

### INSTALLATION

Installation is basically the reverse order of removal.

# IN-VEHICLE SENSOR

## Exploded View

INFOID:0000000004511945



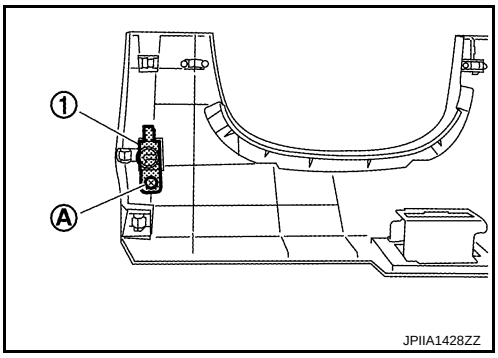

1. In-vehicle sensor
2. Instrument lower panel LH

## Removal and Installation

INFOID:0000000004511946

### REMOVAL

1. Remove instrument lower panel LH. Refer to IP-12, "Exploded View".
2. Remove mounting screw (A), and then remove in-vehicle sensor (1).




### INSTALLATION

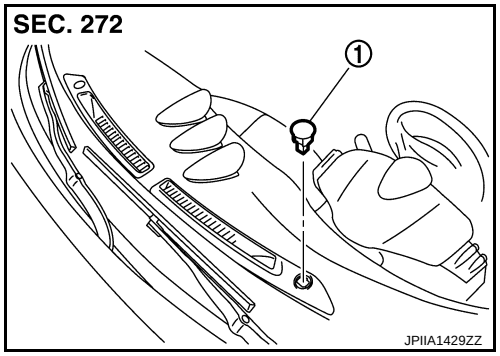
Installation is basically the reverse order of removal.

# SUNLOAD SENSOR

## Exploded View

INFOID:0000000004511947

1. Sunload sensor




## Removal and Installation

INFOID:0000000004511948

### REMOVAL

Disconnect sunload sensor connector, and then remove sunload sensor.

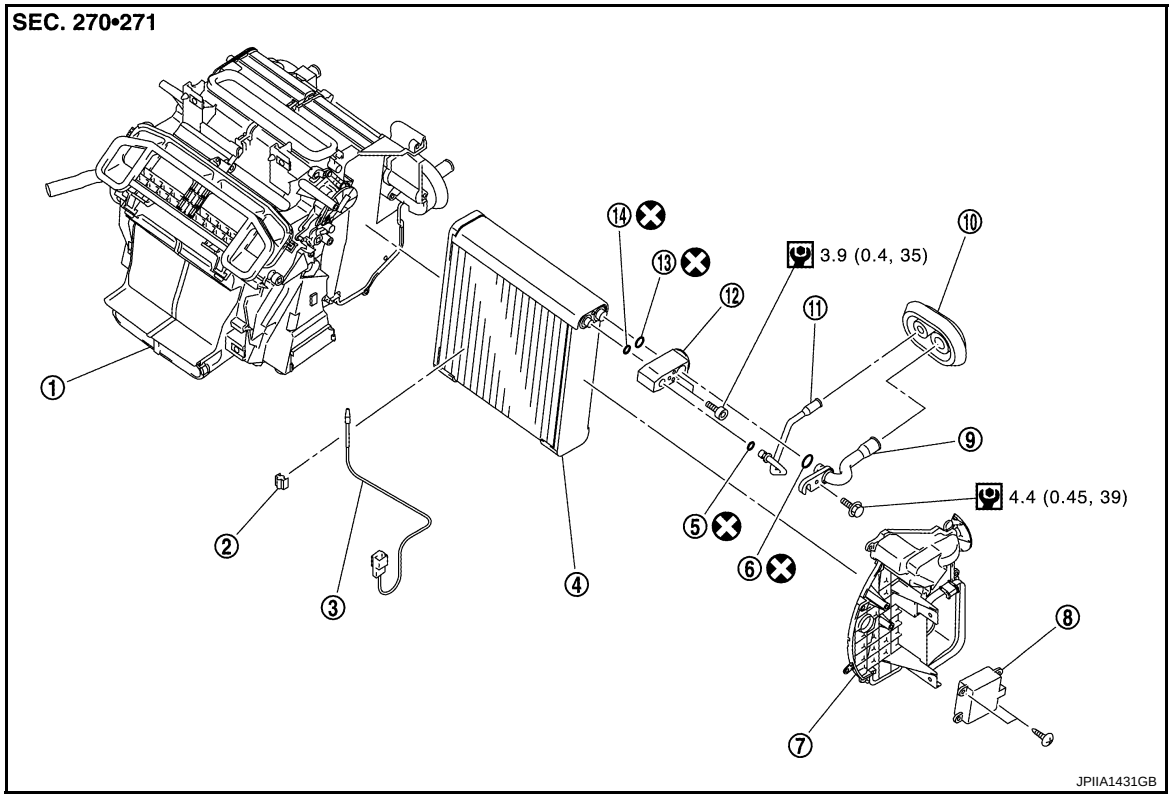
### INSTALLATION

Installation is basically the reverse order of removal.

# INTAKE SENSOR

## Exploded View

INFOID:0000000004511949




1. Heater & cooling unit assembly
2. Intake sensor bracket
3. Intake sensor
4. Evaporator
5. O-ring
6. O-ring
7. Evaporator cover
8. Air mix door motor
9. Low-pressure evaporator pipe
10. Cooler pipe grommet
11. High-pressure evaporator pipe
12. Expansion valve
13. O-ring
14. O-ring

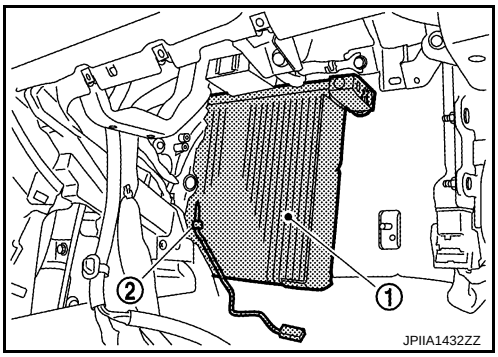
Refer to GI-4, "Components" for symbols in the figure.

## Removal and Installation

INFOID:0000000004511950

### REMOVAL

1. Remove high-pressure evaporator pipe and low-pressure evaporator pipe. Refer to HA-48, "Exploded View".
2. Disconnect intake sensor connector.
3. Slide evaporator (1) toward the right side of the vehicle (as shown in the figure), and then remove intake sensor (2).




### INSTALLATION

Installation is basically the reverse order of removal.

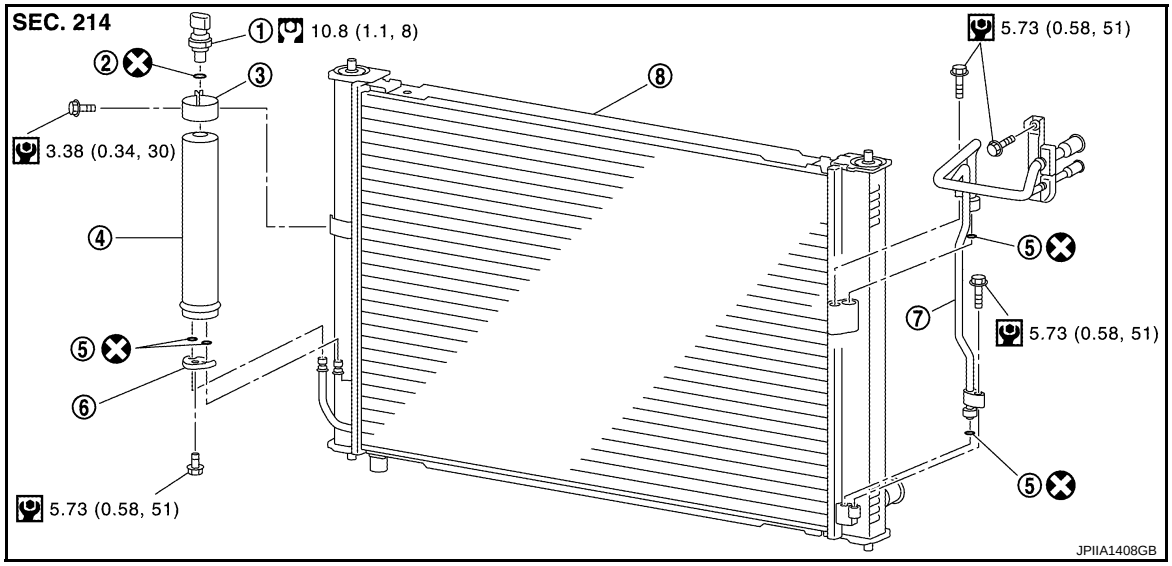
**CAUTION:**

- **Replace O-rings with new ones. Then apply the compressor oil to them when installing.**
- **Mark the mounting position of intake sensor bracket prior to removal so that the reinstalled sensor can be located in the same position.**
- **Never rotate the bracket insertion part when removing and installing the intake sensor.**
- **Check for leakages when recharging refrigerant. Refer to HA-23, "Leak Test".**

# REFRIGERANT PRESSURE SENSOR

## Exploded View

INFOID:0000000004511951




1. Refrigerant pressure sensor
2. O-ring
3. Liquid tank bracket
4. Liquid tank
5. O-ring
6. Bracket
7. Condenser pipe assembly
8. Radiator & condenser assembly

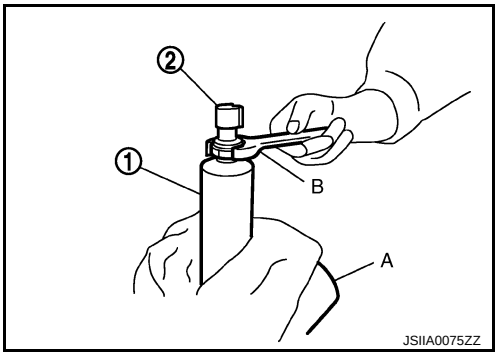
Refer to GI-4, "Components" for symbols in the figure.

## Removal and Installation

INFOID:0000000004534602

### REMOVAL

1. Remove liquid tank. Refer to HA-39, "Exploded View".
2. Fix the liquid tank (1) with a vise (A). Remove the refrigerant pressure sensor (2) with a wrench (B).
   **CAUTION:**
   **Be careful not to damage liquid tank.**




### INSTALLATION

Installation is basically the reverse order of removal.

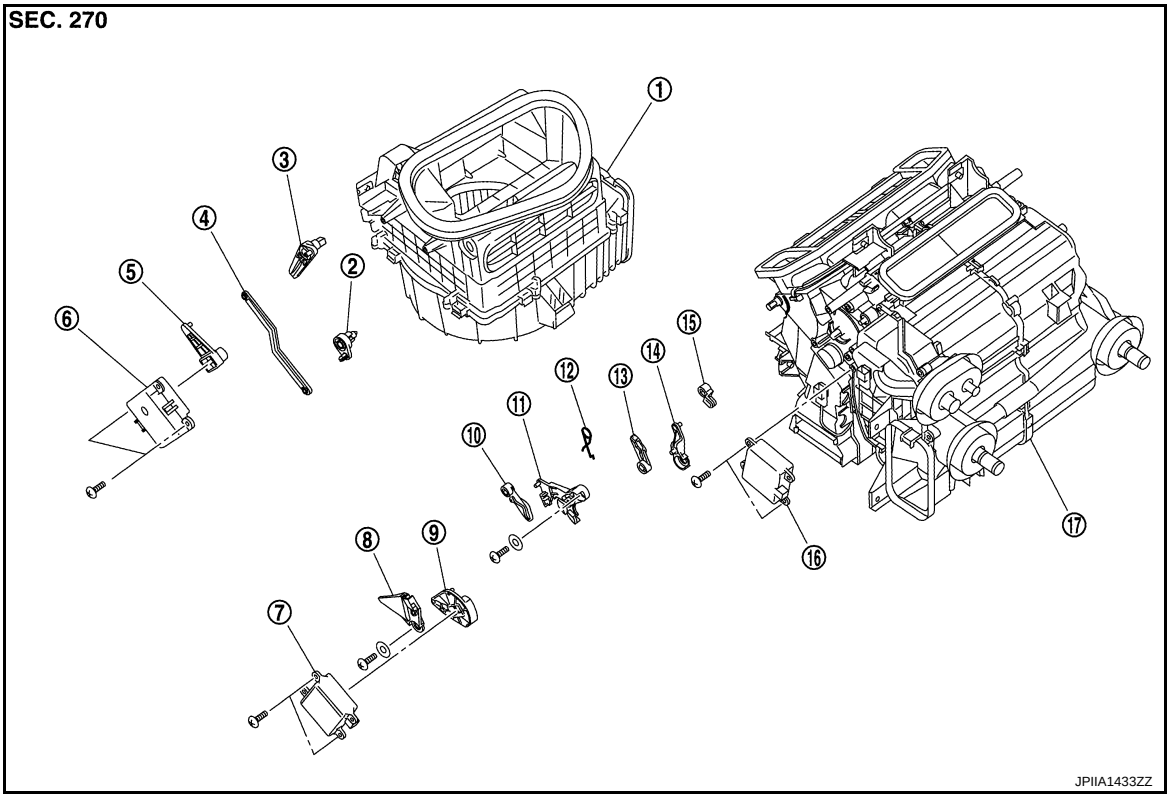
**CAUTION:**

- **Replace O-ring with new one. Then apply compressor oil to them when installing.**
- **Check for leakages when recharging refrigerant. Refer to HA-23, "Leak Test".**

# DOOR MOTOR

## Exploded View

INFOID:0000000004511953




1. Bower unit
2. Intake door lever 3
3. Intake door lever 1
4. Intake door link
5. Intake door lever 2
6. Intake door motor
7. Mode door motor
8. Ventilator door link
9. Main link
10. Ventilator door lever
11. Main link sub
12. Ventilator door lever spring
13. Max. cool door lever
14. Defroster door link
15. Defroster door lever
16. Air mix door motor
17. Heater & cooling unit assembly

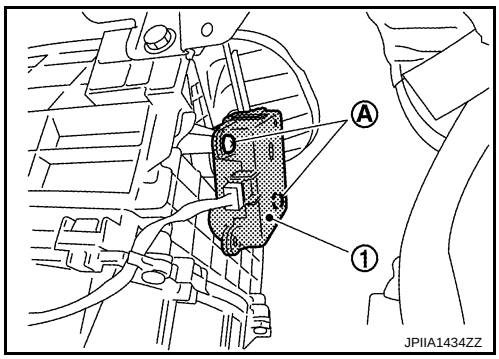
# INTAKE DOOR MOTOR

## INTAKE DOOR MOTOR : Removal and Installation

INFOID:0000000004511954

### REMOVAL

1. Remove instrument lower panel RH. Refer to IP-12, "Exploded View".
2. Remove ECM.
3. Remove mounting screws (A), and then remove intake door motor (1).
4. Disconnect intake door motor connector.




### INSTALLATION

Installation is basically the reverse order of removal.

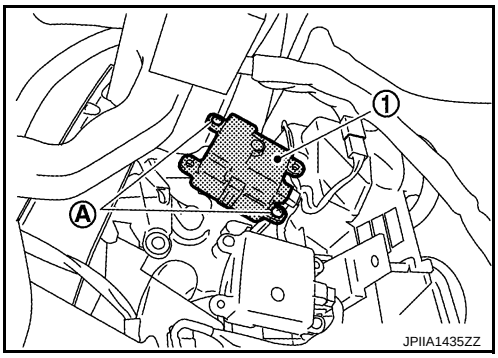
## MODE DOOR MOTOR

### MODE DOOR MOTOR : Removal and Installation

INFOID:0000000004511955

REMOVAL

1. Remove blower unit. Refer to VTL-11, "Exploded View".
2. Remove mounting screws (A), and then remove mode door motor (1).
3. Disconnect mode door motor connector.




INSTALLATION

Installation is basically the reverse order of removal.

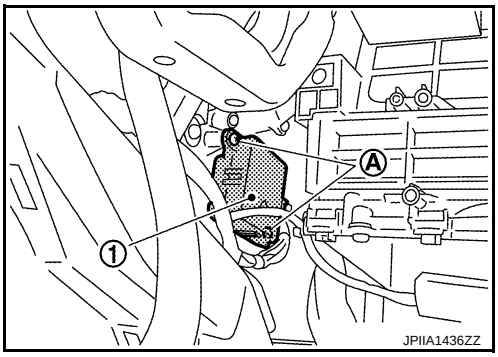
## AIR MIX DOOR MOTOR

### AIR MIX DOOR MOTOR : Removal and Installation

INFOID:0000000004511956

REMOVAL

1. Set the temperature at 18.0°C (60°F).
   **CAUTION:**
   **The angle may be out, when installing the air mix door motor to the air mix door, unless the above procedure is performed.**
2. Disconnect the battery cable from the negative terminal.
3. Remove instrument lower panel RH. Refer to IP-12, "Exploded View".
4. Remove mounting screws (A), and then remove air mix door motor (1).
5. Disconnect air mix door motor connector.




INSTALLATION

Installation is basically the reverse order of removal.