

SECTION HAC

HEATER & AIR CONDITIONING CONTROL SYSTEM

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BASIC INSPECTION

DIAGNOSIS AND REPAIR WORKFLOW

Work Flow

INFOID:000000001713761

DETAILED FLOW

1. LISTEN TO CUSTOMER COMPLAINT

Listen to customer complaint. (Get detailed information about the conditions and environment when the symptom occurs.)

>> GO TO 2.

2. VERIFY THE SYMPTOM WITH OPERATIONAL CHECK

Verify the symptom with operational check. Refer to [HAC-6, "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Description & Inspection"](#) (Without left and right ventilation temperature separately control system) or [HAC-9, "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Description & Inspection"](#) (With left and right ventilation temperature separately control system).

>> GO TO 3.

3. GO TO APPROPRIATE TROUBLE DIAGNOSIS

Go to appropriate trouble diagnosis (Refer to [HAC-129, "Diagnosis Chart By Symptom"](#) below).

>> GO TO 4.

4. REPAIR OR REPLACE

Repair or replace the specific parts.

>> GO TO 5.

5. FINAL CHECK

Final check.

Is the inspection result normal?

YES >> CHECK OUT
NO >> GO TO 3.

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INSPECTION AND ADJUSTMENT

< BASIC INSPECTION >

[AUTOMATIC AIR CONDITIONER]

INSPECTION AND ADJUSTMENT

WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM

WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Description & Inspection

INFOID:000000001675663

DESCRIPTION

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

Conditions : Engine running at normal operating temperature

INSPECTION PROCEDURE

Memory Function

1. Turn temperature control dial clockwise until 32°C (90°F) is displayed.
2. Press OFF switch.
3. Turn ignition switch OFF.
4. Turn ignition switch ON.
5. Press AUTO switch.
6. Confirm that the set temperature remains at previous temperature.
7. Press OFF switch.

If NG, go to trouble diagnosis procedure for [HAC-138, "Inspection procedure"](#).

If OK, continue the check.

Blower






1. Turn fan control dial clockwise. Blower should operate on low speed. The fan symbol should have one blade lit.
2. Turn fan control dial clockwise again, and continue checking blower speed and fan symbol until all speeds are checked.
3. Leave blower on max. speed.

If NG, go to trouble diagnosis procedure for [HAC-77, "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Procedure"](#).

If OK, continue the check.

Discharge Air

1. Press MODE switches and DEF switch.
2. Each position indicator should change shape.
3. Confirm that discharge air comes out according to the air distribution table. Refer to [HAC-23, "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : System Description"](#).

| Discharge air flow | | | | |
|---|-------------------------|-------|------|-----|
| Mode position indication | Air outlet/distribution | | | |
| | VENT | FOOT | | DEF |
| | | Front | Rear | |
|  | 100% | — | — | — |
|  | 53% | 29% | 18% | — |
|  | 11% | 39% | 24% | 26% |
|  | 9% | 33% | 21% | 37% |
|  | 16% | — | — | 84% |

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INSPECTION AND ADJUSTMENT

[AUTOMATIC AIR CONDITIONER]

< BASIC INSPECTION >

If NG, go to trouble diagnosis procedure for [HAC-67. "Diagnosis Procedure"](#).

If OK, continue the check.

NOTE:

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

Intake Air

1. Press intake switch. Recirculation indicator should illuminate.
2. Press intake switch again. Fresh indicator should illuminate.
3. Listen for intake door position change. (Slight change of blower sound can be heard.)

If NG, go to trouble diagnosis procedure for [HAC-75. "Diagnosis Procedure"](#).

If OK, continue the check.

NOTE:

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

Temperature Decrease

1. Turn temperature control dial counterclockwise until 18°C (60°F) is displayed.
2. Check for cold air at discharge air outlets.

If NG, go to trouble diagnosis procedure for [HAC-130. "Inspection procedure"](#).

If OK, continue the check.

Temperature Increase

1. Turn temperature control dial clockwise until 32°C (90°F) is displayed.
2. Check for warm air at discharge air outlets.

If NG, go to trouble diagnosis procedure for [HAC-133. "Inspection procedure"](#).

If OK, continue the check.

A/C Switch

1. Press AUTO switch and A/C switch.
2. A/C switch indicator will turn ON.
 - Confirm that the compressor clutch engages (sound or visual inspection).

Auto Mode

1. Press AUTO switch and A/C switch.
2. Display should indicate AUTO.
 - Confirm that discharge air and blower speed depend on ambient, in-vehicle, and set temperatures.

If NG, go to trouble diagnosis procedure for [HAC-101. "Diagnosis Procedure"](#), then if necessary, trouble diagnosis procedure for [HAC-85. "Diagnosis Procedure"](#).

Go to Incident Simulation Tests in [GI-34. "Work Flow"](#) and perform tests as outlined to simulate driving conditions environment. If all operational checks are OK (symptom cannot be duplicated). Refer to [HAC-129. "Diagnosis Chart By Symptom"](#) and perform applicable trouble diagnosis procedures if symptom appears.

WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Temperature Setting Trimmer

INFOID:000000001733705

DESCRIPTION

The trimmer compensates for differences in range of $\pm 3^{\circ}\text{C}$ ($\pm 6^{\circ}\text{F}$) between temperature setting (displayed digitally) and temperature felt by customer.

Operating procedures for this trimmer are as per the following:

1. Begin self-diagnosis STEP-5 mode. Refer to [HAC-42. "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#).
2. Turn fan control dial clockwise to set system in auxiliary mode.
3. Display shows "61" in auxiliary mechanism. It takes approximately 3 seconds to enable setting operation.
4. Turn temperature control dial as desired. Temperature will change at a rate of 0.5°C (1.0°F) each time a dial is turned.

CAUTION:

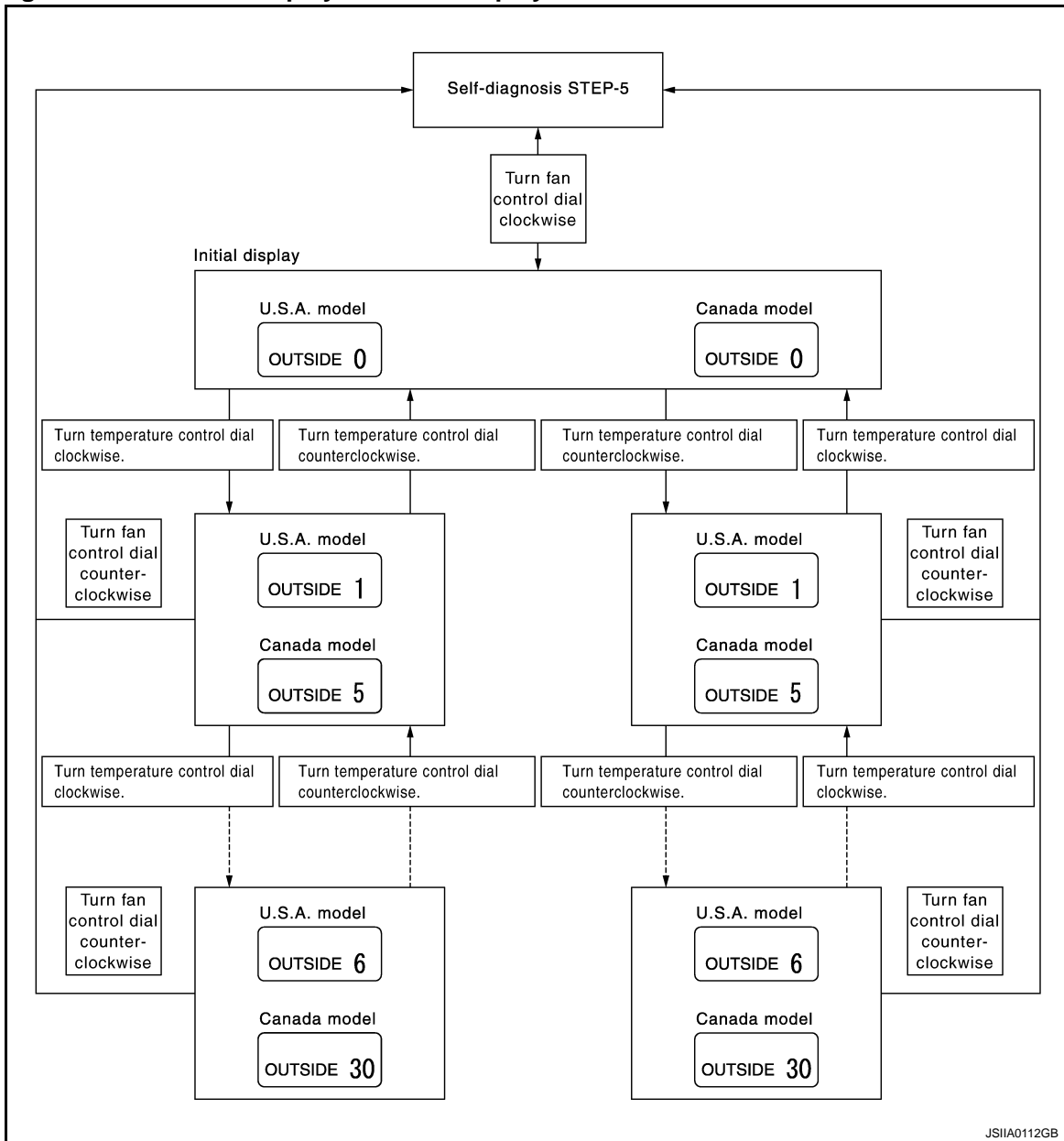
- A decimal point is not indicated on the display.

INSPECTION AND ADJUSTMENT

< BASIC INSPECTION >

[AUTOMATIC AIR CONDITIONER]

- Negative value is not displayed on the display.



NOTE:

When battery cable is disconnected or battery voltage is below 10 V, trimmer operation is canceled. Temperature set becomes that of initial condition, i.e. 0°C (0°F).

WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Foot Position Setting Trimmer

INFOID:000000001733706

DESCRIPTION

Wind distribution ratio in FOOT mode can be set.

Operating procedures for this trimmer are as per the following:

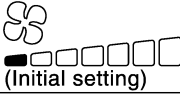
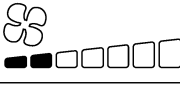
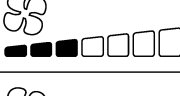

1. Begin self-diagnosis STEP-5 mode. Refer to [HAC-42, "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#).
2. Turn fan control dial clockwise to set system in auxiliary mode.

INSPECTION AND ADJUSTMENT

< BASIC INSPECTION >

[AUTOMATIC AIR CONDITIONER]

3. Press each mode switch as desired.

| Display | Discharge air flow | | | | | | | |
|--|--------------------------------------|------|-------|-----|---------------------------------|------|-----|-----|
| | Automatically controls the mode door | | | | Manually controls the mode door | | | |
| | VENT | FOOT | | DEF | VENT | FOOT | | DEF |
| Front | | Rear | Front | | | Rear | | |
|  (Initial setting) | 11% | 39% | 24% | 26% | 11% | 39% | 24% | 26% |
|  | 11% | 39% | 24% | 26% | 15% | 53% | 32% | — |
|  | 15% | 53% | 32% | — | 11% | 39% | 24% | 26% |
|  | 15% | 53% | 32% | — | 15% | 53% | 32% | — |

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NOTE:

When battery cable is disconnected or battery voltage is below 10 V, trimmer operation is canceled. Wind distribution ratio set becomes that of initial condition.

WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Inlet Port Memory Function

INFOID:000000001733707

DESCRIPTION

When ignition switch is turned from OFF to ON, inlet port can be set to AUTO or manual.

Operating procedures for this trimmer are as per the following:

1. Begin self-diagnosis STEP-5 mode. Refer to [HAC-42. "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#).
2. Turn fan control dial clockwise to set system in auxiliary mode.
3. Press intake switch as desired.

| LED status of FRE position | LED status of REC position | Setting status | | Setting changeover method |
|----------------------------|----------------------------|---------------------------------|---|---------------------------|
| | | FRE | REC | |
| OFF | ON | AUTO control (Initial setting) | Manual REC status is memorized. (Initial setting) | Intake switch: ON |
| ON | ON | Manual FRE status is memorized. | Manual REC status is memorized. | |
| ON | OFF | Manual FRE status is memorized. | AUTO control | |
| OFF | OFF | AUTO control | AUTO control | |

NOTE:

When battery cable is disconnected or battery voltage is below 10 V, memory function is canceled. Memory function set becomes that of initial condition.

WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM

WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Description & Inspection

INFOID:000000001675664

DESCRIPTION

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

Conditions : Engine running at normal operating temperature

INSPECTION PROCEDURE

INSPECTION AND ADJUSTMENT

< BASIC INSPECTION >

[AUTOMATIC AIR CONDITIONER]

Memory Function

1. Turn temperature control dial (driver side) clockwise until 32°C (90°F) is displayed.
2. Press OFF switch.
3. Turn ignition switch OFF.
4. Turn ignition switch ON.
5. Press AUTO switch.
6. Confirm that the set temperature remains at previous temperature.
7. Press OFF switch.

If NG, go to trouble diagnosis procedure for [HAC-138, "Inspection procedure"](#).

If OK, continue the check.

Blower






1. Press fan (UP:+) switch. Blower should operate on low speed. The fan symbol should have one blade lit.
2. Press fan (UP:+) switch again, and continue checking blower speed and fan symbol until all speeds are checked.
3. Leave blower on max. speed.

If NG, go to trouble diagnosis procedure for [HAC-81, "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Procedure"](#).

If OK, continue the check.

Discharge Air

1. Press MODE switch and DEF switch.
2. Each position indicator should change shape.
3. Confirm that discharge air comes out according to the air distribution table. Refer to [HAC-32, "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : System Description"](#).

| Discharge air flow | | | | | |
|---|------------------|-------------------------|-------|------|-----|
| Mode position indication | Condition | Air outlet/distribution | | | |
| | | VENT | FOOT | | DEF |
| | | | Front | Rear | |
|  | DUAL switch: OFF | 100% | — | — | — |
|  | | 53% | 29% | 18% | — |
|  | | 11% | 39% | 24% | 26% |
|  | | 9% | 33% | 21% | 37% |
|  | | 16% | — | — | 84% |

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If NG, go to trouble diagnosis procedure for [HAC-67, "Diagnosis Procedure"](#).

If OK, continue the check.

NOTE:

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

Intake Air

1. Press intake switch. Recirculation indicator should illuminate.
2. Press intake switch again. Fresh indicator should illuminate.
3. Listen for intake door position change. (Slight change of blower sound can be heard.)

If NG, go to trouble diagnosis procedure for [HAC-75, "Diagnosis Procedure"](#).

If OK, continue the check.

NOTE:

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

Temperature Decrease

INSPECTION AND ADJUSTMENT

[AUTOMATIC AIR CONDITIONER]

< BASIC INSPECTION >

1. Turn temperature control dial (driver side) counterclockwise until 18°C (60°F) is displayed.
2. Check for cold air at discharge air outlets.

If NG, go to trouble diagnosis procedure for [HAC-130, "Inspection procedure"](#).
If OK, continue the check.

Temperature Increase

1. Turn temperature control dial (driver side) clockwise until 32°C (90°F) is displayed.
2. Check for warm air at discharge air outlets.

If NG, go to trouble diagnosis procedure for [HAC-133, "Inspection procedure"](#).
If OK, continue the check.

A/C Switch

1. Press AUTO switch and A/C switch.
2. A/C switch indicator will turn ON.
 - Confirm that the compressor clutch engages (sound or visual inspection).

Auto Mode

1. Press AUTO switch and A/C switch.
2. Display should indicate AUTO.
 - Confirm that discharge air and blower speed depend on ambient, in-vehicle, and set temperatures.

If NG, go to trouble diagnosis procedure for [HAC-101, "Diagnosis Procedure"](#), then if necessary, trouble diagnosis procedure for [HAC-85, "Diagnosis Procedure"](#).

Go to Incident Simulation Tests in [GI-34, "Work Flow"](#) and perform tests as outlined to simulate driving conditions environment if all operational checks are OK (symptom cannot be duplicated). Refer to [HAC-129, "Diagnosis Chart By Symptom"](#) and perform applicable trouble diagnosis procedures if symptom appears.

WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Temperature Setting Trimmer

INFOID:000000001733713

HAC

DESCRIPTION

The trimmer compensates for differences in range of $\pm 3^{\circ}\text{C}$ ($\pm 6^{\circ}\text{F}$) between temperature setting (displayed digitally) and temperature felt by customer.

Operating procedures for this trimmer are as per the following:

1. Begin self-diagnosis STEP-5 mode. Refer to [HAC-48, "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#).
2. Press fan (UP: +) switch to set system in auxiliary mode.
3. Display shows "61" in auxiliary mechanism. It takes approximately 3 seconds to enable setting operation.
4. Turn temperature control dial (driver side) as desired. Temperature will change at a rate of 0.5°C (1.0°F) each time a dial is turned.

CAUTION:

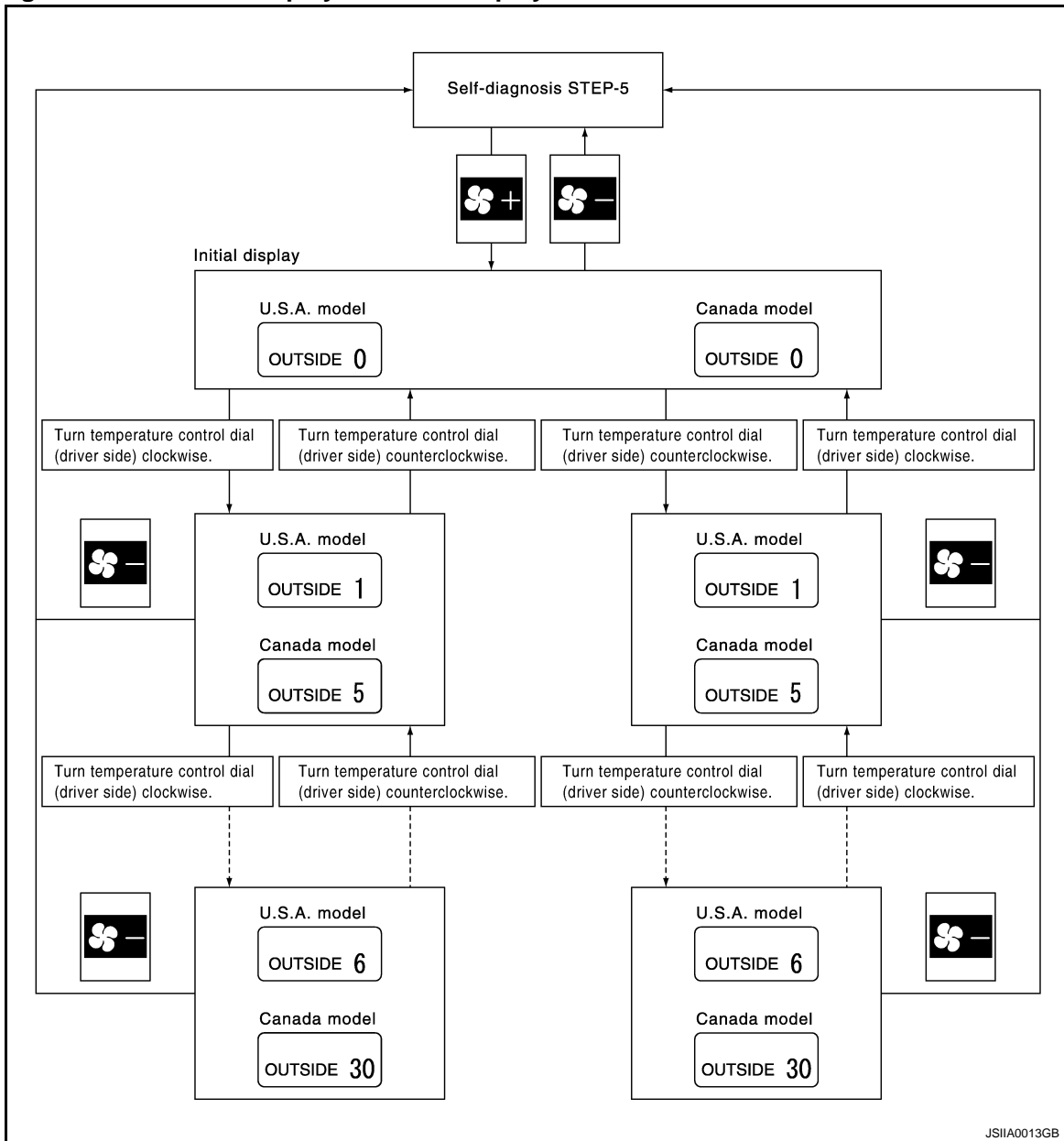
- A decimal point is not indicated on the display.

INSPECTION AND ADJUSTMENT

< BASIC INSPECTION >

[AUTOMATIC AIR CONDITIONER]

- Negative value is not displayed on the display.



NOTE:

When battery cable is disconnected or battery voltage is below 10 V, trimmer operation is canceled. Temperature set becomes that of initial condition, i.e. 0°C (0°F).

WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Foot Position Setting Trimmer

INFOID:000000001733714

DESCRIPTION

Wind distribution ratio in FOOT mode can be set.

Operating procedures for this trimmer are as per the following:

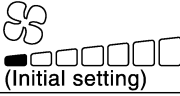
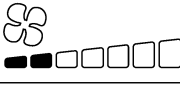
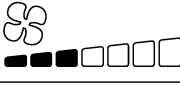
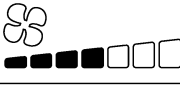
1. Begin self-diagnosis STEP-5 mode. Refer to [HAC-48, "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#).
2. Press fan (UP:+) switch to set system in auxiliary mode.

INSPECTION AND ADJUSTMENT

< BASIC INSPECTION >

[AUTOMATIC AIR CONDITIONER]

3. Press mode switch as desired.

| Display | Discharge air flow | | | | | | | |
|--|--------------------------------------|------|-------|-----|---------------------------------|------|-----|-----|
| | Automatically controls the mode door | | | | Manually controls the mode door | | | |
| | VENT | FOOT | | DEF | VENT | FOOT | | DEF |
| Front | | Rear | Front | | | Rear | | |
|  (Initial setting) | 11% | 39% | 24% | 26% | 11% | 39% | 24% | 26% |
|  | 11% | 39% | 24% | 26% | 15% | 53% | 32% | — |
|  | 15% | 53% | 32% | — | 11% | 39% | 24% | 26% |
|  | 15% | 53% | 32% | — | 15% | 53% | 32% | — |

JSIIA0864GB

When battery cable is disconnected or battery voltage is below 10 V, trimmer operation is canceled. Wind distribution ratio set becomes that of initial condition.

WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Inlet Port Memory Function

INFOID:000000001733715

DESCRIPTION

When ignition switch is turned from OFF to ON, inlet port can be set to AUTO or manual.

Operating procedures for this trimmer are as per the following:

1. Begin self-diagnosis STEP-5 mode. Refer to [HAC-48. "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#).
2. Press fan (UP:+) switch to set system in auxiliary mode.
3. Press intake switch as desired.

| LED status of FRE position | LED status of REC position | Setting status | | Setting changeover method |
|----------------------------|----------------------------|---------------------------------|---|---------------------------|
| | | FRE | REC | |
| OFF | ON | AUTO control (Initial setting) | Manual REC status is memorized. (Initial setting) | Intake switch: ON |
| ON | ON | Manual FRE status is memorized. | Manual REC status is memorized. | |
| ON | OFF | Manual FRE status is memorized. | AUTO control | |
| OFF | OFF | AUTO control | AUTO control | |

When battery cable is disconnected or battery voltage is below 10 V, memory function is canceled. Memory function set becomes that of initial condition.

COMPRESSOR CONTROL FUNCTION

< FUNCTION DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

FUNCTION DIAGNOSIS

COMPRESSOR CONTROL FUNCTION

WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM

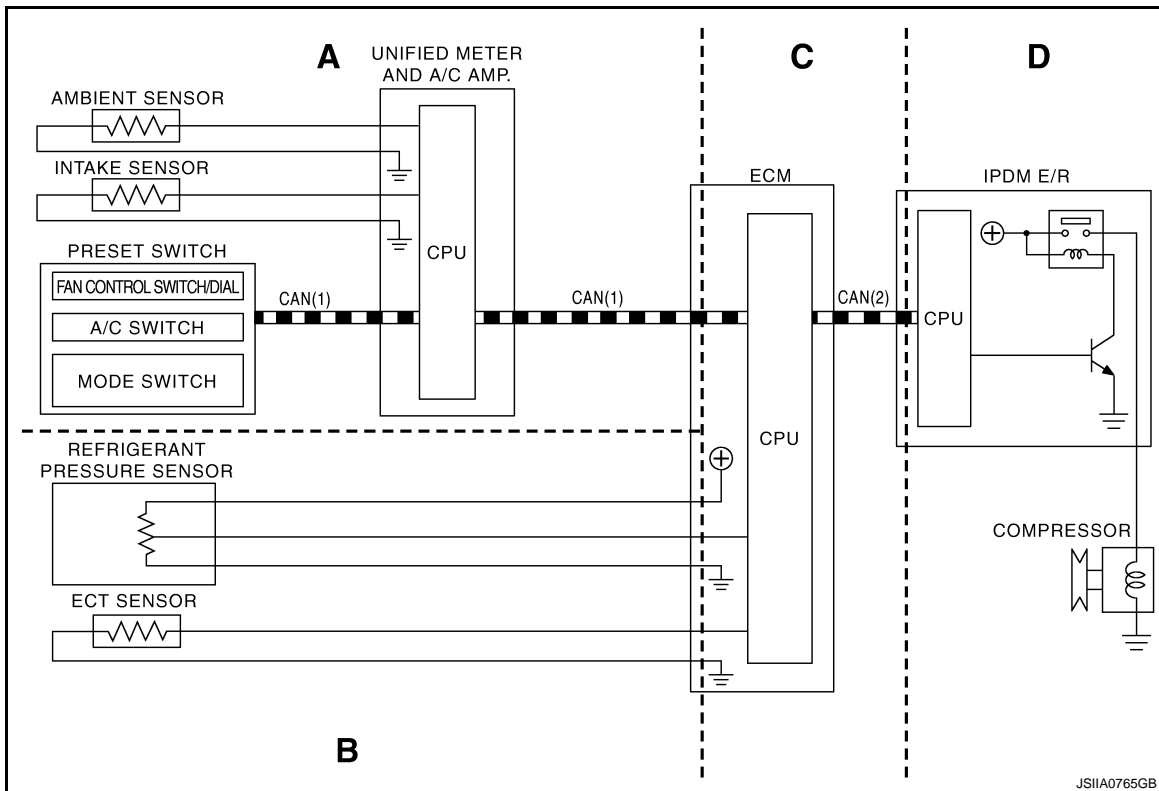
WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Description

INFOID:000000001675665

PRINCIPLE OF OPERATION

Compressor is not activated.

Functional circuit diagram



CAN(1) : A/C signal

CAN(2) : Compressor request signal

Functional initial inspection chart

| Location | | A | B | C | D |
|--|-----------------------|-----|-----|-----|-----|
| CONSULT-III | ECM DATA MONITOR | | Yes | Yes | |
| | IPDM E/R DATA MONITOR | | | Yes | |
| AUTO ACTIVE TEST | | | | | Yes |
| Self-diagnosis function (except CAN diagnosis) | | Yes | | | |

WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Fail-Safe

INFOID:000000001675666

FAIL-SAFE FUNCTION

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

COMPRESSOR CONTROL FUNCTION

< FUNCTION DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

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

A

B

C

WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Component Part Location

INFOID:000000001675667

D

ENGINE COMPARTMENT

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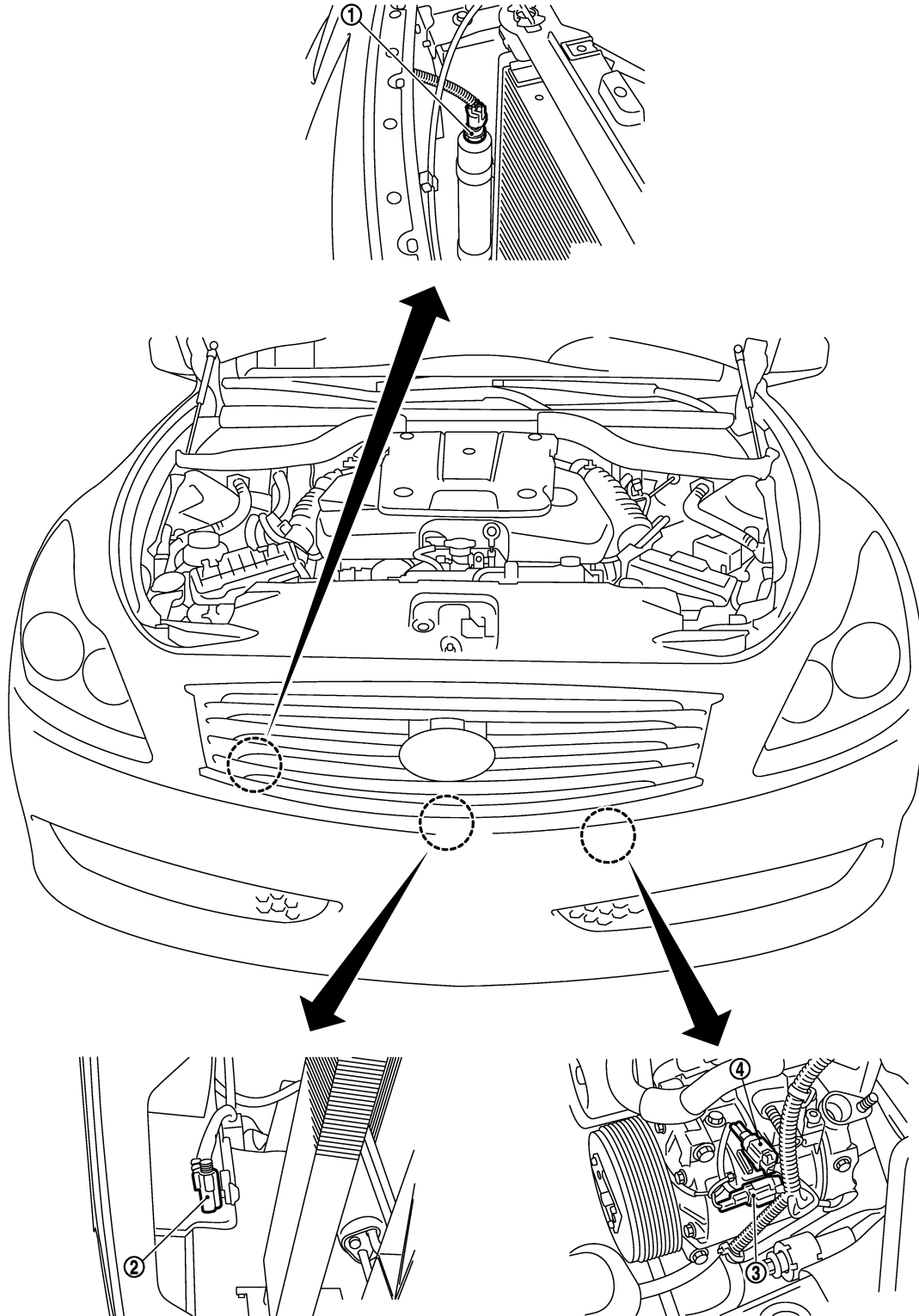
O

P

COMPRESSOR CONTROL FUNCTION

< FUNCTION DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]



JS1IA0746ZZ

- 1. Refrigerant pressure sensor
- 4. Compressor (ECV)

- 2. Ambient sensor

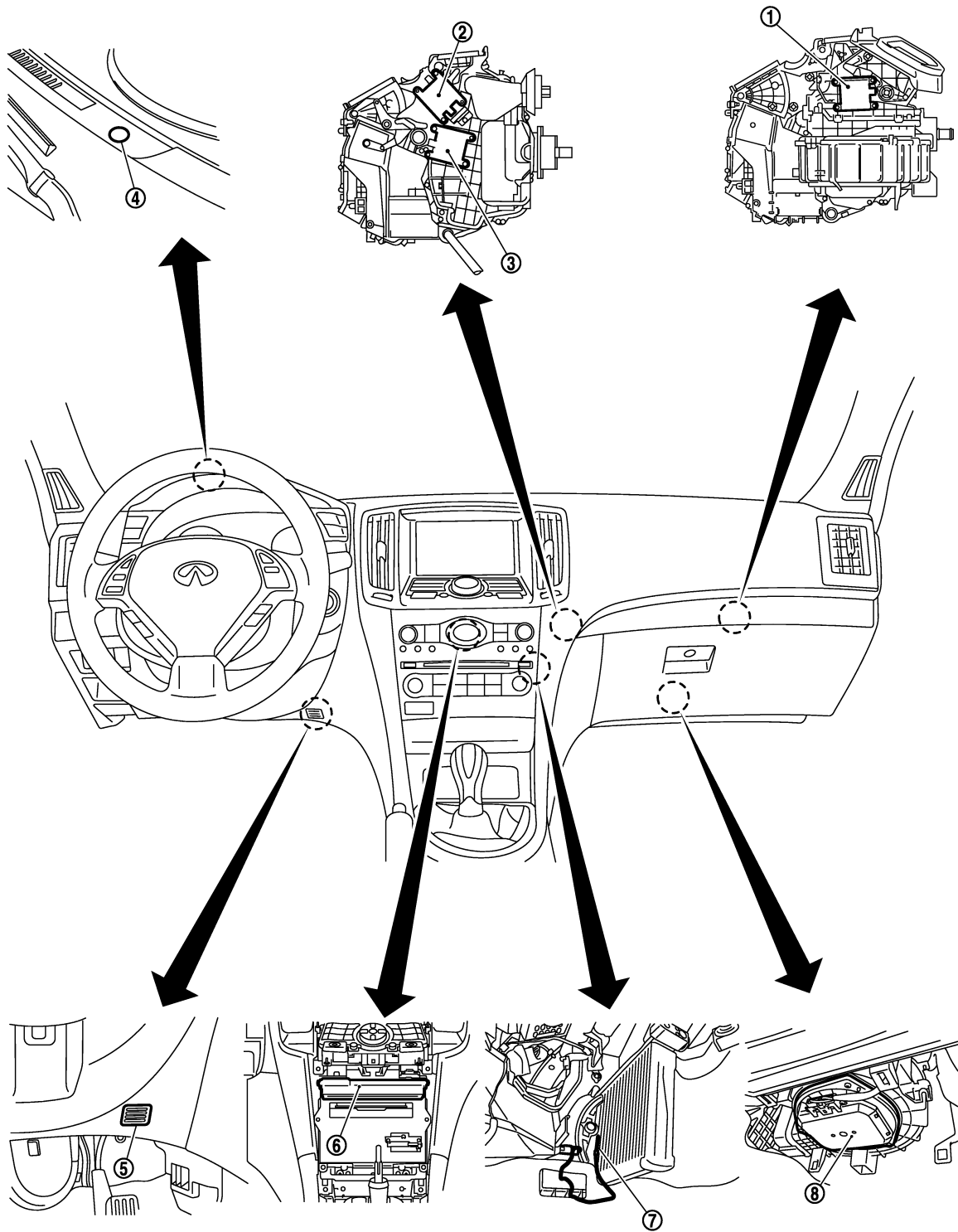
- 3. Compressor (magnet clutch)

PASSENGER COMPARTMENT

COMPRESSOR CONTROL FUNCTION

< FUNCTION DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]



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- | | | |
|----------------------|----------------------|-------------------------------|
| 1. Intake door motor | 2. Mode door motor | 3. Air mix door motor |
| 4. Sunload sensor | 5. In-vehicle sensor | 6. Unified meter and A/C amp. |
| 7. Intake sensor | 8. Blower motor | |

JSIIA0122ZZ

WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CON-

COMPRESSOR CONTROL FUNCTION

< FUNCTION DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

TROL SYSTEM : Component's role

INFOID:000000001675668

| Component | Reference |
|-----------------------------|--|
| Air mix door motor | HAC-70. "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Description" |
| Ambient sensor | HAC-88. "Description" |
| Blower motor | HAC-77. "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Description" |
| Compressor | HAC-85. "Description" |
| intake door motor | HAC-75. "Description" |
| intake sensor | HAC-97. "Description" |
| In-vehicle sensor | HAC-91. "Description" |
| Mode door motor | HAC-67. "Description" |
| Refrigerant pressure sensor | EC-511. "Description" |
| Sunload sensor | HAC-94. "Description" |
| Unified meter and A/C amp. | HAC-100. "Description" |

WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM

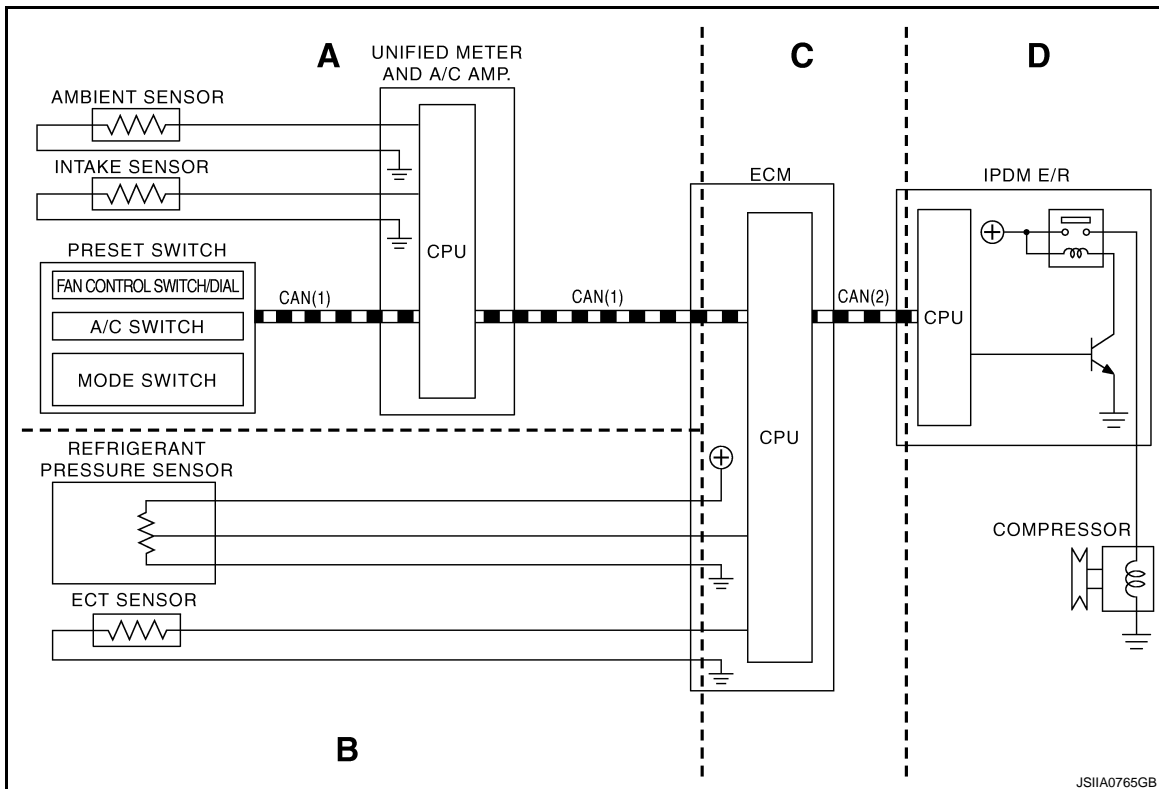
WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Description

INFOID:000000001713972

PRINCIPLE OF OPERATION

Compressor is not activated.

Functional circuit diagram



JSIIA0765GB

CAN(1) : A/C signal

CAN(2) : Compressor request signal

COMPRESSOR CONTROL FUNCTION

< FUNCTION DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

Functional initial inspection chart

| Location | | A | B | C | D |
|--|-----------------------|-----|-----|-----|-----|
| CONSULT-III | ECM DATA MONITOR | | Yes | Yes | |
| | IPDM E/R DATA MONITOR | | | Yes | |
| AUTO ACTIVE TEST | | | | | Yes |
| Self-diagnosis function (except CAN diagnosis) | | Yes | | | |

WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Fail-Safe

INFOID:000000001713973

FAIL-SAFE FUNCTION

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

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

WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Component Part Location

INFOID:000000001689947

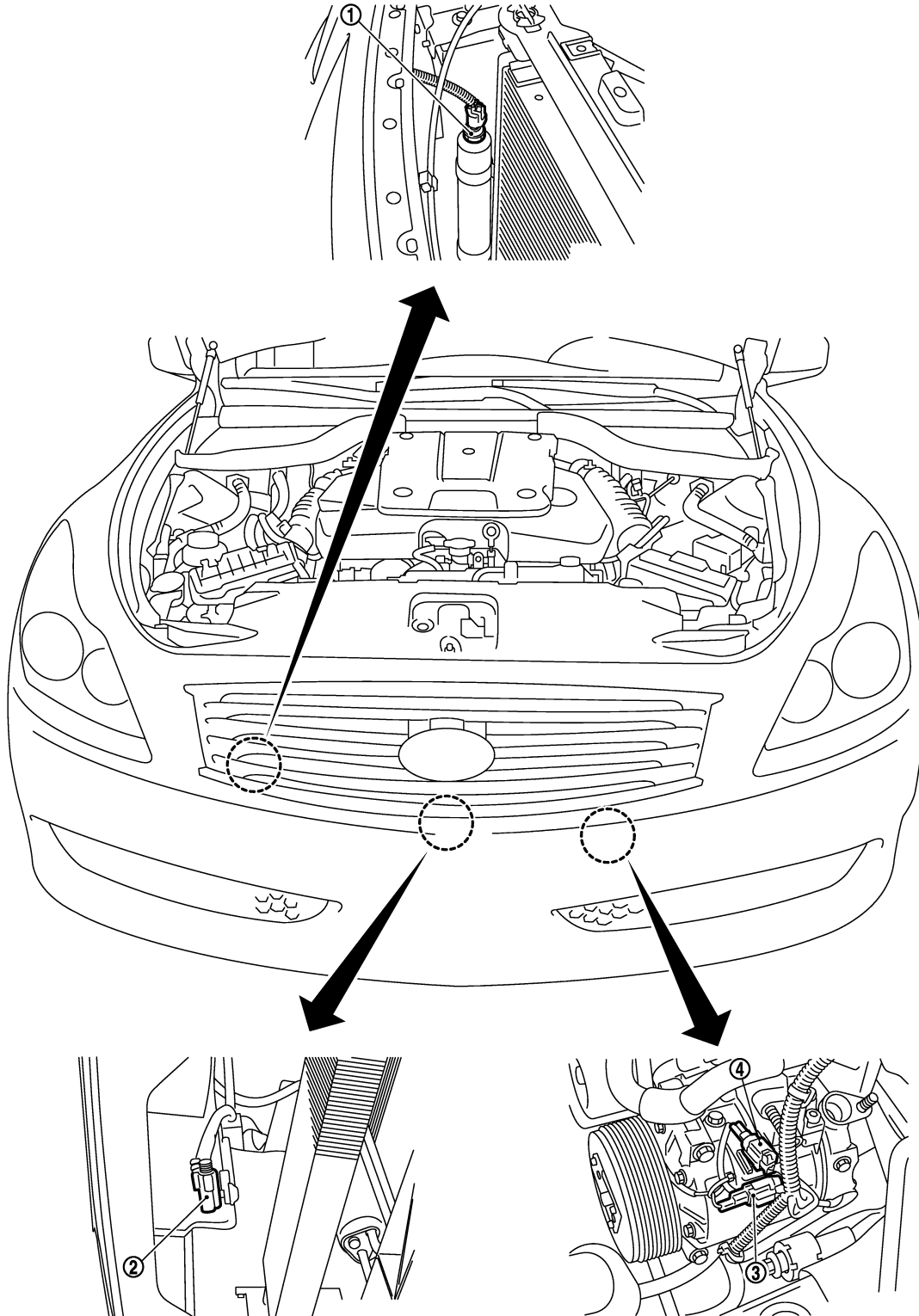
ENGINE COMPARTMENT

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COMPRESSOR CONTROL FUNCTION

< FUNCTION DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]



JS1IA0746ZZ

- 1. Refrigerant pressure sensor
- 4. Compressor (ECV)

- 2. Ambient sensor

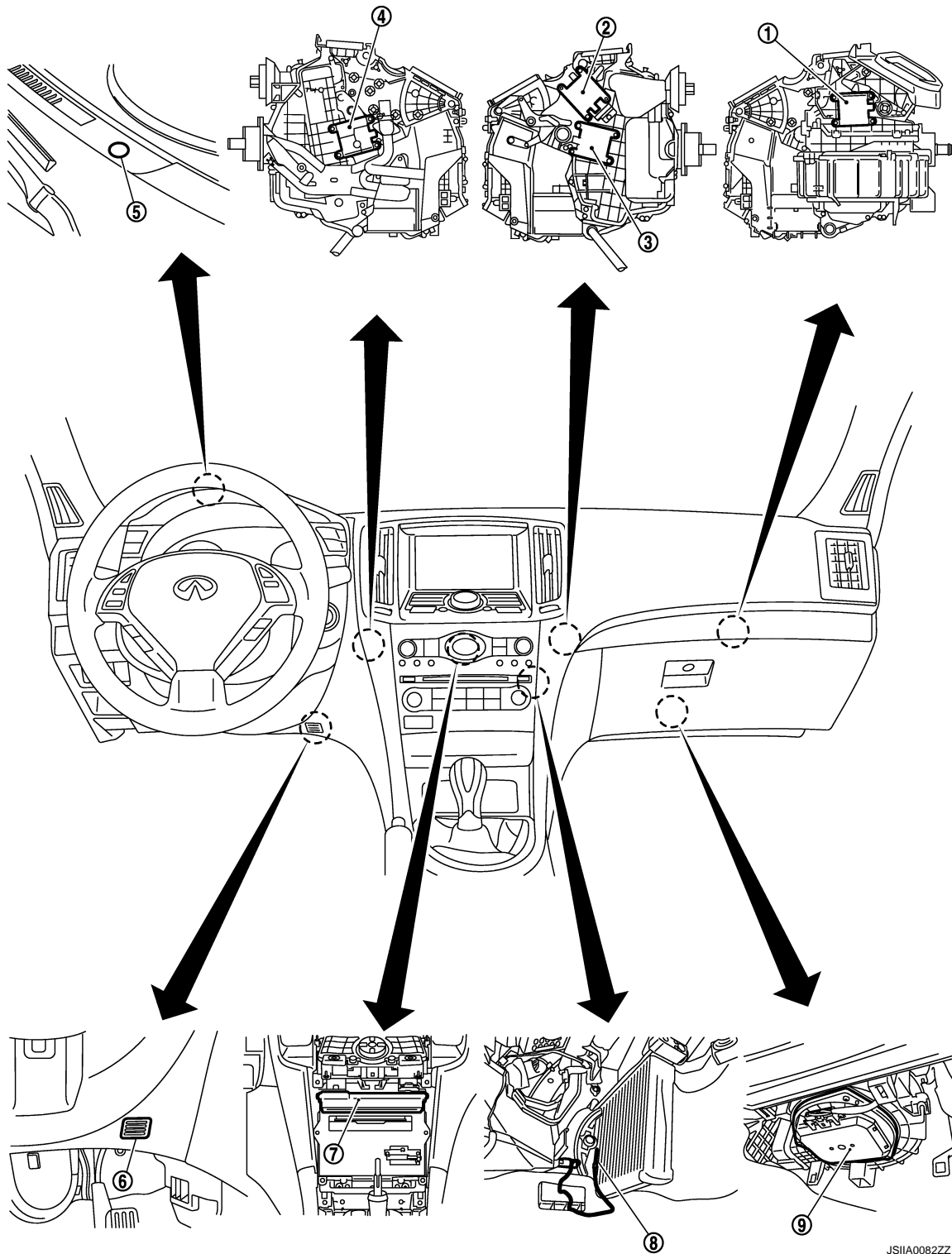
- 3. Compressor (magnet clutch)

PASSENGER COMPARTMENT

COMPRESSOR CONTROL FUNCTION

< FUNCTION DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]



- | | | |
|-------------------------------------|--------------------|--|
| 1. Intake door motor | 2. Mode door motor | 3. Air mix door motor (passenger side) |
| 4. Air mix door motor (driver side) | 5. Sunload sensor | 6. In-vehicle sensor |
| 7. Unified meter and A/C amp. | 8. Intake sensor | 9. Blower motor |

WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL

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COMPRESSOR CONTROL FUNCTION

< FUNCTION DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

SYSTEM : Component's role

INFOID:000000001675672

| Component | Reference |
|-----------------------------|---|
| Air mix door motor | HAC-71. "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Description" |
| Ambient sensor | HAC-88. "Description" |
| Blower motor | HAC-80. "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Description" |
| Compressor | HAC-85. "Description" |
| intake door motor | HAC-75. "Description" |
| intake sensor | HAC-97. "Description" |
| In-vehicle sensor | HAC-91. "Description" |
| Mode door motor | HAC-67. "Description" |
| Refrigerant pressure sensor | EC-511. "Description" |
| Sunload sensor | HAC-94. "Description" |
| Unified meter and A/C amp. | HAC-100. "Description" |

AUTOMATIC AIR CONDITIONER SYSTEM

< FUNCTION DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

AUTOMATIC AIR CONDITIONER SYSTEM

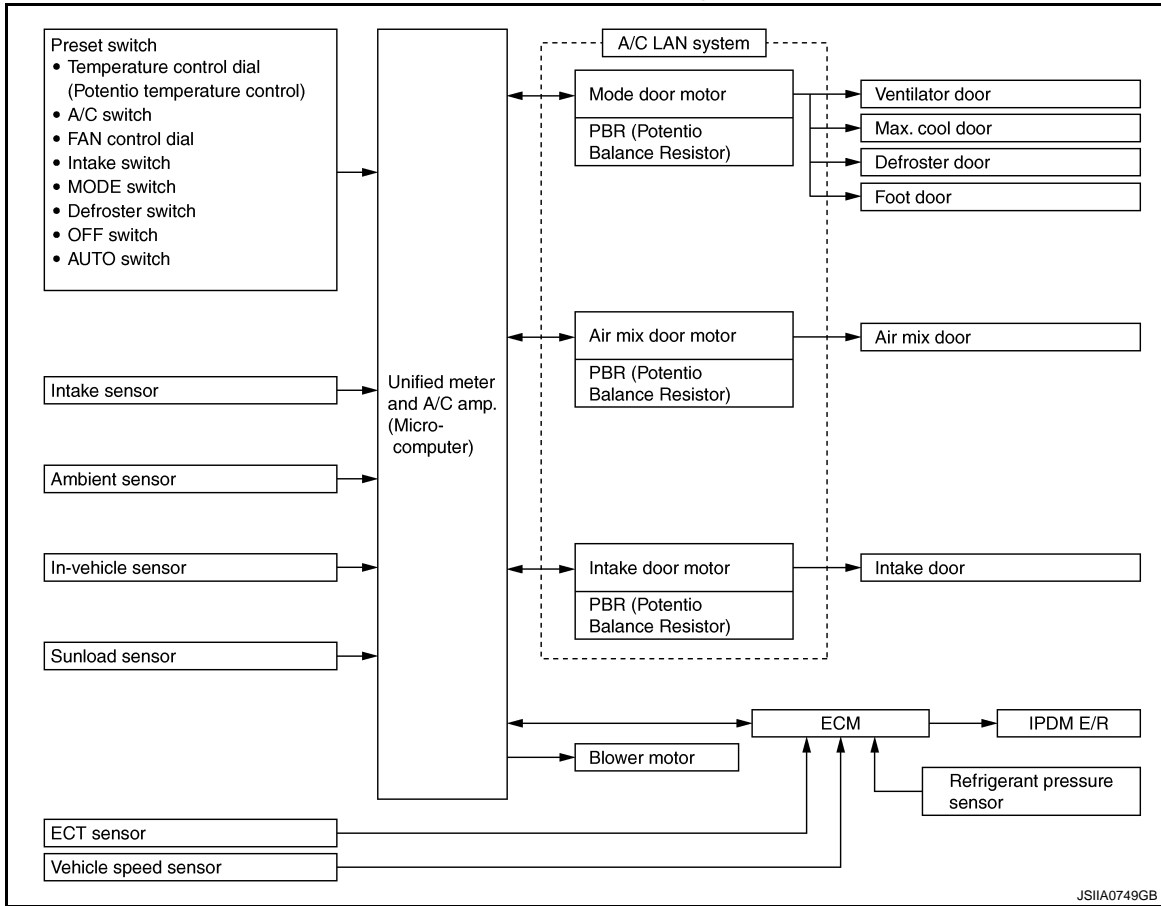
WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM

WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : System Diagram

INFOID:000000001675673

CONTROL SYSTEM

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



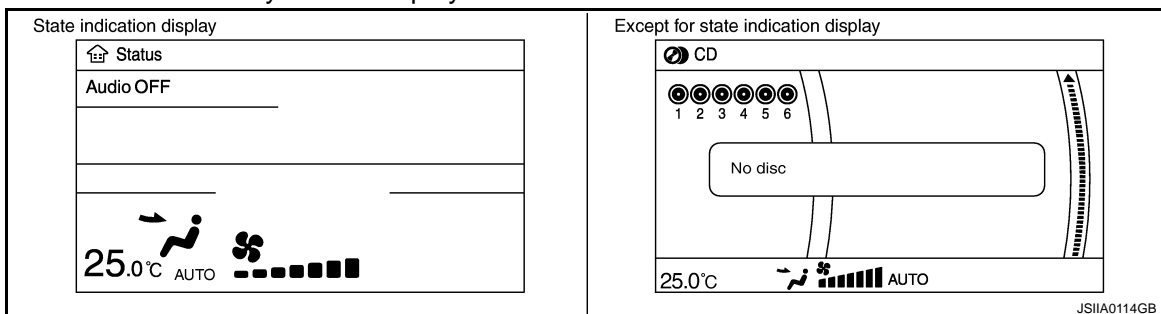
WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : System Description

INFOID:000000001675674

CONTROL OPERATION

Display Screen

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

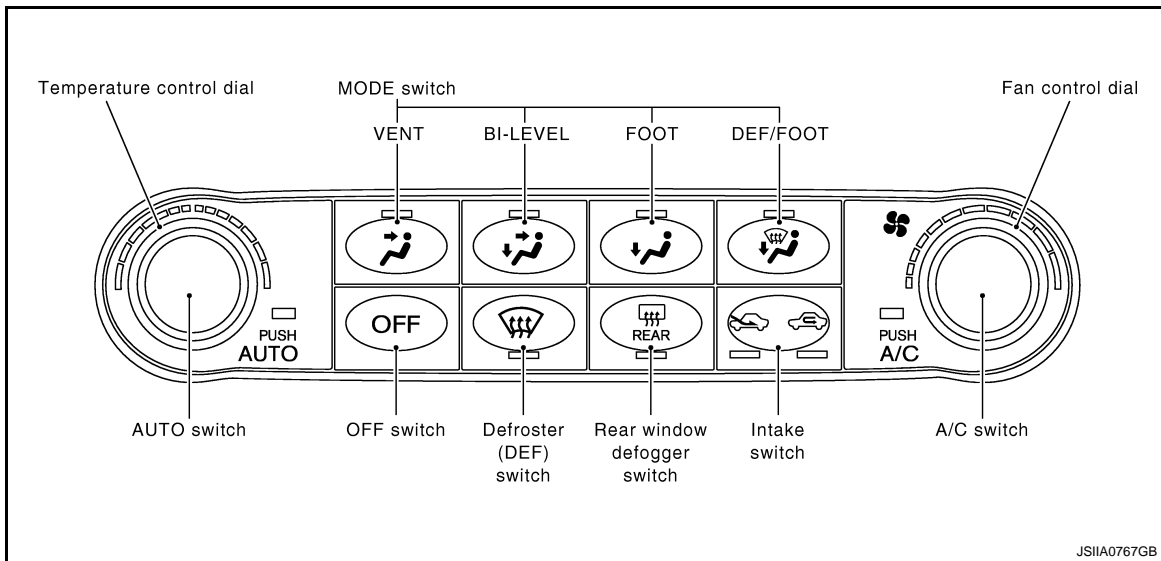


AUTOMATIC AIR CONDITIONER SYSTEM

< FUNCTION DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

Preset Switch



MODE Switch

The air discharge outlets is controlled with these switches.

Temperature Control Dial (Potentio Temperature Control)

The set temperature is increased or decreased with this dial.

AUTO Switch

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

Defroster (DEF) Switch

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

A/C Switch

Compressor is ON or OFF with this switch.

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

Fan Control Dial

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

OFF Switch

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

Rear Window Defogger Switch

When illumination is ON, rear window is defogged.

Intake Switch

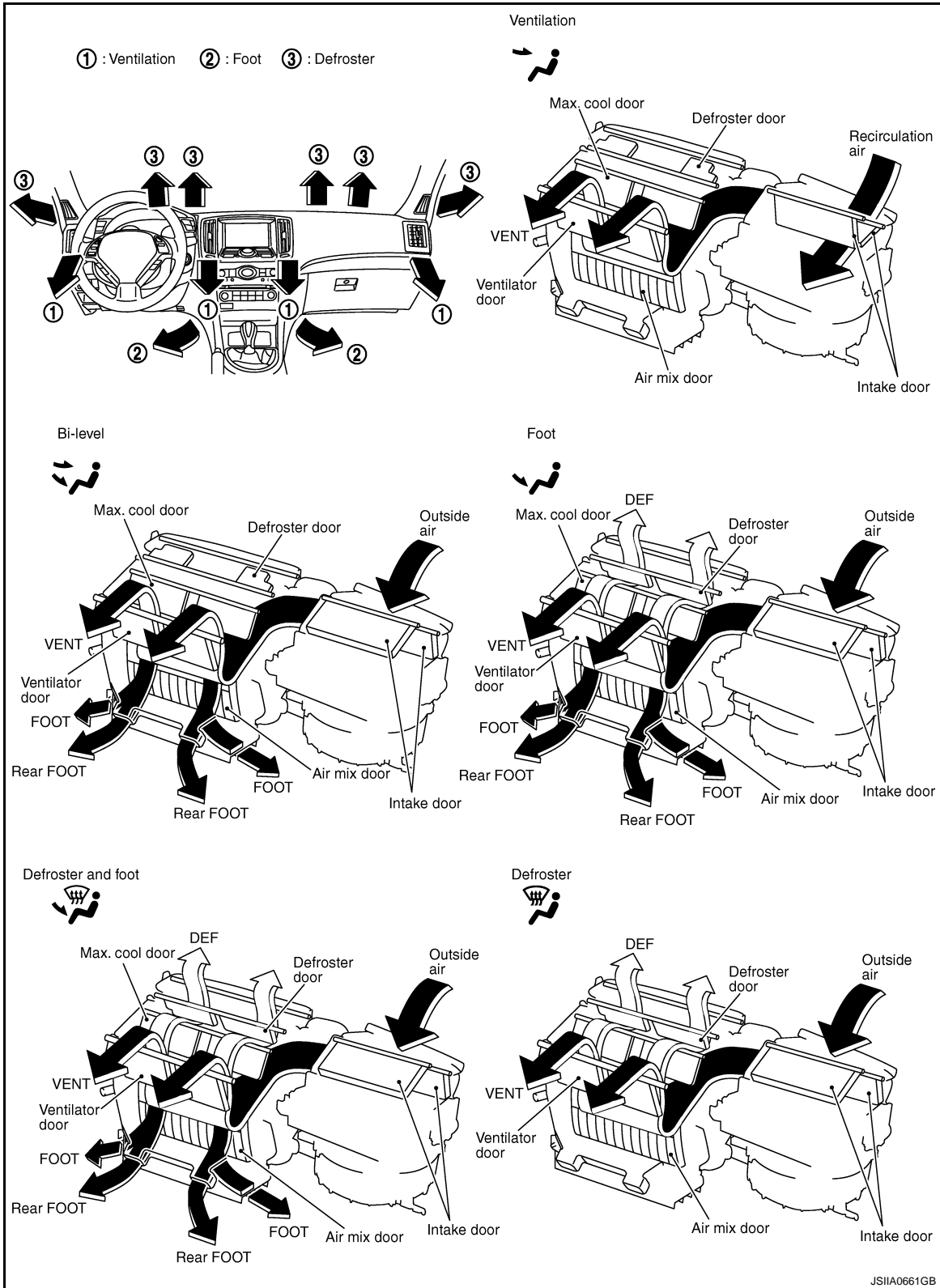
- When intake switch is ON, FRE LED turns ON, and air inlet is fixed to FRE.
- When intake switch is pressed again, REC LED turns ON, and air inlet is fixed to REC.
- When intake switch is pressed for approximately 1.5 seconds or longer, FRE and REC LEDs blink twice. Then, automatic control mode is entered.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

AUTOMATIC AIR CONDITIONER SYSTEM

< FUNCTION DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

DISCHARGE AIR FLOW



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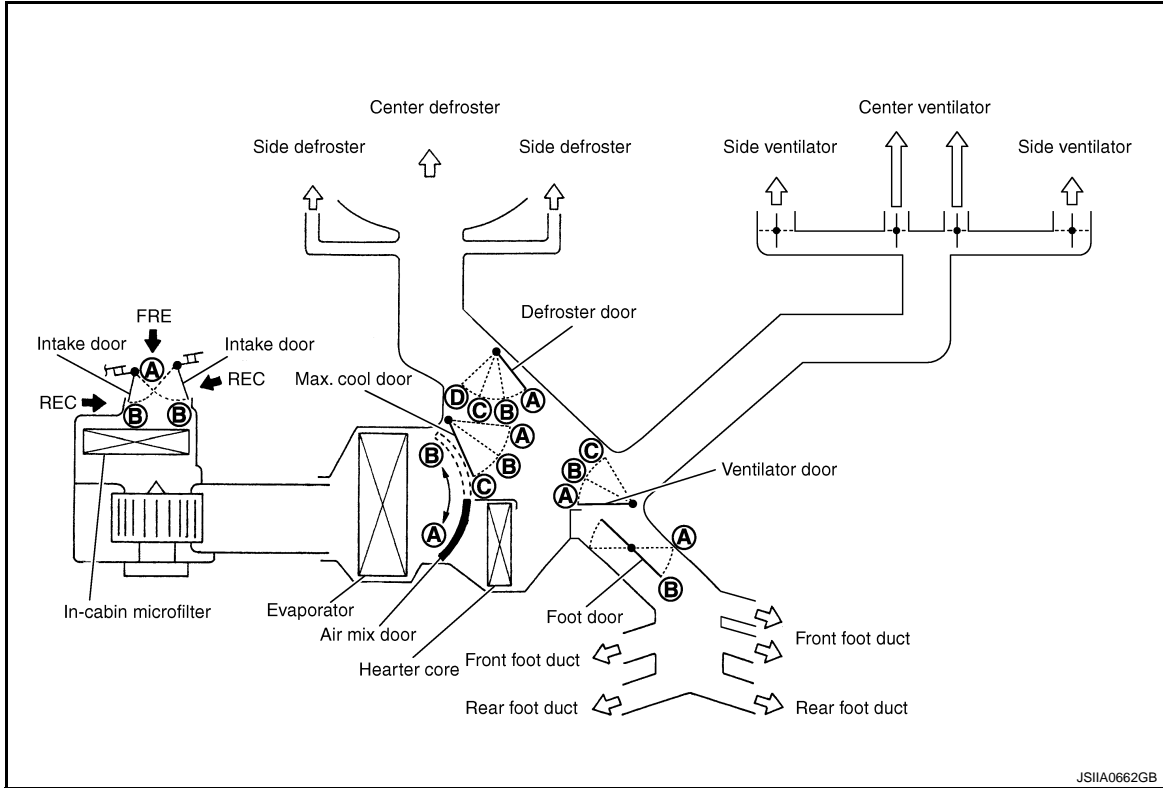
HAC

AUTOMATIC AIR CONDITIONER SYSTEM

< FUNCTION DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

SWITCHES AND THEIR CONTROL FUNCTION



JSIIA0662GB

| Position or switch | MODE switch | | | | DEF switch | | AUTO switch | Intake switch | | Temperature control dial | | | OFF switch |
|--------------------|-------------|-----|------|-----|------------|-----|-------------|---------------|------|--------------------------|------|-------------|------------|
| | VENT | B/L | FOOT | D/F | ON | OFF | | FRE | REC | | | | OFF |
| | | | | | | | | | | 18°C (60°F) | ↔ | 32°C (90°F) | OFF |
| Ventilator door | (A) | (B) | (C) | (C) | (C) | | AUTO | — | — | — | | | AUTO |
| Max. cool door | (A) | (B) | (C) | (C) | (C) | | | — | — | — | | | |
| Defroster door | (D) | (D) | (C) | (B) | (A) | | | — | — | — | | | |
| Foot door | (B) | (B) | (B) | (B) | (A) | | | — | — | — | | | |
| Intake door | — | | | (B) | (B) | | | (B)* | (A)* | — | | | |
| Air mix door | — | | | | — | | | — | — | (A) | AUTO | (B) | |

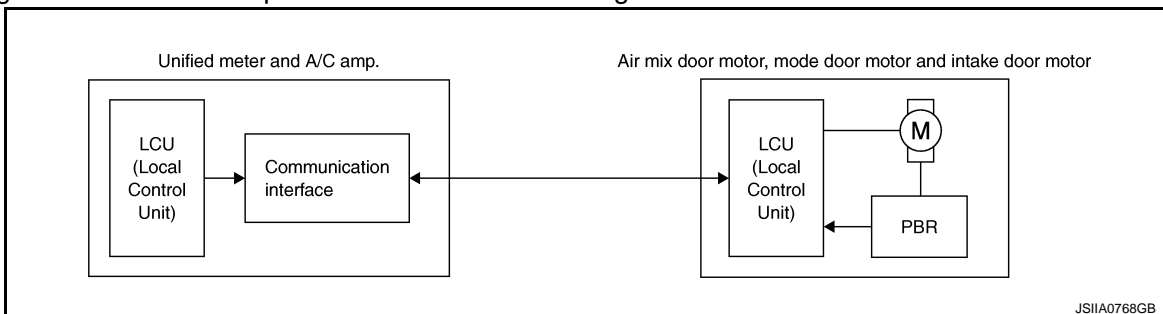
*:Inlet status is displayed by LED when activating automatic control.

JSIIA0663GB

AIR CONDITIONER LAN CONTROL SYSTEM

The LAN (Local Area Network) system consists of unified meter and A/C amp., mode door motor, air mix door motor and intake door motor.

A configuration of these components is as shown in the figure below.



JSIIA0768GB

AUTOMATIC AIR CONDITIONER SYSTEM

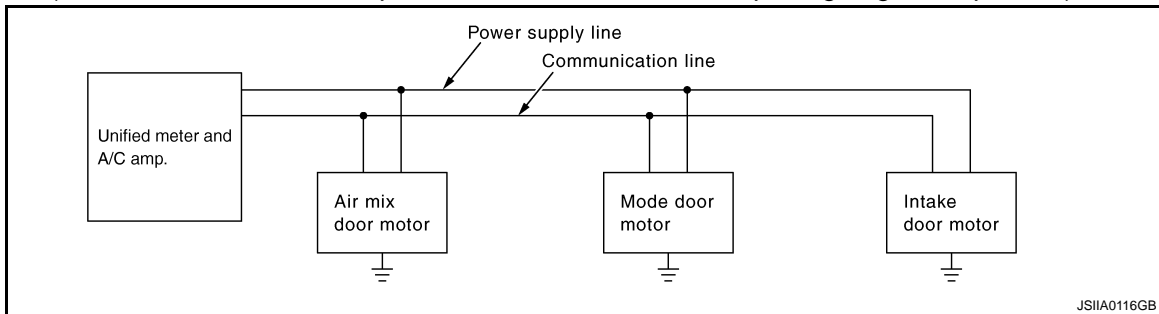
[AUTOMATIC AIR CONDITIONER]

< FUNCTION DIAGNOSIS >

SYSTEM CONSTRUCTION

A small network is constructed between the unified meter and A/C amp., mode door motor, air mix door motor and intake door motor. The unified meter and A/C amp. and motors are connected by data transmission lines and motor power supply lines. The LAN network is built through the ground circuits of each door motor. Addresses, motor opening angle signals, motor stop signals and error checking messages are all transmitted through the data transmission lines connecting the unified meter and A/C amp. and each door motor. The following functions are contained in LCUs built into the mode door motor, the air mix door motor and the intake door motor.

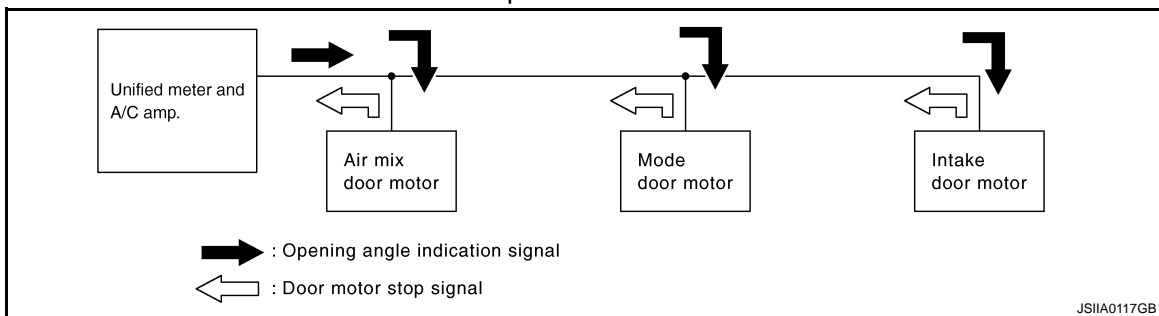
- Address
- Motor opening angle signals
- Data transmission
- Motor stop and drive decision
- Opening angle sensor (PBR function)
- Comparison
- Decision (Unified meter and A/C amp. indicated value and motor opening angle comparison)



Operation

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

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



Transmission Data and Transmission Order

Unified meter and A/C amp. data is transmitted consecutively to each of the doors motor following the form as shown in the figure below.

START:

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

ADDRESS:

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

AUTOMATIC AIR CONDITIONER SYSTEM

[AUTOMATIC AIR CONDITIONER]

< FUNCTION DIAGNOSIS >

OPENING ANGLE:

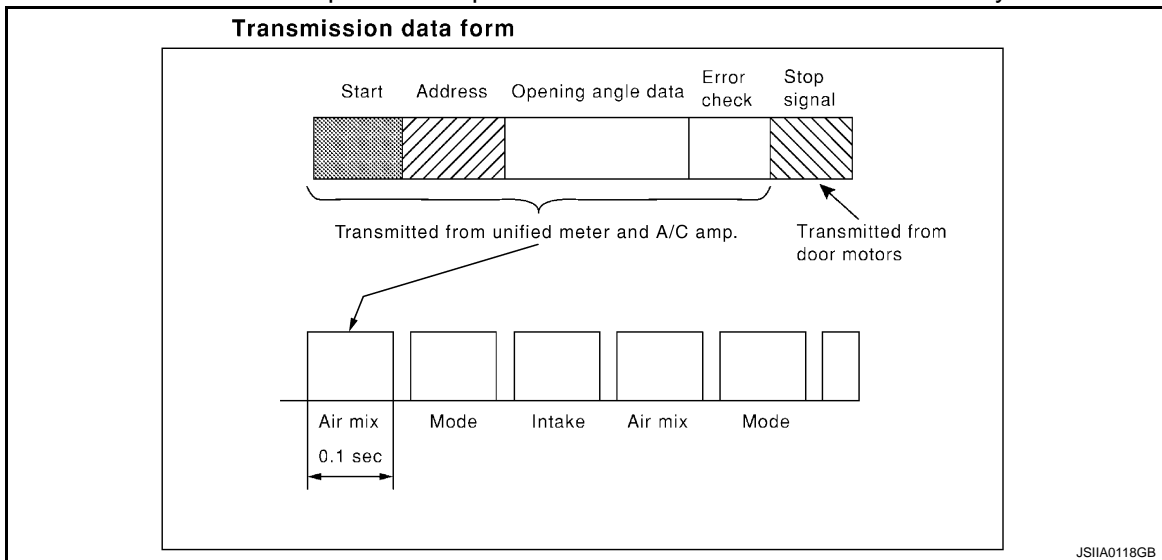
- Data that shows the indicated door opening angle of each door motor.

ERROR CHECK:

- In this procedure, transmitted and received data is checked for errors. Error data are then compiled. The error check prevents corrupted data from being used by the mode door motor, the air mix door motor and the intake door motor. Error data can be related to the following symptoms.
 - Malfunction of electrical frequency
 - Poor electrical connections
 - Signal leakage from transmission lines
 - Signal level fluctuation

STOP SIGNAL:

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



WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Component Part Location

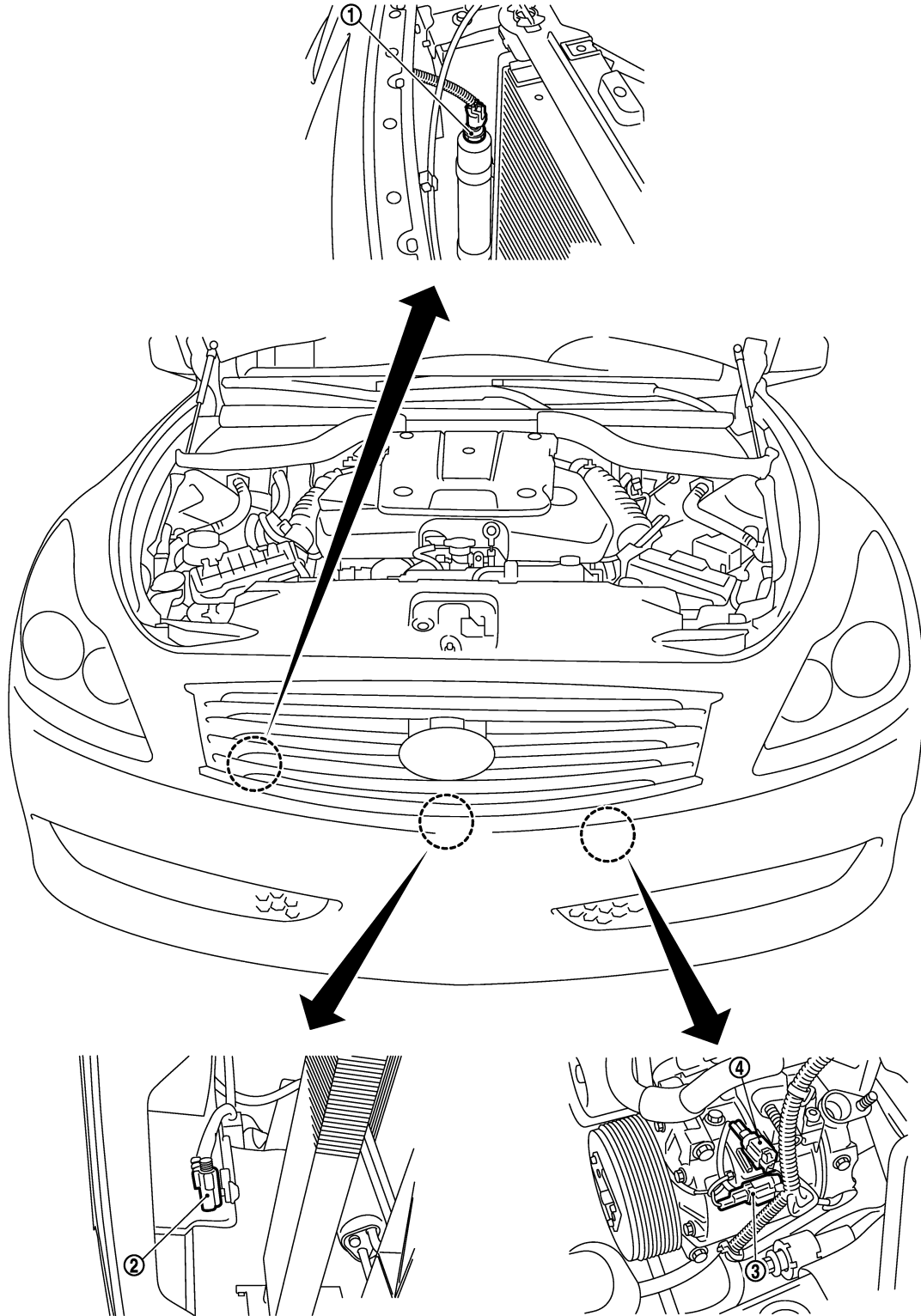
INFOID:000000001713979

ENGINE COMPARTMENT

AUTOMATIC AIR CONDITIONER SYSTEM

< FUNCTION DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]



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

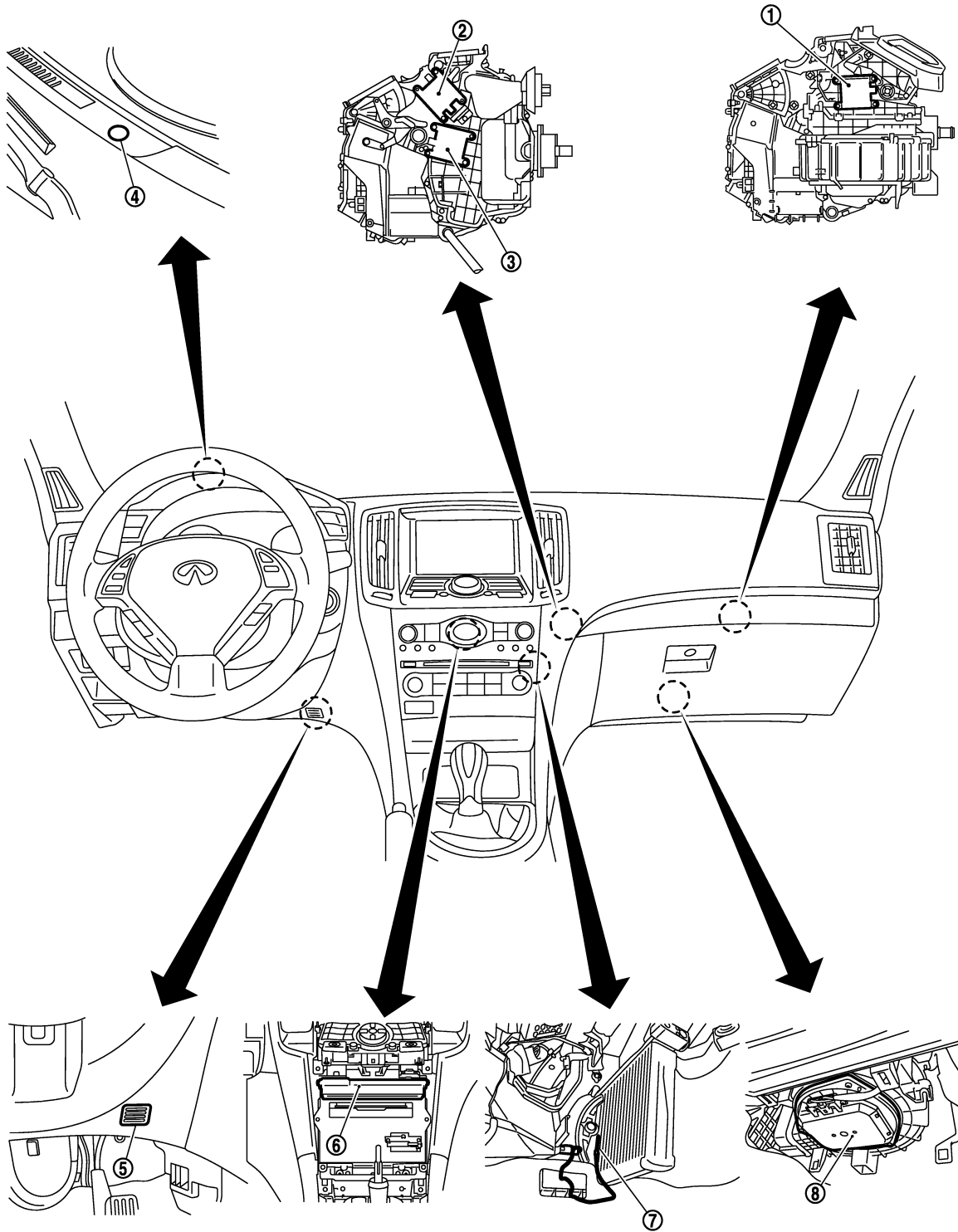
JSIIA0746ZZ

PASSENGER COMPARTMENT

AUTOMATIC AIR CONDITIONER SYSTEM

< FUNCTION DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]



JSIAA0122ZZ

- | | | |
|----------------------|----------------------|-------------------------------|
| 1. Intake door motor | 2. Mode door motor | 3. Air mix door motor |
| 4. Sunload sensor | 5. In-vehicle sensor | 6. Unified meter and A/C amp. |
| 7. Intake sensor | 8. Blower motor | |

WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CON-

AUTOMATIC AIR CONDITIONER SYSTEM

< FUNCTION DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

TROL SYSTEM : Component Description

INFOID:000000001675676

| Component | Reference |
|-----------------------------|--|
| Air mix door motor | HAC-70. "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Description" |
| Ambient sensor | HAC-88. "Description" |
| Blower motor | HAC-77. "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Description" |
| Compressor | HAC-85. "Description" |
| intake door motor | HAC-75. "Description" |
| intake sensor | HAC-97. "Description" |
| In-vehicle sensor | HAC-91. "Description" |
| Mode door motor | HAC-67. "Description" |
| Refrigerant pressure sensor | EC-511. "Description" |
| Sunload sensor | HAC-94. "Description" |
| Unified meter and A/C amp. | HAC-100. "Description" |

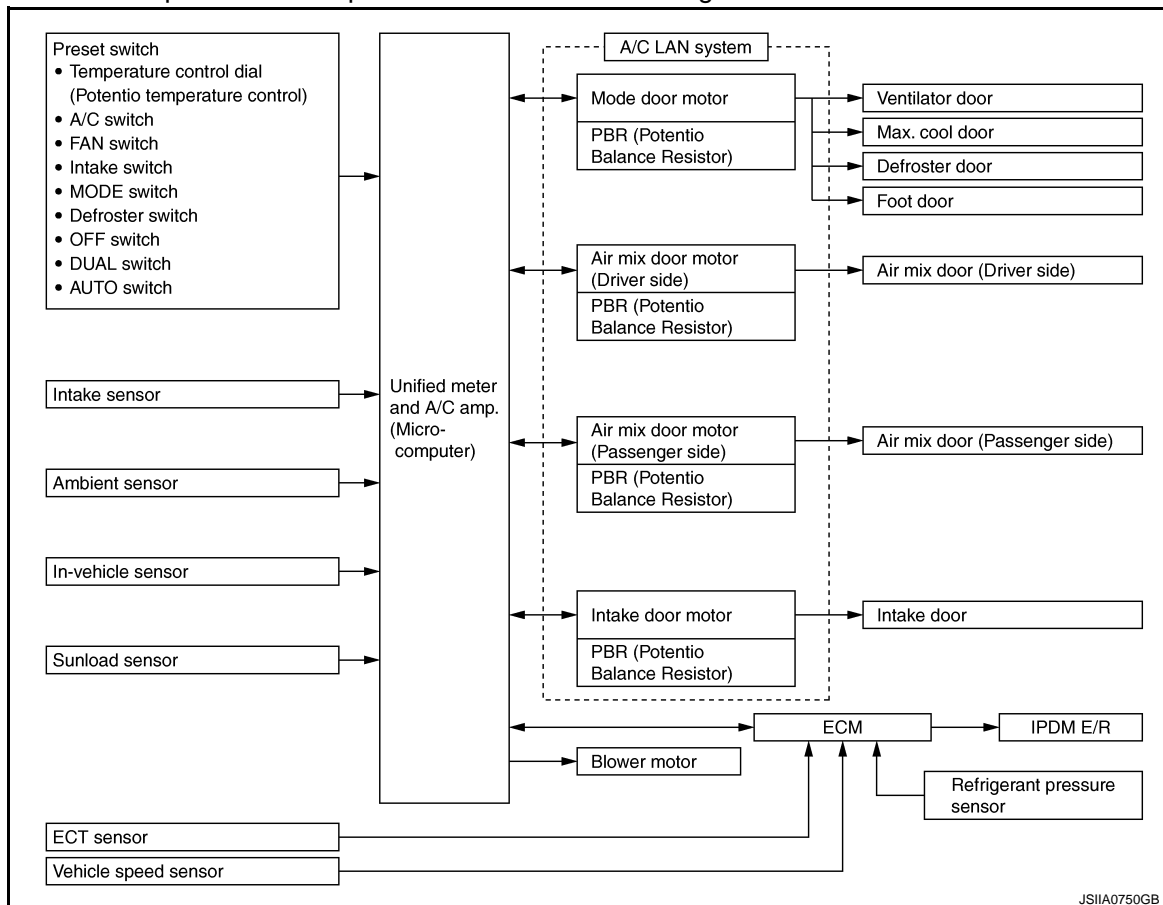
WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM

WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : System Diagram

INFOID:000000001675677

CONTROL SYSTEM

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



AUTOMATIC AIR CONDITIONER SYSTEM

< FUNCTION DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

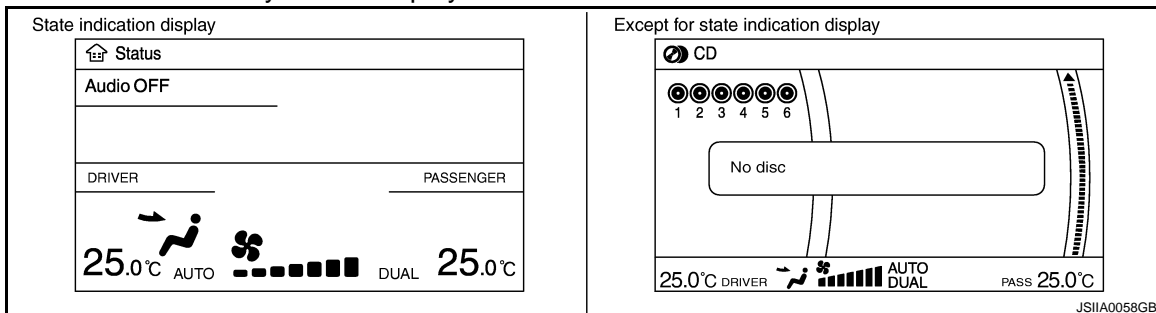
WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : System Description

INFOID:000000001675678

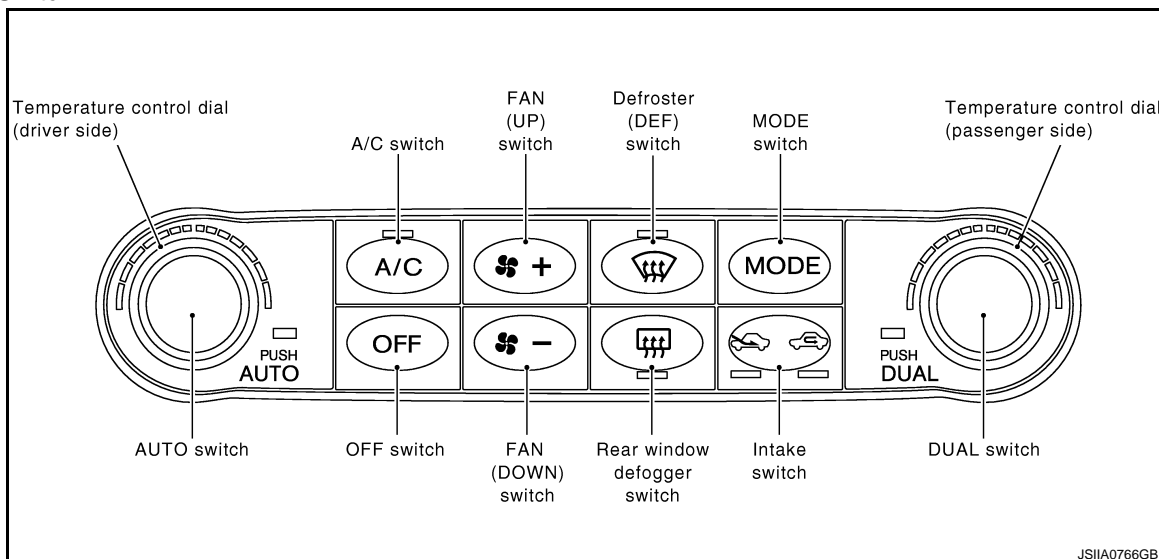
CONTROL OPERATION

Display Screen

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



Preset Switch



MODE Switch

The air discharge outlets is controlled with this switch.

Temperature Control Dial (Potentio Temperature Control) (Driver Side)

The set temperature is increased or decreased with this dial.

Temperature Control Dial (Potentio Temperature Control) (Passenger Side)

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

AUTO Switch

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

Defroster (DEF) Switch

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

A/C Switch

Compressor is ON or OFF with this switch.

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

FAN Switches

AUTOMATIC AIR CONDITIONER SYSTEM

< FUNCTION DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

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

A

OFF Switch

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

B

Rear Window Defogger Switch

When illumination is ON, rear window is defogged.

Intake Switch

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

C

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E

DUAL Switch

- When the DUAL switch indicator is illuminated, the driver side and passenger side, temperature can each be set independently.
- When the DUAL switch indicator is not illuminated, the driver side outlet and setting temperature is applied to both sides.

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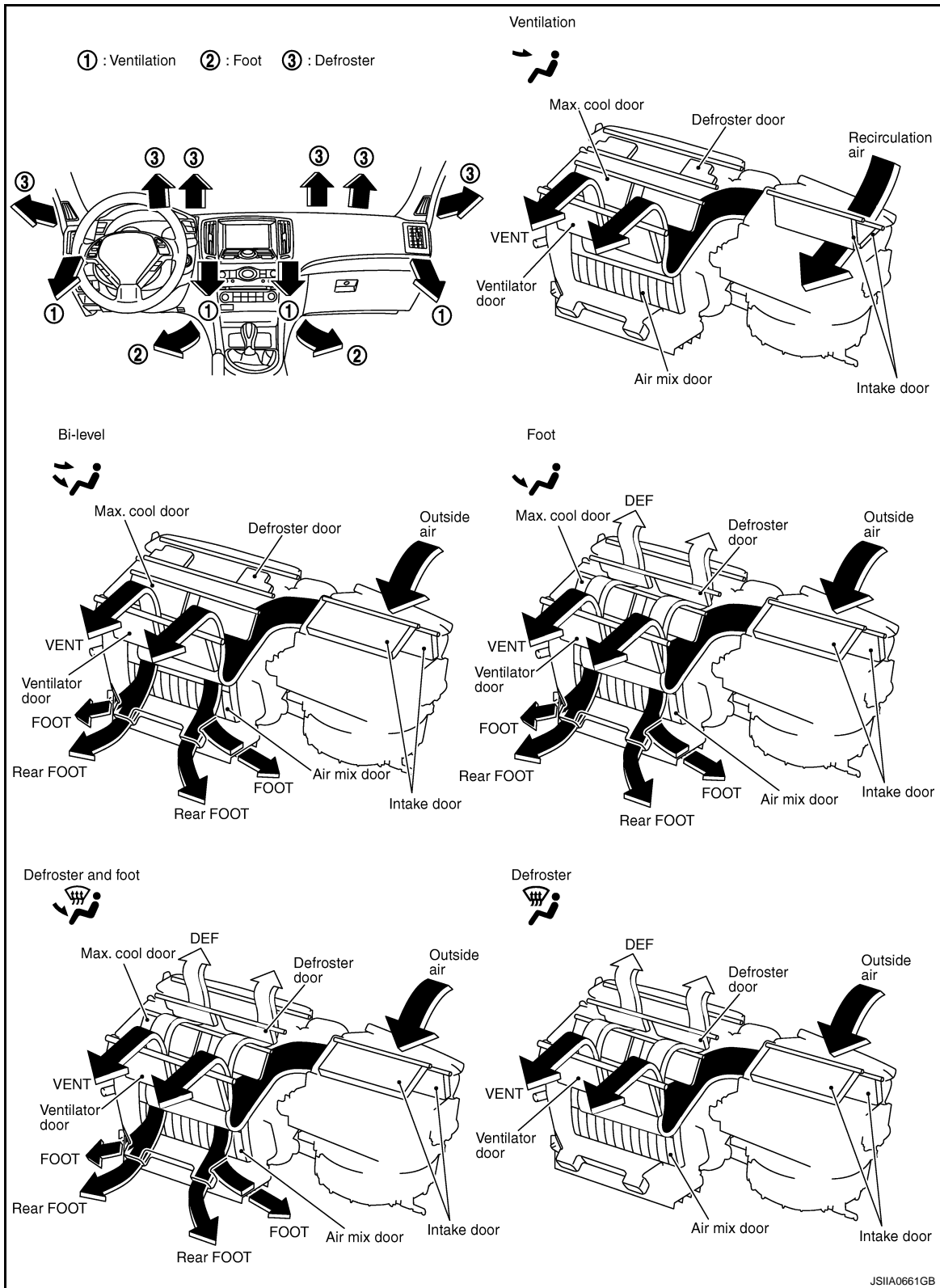
P

AUTOMATIC AIR CONDITIONER SYSTEM

< FUNCTION DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

DISCHARGE AIR FLOW

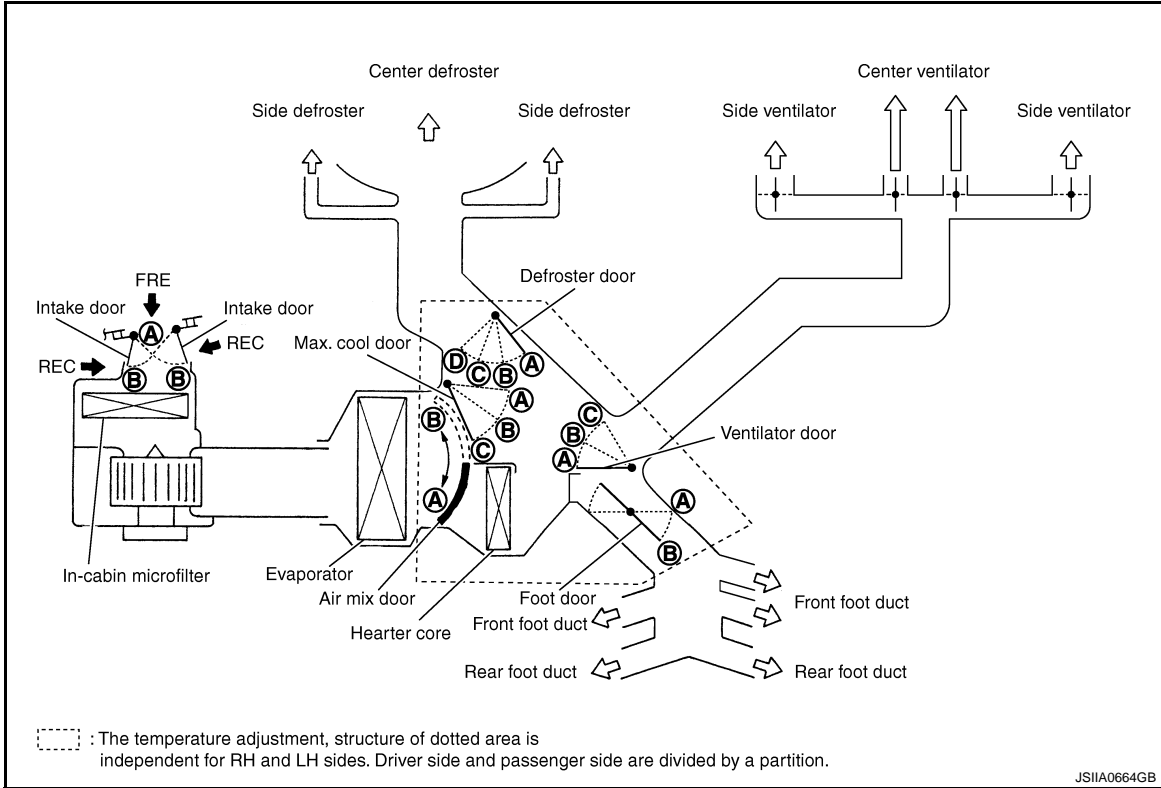


AUTOMATIC AIR CONDITIONER SYSTEM

< FUNCTION DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

SWITCHES AND THEIR CONTROL FUNCTION



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| Position or switch | DUAL switch | MODE switch | | | | DEF switch | | AUTO switch | Intake switch | | Temperature control dial(Driver side) | | Temperature control dial(Passenger side) | | OFF switch |
|-------------------------------|-------------|-------------|-----|------|-----|------------|-----|-------------|---------------|------|---------------------------------------|-------------|--|-------------|------------|
| | | VENT | B/L | FOOT | D/F | ON | OFF | | FRE | REC | | | | | |
| Door | | MODE | | | | | | | | | 18°C (60°F) | 32°C (90°F) | 18°C (60°F) | 32°C (90°F) | OFF |
| Ventilator door | — | (A) | (B) | (C) | (C) | (C) | — | AUTO | — | — | — | — | — | AUTO | |
| Max. cool door | — | (A) | (B) | (C) | (C) | (C) | — | | — | — | — | — | — | | — |
| Defroster door | — | (D) | (D) | (C) | (B) | (A) | — | | — | — | — | — | — | | — |
| Foot door | — | (B) | (B) | (B) | (B) | (A) | — | | — | — | — | — | — | | — |
| Intake door | — | — | | | | (B) | (B) | | — | (B)* | (A)* | — | — | | — |
| Air mix door (Driver side) | — | — | | | | — | — | — | — | — | (A) AUTO | (B) | — | — | |
| Air mix door (Passenger side) | ON | — | | | | — | — | — | — | — | — | (A) AUTO | (B) | — | |
| | OFF | — | | | | — | — | — | — | — | (A) AUTO | (B) | — | — | |

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

JSIIA0665GB

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AIR CONDITIONER LAN CONTROL SYSTEM

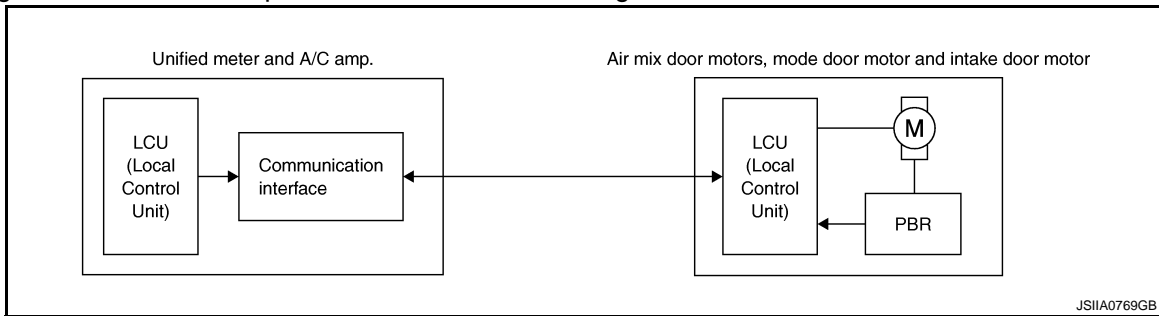
The LAN (Local Area Network) system consists of unified meter and A/C amp., mode door motor, air mix door motors and intake door motor.

AUTOMATIC AIR CONDITIONER SYSTEM

< FUNCTION DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

A configuration of these components is as shown in the figure below.



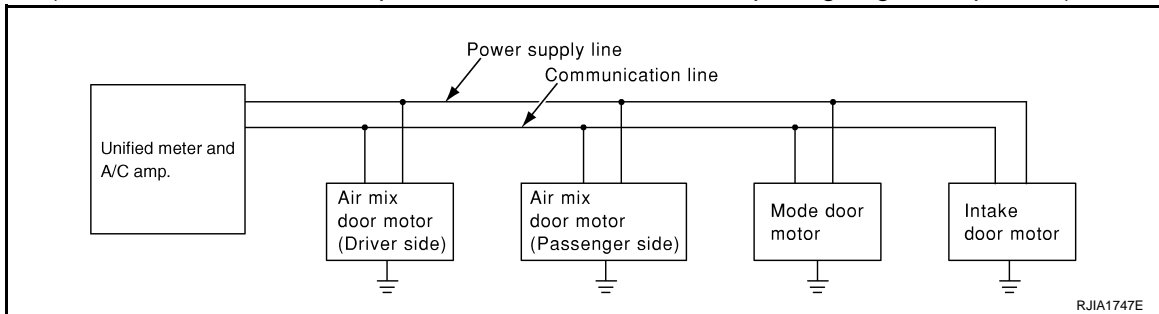
SYSTEM CONSTRUCTION

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

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

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

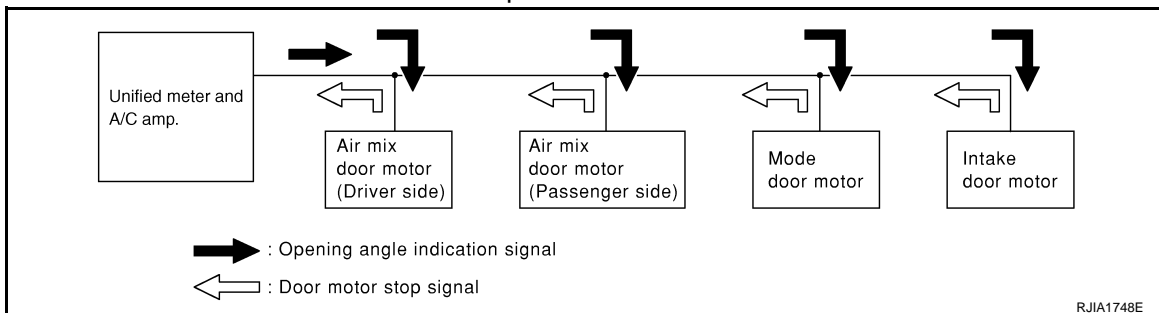
- Address
- Motor opening angle signals
- Data transmission
- Motor stop and drive decision
- Opening angle sensor (PBR function)
- Comparison
- Decision (Unified meter and A/C amp. indicated value and motor opening angle comparison)



Operation

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

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



Transmission Data and Transmission Order

Unified meter and A/C amp. data is transmitted consecutively to each of the doors motor following the form as shown in the figure below.

AUTOMATIC AIR CONDITIONER SYSTEM

[AUTOMATIC AIR CONDITIONER]

< FUNCTION DIAGNOSIS >

START:

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

ADDRESS:

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

OPENING ANGLE:

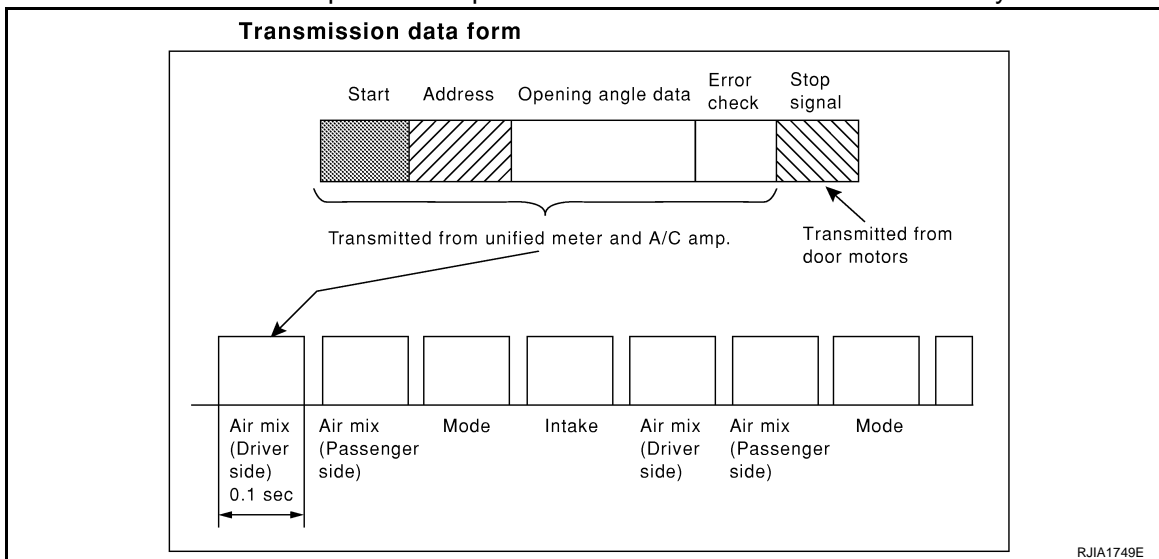
- Data that shows the indicated door opening angle of each door motor.

ERROR CHECK:

- In this procedure, transmitted and received data is checked for errors. Error data are then compiled. The error check prevents corrupted data from being used by the mode door motor, the air mix door motors and the intake door motor. Error data can be related to the following symptoms.
 - Malfunction of electrical frequency
 - Poor electrical connections
 - Signal leakage from transmission lines
 - Signal level fluctuation

STOP SIGNAL:

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



WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Component Part Location

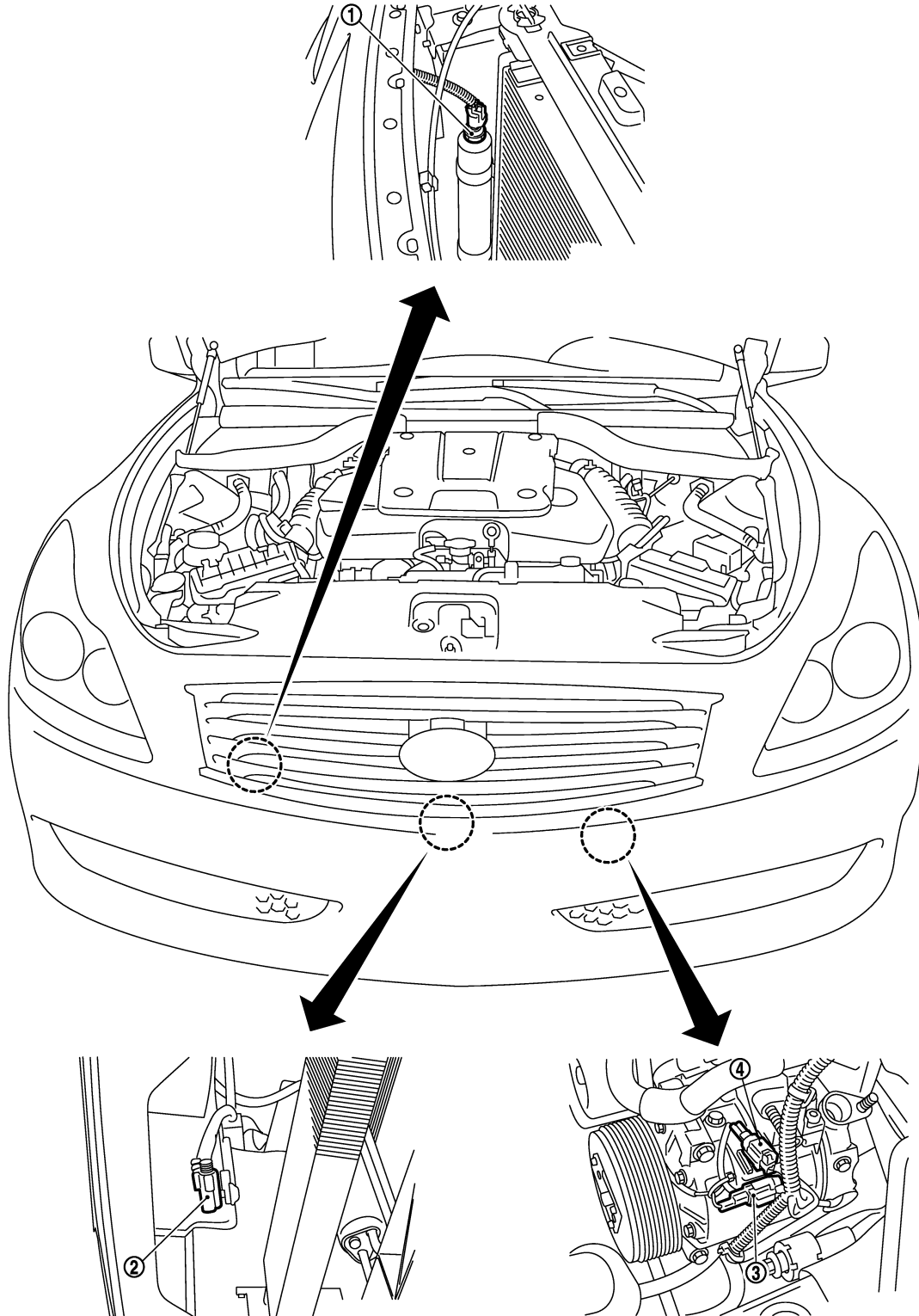
INFOID:000000001713978

ENGINE COMPARTMENT

AUTOMATIC AIR CONDITIONER SYSTEM

< FUNCTION DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]



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- 1. Refrigerant pressure sensor
- 4. Compressor (ECV)

- 2. Ambient sensor

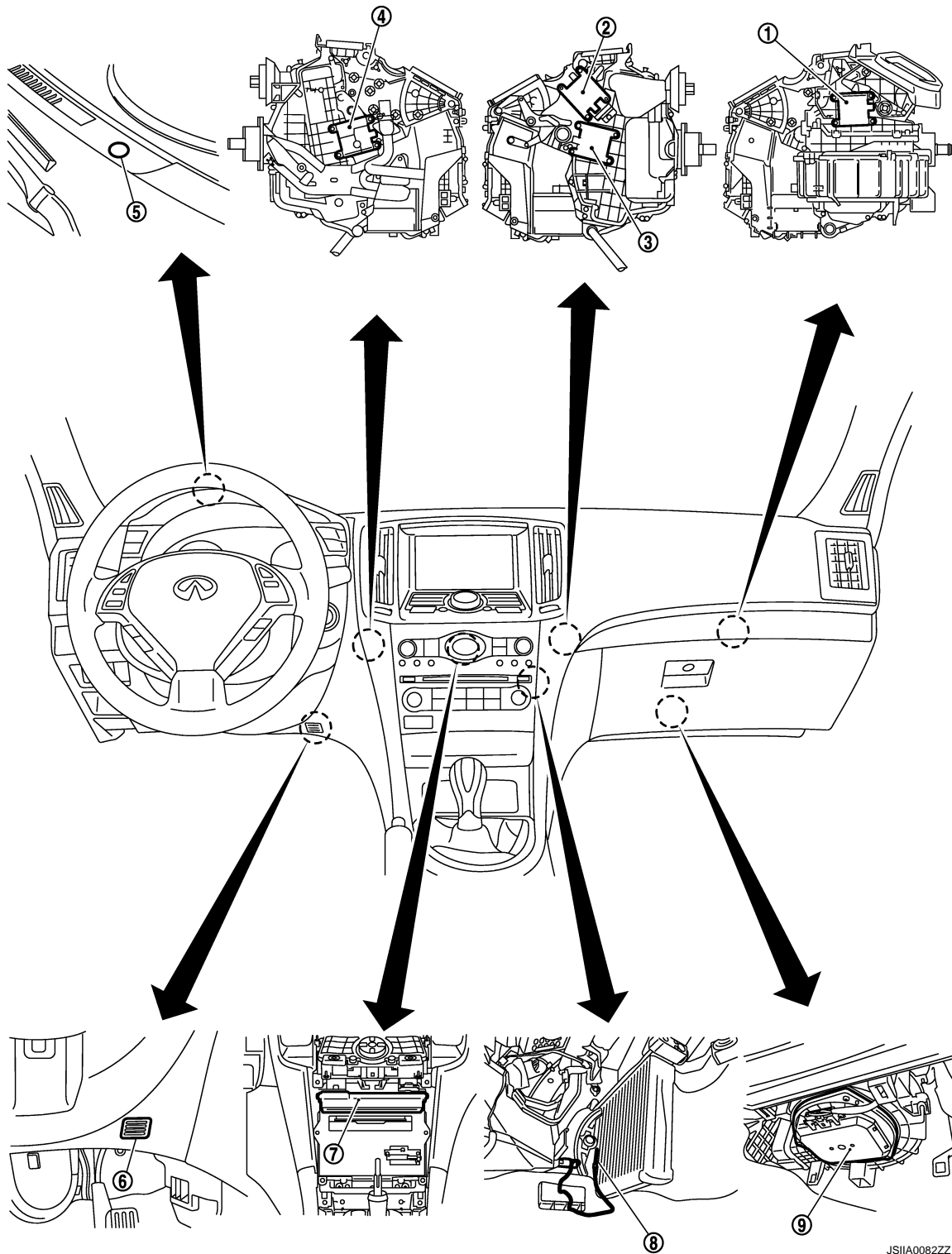
- 3. Compressor (magnet clutch)

PASSENGER COMPARTMENT

AUTOMATIC AIR CONDITIONER SYSTEM

< FUNCTION DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]



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|-------------------------------------|--------------------|--|
| 1. Intake door motor | 2. Mode door motor | 3. Air mix door motor (passenger side) |
| 4. Air mix door motor (driver side) | 5. Sunload sensor | 6. In-vehicle sensor |
| 7. Unified meter and A/C amp. | 8. Intake sensor | 9. Blower motor |

JSIIA0082ZZ

WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL

AUTOMATIC AIR CONDITIONER SYSTEM

< FUNCTION DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

SYSTEM : Component Description

INFOID:000000001675680

| Component | Reference |
|-----------------------------|---|
| Air mix door motor | HAC-71. "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Description" |
| Ambient sensor | HAC-88. "Description" |
| Blower motor | HAC-80. "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Description" |
| Compressor | HAC-85. "Description" |
| intake door motor | HAC-75. "Description" |
| intake sensor | HAC-97. "Description" |
| In-vehicle sensor | HAC-91. "Description" |
| Mode door motor | HAC-67. "Description" |
| Refrigerant pressure sensor | EC-511. "Description" |
| Sunload sensor | HAC-94. "Description" |
| Unified meter and A/C amp. | HAC-100. "Description" |

CAN COMMUNICATION SYSTEM

System Description

INFOID:000000001675681

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN-H line, CAN-L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only. For details, refer to [LAN-25, "CAN System Specification Chart"](#).

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DIAGNOSIS SYSTEM (AUTO AMP.)

< FUNCTION DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

DIAGNOSIS SYSTEM (AUTO AMP.)

WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM

WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description

INFOID:000000001675682

SELF-DIAGNOSIS SYSTEM

The self-diagnosis system is built into the unified meter and A/C amp. to quickly locate the cause of malfunctions.

SELF-DIAGNOSIS FUNCTION

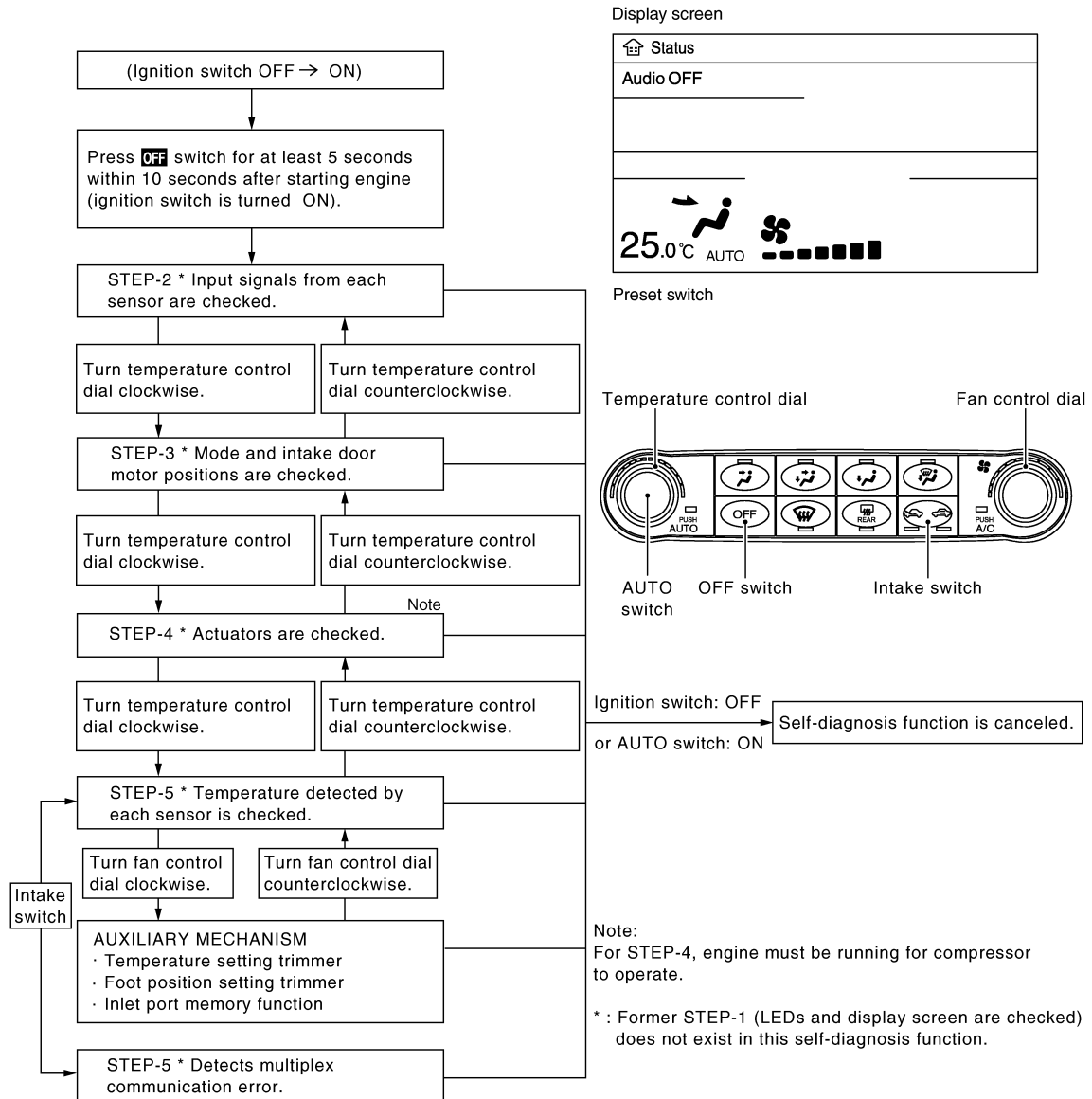
The self-diagnosis system diagnoses sensors, door motors, blower motor, etc. by system line. Refer to applicable sections (items) for details. Shifting from normal control to the self-diagnosis system is accomplished by starting the engine (turning the ignition switch ON) and pressing OFF switch for at least 5 seconds. The OFF switch must be pressed within 10 seconds after starting the engine (ignition switch is turned ON). This system is canceled by either pressing AUTO switch or turning the ignition switch OFF. Shifting from one step is accomplished by means of turning temperature control dial, as required.

DIAGNOSIS SYSTEM (AUTO AMP.)

[AUTOMATIC AIR CONDITIONER]

< FUNCTION DIAGNOSIS >

Shifting from STEP-5 to AUXILIARY MECHANISM is accomplished by means of turning fan control dial clockwise.



JSIIA0770GB

CONFORMATION METHOD

1.SET IN SELF-DIAGNOSIS MODE

1. Turn ignition switch ON.
2. Set in self-diagnosis mode as per the following. Press OFF switch for at least 5 seconds within 10 seconds after starting engine (ignition switch is turned ON).

NOTE:

- If battery voltage drops below 12 V during diagnosis STEP-3, door motor speed becomes slower and as a result, the system may generate an error even when operation is normal. Start engine before performing this diagnosis to avoid this.
- Former STEP-1 (LEDs and display screen are checked) does not exist in this self-diagnosis function.
- OFF switch may not be recognized according to the timing of pressing it. Operate OFF switch after turning the intake switch LEDs (REC/FRE) ON.

>> GO TO 2.

2.STEP-2: SENSOR AND DOOR MOTOR CIRCUITS ARE CHECKED FOR OPEN OR SHORT CIRCUIT

DIAGNOSIS SYSTEM (AUTO AMP.)

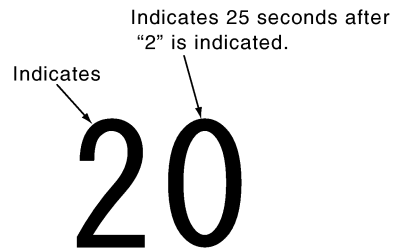
< FUNCTION DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

Does code No. 20 appear on the display?

- YES >> GO TO 3.
- NO >> GO TO 11.

Display (when all sensors are in good order)



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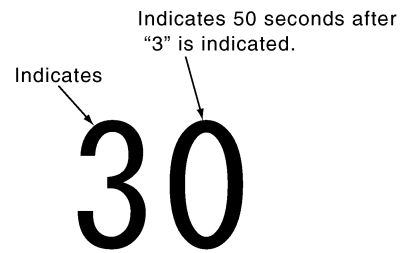
3.STEP-3: MODE DOOR AND INTAKE DOOR POSITIONS ARE CHECKED

Turn temperature control dial clockwise.

Does code No. 30 appear on the display?

- YES >> GO TO 4.
- NO >> GO TO 12.

Display (when all doors are in good order)

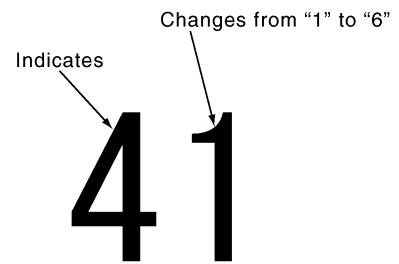


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4.STEP-4: OPERATION OF EACH DOOR MOTOR IS CHECKED

1. Turn temperature control dial clockwise.
2. Press DEF (DEF) switch. Code No. of each door motor test is indicated on the display.

>> GO TO 5.



SJIA1780E

5.CHECK ACTUATORS

Refer to the following chart and check discharge air flow, air temperature, blower motor duty ratio and compressor operation.

| Discharge air flow | | | | |
|--------------------------|-------------------------|-------|------|-----|
| Mode position indication | Air outlet/distribution | | | |
| | VENT | FOOT | | DEF |
| | | Front | Rear | |
| | 100% | — | — | — |
| | 53% | 29% | 18% | — |
| | 11% | 39% | 24% | 26% |
| | 9% | 33% | 21% | 37% |
| | 16% | — | — | 84% |

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DIAGNOSIS SYSTEM (AUTO AMP.)

< FUNCTION DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

| Code No. | 41 | 42 | 43 | 44 | 45 | 46 |
|---|-----------|-----------|----------|----------|----------|----------|
| 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 COOL | FULL COOL | FULL HOT | FULL HOT | FULL HOT | FULL HOT |
| Blower motor duty ratio | 37% | 91% | 65% | 65% | 65% | 91% |
| Compressor (Magnet clutch) | ON | ON | OFF | OFF | ON | ON |
| Electronic control valve (ECV) duty ratio | 100% | 100% | 0% | 0% | 50% | 100% |

Checks must be made visually, by listening the sound, or by touching air outlets with hand, etc. for improper operation.

Is the inspection result normal?

YES >> GO TO 6.

NO-1 >> Air outlet does not change. Go to Mode Door Motor Circuit. Refer to [HAC-67. "Diagnosis Procedure"](#).

NO-2 >> Intake door does not change. Go to Intake Door Motor Circuit. Refer to [HAC-75. "Diagnosis Procedure"](#).

NO-3 >> Discharge air temperature does not change. Go to Air Mix Door Motor Circuit. Refer to [HAC-70. "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Procedure"](#).

NO-4 >> Blower motor operation is malfunctioning. Go to Blower Motor Circuit. Refer to [HAC-77. "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Procedure"](#).


NO-5 >> Magnet clutch does not engage. Go to Magnet Clutch Circuit. Refer to [HAC-85. "Diagnosis Procedure"](#).

6. STEP-5: TEMPERATURE OF EACH SENSOR IS CHECKED

1. Turn temperature control dial clockwise.
2. Code No. 51 appears on the display.

>> GO TO 7.

7. CHECK AMBIENT SENSOR

Press DEF () switch one time. Temperature detected by ambient sensor is indicated on the display.

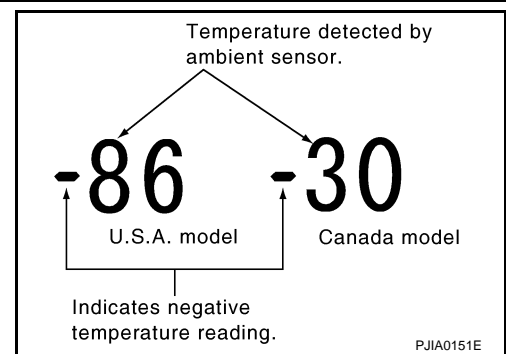
NOTE:

Check sensor circuit first if the temperature indicated on the display greatly differs from the actual temperature, and then check sensor.

Is the inspection result normal?

YES >> GO TO 8.

NO >> Go to Ambient Sensor Circuit. Refer to [HAC-88. "Diagnosis Procedure"](#).




8. CHECK IN-VEHICLE SENSOR

DIAGNOSIS SYSTEM (AUTO AMP.)

[AUTOMATIC AIR CONDITIONER]

< FUNCTION DIAGNOSIS >

Press DEF () switch for the second time. Temperature detected by in-vehicle sensor is indicated on the display.

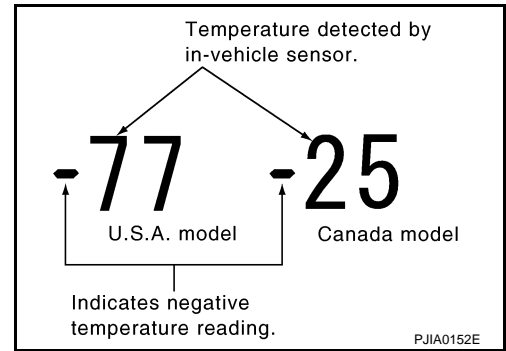
NOTE:

Check sensor circuit first if the temperature indicated on the display greatly differs from the actual temperature, and then check sensor.


Is the inspection result normal?

YES >> GO TO 9.

NO >> Go to In-vehicle Sensor Circuit. Refer to [HAC-92. "Diagnosis Procedure"](#).



9. CHECK INTAKE SENSOR

Press DEF () switch for the third time. Temperature detected by intake sensor is indicated on the display.

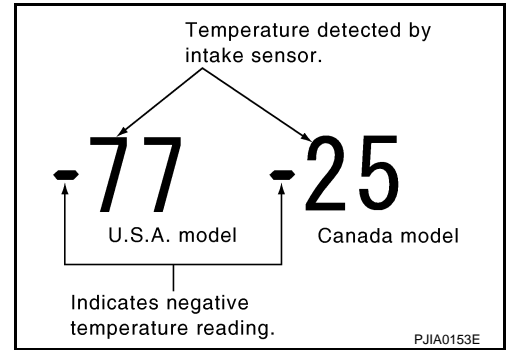
NOTE:

Check sensor circuit first if the temperature indicated on the display greatly differs from the actual temperature, and then check sensor.

Is the inspection result normal?

YES >> GO TO 10.

NO >> Go to Intake Sensor Circuit. Refer to [HAC-97. "Diagnosis Procedure"](#).





10. CHECK CAN COMMUNICATION ERROR

1. Press intake switch.
2. CAN communication error between each unit that uses the unified meter and A/C amp. can be detected as self-diagnosis results. (The display of each error will blink twice for 0.5 second intervals if plural errors occur.)

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to CAN communication (Unified meter and A/C amp. - AV control unit). Refer to [MWI-41. "Diagnosis Procedure"](#).

| Display | CAN communication error |
|--|---------------------------------------|
| 52 | In good order |
| 52  | AV C/U ⇨ Unified meter and A/C amp. |
| 52  | Unified meter and A/C amp. ⇨ All unit |

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11. CHECK MALFUNCTIONING SENSOR AND DOOR MOTOR

Refer to the following chart for malfunctioning code No.

(Corresponding code Nos. indicates 1 second each if two or more sensors and door motor malfunction.)

| Code No. | Malfunctioning sensor and door motor (Including circuits) | Reference |
|----------|---|--|
| 21 / -21 | Ambient sensor | HAC-88. "Diagnosis Procedure" |
| 22 / -22 | In-vehicle sensor | HAC-92. "Diagnosis Procedure" |
| 24 / -24 | Intake sensor | HAC-97. "Diagnosis Procedure" |
| 25 / -25 | Sunload sensor * | HAC-94. "Diagnosis Procedure" |
| 26 / -26 | Air mix door motor PBR | HAC-70. "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Procedure" |

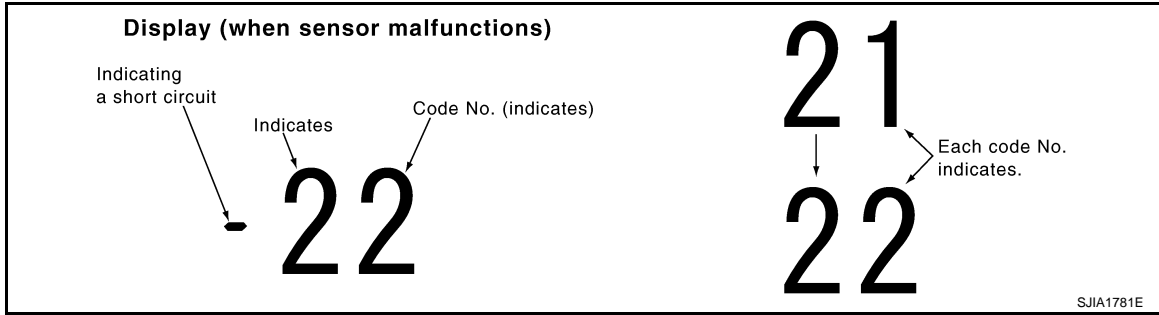
*: Perform self-diagnosis STEP-2 under sunshine.

DIAGNOSIS SYSTEM (AUTO AMP.)

[AUTOMATIC AIR CONDITIONER]

< FUNCTION DIAGNOSIS >

When performing indoors, aim a light (more than 60 W) at sunload sensor, otherwise code No. 25 indicates despite that sunload sensor is functioning normally.



>> INSPECTION END

12. CHECK MALFUNCTIONING DOOR MOTOR POSITION SWITCH

Mode and/or intake door motor PBR(s) is/are malfunctioning.

| Code No. *1 *2 | Mode or intake door position | Reference |
|----------------|------------------------------|--|
| 31 | VENT | Mode door motor HAC-67, "Diagnosis Procedure" |
| 32 | DEF | |
| 37 | FRE | |
| 38 | 20% FRE | Intake door motor HAC-75, "Diagnosis Procedure" |
| 39 | REC | |

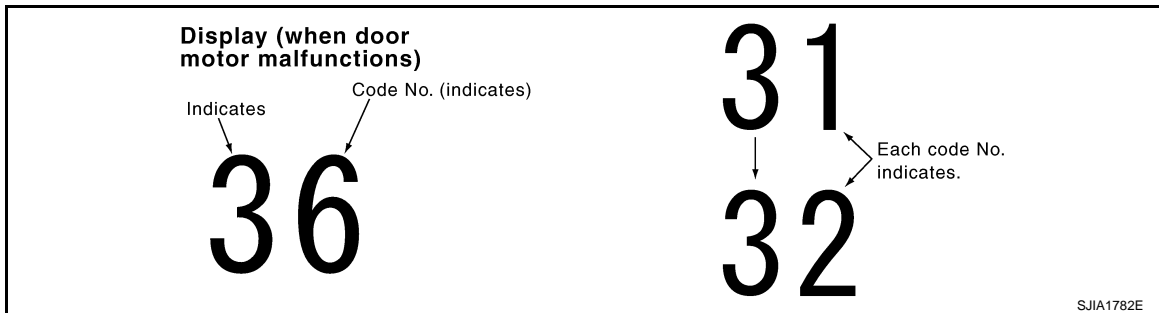
(Corresponding code Nos. indicates 1 second each if two or more mode or intake door motors malfunction.)

*1: The following display pattern will appear if mode door motor harness connector is disconnected.

31→32→Return to 31

*2: The following display pattern will appear if intake door motor harness connector is disconnected.

37→38→39→Return to 37



>> INSPECTION END

WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : CONSULT-III Function

INFOID:000000001675683

CONSULT-III APPLICATION ITEMS

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

| System part | Check item, diagnosis mode | Description |
|-------------|----------------------------|---------------------------------------|
| ECM | Data monitor | Displays ECM input data in real time. |

DATA MONITOR

DIAGNOSIS SYSTEM (AUTO AMP.)

< FUNCTION DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

Display Item List

| Monitor Item | Condition | | Value/Status |
|-----------------------------|---|-----------------------------|--------------|
| IGN ON SW | Ignition switch OFF → ON | | OFF → ON |
| FAN ON SIG | Ignition switch ON | Blower fan motor switch ON | ON |
| | | Blower fan motor switch OFF | OFF |
| AIR COND SW | Ignition switch ON | Compressor ON | ON |
| | | Compressor OFF | OFF |
| REFRIGERANT PRESSURE SENSOR | <ul style="list-style-type: none">• Engine is running• Warm-up condition• Both A/C switch and blower fan motor switch: ON (Compressor operates) | | 1.0 - 4.0 V |

WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM

WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description

INFOID:000000001675684

SELF-DIAGNOSIS SYSTEM

The self-diagnosis system is built into the unified meter and A/C amp. to quickly locate the cause of malfunctions.

SELF-DIAGNOSIS FUNCTION

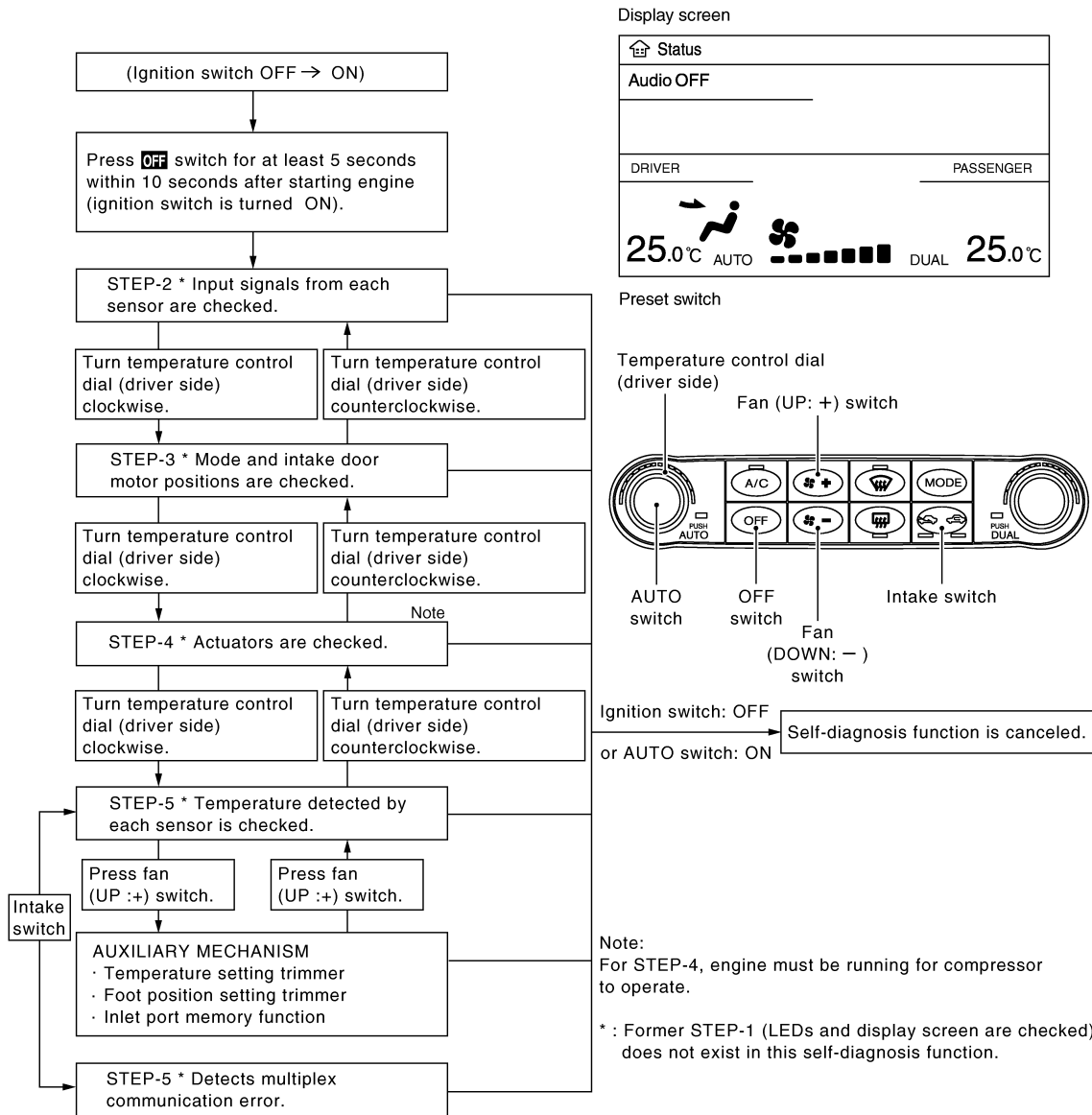
The self-diagnosis system diagnoses sensors, door motors, blower motor, etc. by system line. Refer to applicable sections (items) for details. Shifting from normal control to the self-diagnosis system is accomplished by starting the engine (turning the ignition switch ON) and pressing OFF switch for at least 5 seconds. The OFF switch must be pressed within 10 seconds after starting the engine (ignition switch is turned ON). This system is canceled by either pressing AUTO switch or turning the ignition switch OFF. Shifting from one step is accomplished by means of turning temperature control dial (driver side), as required.

DIAGNOSIS SYSTEM (AUTO AMP.)

[AUTOMATIC AIR CONDITIONER]

< FUNCTION DIAGNOSIS >

Shifting from STEP-5 to AUXILIARY MECHANISM is accomplished by means of pressing fan (UP:+) switch.



JSIIA0771GB

CONFORMATION METHOD

1.SET IN SELF-DIAGNOSIS MODE

1. Turn ignition switch ON.
2. Set in self-diagnosis mode as per the following. Press OFF switch for at least 5 seconds Within 10 seconds after starting engine (ignition switch is turned ON).

NOTE:

- If battery voltage drops below 12 V during diagnosis STEP-3, door motor speed becomes slower and as a result, the system may generate an error even when operation is normal. Start engine before performing this diagnosis to avoid this.
- Former STEP-1 (LEDs and display screen are checked) does not exist in this self-diagnosis function.
- OFF switch may not be recognized according to the timing of pressing it. Operate OFF switch after turning the intake switch LEDs (REC/FRE) ON.

>> GO TO 2.

2.STEP-2: SENSOR AND DOOR MOTOR CIRCUITS ARE CHECKED FOR OPEN OR SHORT CIRCUIT

DIAGNOSIS SYSTEM (AUTO AMP.)

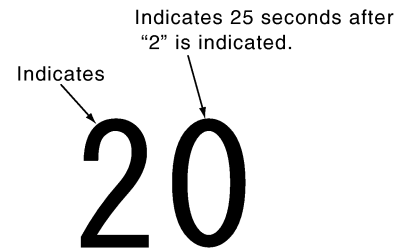
< FUNCTION DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

Does code No. 20 appear on the display?

- YES >> GO TO 3.
- NO >> GO TO 11.

Display (when all sensors are in good order)



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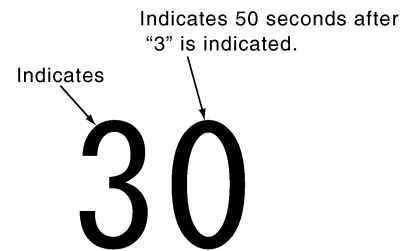
3.STEP-3: MODE DOOR AND INTAKE DOOR POSITIONS ARE CHECKED

Turn temperature control dial (driver side) clockwise.

Does code No. 30 appear on the display?

- YES >> GO TO 4.
- NO >> GO TO 12.

Display (when all doors are in good order)

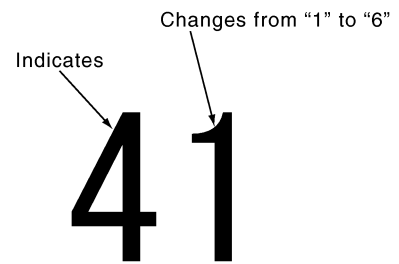


SJIA1779E

4.STEP-4: OPERATION OF EACH DOOR MOTOR IS CHECKED

1. Turn temperature control dial (driver side) clockwise.
2. Press DEF (DEF) switch. Code No. of each door motor test is indicated on the display.

>> GO TO 5.



SJIA1780E

5.CHECK ACTUATORS

Refer to the following chart and check discharge air flow, air temperature, blower motor duty ratio and compressor operation.

| Discharge air flow | | | | | |
|--------------------------|------------------|-------------------------|-------|------|-----|
| Mode position indication | Condition | Air outlet/distribution | | | |
| | | VENT | FOOT | | DEF |
| | | | Front | Rear | |
| | DUAL switch: OFF | 100% | — | — | — |
| | | 53% | 29% | 18% | — |
| | | 11% | 39% | 24% | 26% |
| | | 9% | 33% | 21% | 37% |
| | | 16% | — | — | 84% |

JSIIA0866GB

DIAGNOSIS SYSTEM (AUTO AMP.)

< FUNCTION DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

| Code No. | 41 | 42 | 43 | 44 | 45 | 46 |
|---|-----------|-----------|----------|----------|----------|----------|
| 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 COOL | FULL COOL | FULL HOT | FULL HOT | FULL HOT | FULL HOT |
| Blower motor duty ratio | 37% | 91% | 65% | 65% | 65% | 91% |
| Compressor (Magnet clutch) | ON | ON | OFF | OFF | ON | ON |
| Electronic control valve (ECV) duty ratio | 100% | 100% | 0% | 0% | 50% | 100% |

Checks must be made visually, by listening the sound, or by touching air outlets with hand, etc. for improper operation.

Is this inspection result normal?

YES >> GO TO 6.

NO-1 >> Air outlet does not change. Go to Mode Door Motor Circuit. Refer to [HAC-67. "Diagnosis Procedure"](#).

NO-2 >> Intake door does not change. Go to Intake Door Motor Circuit. Refer to [HAC-75. "Diagnosis Procedure"](#).

NO-3 >> Discharge air temperature does not change. Go to Air Mix Door Motor Circuit. Refer to [HAC-72. "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Procedure"](#).

NO-4 >> Blower motor operation is malfunctioning. Go to Blower Motor Circuit. Refer to [HAC-81. "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Procedure"](#).

NO-5 >> Magnet clutch does not engage. Go to Magnet Clutch Circuit. Refer to [HAC-85. "Diagnosis Procedure"](#).

6. STEP-5: TEMPERATURE OF EACH SENSOR IS CHECKED

1. Turn temperature control dial (driver side) clockwise.
2. Code No. 51 appears on the display.

>> GO TO 7.

7. CHECK AMBIENT SENSOR

Press DEF (⚡) switch one time. Temperature detected by ambient sensor is indicated on the display.

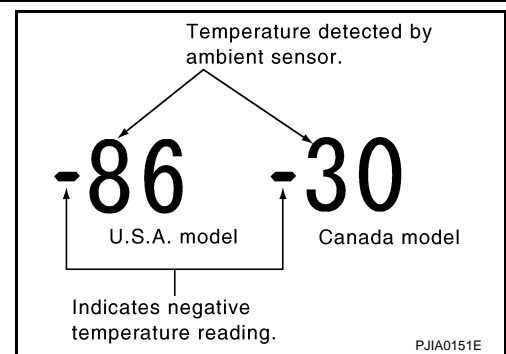
NOTE:

Check sensor circuit first if the temperature indicated on the display greatly differs from the actual temperature, and then check sensor.

Is this inspection result normal?

YES >> GO TO 8.

NO >> Go to Ambient Sensor Circuit. Refer to [HAC-88. "Diagnosis Procedure"](#).



8. CHECK IN-VEHICLE SENSOR

DIAGNOSIS SYSTEM (AUTO AMP.)

[AUTOMATIC AIR CONDITIONER]

< FUNCTION DIAGNOSIS >

Press DEF (⚡) switch for the second time. Temperature detected by in-vehicle sensor is indicated on the display.

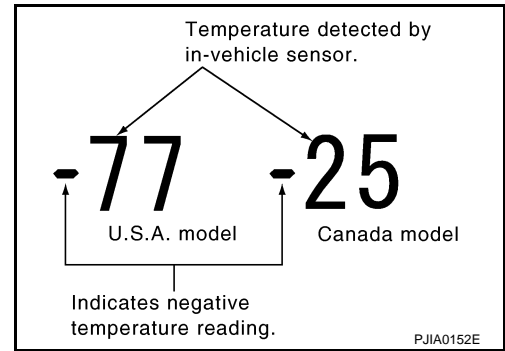
NOTE:

Check sensor circuit first if the temperature indicated on the display greatly differs from the actual temperature, and then check sensor.

Is this inspection result normal?

YES >> GO TO 9.

NO >> Go to In-vehicle Sensor Circuit. Refer to [HAC-92. "Diagnosis Procedure"](#).



9. CHECK INTAKE SENSOR

Press DEF (⚡) switch for the third time. Temperature detected by intake sensor is indicated on the display.

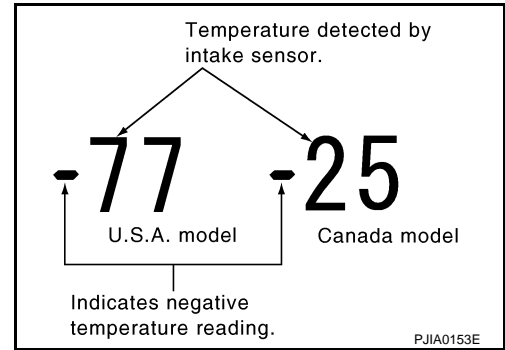
NOTE:

Check sensor circuit first if the temperature indicated on the display greatly differs from the actual temperature, and then check sensor.

Is this inspection result normal?

YES >> GO TO 10.

NO >> Go to Intake Sensor Circuit. Refer to [HAC-97. "Diagnosis Procedure"](#).



10. CHECK CAN COMMUNICATION ERROR

1. Press intake switch.
2. CAN communication error between each unit that uses the unified meter and A/C amp. can be detected as self-diagnosis results. (The display of each error will blink twice for 0.5 second intervals if plural errors occur.)

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to CAN communication (Unified meter and A/C amp. - AV control unit). Refer to [MWI-41. "Diagnosis Procedure"](#).

| Display | CAN communication error |
|------------------|---------------------------------------|
| 52 | In good order |
| 52 ■■■■■■ | AV C/U ⇨ Unified meter and A/C amp. |
| 52 ■■■■■■ | Unified meter and A/C amp. ⇨ All unit |

JSIIA0138GB

11. CHECK MALFUNCTIONING SENSOR AND DOOR MOTOR

Refer to the following chart for malfunctioning code No.

(Corresponding code Nos. indicates 1 second each if two or more sensors and door motors malfunction.)

(Corresponding code Nos. indicates 0.5 second each if two door motors malfunction.)

| Code No. | Malfunctioning sensor and door motor (Including circuits) | Reference |
|----------|---|---|
| 21 / -21 | Ambient sensor | HAC-88. "Diagnosis Procedure" |
| 22 / -22 | In-vehicle sensor | HAC-92. "Diagnosis Procedure" |
| 24 / -24 | Intake sensor | HAC-97. "Diagnosis Procedure" |
| 25 / -25 | Sunload sensor * | HAC-94. "Diagnosis Procedure" |
| 26 / -26 | Air mix door motor PBR (Driver side) | HAC-72. "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Procedure" |
| 27 / -27 | Air mix door motor PBR (Passenger side) | |

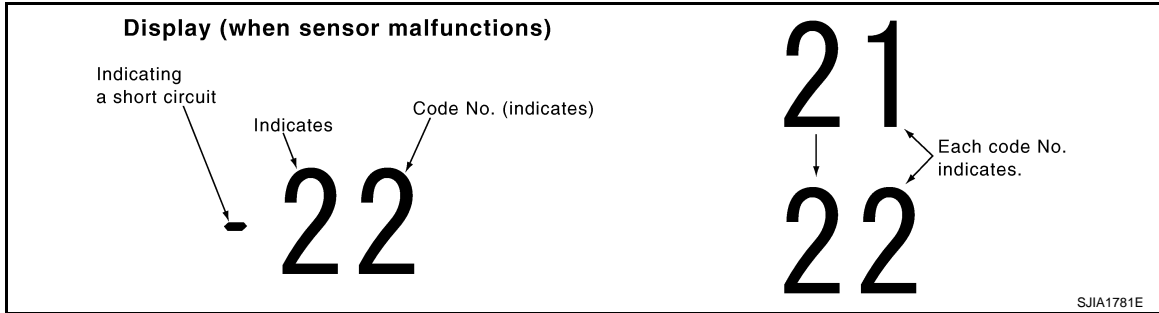
*: Perform self-diagnosis STEP-2 under sunshine.

DIAGNOSIS SYSTEM (AUTO AMP.)

[AUTOMATIC AIR CONDITIONER]

< FUNCTION DIAGNOSIS >

When performing indoors, aim a light (more than 60 W) at sunload sensor, otherwise code No. 25 indicates despite that sunload sensor is functioning normally.



>> INSPECTION END

12. CHECK MALFUNCTIONING DOOR MOTOR POSITION SWITCH

Mode and/or intake door motor PBR(s) is/are malfunctioning.

| Code No. *1 *2 | Mode or intake door position | Reference |
|----------------|------------------------------|--|
| 31 | VENT | Mode door motor HAC-67, "Diagnosis Procedure" |
| 32 | DEF | |
| 37 | FRE | Intake door motor HAC-75, "Diagnosis Procedure" |
| 38 | 20% FRE | |
| 39 | REC | |

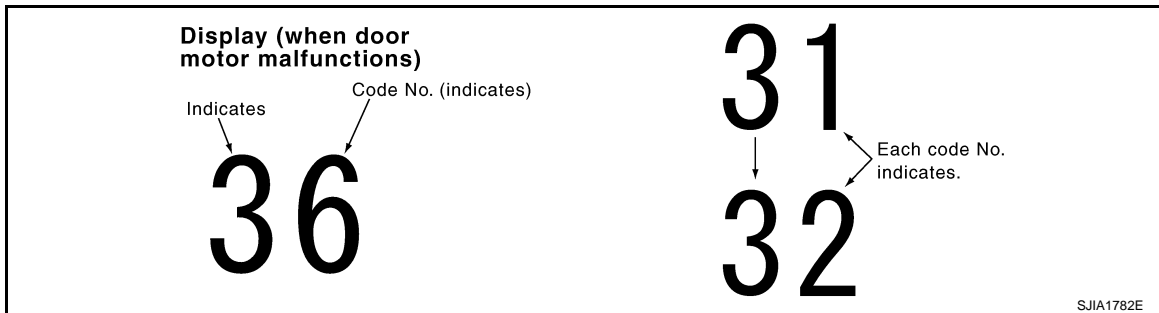
(Corresponding code Nos. indicates 1 second each if two or more mode or intake door motors malfunction.)

*1: The following display pattern will appear if mode door motor harness connector is disconnected.

31→32→Return to 31

*2: The following display pattern will appear if intake door motor harness connector is disconnected.

37→38→39→Return to 37



>> INSPECTION END

WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : CONSULT-III Function

INFOID:000000001713980

CONSULT-III APPLICATION ITEMS

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

| System part | Check item, diagnosis mode | Description |
|-------------|----------------------------|---------------------------------------|
| ECM | Data monitor | Displays ECM input data in real time. |

DATA MONITOR

DIAGNOSIS SYSTEM (AUTO AMP.)

< FUNCTION DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

Display Item List

| Monitor Item | Condition | | Value/Status |
|-----------------------------|---|-----------------------------|--------------|
| IGN ON SW | Ignition switch OFF → ON | | OFF → ON |
| FAN ON SIG | Ignition switch ON | Blower fan motor switch ON | ON |
| | | Blower fan motor switch OFF | OFF |
| AIR COND SW | Ignition switch ON | Compressor ON | ON |
| | | Compressor OFF | OFF |
| REFRIGERANT PRESSURE SENSOR | <ul style="list-style-type: none">• Engine is running• Warm-up condition• Both A/C switch and blower fan motor switch: ON (Compressor operates) | | 1.0 - 4.0 V |

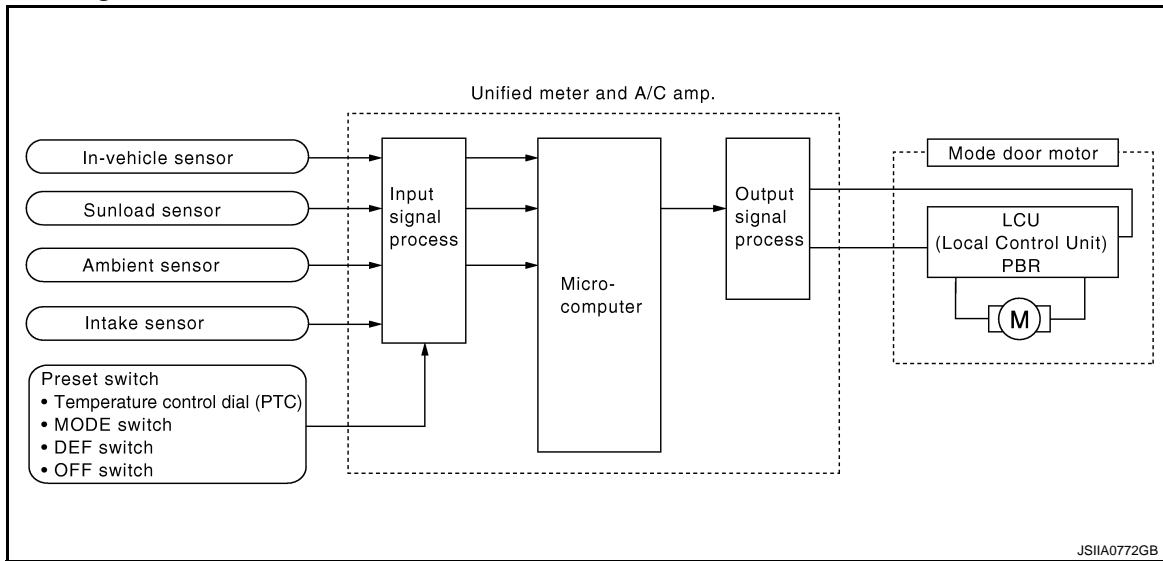
MODE DOOR CONTROL SYSTEM

< FUNCTION DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

MODE DOOR CONTROL SYSTEM

System Diagram



System Description

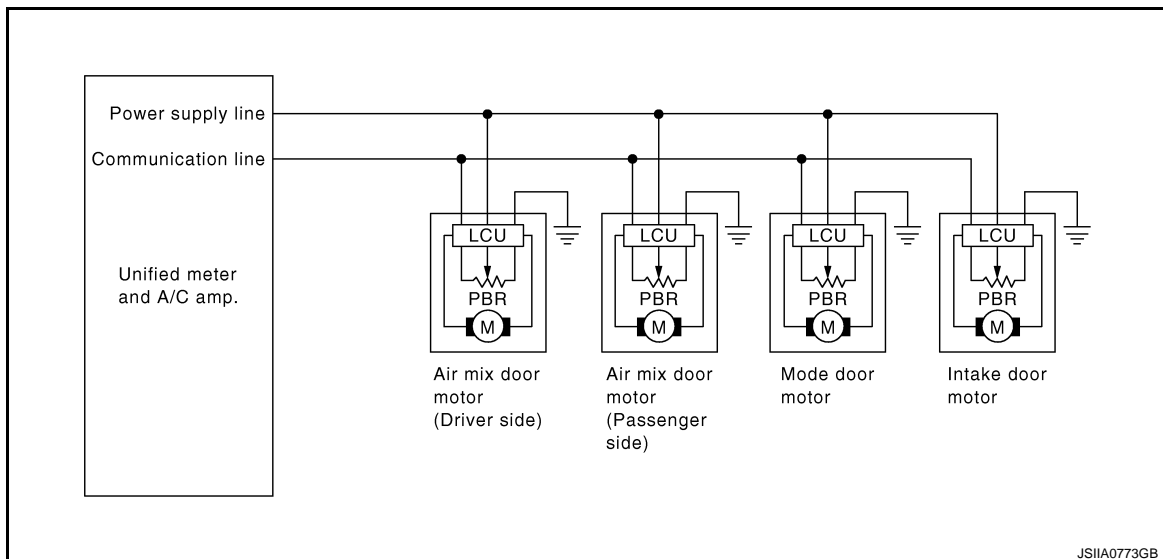
INFOID:000000001733794

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

SYSTEM OPERATION

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

Door Motor Circuit



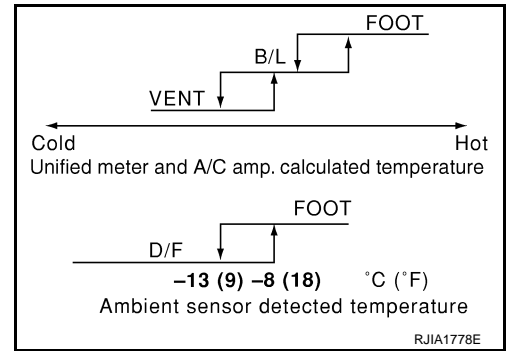
Mode Door Control Specification

MODE DOOR CONTROL SYSTEM

< FUNCTION DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

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



AIR MIX DOOR CONTROL SYSTEM

< FUNCTION DIAGNOSIS >

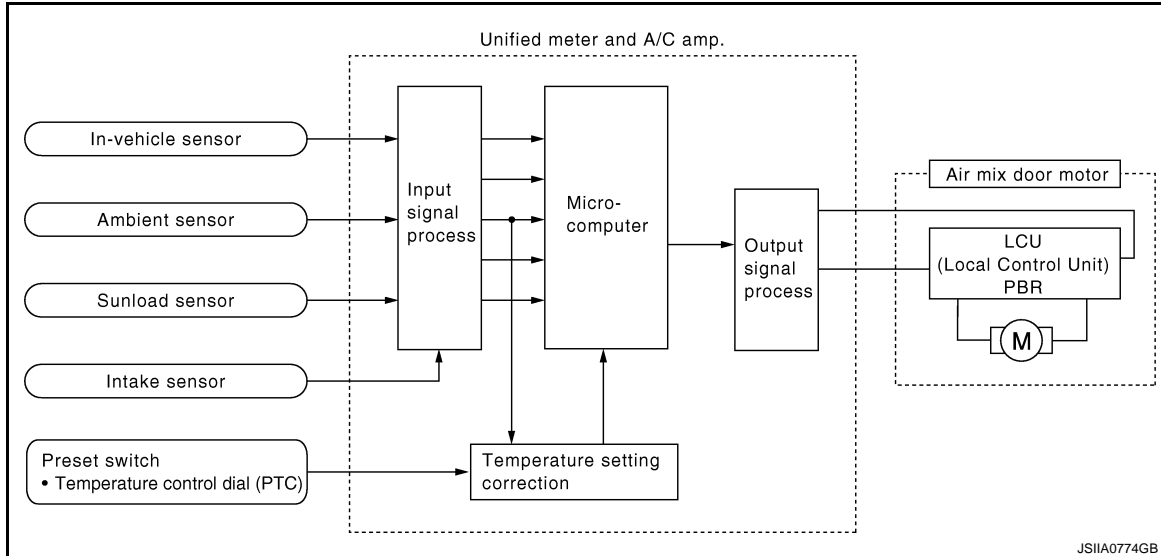
[AUTOMATIC AIR CONDITIONER]

AIR MIX DOOR CONTROL SYSTEM

WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM

WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : System Diagram

INFOID:000000001733795



WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : System Description

INFOID:000000001733796

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

SYSTEM OPERATION

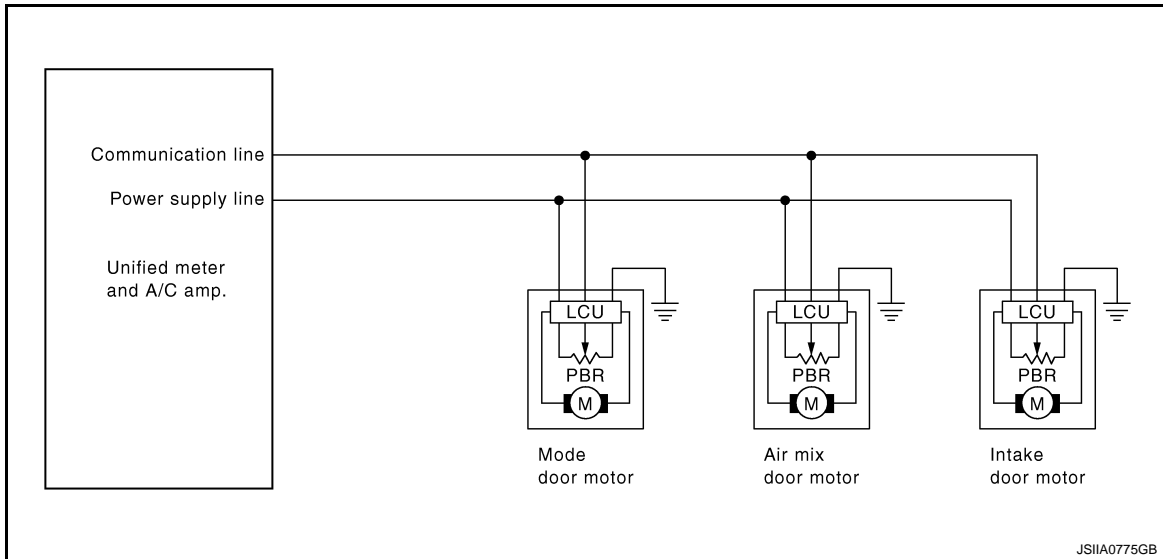
- The unified meter and A/C amp. receives data from each of the sensors. The unified meter and A/C amp. sends air mix doors, mode door and intake door opening angle data to the air mix door motor LCUs, mode door motor LCU and intake door motor LCU.
- The air mix door motors, mode door motor and intake door motor read their respective signals according to the address signal. Opening angle indication signals received from the unified meter and A/C amp. and each of the motor position sensors are compared by the LCUs in each door motor with the existing decision and opening angles. Subsequently, HOT/COLD, DEF/VENT and FRE/REC operation is selected. The new selection data are returned to the unified meter and A/C amp.

AIR MIX DOOR CONTROL SYSTEM

[AUTOMATIC AIR CONDITIONER]

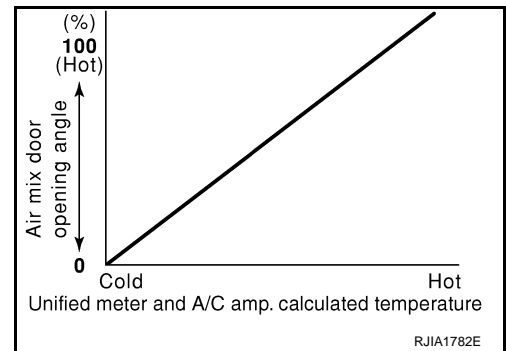
< FUNCTION DIAGNOSIS >

Door Motor Circuit



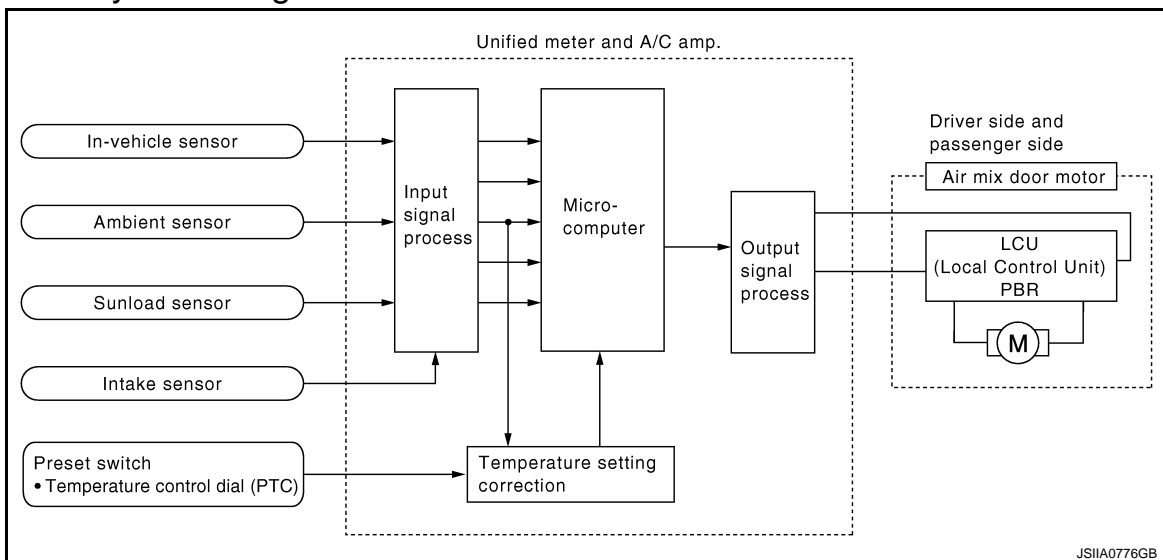
Air Mix Door Control Specification

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



WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM

WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : System Diagram



WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL

AIR MIX DOOR CONTROL SYSTEM

[AUTOMATIC AIR CONDITIONER]

< FUNCTION DIAGNOSIS >

INFOID:000000001733798

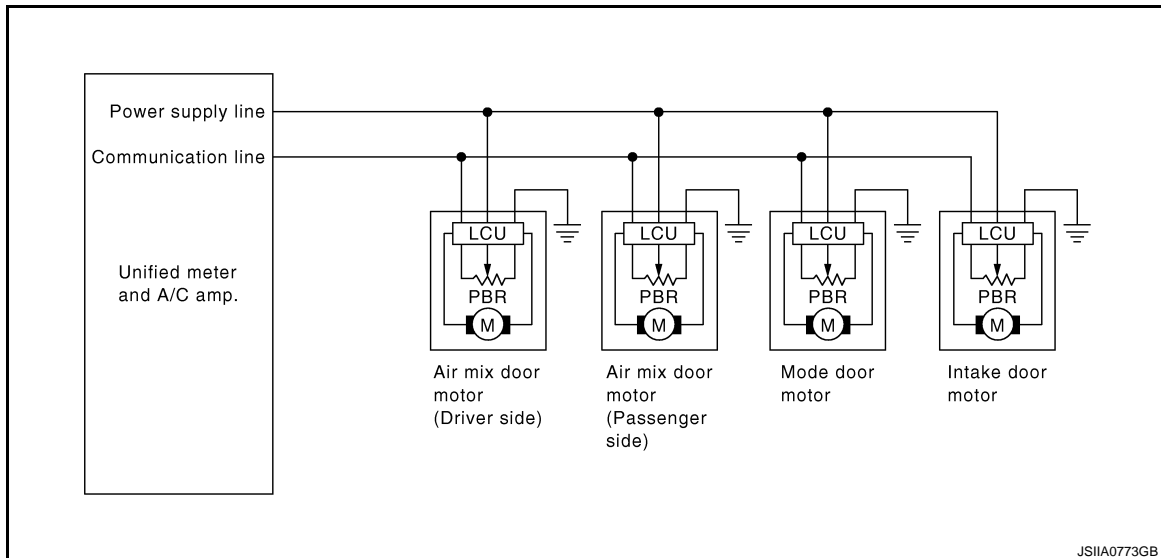
SYSTEM : System Description

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

SYSTEM OPERATION

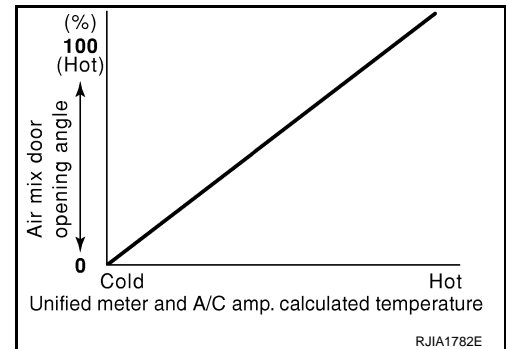
- The unified meter and A/C amp. receives data from each of the sensors. The unified meter and A/C amp. sends air mix doors, mode door and intake door opening angle data to the air mix door motor LCUs, mode door motor LCU and intake door motor LCU.
- The air mix door motors, mode door motor and intake door motor read their respective signals according to the address signal. Opening angle indication signals received from the unified meter and A/C amp. and each of the motor position sensors are compared by the LCUs in each door motor with the existing decision and opening angles. Subsequently, HOT/COLD, DEF/VENT and FRE/REC operation is selected. The new selection data are returned to the unified meter and A/C amp.

Door Motor Circuit



Air Mix Door Control Specification

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



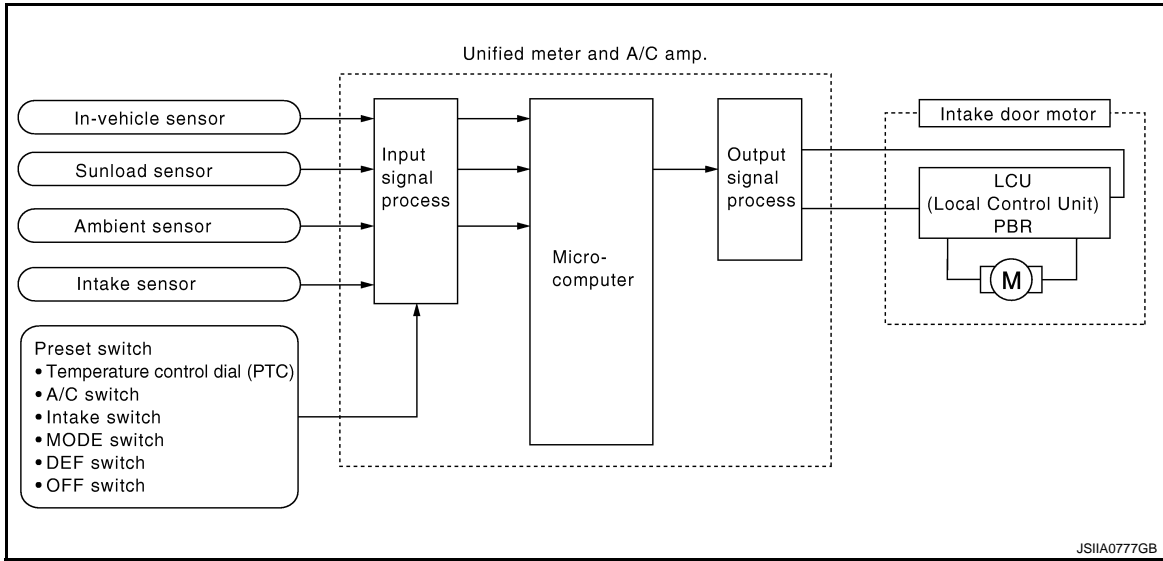
INTAKE DOOR CONTROL SYSTEM

< FUNCTION DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

INTAKE DOOR CONTROL SYSTEM

System Diagram



System Description

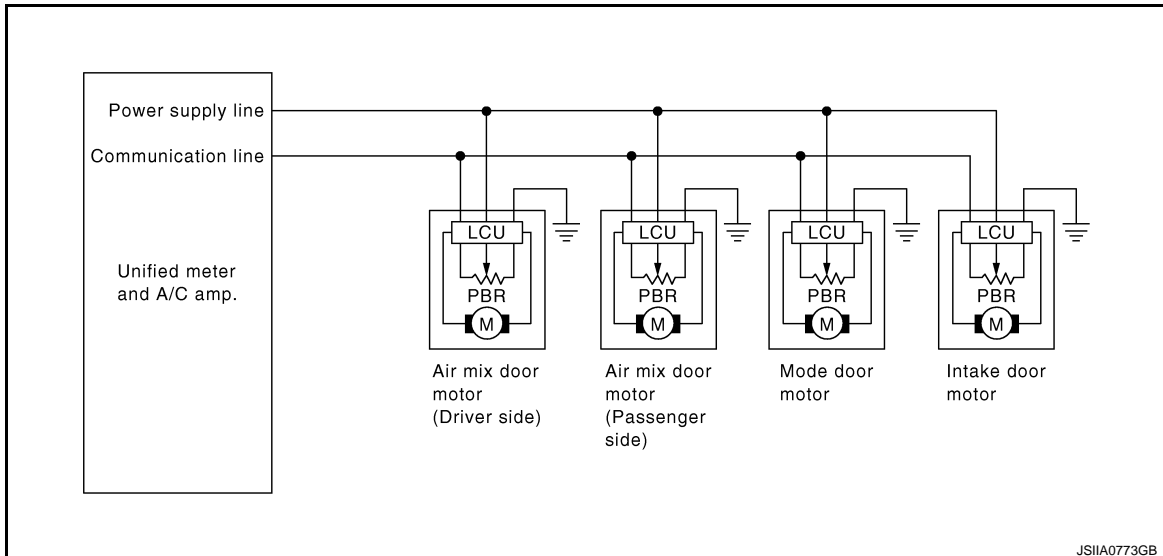
INFOID:000000001733800

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

SYSTEM OPERATION

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

Door Motor Circuit



Intake Door Control Specification

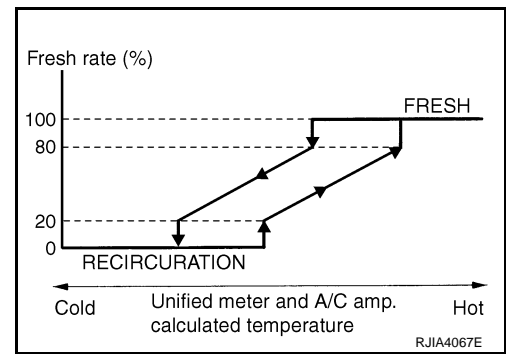
INTAKE DOOR CONTROL SYSTEM

[AUTOMATIC AIR CONDITIONER]

< FUNCTION DIAGNOSIS >

Intake door position is basically fixed at FRE when FRE indicator lamps of DEF switch and intake switch turn ON, and fixed at REC when REC indicator lamp of intake switch turns ON.

Intake door automatic control selects FRE, 20 - 80%FRE, or REC depending on a target air mix door opening angle, based on in-vehicle temperature, ambient temperature, and sunload.



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HAC

BLOWER MOTOR CONTROL SYSTEM

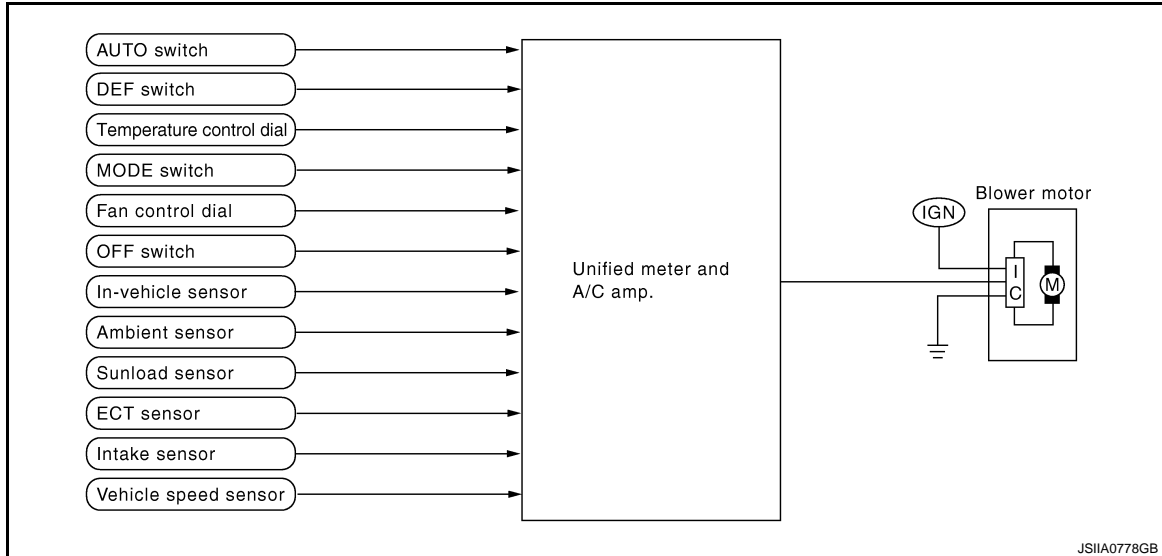
< FUNCTION DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

BLOWER MOTOR CONTROL SYSTEM

WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM

WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : System Diagram



WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : System Description

INFOID:000000001734533

Blower speed is automatically controlled by the temperature setting, ambient temperature, in-vehicle temperature, intake temperature, amount of sunload and air mix door position.

With pressing AUTO switch, the blower motor starts to increase gradually air flow volume.

When engine coolant temperature is low, the blower motor operation is delayed to prevent cool air from flowing.

SYSTEM OPERATION

Automatic Mode

In the automatic mode, the blower motor speed is calculated by the unified meter and A/C amp. based on the input from the PBR, in-vehicle sensor, sunload sensor, intake sensor and ambient sensor.

When the air flow is increased, the duty ratio of the blower fan motor's drive signal is changed at 8%/sec. to prevent a sudden increase in air flow.

In addition to manual air flow control and the usual automatic air flow control, starting air flow control, low water temperature starting control and high passenger compartment temperature starting control are available.

Starting Fan Speed Control

Start up from COLD SOAK Condition (Automatic mode)

In a cold start up condition where the engine coolant temperature is below 56°C (133°F), the blower does not operate for a short period of time (up to 150 seconds). The exact start delay time varies depending on the ambient and engine coolant temperature.

In the most extreme case (very low ambient) the blower start delay is 150 seconds as described above. After this delay, the blower will operate at low speed until the engine coolant temperature rises above 56°C (133°F), and then the blower speed increases to the objective speed.

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

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

Blower Speed Compensation

Sunload

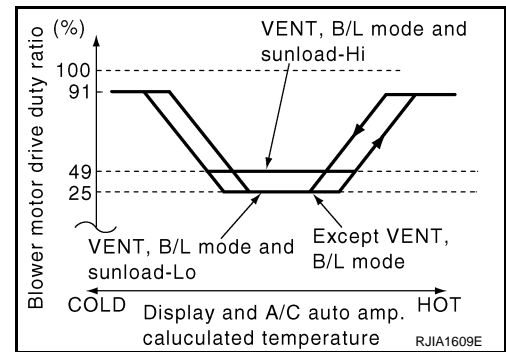
BLOWER MOTOR CONTROL SYSTEM

[AUTOMATIC AIR CONDITIONER]

< FUNCTION DIAGNOSIS >

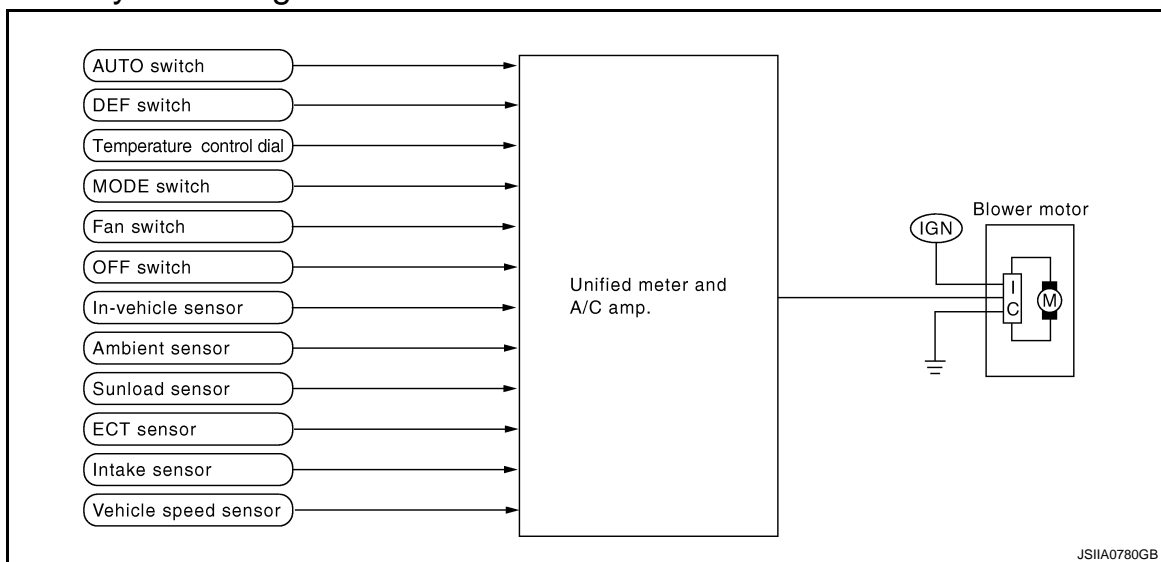
When the in-vehicle temperature and the set temperature are very close, the blower operates at low speed. The low speed varies depending on the sunload. During conditions of low or no sunload, the blower speed is at duty ratio 25%. During high sunload conditions, the unified meter and A/C amp. raise the blower speed (duty ratio 49%).

Fan Speed Control Specification



WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM

WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : System Diagram



WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : System Description

Blower speed is automatically controlled by the temperature setting, ambient temperature, in-vehicle temperature, intake temperature, amount of sunload and air mix door position.

With pressing AUTO switch, the blower motor starts to increase gradually air flow volume.

When engine coolant temperature is low, the blower motor operation is delayed to prevent cool air from flowing.

SYSTEM OPERATION

Automatic Mode

In the automatic mode, the blower motor speed is calculated by the unified meter and A/C amp. based on the input from the PBR, in-vehicle sensor, sunload sensor, intake sensor and ambient sensor.

When the air flow is increased, the duty ratio of the blower fan motor's drive signal is changed at 8%/sec. to prevent a sudden increase in air flow.

BLOWER MOTOR CONTROL SYSTEM

[AUTOMATIC AIR CONDITIONER]

< FUNCTION DIAGNOSIS >

In addition to manual air flow control and the usual automatic air flow control, starting air flow control, low water temperature starting control and high passenger compartment temperature starting control are available.

Starting Fan Speed Control

Start up from COLD SOAK Condition (Automatic mode)

In a cold start up condition where the engine coolant temperature is below 56°C (133°F), the blower does not operate for a short period of time (up to 150 seconds). The exact start delay time varies depending on the ambient and engine coolant temperature.

In the most extreme case (very low ambient) the blower start delay is 150 seconds as described above. After this delay, the blower will operate at low speed until the engine coolant temperature rises above 56°C (133°F), and then the blower speed increases to the objective speed.

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

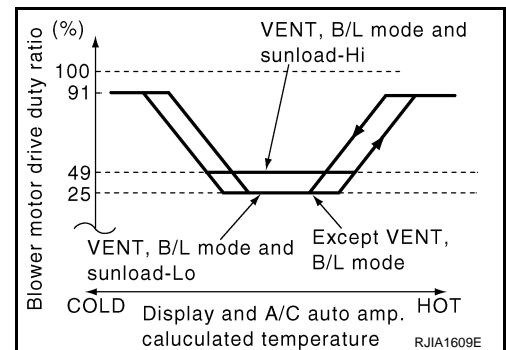
The blower will begin operation momentarily after the AUTO switch is pressed. The blower speed rises gradually to the objective speed over a time period of 3 seconds or less (actual time depends on the objective blower speed).

Blower Speed Compensation

Sunload

When the in-vehicle temperature and the set temperature are very close, the blower operates at low speed. The low speed varies depending on the sunload. During conditions of low or no sunload, the blower speed is at duty ratio 25%. During high sunload conditions, the unified meter and A/C amp. raise the blower speed (duty ratio 49%).

Fan Speed Control Specification



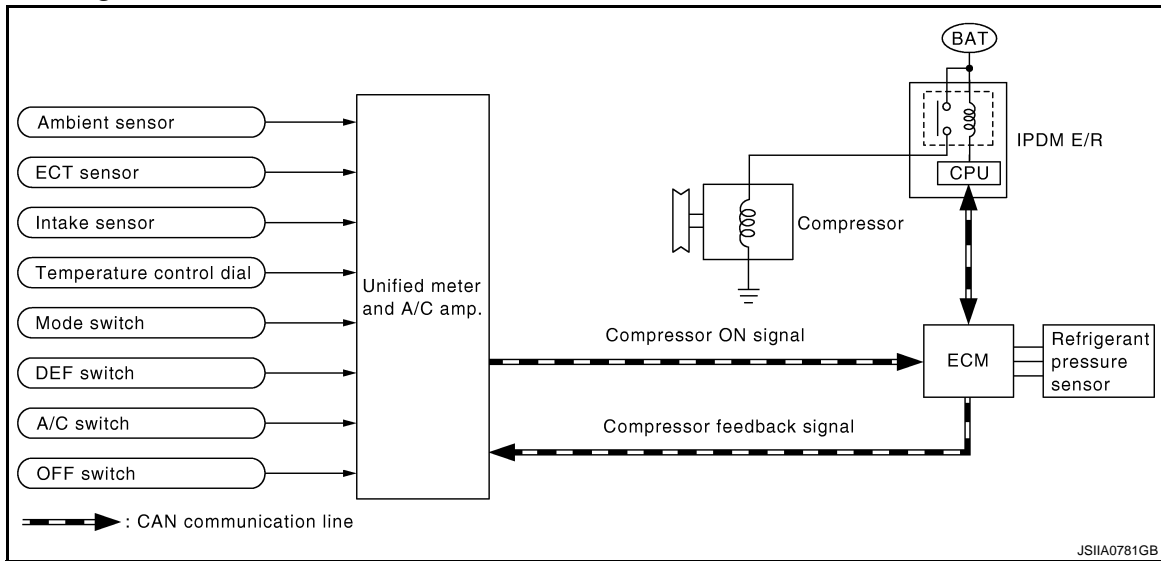
MAGNET CLUTCH CONTROL SYSTEM

< FUNCTION DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

MAGNET CLUTCH CONTROL SYSTEM

System Diagram



System Description

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

SYSTEM OPERATION

When A/C switch, AUTO switch, DEF switch or D/F switch is pressed, unified meter and A/C amp. transmits compressor ON signal to ECM, via CAN communication.

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

Upon receipt of compressor ON signal from ECM, IPDM E/R turns air conditioner relay ON to operate compressor.

When sending compressor ON signal to IPDM E/R via CAN communication line, ECM simultaneously sends compressor feedback signal to ECM via CAN communication line.

ECM sends compressor feedback signal to unified meter and A/C amp., then, uses input compressor feedback signal to control air inlet.

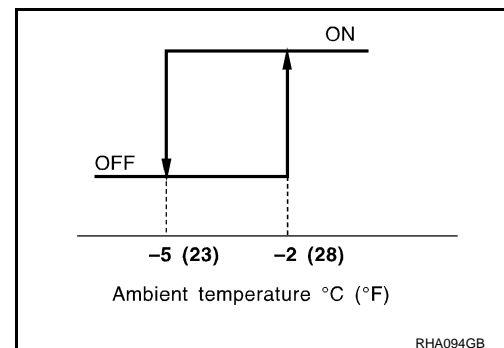
Compressor Protection Control

When the high-pressure side detected by the refrigerant pressure sensor is either approximately 3,119 kPa (31.8 kg/cm², 452 psi) or more, or approximately 118 kPa (1.2 kg/cm², 17 psi) or less, ECM turns the A/C relay OFF and stops the compressor.

Low Temperature Protection Control

Unified meter and A/C amp. turns compressor ON or OFF as judged by a signal detected by ambient sensor and intake sensor.

When ambient temperature is higher than -2°C (28°F), the compressor turns ON. The compressor turns OFF when ambient temperature is lower than -5°C (23°F).

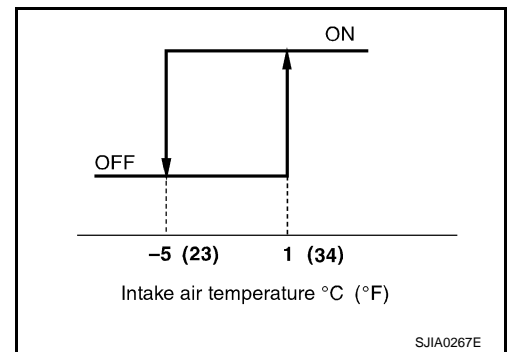


MAGNET CLUTCH CONTROL SYSTEM

[AUTOMATIC AIR CONDITIONER]

< FUNCTION DIAGNOSIS >

When intake air temperature is higher than 1°C (34°F), the compressor turns ON. The compressor turns OFF when intake air temperature is lower than -5°C (23°F).



COMPONENT DIAGNOSIS

MODE DOOR MOTOR

Description

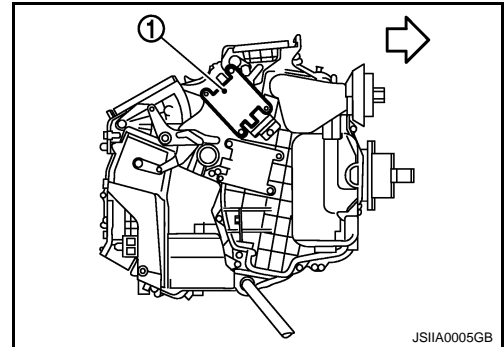
INFOID:000000001675693

COMPONENT DESCRIPTION

Mode Door Motor

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

← Vehicle front



JSIIA0005GB

Component Function Check

INFOID:000000001675694

1. CONFIRM SYMPTOM BY PERFORMING THE FOLLOWING OPERATIONAL CHECK

1. Press MODE switch(es) and DEF switch.
2. Each position indicator should change shape.
3. Confirm that discharge air comes out according to the air distribution table at below. Refer to [HAC-23. "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : System Description"](#) (Without left and right ventilation temperature separately control system) or [HAC-32. "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : System Description"](#) (With left and right ventilation temperature separately control system).

NOTE:

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

Is the inspection result normal?

YES >> END.

NO >> Go to diagnosis procedure. Refer to [HAC-67. "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:000000001675695

1. PERFORM SELF-DIAGNOSIS STEP-2

Perform self-diagnosis STEP-2. Refer to [HAC-42. "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (Without left and right ventilation temperature separately control system) or [HAC-48. "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (With left and right ventilation temperature separately control system), see Nos. 1 to 2.

Does code No. 20 appear on the display?

YES >> GO TO 2.

NO >> Go to appropriate malfunctioning sensor circuit. Refer to [HAC-42. "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (Without left and right ventilation temperature separately control system) or [HAC-48. "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (With left and right ventilation temperature separately control system), see No. 11.

2. PERFORM SELF-DIAGNOSIS STEP-3

Perform self-diagnosis STEP-3. Refer to [HAC-42. "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (Without left and right ventilation temperature separately control system) or [HAC-48. "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (With left and right ventilation temperature separately control system), see No. 11.

MODE DOOR MOTOR

< COMPONENT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

[SEPARATELY CONTROL SYSTEM : Diagnosis Description](#)" (With left and right ventilation temperature separately control system), see Nos. 1 to 3.

Does code No. 30 appear on the display?

YES >> GO TO 6.

NO-1 >> Code No. 31 or 32 appear on the display: GO TO 3.

NO-2 >> Code No. 37, 38 or 39 appear on the display: Go to Intake Door Motor Circuit. Refer to [HAC-75, "Diagnosis Procedure"](#).

3. CHECK POWER SUPPLY FOR MODE DOOR MOTOR

Check voltage between mode door motor harness connector and ground.

| (+) | | (-) | Voltage |
|-----------------|----------|--------|-----------------|
| Mode door motor | | — | |
| Connector | Terminal | | |
| M253 | 1 | Ground | Battery voltage |

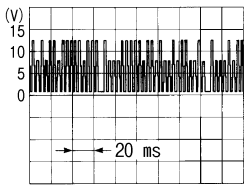
Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair harness or connector.

4. CHECK SIGNAL FOR MODE DOOR MOTOR

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

| (+) | | (-) | Voltage |
|-----------------|----------|--------|--|
| Mode door motor | | — | |
| Connector | Terminal | | |
| M253 | 3 | Ground |  |

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair harness or connector.

5. CHECK MODE DOOR MOTOR GROUND CIRCUIT

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

| Mode door motor | | — | Continuity |
|-----------------|----------|--------|------------|
| Connector | Terminal | | |
| M253 | 2 | Ground | Existed |

Is the inspection result normal?

YES >> Replace mode door motor.

NO >> Repair harness or connector.

6. PERFORM SELF-DIAGNOSIS STEP-4

Perform self-diagnosis STEP-4. Refer to [HAC-42, "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (Without left and right ventilation temperature separately control system) [HAC-48, "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (With left and right ventilation temperature separately control system), see Nos. 1 to 5.

MODE DOOR MOTOR

< COMPONENT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

Is it operated normally?

YES >> END.

NO >> GO TO 7.

7. CHECK MODE DOOR CONTROL LINKAGE

Check mode door control linkage.

Is it installed normally?

YES >> Refer to [VTL-38. "Exploded View"](#).

NO >> Repair or adjust control linkage.

A

B

C

D

E

F

G

H

HAC

J

K

L

M

N

O

P

AIR MIX DOOR MOTOR

< COMPONENT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

AIR MIX DOOR MOTOR

WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM

WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Description

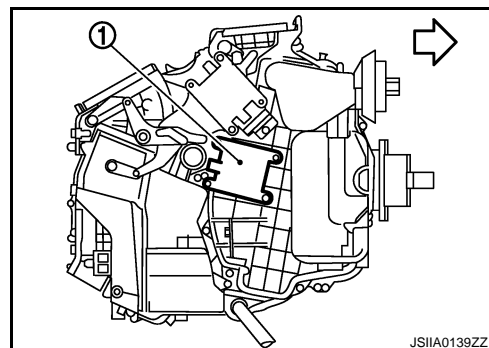
INFOID:000000001675696

COMPONENT DESCRIPTION

Air Mix Door Motor

The air mix door motor (1) is attached to the heater & cooling unit assembly. It rotates so that the air mix door is opened or closed to a position set by the unified meter and A/C amp. Motor rotation is then conveyed through a shaft and the air mix door position feedback is then sent to the unified meter and A/C amp. by PBR built-in air mix door motor.

←: Vehicle front



WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Component Function Check

INFOID:000000001675697

1.CONFIRM SYMPTOM BY PERFORMING THE FOLLOWING OPERATIONAL CHECK

1. Turn temperature control dial clockwise until 32°C (90°F) is displayed.
2. Check for hot air at discharge air outlets.
3. Turn temperature control dial counterclockwise until 18°C (60°F) is displayed.
4. Check for cold air at discharge air outlets.

Is the inspection result normal?

YES >> END.

NO >> Go to diagnosis procedure. Refer to [HAC-70, "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Procedure"](#).

WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Procedure

INFOID:000000001675698

1.PERFORM SELF-DIAGNOSIS STEP-2

Perform self-diagnosis STEP-2. Refer to [HAC-42, "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#), see Nos. 1 to 2.

Does code No. 20 appear on the display.

YES >> GO TO 2.

NO >> Go to appropriate malfunctioning sensor circuit. Refer to [HAC-42, "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#), see No. 11.

2.PERFORM SELF-DIAGNOSIS STEP-4

Perform self-diagnosis STEP-4. Refer to [HAC-42, "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#), see Nos. 1 to 5.

Is it operated normally?

YES >> END.

NO >> GO TO 3.

3.CHECK INSTALLATION OF AIR MIX DOOR MOTOR

Check installation of air mix door motor. Refer to [VTL-40, "Exploded View"](#).

AIR MIX DOOR MOTOR

< COMPONENT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

Is it installed normally?

- YES >> GO TO 4.
- NO >> Repair or replace air mix door motor.

4.CHECK POWER SUPPLY FOR AIR MIX DOOR MOTOR

Check voltage between air mix door motor harness connector and ground.

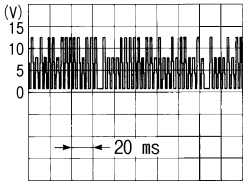
| (+) | | (-) | Voltage |
|--------------------|----------|--------|-----------------|
| Air mix door motor | | — | |
| Connector | Terminal | | |
| M255 | 1 | Ground | Battery voltage |

Is the inspection result normal?

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

5.CHECK SIGNAL FOR AIR MIX DOOR MOTOR

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

| (+) | | (-) | Voltage |
|--------------------|----------|--------|---|
| Air mix door motor | | — | |
| Connector | Terminal | | |
| M255 | 3 | Ground |  <p style="text-align: right; font-size: small;">SJIA1453J</p> |

Is the inspection result normal?

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

6.CHECK AIR MIX DOOR MOTOR GROUND CIRCUIT

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

| Air mix door motor | | (-) | Continuity |
|--------------------|----------|--------|------------|
| Connector | Terminal | — | |
| M255 | 2 | Ground | Existed |

Is the inspection result normal?

- YES >> Replace air mix door motor.
- NO >> Repair harness or connector.

WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM

WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Description

INFOID:000000001675699

COMPONENT DESCRIPTION

Air Mix Door Motor

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

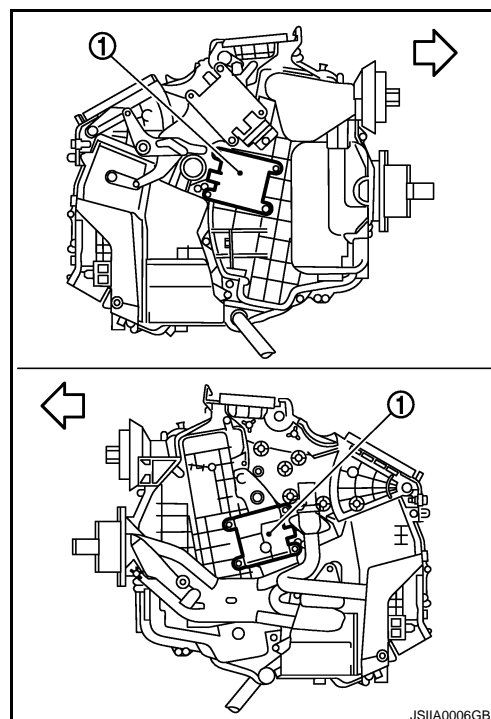
AIR MIX DOOR MOTOR

< COMPONENT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

The air mix door motors (1) are attached to the heater & cooling unit assembly. It rotates so that the air mix door is opened or closed to a position set by the unified meter and A/C amp. Motor rotation is then conveyed through a shaft and the air mix door position feedback is then sent to the unified meter and A/C amp. by PBR built-in air mix door motor.

← Vehicle front



WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Component Function Check

INFOID:000000001675700

1.CONFIRM SYMPTOM BY PERFORMING THE FOLLOWING OPERATIONAL CHECK

1. Turn temperature control dial (driver side) clockwise until 32°C (90°F) is displayed.
2. Check for hot air at discharge air outlets.
3. Turn temperature control dial (driver side) counterclockwise until 18°C (60°F) is displayed.
4. Check for cold air at discharge air outlets.

Is the inspection result normal?

YES >> END.

NO >> Go to diagnosis procedure. Refer to [HAC-72. "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Procedure"](#).

WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Procedure

INFOID:000000001675701

1.PERFORM SELF-DIAGNOSIS STEP-2

Perform self-diagnosis STEP-2. Refer to [HAC-48. "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#), see Nos. 1 to 2.

Does code No. 20 appear on the display?

YES >> GO TO 2.

NO >> Go to appropriate malfunctioning sensor circuit. Refer to [HAC-48. "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#), see No. 11.

2.PERFORM SELF-DIAGNOSIS STEP-4

Perform self-diagnosis STEP-4. Refer to [HAC-48. "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#), see Nos. 1 to 5.

Is it operated normally?

YES >> END.

NO-1 >> Malfunction is detected on driver seat side. GO TO 3.

NO-2 >> Malfunction is detected on passenger seat side. GO TO 7.

3.CHECK INSTALLATION OF AIR MIX DOOR MOTOR (DRIVER SIDE)

AIR MIX DOOR MOTOR

[AUTOMATIC AIR CONDITIONER]

< COMPONENT DIAGNOSIS >

Check installation of air mix door motor (driver side). Refer to [VTL-40. "Exploded View"](#).

Is it installed normally?

YES >> GO TO 4.

NO >> Repair or replace air mix door motor (driver side).

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

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

| (+) | | (-) | Voltage |
|----------------------------------|----------|--------|-----------------|
| Air mix door motor (driver side) | | — | |
| Connector | Terminal | | |
| M252 | 1 | Ground | Battery voltage |

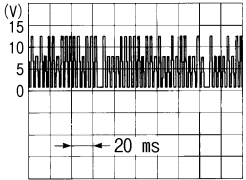
Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair harness or connector.

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

Confirm A/C LAN signal between air mix door motor (driver side) harness connector and ground using an oscilloscope.

| (+) | | (-) | Voltage |
|----------------------------------|----------|--------|--|
| Air mix door motor (driver side) | | — | |
| Connector | Terminal | | |
| M252 | 3 | Ground |  <p style="text-align: right; font-size: small;">SJIA1453J</p> |

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair harness or connector.

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

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

| Air mix door motor (driver side) | | — | Continuity |
|----------------------------------|----------|--------|------------|
| Connector | Terminal | | |
| M252 | 2 | Ground | Existed |

Is the inspection result normal?

YES >> Replace air mix door motor (driver side).

NO >> Repair harness or connector.

7. CHECK INSTALLATION OF AIR MIX DOOR MOTOR (PASSENGER SIDE)

Check installation of air mix door motor (passenger side). Refer to [VTL-40. "Exploded View"](#).

Is it installed normally?

YES >> GO TO 8.

NO >> Repair or replace air mix door motor (passenger side).

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

AIR MIX DOOR MOTOR

< COMPONENT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

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

| (+) | | (-) | Voltage |
|-------------------------------------|----------|--------|-----------------|
| Air mix door motor (passenger side) | | — | |
| Connector | Terminal | | |
| M255 | 1 | Ground | Battery voltage |

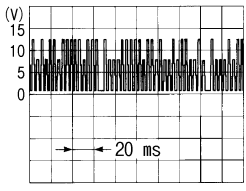
Is the inspection result normal?

YES >> GO TO 9.

NO >> Repair harness or connector.

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

Confirm A/C LAN signal between air mix door motor (passenger side) harness connector and ground using an oscilloscope.

| (+) | | (-) | Voltage |
|-------------------------------------|----------|--------|--|
| Air mix door motor (passenger side) | | — | |
| Connector | Terminal | | |
| M255 | 3 | Ground |  |

SJIA1453J

Is the inspection result normal?

YES >> GO TO 10.

NO >> Repair harness or connector.

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

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

| Air mix door motor (passenger side) | | — | Continuity |
|-------------------------------------|----------|--------|------------|
| Connector | Terminal | | |
| M255 | 2 | Ground | Existed |

Is the inspection result normal?

YES >> Replace air mix door motor (passenger side).

NO >> Repair harness or connector.

INTAKE DOOR MOTOR

< COMPONENT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

INTAKE DOOR MOTOR

Description

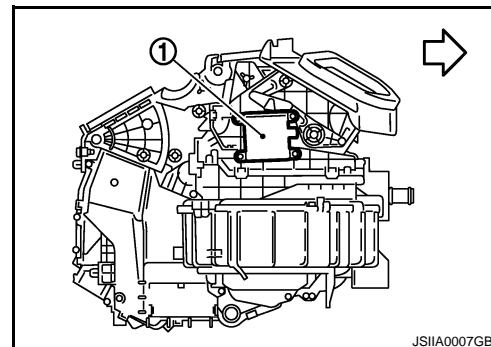
INFOID:000000001675702

COMPONENT DESCRIPTION

Intake Door Motor

The intake door motor (1) is attached to the blower unit. It rotates so that air is drawn from inlets set by the unified meter and A/C amp. Motor rotation is conveyed to a lever which activates the intake door.

←: Vehicle front



Component Function Check

INFOID:000000001675703

1. CONFIRM SYMPTOM BY PERFORMING THE FOLLOWING OPERATIONAL CHECK

1. Press intake switch.
2. REC indicator should illuminate.
3. Listen for intake door position change (Slight change of blower sound can be heard.).
4. Press intake switch again.
5. FRE indicator should illuminate.

Is the inspection result normal?

YES >> END.

NO >> Go to diagnosis procedure. Refer to [HAC-75, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:000000001675704

1. PERFORM SELF-DIAGNOSIS STEP-2

Perform self-diagnosis STEP-2. Refer to [HAC-42, "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (Without left and right ventilation temperature separately control system) or [HAC-48, "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (With left and right ventilation temperature separately control system), see Nos. 1 to 2.

Does code No. 20 appear on the display?

YES >> GO TO 2.

NO >> Go to appropriate malfunctioning sensor circuit. Refer to [HAC-42, "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (Without left and right ventilation temperature separately control system) or [HAC-48, "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (With left and right ventilation temperature separately control system), see No. 11.

2. PERFORM SELF-DIAGNOSIS STEP-4

Perform self-diagnosis STEP-4. Refer to [HAC-42, "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (Without left and right ventilation temperature separately control system) or [HAC-48, "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (With left and right ventilation temperature separately control system), see Nos. 1 to 5.

Is it operated normally?

YES >> END.

NO >> GO TO 3.

3. CHECK INTAKE DOOR CONTROL LINKAGE

INTAKE DOOR MOTOR

[AUTOMATIC AIR CONDITIONER]

< COMPONENT DIAGNOSIS >

Check intake door control linkage.

Is it installed normally?

YES >> GO TO 4.

NO >> Repair or adjust control linkage.

4.CHECK POWER SUPPLY FOR INTAKE DOOR MOTOR

Check voltage between intake door motor harness connector and ground.

| (+) | | (-) | Voltage |
|-------------------|----------|--------|-----------------|
| Intake door motor | | — | |
| Connector | Terminal | | |
| M254 | 1 | Ground | Battery voltage |

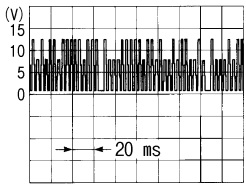
Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair harness or connector.

5.CHECK SIGNAL FOR INTAKE DOOR MOTOR

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

| (+) | | (-) | Voltage |
|-------------------|----------|--------|---|
| Intake door motor | | — | |
| Connector | Terminal | | |
| M254 | 3 | Ground |  |

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair harness or connector.

6.CHECK INTAKE DOOR MOTOR GROUND CIRCUIT

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

| Intake door motor | | — | Continuity |
|-------------------|----------|--------|------------|
| Connector | Terminal | | |
| M254 | 2 | Ground | Existed |

Is the inspection result normal?

YES >> Replace intake door motor.

NO >> Repair harness or connector.

BLOWER MOTOR

[AUTOMATIC AIR CONDITIONER]

< COMPONENT DIAGNOSIS >

BLOWER MOTOR

WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM

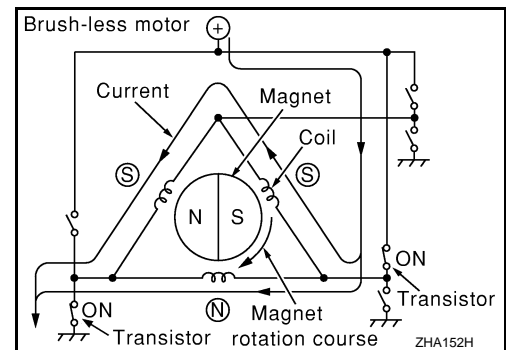
WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Description

INFOID:000000001675705

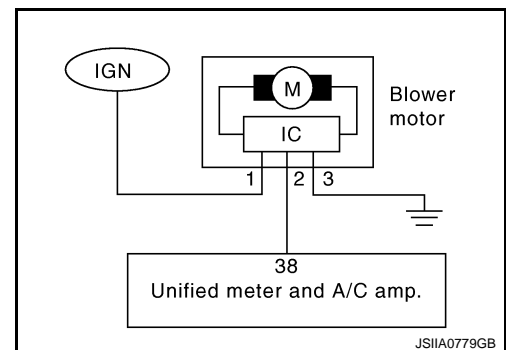
COMPONENT DESCRIPTION

Brush-less Motor

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



Blower motor circuit



WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Component Function Check

INFOID:000000001675706

1. CONFIRM SYMPTOM BY PERFORMING THE FOLLOWING OPERATIONAL CHECK

1. Start engine and warm it up to normal operating temperature.
2. Turn fan control dial clockwise. Blower should operate on low speed.
3. Turn fan control dial clockwise, and continue checking blower speed and fan symbol until all speeds checked.

Is the inspection result normal?

YES >> END.

NO >> Go to diagnosis procedure. Refer to [HAC-77. "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Procedure"](#)

WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Procedure

INFOID:000000001675707

1. PERFORM SELF-DIAGNOSIS STEP-4

Perform self-diagnosis STEP-4. Refer to [HAC-42. "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#), see Nos. 1 to 5.

BLOWER MOTOR

< COMPONENT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

| Code No. | 41 | 42 | 43 | 44 | 45 | 46 |
|-------------------------|-----|-----|----|-----|----|-----|
| Blower motor duty ratio | 37% | 91% | | 65% | | 91% |

Does blower motor speed change according to each code No.?

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

2. CHECK POWER SUPPLY FOR BLOWER MOTOR

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

| (+) | | (-) | Voltage |
|--------------|----------|--------|-----------------|
| Blower motor | | — | |
| Connector | Terminal | | |
| M109 | 1 | Ground | Battery voltage |

Is the inspection result normal?

- OK >> GO TO 3.
NG >> GO TO 6.

3. CHECK BLOWER MOTOR GROUND CIRCUIT

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

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

Is the inspection result normal?

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

4. CHECK CIRCUIT CONTINUITY BETWEEN BLOWER MOTOR AND UNIFIED METER AND A/C AMP.

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

| blower motor | | Unified meter and A/C amp. | | Continuity |
|--------------|----------|----------------------------|----------|------------|
| Connector | Terminal | Connector | Terminal | |
| M109 | 2 | M66 | 38 | Existed |

3. Check continuity between blower motor harness connector and ground.

| blower motor | | — | Continuity |
|--------------|----------|--------|-------------|
| Connector | Terminal | | |
| M109 | 2 | ground | Not existed |

Is the inspection result normal?

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

5. CHECK UNIFIED METER AND A/C AMP. OUTPUT SIGNAL

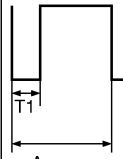
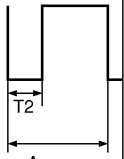
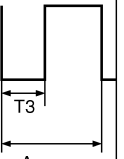
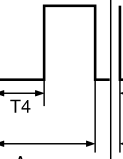
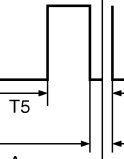
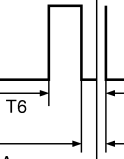
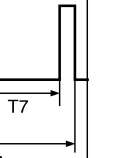
1. Reconnect blower motor connector and unified meter and A/C amp. connector.
2. Turn ignition switch ON.
3. Set MODE switch to VENT position.

BLOWER MOTOR

[AUTOMATIC AIR CONDITIONER]

< COMPONENT DIAGNOSIS >

4. Change fan speed from Lo to Hi, and check duty ratios between blower motor harness connector M109 terminal 2 and ground by using an oscilloscope. Normal terminal 2 drive signal duty ratios are shown in the table below.

| Blower fan speed (Manual) Vent mode | 1st | 2nd | 3rd | 4th | 5th | 6th | 7th |
|---|---|---|---|---|--|---|---|
| Blower motor connector M109 terminal No. 2 (Oscilloscope) |  |  |  |  |  |  |  |
| Duty ratio | Approx. 25% | Approx. 33% | Approx. 41% | Approx. 51% | Approx. 61% | Approx. 71% | Approx. 83% |

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

JSIIA0068GB

Is the inspection result normal?

- YES >> Check blower motor. Refer to [HAC-80, "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Component Inspection"](#).
 NO >> Replace unified meter and A/C amp.

6.CHECK POWER VOLTAGE OF BLOWER FAN MOTOR

Check the voltage between fuse block connector and ground. Refer to [PG-91, "Fuse, Connector and Terminal Arrangement"](#).

| (+) | | (-) | Voltage |
|------------------|----------|--------|-----------------|
| Fuse block (J/B) | | — | |
| Connector | Terminal | | |
| M1 | 3A | Ground | Battery voltage |
| | 8A | | |

Is the inspection result normal?

- YES >> Repair harness or connector [between fuse block (J/B) and blower fan motor].
 NO >> GO TO 7.

7.CHECK POWER VOLTAGE OF BLOWER RELAY

Check the voltage between fuse block (J/B) connector and ground. Refer to [PG-91, "Fuse, Connector and Terminal Arrangement"](#).

| (+) | | (-) | Voltage |
|------------------|----------|--------|-----------------|
| Fuse block (J/B) | | — | |
| Connector | Terminal | | |
| E103 | 6F | Ground | Battery voltage |

Is the inspection result normal?

- YES >> GO TO 8.
 NO >> GO TO 9.

8.CHECK FUSE

Check fuse 15A [Nos 21 and 22, located in the fuse block (J/B)]. Refer to [PG-91, "Fuse, Connector and Terminal Arrangement"](#).

Is the inspection result normal?

BLOWER MOTOR

[AUTOMATIC AIR CONDITIONER]

< COMPONENT DIAGNOSIS >

- YES >> Replace blower relay.
- NO >> Be sure to eliminate cause of malfunction before installing new fuse.

9. CHECK POWER VOLTAGE OF BLOWER RELAY (BCM)

Check the voltage between fuse block (J/B) connector and ground.

| (+) | | (-) | Voltage |
|-----------|----------|--------|-----------------|
| BCM | | — | |
| Connector | Terminal | Ground | Battery voltage |
| M122 | 102 | | |

Is the inspection result normal?

- YES >> Repair harness or connector (between BCM and fuse block).
- NO >> Check ignition power supply. Refer to [PCS-73, "Diagnosis Procedure"](#).

WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Component Inspection

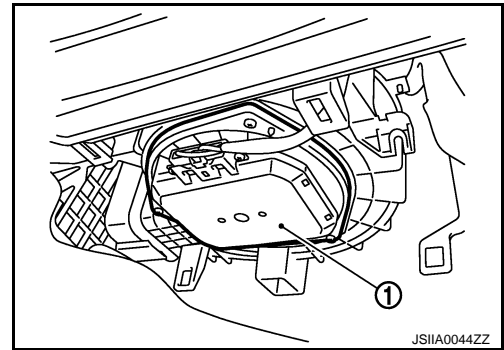
INFOID:000000001675708

1. CHECK BLOWER MOTOR

1. Remove blower motor (1).
2. Confirm smooth rotation of the blower motor.

Is the inspection result normal?

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



WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM

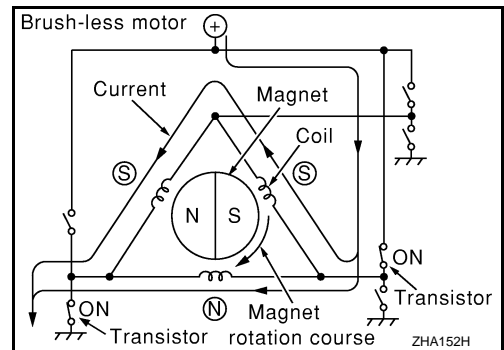
WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Description

INFOID:000000001713993

COMPONENT DESCRIPTION

Brush-less Motor

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

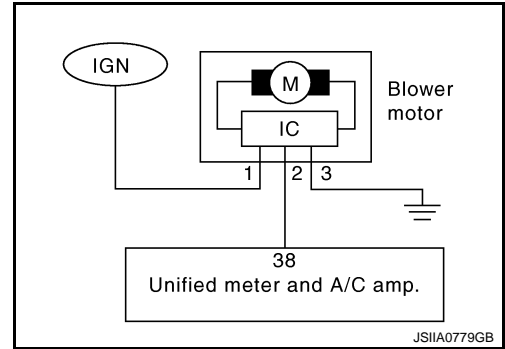


BLOWER MOTOR

< COMPONENT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

Blower motor circuit



WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Component Function Check

INFOID:000000001675710

1. CONFIRM SYMPTOM BY PERFORMING THE FOLLOWING OPERATIONAL CHECK

1. Start engine and warm it up to normal operating temperature.
2. Press fan (UP: +) switch. Blower should operate on low speed.
3. Press fan (UP: +) switch, and continue checking blower speed and fan symbol until all speeds checked.

Is the inspection result normal?

YES >> END.

NO >> Go to diagnosis procedure. Refer to [HAC-81, "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Procedure"](#).

WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Procedure

INFOID:000000001675711

1. PERFORM SELF-DIAGNOSIS STEP-4

Perform self-diagnosis STEP-4. Refer to [HAC-48, "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#), see Nos. 1 to 5.

| Code No. | 41 | 42 | 43 | 44 | 45 | 46 |
|-------------------------|-----|-----|----|-----|----|-----|
| Blower motor duty ratio | 37% | 91% | | 65% | | 91% |

Does blower motor speed change according to each code No.?

YES >> END.

NO >> GO TO 2.

2. CHECK POWER SUPPLY FOR BLOWER MOTOR

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

| (+) | | (-) | Voltage |
|-----------|----------|--------|-----------------|
| Connector | Terminal | | |
| M109 | 1 | Ground | Battery voltage |

Is the inspection result normal?

YES >> GO TO 3.

NO >> GO TO 6.

3. CHECK BLOWER MOTOR GROUND CIRCUIT

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

BLOWER MOTOR

< COMPONENT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

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

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair harness or connector.

4. CHECK CIRCUIT CONTINUITY BETWEEN BLOWER MOTOR AND UNIFIED METER AND A/C AMP.

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

| | | | | |
|--------------|----------|----------------------------|----------|------------|
| blower motor | | Unified meter and A/C amp. | | Continuity |
| Connector | Terminal | Connector | Terminal | |
| M109 | 2 | M66 | 38 | Existed |

3. Check continuity between blower motor harness connector and ground.

| | | | |
|--------------|----------|--------|-------------|
| blower motor | | — | Continuity |
| Connector | Terminal | | |
| M109 | 2 | ground | Not existed |

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair harness or connector.

5. CHECK UNIFIED METER AND A/C AMP. OUTPUT SIGNAL

1. Reconnect blower motor connector and unified meter and A/C amp. connector.
2. Turn ignition switch ON.
3. Set MODE switch to VENT position.
4. Change fan speed from Lo to Hi, and check duty ratios between blower motor harness connector M109 terminal 2 and ground by using an oscilloscope. Normal terminal 2 drive signal duty ratios are shown in the table below.

| Blower fan speed (Manual) Vent mode | 1st | 2nd | 3rd | 4th | 5th | 6th | 7th |
|---|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Blower motor connector M109 terminal No. 2 (Oscilloscope) | | | | | | | |
| Duty ratio | Approx. 25% | Approx. 33% | Approx. 41% | Approx. 51% | Approx. 61% | Approx. 71% | Approx. 83% |

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

JSIIA0068GB

Is the inspection result normal?

YES >> Check blower motor. Refer to [HAC-83. "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Component Inspection"](#).

NO >> Replace unified meter and A/C amp.

BLOWER MOTOR

< COMPONENT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

6. CHECK POWER VOLTAGE OF BLOWER FAN MOTOR

Check the voltage between fuse block connector and ground. Refer to [PG-91, "Fuse, Connector and Terminal Arrangement"](#).

| (+) | | (-) | Voltage |
|------------------|----------|--------|-----------------|
| Fuse block (J/B) | | — | |
| Connector | Terminal | | |
| M1 | 3A | Ground | Battery voltage |
| | 8A | | |

Is the inspection result normal?

- YES >> Repair harness or connector [between fuse block (J/B) and blower fan motor].
- NO >> GO TO 7.

7. CHECK POWER VOLTAGE OF BLOWER RELAY

Check the voltage between fuse block (J/B) connector and ground. Refer to [PG-91, "Fuse, Connector and Terminal Arrangement"](#).

| (+) | | (-) | Voltage |
|------------------|----------|--------|-----------------|
| Fuse block (J/B) | | — | |
| Connector | Terminal | | |
| E103 | 6F | Ground | Battery voltage |

Is the inspection result normal?

- YES >> GO TO 8.
- NO >> GO TO 9.

8. CHECK FUSE

Check fuse 15A [Nos 21 and 22, located in the fuse block (J/B)]. Refer to [PG-91, "Fuse, Connector and Terminal Arrangement"](#).

Is the inspection result normal?

- YES >> Replace blower relay.
- NO >> Be sure to eliminate cause of malfunction before installing new fuse.

9. CHECK POWER VOLTAGE OF BLOWER RELAY (BCM)

Check the voltage between fuse block (J/B) connector and ground.

| (+) | | (-) | Voltage |
|-----------|----------|--------|-----------------|
| BCM | | — | |
| Connector | Terminal | | |
| M122 | 102 | Ground | Battery voltage |

Is the inspection result normal?

- YES >> Repair harness or connector (between BCM and fuse block).
- NO >> Check ignition power supply. Refer to [PCS-73, "Diagnosis Procedure"](#).

WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Component Inspection

INFOID:000000001713995

1. CHECK BLOWER MOTOR

BLOWER MOTOR

[AUTOMATIC AIR CONDITIONER]

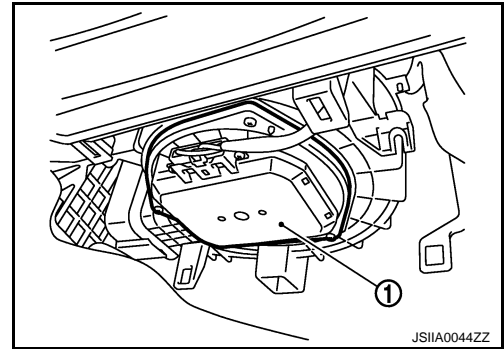
< COMPONENT DIAGNOSIS >

1. Remove blower motor (1).
2. Confirm smooth rotation of the blower motor.

Is the inspection result normal?

YES >> END.

NO >> Replace blower motor.



MAGNET CLUTCH

< COMPONENT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

MAGNET CLUTCH

Description

INFOID:000000001675713

Magnet clutch drives a compressor, by a signal of IPDM E/R.

Component Function Check

INFOID:000000001675714

1. CONFIRM SYMPTOM BY PERFORMING THE FOLLOWING OPERATIONAL CHECK

1. Press AUTO switch and A/C switch.
2. Display should indicate AUTO. Confirm that the magnet clutch engages (sound or visual inspection). (Discharge air and blower speed depend on ambient, in-vehicle and set temperatures.)

Does the magnet clutch operate?

YES >> END.

NO >> Go to Diagnosis Procedure. Refer to [HAC-85, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:000000001675715

1. PERFORM SELF-DIAGNOSIS STEP-2

Perform self-diagnosis STEP-2. Refer to [HAC-42, "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (Without left and right ventilation temperature separately control system) or [HAC-48, "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (With left and right ventilation temperature separately control system), see Nos. 1 to 2.

Is there any malfunction displayed?

YES >> Go to appropriate malfunctioning sensor circuit. Refer to [HAC-42, "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (Without left and right ventilation temperature separately control system) or [HAC-48, "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (With left and right ventilation temperature separately control system), see to No. 11.

NO >> GO TO 2.

2. PERFORM SELF-DIAGNOSIS STEP-4

Perform self-diagnosis STEP-4. Refer to [HAC-42, "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (Without left and right ventilation temperature separately control system) or [HAC-48, "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (With left and right ventilation temperature separately control system), see Nos. 1 to 5.

Is it operated normally?

YES >> END.

NO >> GO TO 3.

3. PERFORM IPDM E/R AUTO ACTIVE TEST

Perform IPDM E/R auto active test. Refer to [PCS-11, "Diagnosis Description"](#).

Does the magnet clutch operate?

YES >> • WITH CONSULT-III: GO TO 6.

• WITHOUT CONSULT-III: GO TO 7.

NO >> Check 10A fuse (No. 49, located in IPDM E/R), and GO TO 4.

4. CHECK CIRCUIT CONTINUITY BETWEEN IPDM E/R AND COMPRESSOR

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

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

MAGNET CLUTCH

[AUTOMATIC AIR CONDITIONER]

< COMPONENT DIAGNOSIS >

Is the inspection result normal?

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

5.CHECK MAGNET CLUTCH CIRCUIT

Check for operation sound when applying battery voltage direct current to terminal.

Is the inspection result normal?

- YES >> 1. Replace IPDM E/R.
2. Refer to self-diagnosis procedure [HAC-42. "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (Without left and right ventilation temperature separately control system) or [HAC-48. "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (With left and right ventilation temperature separately control system) and perform self-diagnosis STEP-4. Confirm that magnet clutch operation normal.
- NO >> 1. Replace compressor.
2. Refer to self-diagnosis procedure [HAC-42. "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (Without left and right ventilation temperature separately control system) or [HAC-48. "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (With left and right ventilation temperature separately control system) and perform self-diagnosis STEP-4. Confirm that magnet clutch operation normal.

6.CHECK ECM INPUT (COMPRESSOR ON) SIGNAL

Check compressor ON/OFF signal in "Data monitor". Refer to [HAC-47. "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : CONSULT-III Function"](#).

A/C SW ON : AIR COND SIG ON
A/C SW OFF : AIR COND SIG OFF

Is the inspection result normal?

- YES >> GO TO 9.
NO >> GO TO 7.

7.CHECK REFRIGERANT PRESSURE SENSOR

Ⓟ WITH CONSULT-III

1. Start the engine.
2. Check voltage of refrigerant pressure sensor in "Data monitor". Refer to [HAC-102. "Reference Value"](#).

ⓧ WITHOUT CONSULT-III

1. Start the engine.
2. Check voltage between ECM harness connector and ground.

| (+) | | (-) | Condition | Voltage |
|-----------|----------|--------|--|---------------------|
| ECM | | — | | |
| connector | Terminal | | | |
| M107 | 105 | Ground | A/C switch: ON (Blower motor operates.) | Approx. 1.0 - 4.0 V |

Is the inspection result normal?

- YES >> • Ⓟ WITH CONSULT-III: GO TO 8.
• ⓧ WITHOUT CONSULT-III: Repair harness or connector.
- NO >> Refer to [EC-511. "Diagnosis Procedure"](#).

8.CHECK ECM INPUT (FAN ON) SIGNAL

Check FAN ON/OFF signal in "Data monitor". Refer to [HAC-47. "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : CONSULT-III Function"](#).

FAN SW ON : HEATER FAN SW ON
FAN SW OFF : HEATER FAN SW OFF

MAGNET CLUTCH

[AUTOMATIC AIR CONDITIONER]

< COMPONENT DIAGNOSIS >

Is the inspection result normal?

YES >> GO TO 9.

NO >> Repair harness or connector.

9.CHECK CAN COMMUNICATION

Check CAN communication. Refer to [LAN-16. "Trouble Diagnosis Flow Chart"](#).

- ECM – IPDM E/R
- ECM – Unified meter and A/C amp.

Is the inspection result normal?

YES >> Replace ECM.

NO >> Repair or replace malfunctioning part(s).

A

B

C

D

E

F

G

H

HAC

J

K

L

M

N

O

P

AMBIENT SENSOR

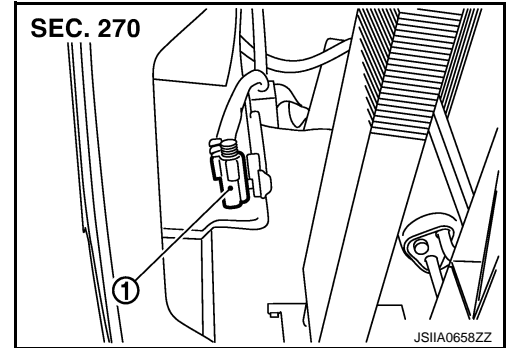
Description

INFOID:000000001675717

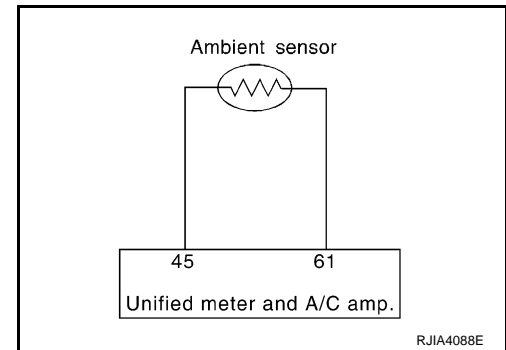
COMPONENT DESCRIPTION

Ambient Sensor

The ambient sensor (1) is attached on the bumper reinforcement (right side). It detects ambient temperature and converts it into a resistance value which is then input into the unified meter and A/C amp.



Ambient Sensor Circuit



AMBIENT TEMPERATURE INPUT PROCESS

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

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

Component Function Check

INFOID:000000001675718

1. PERFORM SELF-DIAGNOSIS STEP-2

Perform self-diagnosis STEP-2. Refer to [HAC-42, "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (Without left and right ventilation temperature separately control system) or [HAC-48, "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (With left and right ventilation temperature separately control system), see Nos. 1 to 2.

21 or -21 is displayed.

- YES >> Go to Diagnosis Procedure. Refer to [HAC-88, "Diagnosis Procedure"](#).
- NO >> END.

Diagnosis Procedure

INFOID:000000001675719

1. CHECK VOLTAGE BETWEEN AMBIENT SENSOR AND GROUND

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

AMBIENT SENSOR

< COMPONENT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

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

Is the inspection result normal?

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

2.CHECK CIRCUIT CONTINUITY BETWEEN AMBIENT SENSOR AND UNIFIED METER AND A/C AMP.

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

| Ambient sensor | | Unified meter and A/C amp. | | Continuity |
|----------------|----------|----------------------------|----------|------------|
| Connector | Terminal | Connector | Terminal | |
| E76 | 2 | M67 | 61 | Existed |

Is the inspection result normal?

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

3.CHECK AMBIENT SENSOR

Check ambient sensor. Refer to [HAC-89, "Component Inspection"](#).

Is the inspection result normal?

- YES >> Replace unified meter and A/C amp.
NO >> Replace ambient sensor.

4.CHECK CIRCUIT CONTINUITY BETWEEN AMBIENT SENSOR AND UNIFIED METER AND A/C AMP.

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

| Ambient sensor | | Unified meter and A/C amp. | | Continuity |
|----------------|----------|----------------------------|----------|------------|
| Connector | Terminal | Connector | Terminal | |
| E76 | 1 | M67 | 45 | Existed |

4. Check 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 unified meter and A/C amp.
NO >> Repair harness or connector.

Component Inspection

INFOID:000000001675720

1.CHECK AMBIENT SENSOR

1. Turn ignition switch OFF.
2. Disconnect ambient sensor connector. Refer to [VTL-25, "Exploded View"](#).
3. Check continuity between ambient sensor terminals.

AMBIENT SENSOR

< COMPONENT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

| 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 >> END.

NO >> Replace ambient sensor.

IN-VEHICLE SENSOR

< COMPONENT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

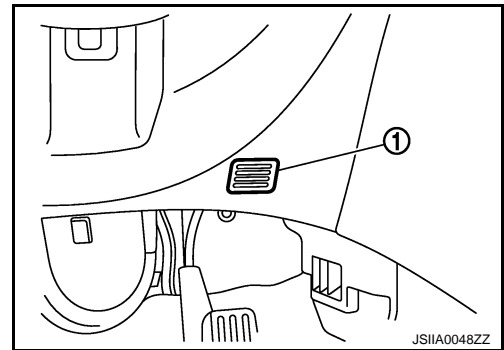
IN-VEHICLE SENSOR

Description

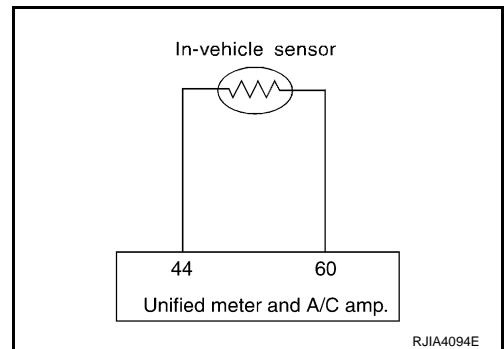
INFOID:000000001675721

In-vehicle Sensor

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

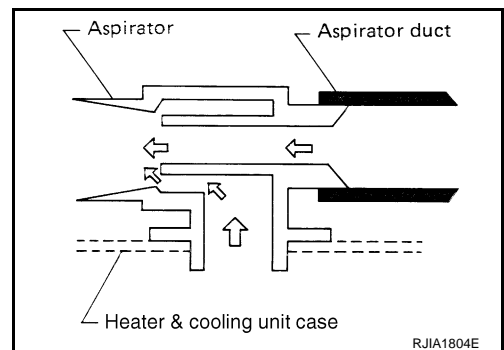
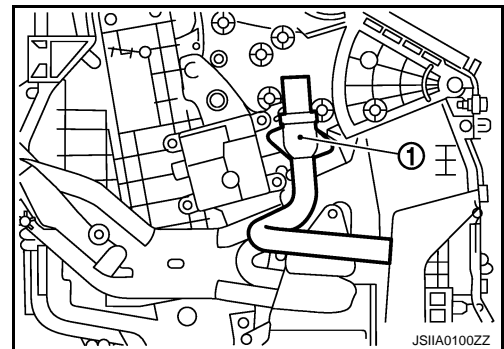


In-vehicle Sensor Circuit



Aspirator

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



Component Function Check

INFOID:000000001675722

1.PERFORM SELF-DIAGNOSIS STEP-2

IN-VEHICLE SENSOR

[AUTOMATIC AIR CONDITIONER]

< COMPONENT DIAGNOSIS >

Perform self-diagnosis STEP-2. Refer to [HAC-42. "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (Without left and right ventilation temperature separately control system) or [HAC-48. "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (With left and right ventilation temperature separately control system), see Nos. 1 to 2.

22 or -22 is displayed.

- YES >> Go to Diagnosis Procedure. Refer to [HAC-92. "Diagnosis Procedure"](#).
NO >> END.

Diagnosis Procedure

INFOID:000000001675723

1.CHECK VOLTAGE BETWEEN IN-VEHICLE SENSOR AND GROUND

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

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

Is the inspection result normal?

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

2.CHECK CIRCUIT CONTINUITY BETWEEN IN-VEHICLE SENSOR AND UNIFIED METER AND A/C AMP.

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

| In-vehicle sensor | | Unified meter and A/C amp. | | Continuity |
|-------------------|----------|----------------------------|----------|------------|
| Connector | Terminal | Connector | Terminal | |
| M61 | 2 | M67 | 60 | Existed |

Is the inspection result normal?

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

3.CHECK IN-VEHICLE SENSOR

Check in-vehicle sensor. Refer to [HAC-93. "Component Inspection"](#).

Is the inspection result normal?

- YES >> Replace unified meter and A/C amp.
NO >> Replace in-vehicle sensor.

4.CHECK CIRCUIT CONTINUITY BETWEEN IN-VEHICLE SENSOR AND UNIFIED METER AND A/C AMP.

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

| In-vehicle sensor | | Unified meter and A/C amp. | | Continuity |
|-------------------|----------|----------------------------|----------|------------|
| Connector | Terminal | Connector | Terminal | |
| M61 | 1 | M67 | 44 | Existed |

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

IN-VEHICLE SENSOR

< COMPONENT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

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

Is the inspection result normal?

- YES >> Replace unified meter and A/C amp.
 NO >> Repair harness or connector.

Component Inspection

INFOID:000000001735253

1. CHECK IN-VEHICLE SENSOR

1. Turn ignition switch OFF.
2. Disconnect in-vehicle sensor connector. Refer to [VTL-26. "Exploded View"](#).
3. Check continuity between in-vehicle sensor terminals.

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

Is the inspection result normal?

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

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SUNLOAD SENSOR

< COMPONENT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

SUNLOAD SENSOR

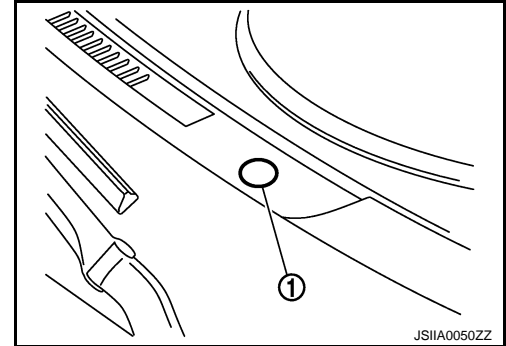
Description

INFOID:000000001675725

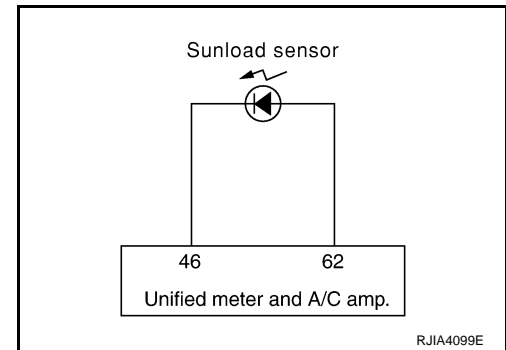
COMPONENT DESCRIPTION

Sunload Sensor

The sunload sensor (1) is located on the driver's side front defroster grille. It detects sunload entering through windshield by means of a photo diode. The sensor converts the sunload into a current value which is then input into the unified meter and A/C amp.



Sunload Sensor Circuit



SUNLOAD INPUT PROCESS

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

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

Component Function Check

INFOID:000000001675726

1. PERFORM SELF-DIAGNOSIS STEP-2

Perform self-diagnosis STEP-2. Refer to [HAC-42, "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (Without left and right ventilation temperature separately control system) or [HAC-48, "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (With left and right ventilation temperature separately control system), see Nos. 1 to 2.

25 or -25 is displayed.

- YES >> Go to Diagnosis Procedure. Refer to [HAC-94, "Diagnosis Procedure"](#).
- NO >> END.

Diagnosis Procedure

INFOID:000000001675727

1. CHECK VOLTAGE BETWEEN SUNLOAD SENSOR AND GROUND

1. Disconnect sunload sensor connector.
2. Turn ignition switch ON.

SUNLOAD SENSOR

[AUTOMATIC AIR CONDITIONER]

< COMPONENT DIAGNOSIS >

3. Check voltage between sunload sensor harness connector and ground.

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

Is the inspection result normal?

YES >> GO TO 2.

NO >> GO TO 4.

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

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

| Sunload sensor | | Unified meter and A/C amp. | | Continuity |
|----------------|----------|----------------------------|----------|------------|
| Connector | Terminal | Connector | Terminal | |
| M46 | 2 | M67 | 62 | Existed |

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair harness or connector.

3.CHECK SUNLOAD SENSOR

1. Reconnect sunload sensor connector and unified meter and A/C amp. connector.
2. Check sunload sensor. Refer to [HAC-95, "Component Inspection"](#).

Is the inspection result normal?

YES >> Replace unified meter and A/C amp.

NO >> Replace sunload sensor.

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

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

| Sunload sensor | | Unified meter and A/C amp. | | Continuity |
|----------------|----------|----------------------------|----------|------------|
| Connector | Terminal | Connector | Terminal | |
| M46 | 1 | M67 | 46 | Existed |

4. Check 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 unified meter and A/C amp.

NO >> Repair harness or connector.

Component Inspection

INFOID:000000001675728

1.CHECK SUNLOAD SENSOR

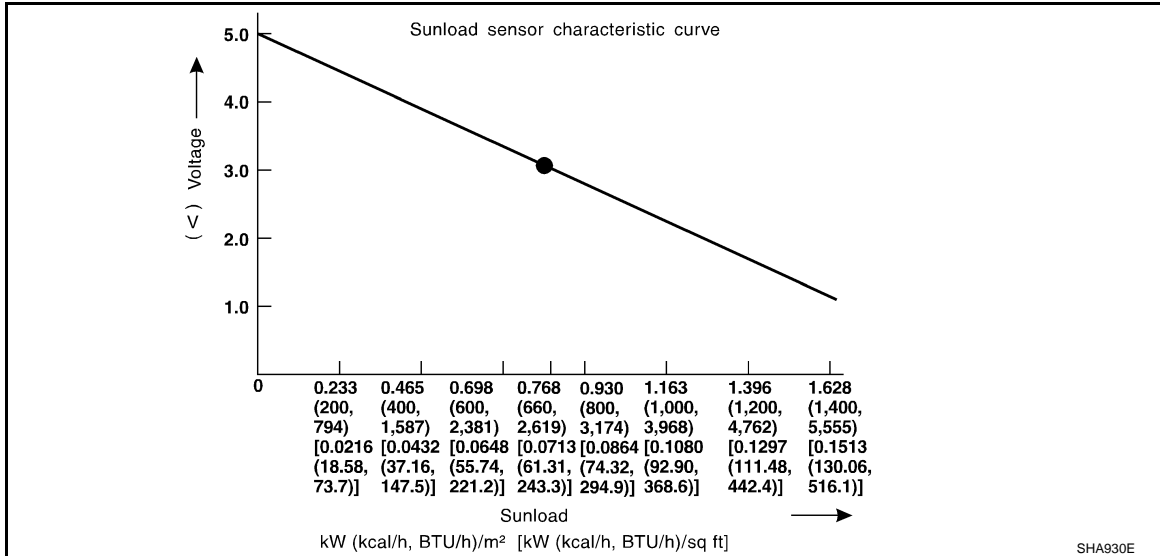
1. Turn ignition switch ON.
2. Check the voltage between unified meter and A/C amp. harness connector and ground.

SUNLOAD SENSOR

< COMPONENT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

| | | |
|----------------------------|----------|--------|
| (+) | | (-) |
| Unified meter and A/C amp. | | — |
| Connector | Terminal | |
| M67 | 46 | Ground |



NOTE:

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

Is the inspection result normal?

YES >> END.

NO >> Replace sunload sensor.

INTAKE SENSOR

< COMPONENT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

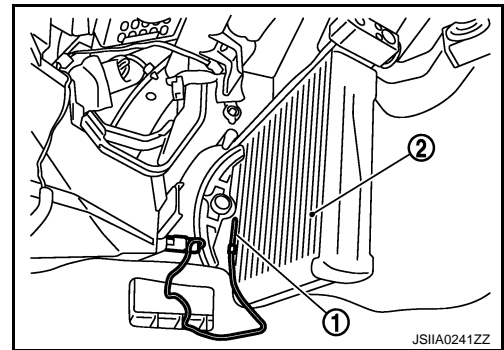
INTAKE SENSOR

Description

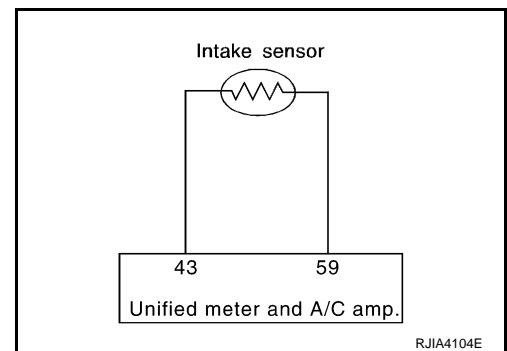
INFOID:000000001675729

Intake Sensor

The intake sensor (1) is located on the heater & cooling unit assembly. It converts air temperature after it passes through the evaporator (2) into a resistance value which is then input to the unified meter and A/C amp.



Intake Sensor Circuit



Component Function Check

INFOID:000000001675730

1. PERFORM SELF-DIAGNOSIS STEP-2

Perform self-diagnosis STEP-2. Refer to [HAC-42, "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (Without left and right ventilation temperature separately control system) or [HAC-48, "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (With left and right ventilation temperature separately control system), see Nos. 1 to 2.

24 or -24 is displayed.

- YES >> Go to Diagnosis Procedure. Refer to [HAC-97, "Diagnosis Procedure"](#).
- NO >> END.

Diagnosis Procedure

INFOID:000000001675731

1. CHECK VOLTAGE BETWEEN INTAKE SENSOR AND GROUND

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

| (+) | | (-) | Voltage |
|---------------|----------|--------|-------------|
| Intake sensor | | — | |
| Connector | Terminal | | |
| M77 | 1 | Ground | Approx. 5 V |

Is the inspection result normal?

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

INTAKE SENSOR

< COMPONENT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

2.CHECK CIRCUIT CONTINUITY BETWEEN INTAKE SENSOR AND UNIFIED METER AND A/C AMP.

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

| Intake sensor | | Unified meter and A/C amp. | | Continuity |
|---------------|----------|----------------------------|----------|------------|
| Connector | Terminal | Connector | Terminal | |
| M77 | 2 | M67 | 59 | Existed |

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair harness or connector.

3.CHECK INTAKE SENSOR

Check intake sensor. Refer to [HAC-98, "Component Inspection"](#).

Is the inspection result normal?

YES >> Replace unified meter and A/C amp.

NO >> Replace intake sensor.

4.CHECK CIRCUIT CONTINUITY BETWEEN INTAKE SENSOR AND UNIFIED METER AND A/C AMP.

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

| Intake sensor | | Unified meter and A/C amp. | | Continuity |
|---------------|----------|----------------------------|----------|------------|
| Connector | Terminal | Connector | Terminal | |
| M77 | 1 | M67 | 43 | Existed |

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

| Intake sensor | | — | Continuity |
|---------------|----------|--------|-------------|
| Connector | Terminal | | |
| M77 | 1 | Ground | Not existed |

Is the inspection result normal?

YES >> Replace unified meter and A/C amp.

NO >> Repair harness or connector.

Component Inspection

INFOID:000000001675732

1.CHECK INTAKE SENSOR

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

INTAKE SENSOR

< COMPONENT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

| Terminal | | Condition | Resistance kΩ |
|----------|---|---------------------|---------------|
| | | Temperature °C (°F) | |
| 1 | 2 | -15 (5) | 12.34 |
| | | -10 (14) | 9.62 |
| | | -5 (23) | 7.56 |
| | | 0 (32) | 6.00 |
| | | 5 (41) | 4.80 |
| | | 10 (50) | 3.87 |
| | | 15 (59) | 3.15 |
| | | 20 (68) | 2.57 |
| | | 25 (77) | 2.12 |
| | | 30 (86) | 1.76 |
| | | 35 (95) | 1.47 |
| | | 40 (104) | 1.23 |
| | | 45 (113) | 1.04 |

Is the inspection result normal?

YES >> END.

NO >> Replace intake sensor.

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HAC

POWER SUPPLY AND GROUND CIRCUIT FOR AUTO AMP.

< COMPONENT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

POWER SUPPLY AND GROUND CIRCUIT FOR AUTO AMP.

Description

INFOID:000000001675733

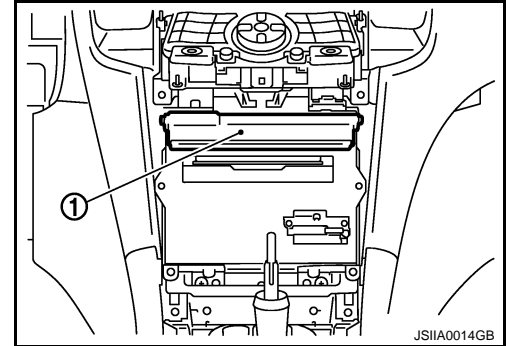
COMPONENT DESCRIPTION

Unified Meter and A/C Amp. (Automatic Amplifier)

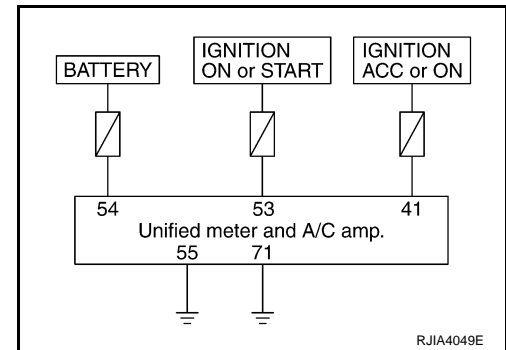
The unified meter and A/C amp. (1) has a built-in microcomputer which processes information sent from various sensors needed for air conditioner operation. The air mix door motor(s), mode door motor, intake door motor, blower motor and compressor are then controlled.

When the various switches and temperature control dial are operated, data is input to the unified meter and A/C amp. from the AV control unit using CAN communication.

Self-diagnosis functions are also built into unified meter and A/C amp. to provide quick check of malfunctions in the auto air conditioner system.



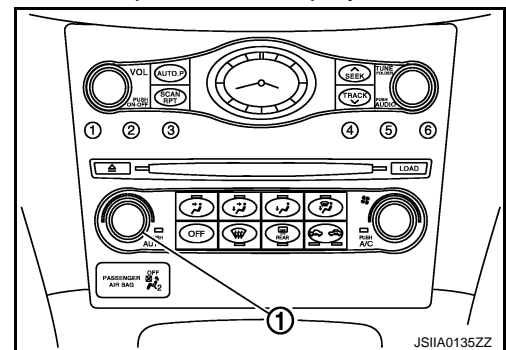
Power Supply and Ground Circuit for Unified Meter and A/C Amp.



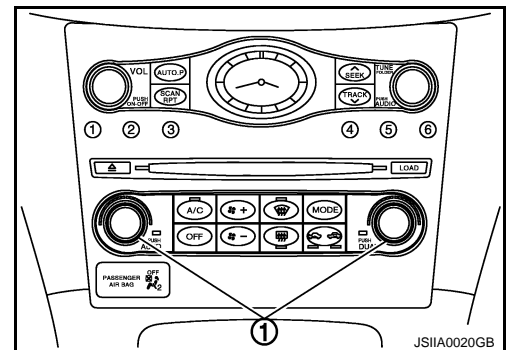
Potential Temperature Control (PTC)

The PTC (1) is built into the preset switch. It can be set at an interval of 0.5°C (1.0°F) in the 18°C (60°F) to 32°C (90°F) temperature range by turning temperature control dial. The set temperature is displayed.

Without left and right ventilation temperature separately system



With left and right ventilation temperature separately system



POWER SUPPLY AND GROUND CIRCUIT FOR AUTO AMP.

< COMPONENT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

Component Function Check

INFOID:000000001675734

1. CONFIRM SYMPTOM BY PERFORMING THE FOLLOWING OPERATIONAL CHECK

1. Press AUTO switch and A/C switch.
2. Display should indicate AUTO. Confirm that the compressor clutch engages (sound or visual inspection). (Discharge air and blower speed depend on ambient, in-vehicle and set temperatures.)

Does magnet clutch engaged?

YES >> END.

NO >> Go to Diagnosis Procedure. Refer to [HAC-101, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:000000001675735

1. CHECK POWER SUPPLY CIRCUIT FOR UNIFIED METER AND A/C AMP.

1. Disconnect unified meter and A/C amp. connector.
2. Check voltage between unified meter and A/C amp. harness connector and ground.

| (+) | | (-) | Voltage | | |
|----------------------------|----------|--------|--------------------------|-----------------|-----------------|
| Unified meter and A/C amp. | | — | Ignition switch position | | |
| Connector | Terminal | | OFF | ACC | ON |
| M67 | 41 | Ground | Approx. 0 V | Battery voltage | Battery voltage |
| | 53 | | Approx. 0 V | Approx. 0 V | Battery voltage |
| | 54 | | Battery voltage | Battery voltage | Battery voltage |

Is the inspection result normal?

YES >> GO TO 3.

NO >> GO TO 2.

2. CHECK FUSE

Check 10A fuses [Nos. 3, 6 and 19, located in the fuse block (J/B)]. Refer to [PG-91, "Fuse, Connector and Terminal Arrangement"](#).

Is the inspection result normal?

YES >> Check harness for open circuit. Repair or replace if necessary.

NO >> Check harness for short circuit and replace fuse.

3. CHECK GROUND CIRCUIT FOR UNIFIED METER AND A/C AMP.

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

| Unified meter and A/C amp. | | (-) | Continuity |
|----------------------------|----------|-----|------------|
| Connector | Terminal | — | Continuity |
| M67 | 55 | | |
| | 71 | | |

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair harness or connector.

4. CHECK PRESET SWITCH

Check preset switch. Refer to [AV-103, "Symptom Table"](#) (BASE AUDIO WITHOUT NAVIGATION), [AV-335, "Symptom Table"](#) (BOSE AUDIO WITHOUT NAVIGATION) or [AV-596, "Symptom Table"](#) (BOSE AUDIO WITH NAVIGATION).

Is the inspection result normal?

YES >> Replace unified meter and A/C amp.

NO >> Repair or replace malfunctioning part(s).

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ECU DIAGNOSIS

ECM

Reference Value

INFOID:000000001910529

VALUES ON THE DIAGNOSIS TOOL

NOTE:

- Specification data are reference values.
- Specification data are output/input values which are detected or supplied by the ECM at the connector.
 - * Specification data may not be directly related to their components signals/values/operations.
 - i.e. Adjust ignition timing with a timing light before monitoring IGN TIMING, because the monitor may show the specification data in spite of the ignition timing not being adjusted to the specification data. this IGN TIMING monitors the data calculated by the ECM according to the signals input from the camshaft position sensor and other ignition timing related sensors.

CONSULT-III MONITOR ITEM

| Monitor Item | Condition | | Values/Status |
|-----------------|--|---------------------------------------|--|
| ENG SPEED | • Run engine and compare CONSULT-III value with the tachometer indication. | | Almost the same speed as the tachometer indication |
| MAS A/F SE-B1 | See EC-132, "Description" . | | |
| MAS A/F SE-B2 | See EC-132, "Description" . | | |
| B/FUEL SCHDL | See EC-132, "Description" . | | |
| A/F ALPHA-B1 | See EC-132, "Description" . | | |
| A/F ALPHA-B2 | See EC-132, "Description" . | | |
| COOLAN TEMP/S | • Ignition switch: ON | | Indicates engine coolant temperature |
| A/F SEN1 (B1) | • Engine: After warming up | Maintaining engine speed at 2,000 rpm | Fluctuates around 2.2 V |
| A/F SEN1 (B2) | • Engine: After warming up | Maintaining engine speed at 2,000 rpm | Fluctuates around 2.2 V |
| HO2S2 (B1) | <ul style="list-style-type: none"> • Revving engine from idle up to 3,000 rpm quickly after the following conditions are met. <ul style="list-style-type: none"> - Engine: After warming up - After keeping engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load | | 0 - 0.3V ↔ Approx. 0.6 - 1.0V |
| HO2S2 (B2) | <ul style="list-style-type: none"> • Revving engine from idle up to 3,000 rpm quickly after the following conditions are met. <ul style="list-style-type: none"> - Engine: After warming up - After keeping engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load | | 0 - 0.3V ↔ Approx. 0.6 - 1.0V |
| HO2S2 MNTR (B1) | <ul style="list-style-type: none"> • Revving engine from idle up to 3,000 rpm quickly after the following conditions are met. <ul style="list-style-type: none"> - Engine: After warming up - After keeping engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load | | LEAN ↔ RICH |
| HO2S2 MNTR (B2) | <ul style="list-style-type: none"> • Revving engine from idle up to 3,000 rpm quickly after the following conditions are met. <ul style="list-style-type: none"> - Engine: After warming up - After keeping engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load | | LEAN ↔ RICH |
| VHCL SPEED SE | • Turn drive wheels and compare CONSULT-III value with the speedometer indication. | | Almost the same speed as speedometer indication |
| BATTERY VOLT | • Ignition switch: ON (Engine stopped) | | 11 - 14V |
| ACCEL SEN 1 | • Ignition switch: ON (Engine stopped) | Accelerator pedal: Fully released | 0.45 - 1.00V |
| | | Accelerator pedal: Fully depressed | 4.4 - 4.8V |
| ACCEL SEN 2*1 | • Ignition switch: ON (Engine stopped) | Accelerator pedal: Fully released | 0.45 - 1.00V |
| | | Accelerator pedal: Fully depressed | 4.3 - 4.8V |

ECM

< ECU DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

| Monitor Item | Condition | | Values/Status | |
|---------------|---|--|--------------------------------------|-----|
| TP SEN 1-B1 | <ul style="list-style-type: none"> Ignition switch: ON (Engine stopped) Selector lever: D (A/T) or 1st (M/T) | Accelerator pedal: Fully released | More than 0.36V | A |
| | | Accelerator pedal: Fully depressed | Less than 4.75V | |
| TP SEN 2-B1*1 | <ul style="list-style-type: none"> Ignition switch: ON (Engine stopped) Selector lever: D (A/T) or 1st (M/T) | Accelerator pedal: Fully released | More than 0.36V | B |
| | | Accelerator pedal: Fully depressed | Less than 4.75V | |
| FUEL T/TMP SE | <ul style="list-style-type: none"> Ignition switch: ON | | Indicates fuel tank temperature | C |
| INT/A TEMP SE | <ul style="list-style-type: none"> Ignition switch: ON | | Indicates intake air temperature | D |
| EVAP SYS PRES | <ul style="list-style-type: none"> Ignition switch: ON | | Approx. 1.8 - 4.8V | E |
| FUEL LEVEL SE | <ul style="list-style-type: none"> Ignition switch: ON | | Depending on fuel level of fuel tank | |
| START SIGNAL | <ul style="list-style-type: none"> Ignition switch: ON → START → ON | | OFF → ON → OFF | |
| CLSD THL POS | <ul style="list-style-type: none"> Ignition switch: ON (Engine stopped) | Accelerator pedal: Fully released | ON | F |
| | | Accelerator pedal: Slightly depressed | OFF | |
| AIR COND SIG | <ul style="list-style-type: none"> Engine: After warming up, idle the engine | Air conditioner switch: OFF | OFF | G |
| | | Air conditioner switch: ON (Compressor operates.) | ON | |
| P/N POSI SW | <ul style="list-style-type: none"> Ignition switch: ON | Selector lever: P or N (A/T), Neutral (M/T) | ON | H |
| | | Selector lever: Except above | OFF | |
| PW/ST SIGNAL | <ul style="list-style-type: none"> Engine: After warming up, idle the engine | Steering wheel: Not being turned | OFF | |
| | | Steering wheel: Being turned | ON | |
| LOAD SIGNAL | <ul style="list-style-type: none"> Ignition switch: ON | Rear window defogger switch: ON and/or Lighting switch: 2nd position | ON | HAC |
| | | Rear window defogger switch and lighting switch: OFF | OFF | J |
| IGNITION SW | <ul style="list-style-type: none"> Ignition switch: ON → OFF → ON | | ON → OFF → ON | |
| HEATER FAN SW | <ul style="list-style-type: none"> Engine: After warming up, idle the engine | Heater fan switch: ON | ON | K |
| | | Heater fan switch: OFF | OFF | |
| BOOST VCUM SW | <ul style="list-style-type: none"> Always a certain value is displayed. This items are not efficient for CV36 models. | | | L |
| BRAKE SW | <ul style="list-style-type: none"> Ignition switch: ON | Brake pedal: Fully released | OFF | |
| | | Brake pedal: Slightly depressed | ON | M |
| INJ PULSE-B1 | <ul style="list-style-type: none"> Engine: After warming up Selector lever: P or N (A/T), Neutral (M/T) Air conditioner switch: OFF No load | Idle | 2.0 - 3.0 msec | |
| | | 2,000 rpm | 1.9 - 2.9 msec | N |
| INJ PULSE-B2 | <ul style="list-style-type: none"> Engine: After warming up Selector lever: P or N (A/T), Neutral (M/T) Air conditioner switch: OFF No load | Idle | 2.0 - 3.0 msec | O |
| | | 2,000 rpm | 1.9 - 2.9 msec | |
| IGN TIMING | <ul style="list-style-type: none"> Engine: After warming up Selector lever: P or N (A/T), Neutral (M/T) Air conditioner switch: OFF No load | Idle | 7° BTDC | P |
| | | 2,000 rpm | 25° - 45° BTDC | |

ECM

< ECU DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

| Monitor Item | Condition | Values/Status |
|----------------|---|--|
| CAL/LD VALUE | <ul style="list-style-type: none"> Engine: After warming up Selector lever: P or N (A/T), Neutral (M/T) Air conditioner switch: OFF No load | Idle 5% - 35% |
| | | 2,500 rpm 5% - 35% |
| MASS AIRFLOW | <ul style="list-style-type: none"> Engine: After warming up Selector lever: P or N (A/T), Neutral (M/T) Air conditioner switch: OFF No load | Idle 2.0 - 6.0 g-m/s |
| | | 2,500 rpm 7.0 - 20.0 g-m/s |
| PURG VOL C/V | <ul style="list-style-type: none"> Engine: After warming up Selector lever: P or N (A/T), Neutral (M/T) Air conditioner switch: OFF No load | Idle (Accelerator pedal: Not depressed even slightly, after engine starting.) 0% |
| | | 2,000 rpm — |
| INT/V SOL (B1) | <ul style="list-style-type: none"> Engine: After warming up Selector lever: P or N (A/T), Neutral (M/T) Air conditioner switch: OFF No load | Idle 0% - 2% |
| | | 2,000 rpm Approx. 0% - 50% |
| INT/V SOL (B2) | <ul style="list-style-type: none"> Engine: After warming up Selector lever: P or N (A/T), Neutral (M/T) Air conditioner switch: OFF No load | Idle 0% - 2% |
| | | 2,000 rpm Approx. 0% - 50% |
| TP SEN 1-B2 | <ul style="list-style-type: none"> Ignition switch: ON (Engine stopped) Selector lever: D (A/T) or 1st (M/T) | Accelerator pedal: Fully released More than 0.36V |
| | | Accelerator pedal: Fully depressed Less than 4.75V |
| TP SEN 2-B2*1 | <ul style="list-style-type: none"> Ignition switch: ON (Engine stopped) Selector lever: D (A/T) or 1st (M/T) | Accelerator pedal: Fully released More than 0.36V |
| | | Accelerator pedal: Fully depressed Less than 4.75V |
| AIR COND RLY | <ul style="list-style-type: none"> Engine: After warming up, idle the engine | Air conditioner switch: OFF OFF |
| | | Air conditioner switch: ON (Compressor operates) ON |
| FUEL PUMP RLY | <ul style="list-style-type: none"> For 1 seconds after turning ignition switch: ON Engine running or cranking | ON |
| | <ul style="list-style-type: none"> Except above | OFF |
| VENT CONT/V | <ul style="list-style-type: none"> Ignition switch: ON | OFF |
| THRTL RELAY | <ul style="list-style-type: none"> Ignition switch: ON | ON |
| HO2S2 HTR (B1) | <ul style="list-style-type: none"> Engine speed: Below 3,600 rpm after the following conditions are met. <ul style="list-style-type: none"> Engine: After warming up Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load | ON |
| | <ul style="list-style-type: none"> Engine speed: Above 3,600 rpm | OFF |
| HO2S2 HTR (B2) | <ul style="list-style-type: none"> Engine speed: Below 3,600 rpm after the following conditions are met. <ul style="list-style-type: none"> Engine: After warming up Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load | ON |
| | <ul style="list-style-type: none"> Engine speed: Above 3,600 rpm | OFF |
| I/P PULLY SPD | <ul style="list-style-type: none"> Vehicle speed: More than 20 km/h (12 MPH) | Almost the same speed as the tachometer indication |
| VEHICLE SPEED | <ul style="list-style-type: none"> Turn drive wheels and compare CONSULT-III value with the speedometer indication. | Almost the same speed as the speedometer indication |

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[AUTOMATIC AIR CONDITIONER]

| Monitor Item | Condition | | Values/Status |
|--------------------------------------|---|---|---|
| IDL A/V LEARN | • Engine: Running | Idle air volume learning has not been performed yet. | YET |
| | | Idle air volume learning has already been performed successfully. | CMPLT |
| ENG OIL TEMP | • Engine: After warming up | | More than 70°C (158°F) |
| TRVL AFTER MIL | • Ignition switch: ON | Vehicle has traveled after MIL has turned ON. | 0 - 65,535 km (0 - 40,723 miles) |
| A/F S1 HTR (B1) | • Engine: After warming up, idle the engine (More than 140 seconds after starting engine) | | 4 - 100% |
| A/F S1 HTR (B2) | • Engine: After warming up, idle the engine (More than 140 seconds after starting engine) | | 4 - 100% |
| AC PRESS SEN | • Engine: Idle • Both A/C switch and blower fan switch: ON (Compressor operates) | | 1.0 - 4.0V |
| VHCL SPEED SE | • Turn drive wheels and compare CONSULT-III value with the speedometer indication. | | Almost the same speed as the speedometer indication |
| SET VHCL SPD | • Engine: Running | ASCD: Operating | The preset vehicle speed is displayed |
| MAIN SW | • Ignition switch: ON | MAIN switch: Pressed | ON |
| | | MAIN switch: Released | OFF |
| CANCEL SW | • Ignition switch: ON | CANCEL switch: Pressed | ON |
| | | CANCEL switch: Released | OFF |
| RESUME/ACC SW | • Ignition switch: ON | RESUME/ACCELERATE switch: Pressed | ON |
| | | RESUME/ACCELERATE switch: Released | OFF |
| SET SW | • Ignition switch: ON | SET/COAST switch: Pressed | ON |
| | | SET/COAST switch: Released | OFF |
| BRAKE SW1 (ICC/ASCD brake switch) | • Ignition switch: ON | Brake pedal: Fully released | ON |
| | | Brake pedal: Slightly depressed | OFF |
| BRAKE SW2 (Stop lamp switch) | • Ignition switch: ON | Brake pedal: Fully released | OFF |
| | | Brake pedal: Slightly depressed | ON |
| DIST SW | • Ignition switch: ON | DISTANCE switch: Pressed | ON |
| | | DISTANCE switch: Released | OFF |
| VHCL SPD CUT | • Ignition switch: ON | | NON |
| LO SPEED CUT | • Ignition switch: ON | | NON |
| AT OD MONITOR | • Ignition switch: ON | | OFF |
| AT OD CANCEL | • Ignition switch: ON | | OFF |
| CRUISE LAMP | • Ignition switch: ON | MAIN switch: Pressed at the 1st time → at the 2nd time | ON → OFF |
| SET LAMP | • MAIN switch: ON • When vehicle speed is between 40 km/h (25 MPH) and 144 km/h (89 MPH) | ASCD: Operating | ON |
| | | ASCD: Not operating | OFF |
| BAT CUR SEN | • Engine speed: Idle • Battery: Fully charged*2 • Selector lever: P or N (A/T), Neutral (M/T) • Air conditioner switch: OFF • No load | | Approx. 2,600 - 3,500mV |
| ALT DUTY | • Engine: Idle | | 0 - 80% |

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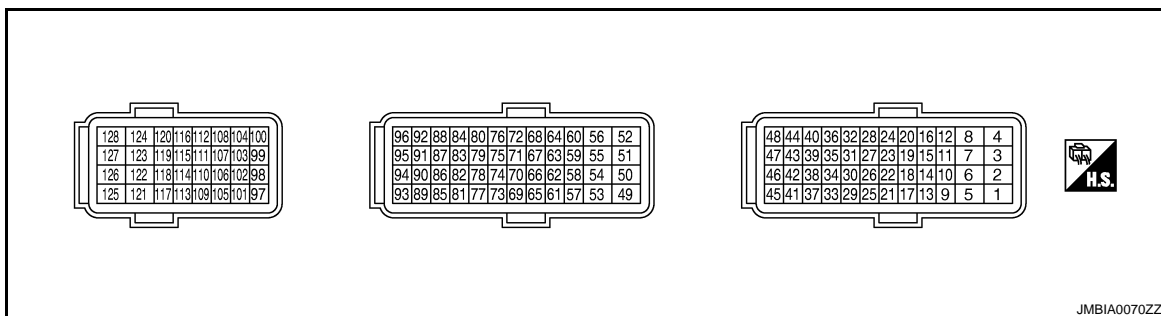
[AUTOMATIC AIR CONDITIONER]

| Monitor Item | Condition | Values/Status |
|----------------------|---|---|
| VVEL POSITION SEN-B1 | • Engine: After warming up • Selector lever: P or N (A/T), Neutral (M/T) • Air conditioner switch: OFF • No load | Idle Approx. 0.25 - 1.40V |
| | | When revving engine up to 2,000 rpm quickly Approx. 0.25 - 4.75V |
| VVEL POSITION SEN-B2 | • Engine: After warming up • Selector lever: P or N (A/T), Neutral (M/T) • Air conditioner switch: OFF • No load | Idle Approx. 0.25 - 1.40V |
| | | When revving engine up to 2,000 rpm quickly Approx. 0.25 - 4.75V |
| VVEL TIM-B1 | • Engine: After warming up • Selector lever: P or N (A/T), Neutral (M/T) • Air conditioner switch: OFF • No load | Idle Approx. 0 - 20 deg |
| | | When revving engine up to 2,000 rpm quickly Approx. 0 - 90 deg |
| VVEL TIM-B2 | • Engine: After warming up • Selector lever: P or N (A/T), Neutral (M/T) • Air conditioner switch: OFF • No load | Idle Approx. 0 - 20 deg |
| | | When revving engine up to 2,000 rpm quickly Approx. 0 - 90 deg |
| VVEL LEARN | • Ignition switch: OFF → ON (After warming up) | VVEL learning has not been performed yet. YET |
| | | VVEL learning has already been performed successfully. DONE |
| VVEL SEN LEARN-B1 | • VVEL learning has already been performed successfully | Approx. 0.30 - 0.80V |
| VVEL SEN LEARN-B2 | • VVEL learning has already been performed successfully | Approx. 0.30 - 0.80V |
| ALT DUTY | • Engine: Idle | 0 - 80% |
| A/F ADJ B1 | • Engine: Running | -0.330 - 0.330 |
| A/F ADJ B2 | • Engine: Running | -0.330 - 0.330 |
| FAN DUTY | • Engine: Running | 0 - 100% |
| ALT DUTY SIG | • Power generation voltage variable control: Operating | ON |
| | • Power generation voltage variable control: Not operating | OFF |

*1: Accelerator pedal position sensor 2 signal and throttle position sensor 2 signal are converted by ECM internally. Thus, they differ from ECM terminals voltage signal.

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

TERMINAL LAYOUT



PHYSICAL VALUES

NOTE:

- ECM is located behind the instrument assist lower panel. For this inspection, remove passenger side instrument lower panel.
- Specification data are reference values and are measured between each terminal and ground.
- Pulse signal is measured by CONSULT-III.

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[AUTOMATIC AIR CONDITIONER]

| Terminal No. (Wire color) | | Description | | Condition | Value (Approx.) |
|------------------------------|------------|---|------------------|---|--|
| + | - | Signal name | Input/ Output | | |
| 1 (W) | 128 (B) | A/F sensor 1 heater (bank 1) | Output | [Engine is running] • Warm-up condition • Idle speed (More than 140 seconds after starting engine) | 2.9 - 8.8V★ 50mSec/div 5V/div JMBIA0030GB |
| 2 (G) | 128 (B) | Throttle control motor (Open) (bank 1) | Output | [Ignition switch: ON] • Engine stopped • Selector lever: D (A/T) or 1st (M/T) • Accelerator pedal: Fully depressed | 0 - 14V★ 500µSec/div 5V/div JMBIA0031GB |
| | | | | [Ignition switch: ON] • Engine stopped • Selector lever: D (A/T) or 1st (M/T) • Accelerator pedal: Fully released | 0 - 14V★ 500µSec/div 5V/div JMBIA0032GB |
| 3 (R) | 128 (B) | Throttle control motor re- lay power supply (bank 1) | Input | [Ignition switch: ON] | BATTERY VOLTAGE (11 - 14V) |
| 4 (BR) | 128 (B) | Throttle control motor (Close) (bank 1) | Output | [Ignition switch: ON] • Engine stopped • Selector lever: D (A/T) or 1st (M/T) • Accelerator pedal: In the middle of re- leasing operation | 0 - 14V★ 500µSec/div 5V/div JMBIA0033GB |
| 5 (GR) | 128 (B) | A/F sensor 1 heater (bank 2) | Output | [Engine is running] • Warm-up condition • Idle speed (More than 140 seconds after starting engine) | 2.9 - 8.8V★ 50mSec/div 5V/div JMBIA0030GB |
| 8 (B) | — | ECM ground | — | — | — |

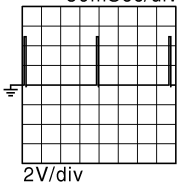
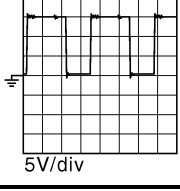
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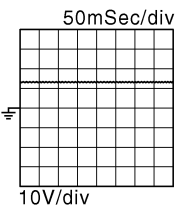
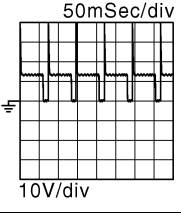
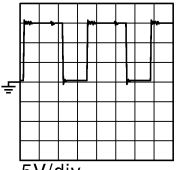
[AUTOMATIC AIR CONDITIONER]

| Terminal No. (Wire color) | | Description | | Condition | Value (Approx.) | |
|------------------------------|------------|---|------------------|--|--|---|
| + | -- | Signal name | Input/ Output | | | |
| 11 (GR) | 128 (B) | Ignition signal No. 4 | Output | [Engine is running] <ul style="list-style-type: none"> • Warm-up condition • Idle speed NOTE: The pulse cycle changes depending on rpm at idle | 0 - 0.2V★ | |
| 12 (L) | | Ignition signal No. 3 | | | [Engine is running] <ul style="list-style-type: none"> • Warm-up condition • Engine speed: 2,000 rpm |  |
| 15 (V) | | Ignition signal No. 5 | | | | |
| 16 (G) | | Ignition signal No. 2 | | | | |
| 19 (SB) | | Ignition signal No. 6 | | | | |
| 20 (Y) | | Ignition signal No. 1 | | | | |
| 17 (P) | 128 (B) | Heated oxygen sensor 2 heater (bank 1) | Output | [Engine is running] <ul style="list-style-type: none"> • Engine speed: Below 3,600 rpm after the following conditions are met <ul style="list-style-type: none"> - Engine: after warming up - Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load | 10V★ | |
| | | | | [Ignition switch: ON] <ul style="list-style-type: none"> • Engine stopped [Engine is running] • Engine speed: Above 3,600 rpm | BATTERY VOLTAGE (11 - 14V) | |
| 18 (W) | 128 (B) | Intake valve timing control solenoid valve (bank 1) | Output | [Engine is running] <ul style="list-style-type: none"> • Warm-up condition • Idle speed | BATTERY VOLTAGE (11 - 14V) | |
| | | | | [Engine is running] <ul style="list-style-type: none"> • Warm-up condition • Engine speed: 2,000rpm | 7 - 12V★ | |
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[AUTOMATIC AIR CONDITIONER]

| Terminal No. (Wire color) | | Description | | Condition | Value (Approx.) |
|------------------------------|------------|---|------------------|--|---|
| + | -- | Signal name | Input/ Output | | |
| 21 (GR) | 128 (B) | EVAP canister purge volume control solenoid valve | Output | [Engine is running] • Idle speed • Accelerator pedal: Not depressed even slightly, after engine starting | BATTERY VOLTAGE (11 - 14V)★  |
| | | | | [Engine is running] • Engine speed: About 2,000 rpm (More than 100 seconds after starting engine) | BATTERY VOLTAGE (11 - 14V)★  |
| 22 (R) | 128 (B) | Fuel pump relay | Output | [Ignition switch: ON] • For 1 second after turning ignition switch ON | 0 - 1.5V |
| | | | | [Engine is running] • More than 1 second after turning ignition switch ON | BATTERY VOLTAGE (11 - 14V) |
| 24 (P) | 128 (B) | ECM relay (Self shut-off) | Output | [Engine is running] [Ignition switch: OFF] • A few seconds after turning ignition switch OFF | 0 - 1.5V |
| | | | | [Ignition switch: OFF] • More than a few seconds after turning ignition switch OFF | BATTERY VOLTAGE (11 - 14V) |
| 25 (O) | 128 (B) | Throttle control motor relay | Output | [Ignition switch: ON → OFF] | 0 - 1.0V ↓ BATTERY VOLTAGE (11 - 14V) ↓ 0V |
| | | | | [Ignition switch: ON] | 0 - 1.0V |
| 28 (BR) | 128 (B) | VVEL actuator motor relay abort signal [VVEL control module] | Output | [Engine is running] • Warm-up condition • Idle speed | 0V |
| 29 (G) | 128 (B) | Intake valve timing control solenoid valve (bank 2) | Output | [Engine is running] • Warm-up condition • Idle speed | BATTERY VOLTAGE (11 - 14V) |
| | | | | [Engine is running] • Warm-up condition • Engine speed: 2,000rpm | 7 - 12V★  |

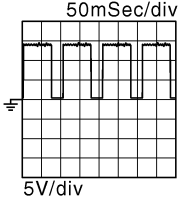
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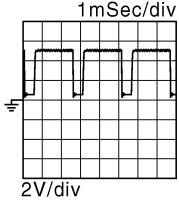
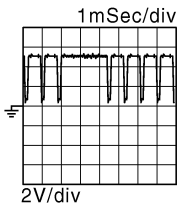
[AUTOMATIC AIR CONDITIONER]

| Terminal No. (Wire color) | | Description | | Condition | Value (Approx.) |
|------------------------------|------------|---|------------------|--|---|
| + | — | Signal name | Input/ Output | | |
| 30 (Y) | 40 (R) | Throttle position sensor 1 (bank 1) | Input | [Ignition switch: ON] • Engine stopped • Selector lever: D (A/T) or 1st (M/T) • Accelerator pedal: Fully released | More than 0.36V |
| | | | | [Ignition switch: ON] • Engine stopped • Selector lever: D (A/T) or 1st (M/T) • Accelerator pedal: Fully depressed | Less than 4.75V |
| 31 (R) | 48 (B) | Throttle position sensor 1 (bank 2) | Input | [Ignition switch: ON] • Engine stopped • Selector lever: D (A/T) or 1st (M/T) • Accelerator pedal: Fully released | More than 0.36V |
| | | | | [Ignition switch: ON] • Engine stopped • Selector lever: D (A/T) or 1st (M/T) • Accelerator pedal: Fully depressed | Less than 4.75V |
| 33 (SB) | 128 (B) | Heated oxygen sensor 2 heater (bank 2) | Output | [Engine is running] • Engine speed: Below 3,600 rpm after the following conditions are met - Engine: after warming up - Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load | 10V★  5V/div JMBIA0037GB |
| | | | | [Ignition switch: ON] • Engine stopped [Engine is running] • Engine speed: Above 3,600 rpm | BATTERY VOLTAGE (11 - 14V) |
| 34 (B) | 40 (R) | Throttle position sensor 2 (bank 1) | Input | [Ignition switch: ON] • Engine stopped • Selector lever: D (A/T) or 1st (M/T) • Accelerator pedal: Fully released | Less than 4.75V |
| | | | | [Ignition switch: ON] • Engine stopped • Selector lever: D (A/T) or 1st (M/T) • Accelerator pedal: Fully depressed | More than 0.36V |
| 35 (W) | 48 (B) | Throttle position sensor 2 (bank 2) | Input | [Ignition switch: ON] • Engine stopped • Selector lever: D (A/T) or 1st (M/T) • Accelerator pedal: Fully released | Less than 4.75V |
| | | | | [Ignition switch: ON] • Engine stopped • Selector lever: D (A/T) or 1st (M/T) • Accelerator pedal: Fully depressed | More than 0.36V |
| 36 (O) | — | Sensor ground [Brake booster pressure sensor] | — | — | — |

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[AUTOMATIC AIR CONDITIONER]

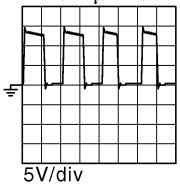
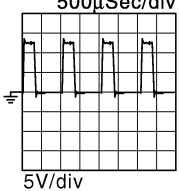
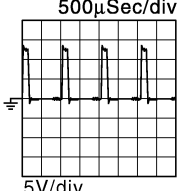
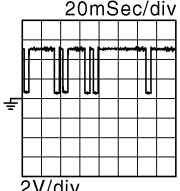
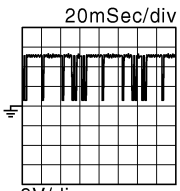
| Terminal No. (Wire color) | | Description | | Condition | Value (Approx.) |
|------------------------------|------------|--|------------------|--|---|
| + | — | Signal name | Input/ Output | | |
| 37 (W) | 128 (B) | Crankshaft position sensor (POS) | Input | [Engine is running] • Warm-up condition • Idle speed NOTE: The pulse cycle changes depending on rpm at idle | 4.0 - 5.0★  JMBIA0041GB |
| | | | | [Engine is running] • Engine speed: 2,000 rpm | 4.0 - 5.0★  JMBIA0042GB |
| 38 (O) | 96 (P) | Manifold absolute pressure (MAP) sensor | Input | [Engine is running] • Warm-up condition • Idle speed | 1.2V |
| | | | | [Engine is running] • Warm-up condition • Engine speed: 2,000 rpm | 1.5V |
| 39 (P) | 36 (O) | Brake booster pressure sensor | Input | [Engine is running] • Warm-up condition • Idle speed • Brake pedal: Fully released | 1.2V |
| | | | | [Engine is running] • Warm-up condition • Idle speed • Brake pedal: Fully depressed | 3.0V |
| 40 (R) | — | Sensor ground [Throttle position sensor (bank 1)] | — | — | — |
| 43 (G) | 48 (B) | Sensor power supply [Throttle position sensor (bank 2)] | — | [Ignition switch: ON] | 5V |
| 44 (L) | 40 (R) | Sensor power supply [Throttle position sensor (bank 1)] | — | [Ignition switch: ON] | 5V |
| 45 (LG) | 36 (O) | Sensor power supply [Brake booster pressure sensor] | — | [Ignition switch: ON] | 5V |
| 46 (R) | 128 (B) | Sensor power supply [Crankshaft position sensor (POS)] | — | [Ignition switch: ON] | 5V |
| 47 (Y) | — | Sensor ground [Crankshaft position sensor (POS)] | — | — | — |
| 48 (B) | — | Sensor ground [Throttle position sensor (bank 2)] | — | — | — |

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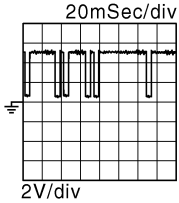
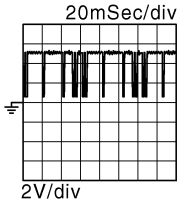
[AUTOMATIC AIR CONDITIONER]

| Terminal No. (Wire color) | | Description | | Condition | Value (Approx.) |
|------------------------------|------------|---|------------------|---|---|
| + | -- | Signal name | Input/ Output | | |
| 49 (GR) | 128 (B) | Throttle control motor (Close) (bank 2) | Output | [Ignition switch: ON] • Engine stopped • Selector lever: D (A/T) or 1st (M/T) • Accelerator pedal: In the middle of re- leasing operation | 0 - 14V★ 500μSec/div  5V/div <small>JMBIA0033GB</small> |
| 50 (V) | 128 (B) | Throttle control motor (Open) (bank 2) | Output | [Ignition switch: ON] • Engine stopped • Selector lever: D (A/T) or 1st (M/T) • Accelerator pedal: Fully depressed | 0 - 14V★ 500μSec/div  5V/div <small>JMBIA0031GB</small> |
| | | | | [Ignition switch: ON] • Engine stopped • Selector lever: D (A/T) or 1st (M/T) • Accelerator pedal: Fully released | 0 - 14V★ 500μSec/div  5V/div <small>JMBIA0032GB</small> |
| 52 (R) | 128 (B) | Throttle control motor re- lay power supply (bank 2) | Input | [Ignition switch: ON] | BATTERY VOLTAGE (11 - 14V) |
| 53 (W) | 128 (B) | Ignition switch | Input | [Ignition switch: OFF] | 0V |
| | | | | [Ignition switch: ON] | BATTERY VOLTAGE (11 - 14V) |
| 54 (Y) | — | CAN communication line [VVEL control module] | Input/ output | — | — |
| 55 (LG) | — | CAN communication line [VVEL control module] | Input/ output | — | — |
| 57 (L) | 128 (B) | A/F sensor 1 (bank 1) | Input | [Ignition switch: ON] | 2.2V |
| 59 (O) | 128 (B) | Camshaft position sen- sor (PHASE) (bank 1) | Input | [Engine is running] • Warm-up condition • Idle speed NOTE: The pulse cycle changes depending on rpm at idle | 3.0 - 5.0★ 20mSec/div  2V/div <small>JMBIA0045GB</small> |
| | | | | [Engine is running] • Engine speed: 2,000 rpm | 3.0 - 5.0★ 20mSec/div  2V/div <small>JMBIA0046GB</small> |

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[AUTOMATIC AIR CONDITIONER]

| Terminal No. (Wire color) | | Description | | Condition | Value (Approx.) |
|------------------------------|------------|--|------------------|--|--|
| + | -- | Signal name | Input/ Output | | |
| 60 (G) | 128 (B) | Sensor power supply [Camshaft position sensor (PHASE) (bank 1), Manifold absolute pressure (MAP) sensor, Power steering pressure sensor] | — | [Ignition switch: ON] | 5V |
| 61 (R) | 128 (B) | A/F sensor 1 (bank 1) | Input | [Engine is running] • Warm-up condition • Engine speed: 2,000 rpm | 1.8V Output voltage varies with air fuel ratio. |
| 63 (L) | 128 (B) | Camshaft position sensor (PHASE) (bank 2) | Input | [Engine is running] • Warm-up condition • Idle speed NOTE: The pulse cycle changes depending on rpm at idle | 3.0 - 5.0★  |
| | | | | [Engine is running] • Engine speed: 2,000 rpm | 3.0 - 5.0★  |
| 64 (SB) | 128 (B) | Sensor power supply [Camshaft position sensor (PHASE) (bank 2), Battery current sensor] | — | [Ignition switch: ON] | 5V |
| 65 (LG) | 128 (B) | A/F sensor 1 (bank 2) | Input | [Ignition switch: ON] | 2.2V |
| 66 (V) | 128 (B) | A/F sensor 1 (bank 2) | Input | [Engine is running] • Warm-up condition • Engine speed: 2,000 rpm | 1.8V Output voltage varies with air fuel ratio. |
| 67 (P) | 128 (B) | Intake air temperature sensor (bank 1) | Input | [Engine is running] | 0 - 4.8V Output voltage varies with intake air temperature. |
| 68 (LG) | — | Sensor ground [Mass air flow sensor (bank 1), Intake air temperature sensor (bank 1)] | — | — | — |
| 69 (W) | 128 (B) | Knock sensor (bank 2) | Input | [Engine is running] • Idle speed | 2.5V*1 |
| 71 (Y) | 128 (B) | Engine coolant temperature sensor | Input | [Engine is running] | 0 - 4.8V Output voltage varies with engine coolant temperature. |
| 72 (—) | — | Sensor ground (Knock sensor) | — | — | — |
| 73 (W) | 128 (B) | Knock sensor (bank 1) | Input | [Engine is running] • Idle speed | 2.5V*1 |

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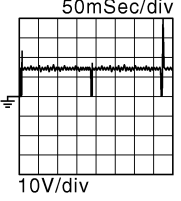
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[AUTOMATIC AIR CONDITIONER]

| Terminal No. (Wire color) | | Description | | Condition | Value (Approx.) |
|------------------------------|------------|--|------------------|---|---|
| + | - | Signal name | Input/ Output | | |
| 76 (W) | 128 (B) | Heated oxygen sensor 2 (bank 1) | Input | [Engine is running] • Revving engine from idle to 3,000 rpm quickly after the following conditions are met - Engine: after warming up - Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load | 0 - 1.0V |
| 77 (SB) | 68 (LG) | Mass air flow sensor (bank 1) | Input | [Engine is running] • Warm-up condition • Idle speed | 0.7 - 1.2V |
| | | | | [Engine is running] • Warm-up condition • Engine speed: 2,500 rpm | 1.3 - 1.7V |
| 78 (G) | 84 (B) | Engine oil temperature sensor | Input | [Engine is running] | 0 - 4.8V Output voltage varies with engine oil temperature. |
| 79 (BR) | 94 (Y) | Mass air flow sensor (bank 2) | Input | [Engine is running] • Warm-up condition • Idle speed | 0.7 - 1.2V |
| | | | | [Engine is running] • Warm-up condition • Engine speed: 2,500 rpm | 1.3 - 1.7V |
| 80 (O) | 128 (B) | Heated oxygen sensor 2 (bank 2) | Input | [Engine is running] • Revving engine from idle to 3,000 rpm quickly after the following conditions are met - Engine: after warming up - Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load | 0 - 1.0V |
| 81 (R) | 128 (B) | Fuel injector No. 3 | Output | [Engine is running] • Warm-up condition • Idle speed NOTE: The pulse cycle changes depending on rpm at idle | BATTERY VOLTAGE (11 - 14V)★  |
| 82 (V) | | Fuel injector No. 6 | | | |
| 85 (BR) | | Fuel injector No. 2 | | | |
| 86 (W) | | Fuel injector No. 5 | | | |
| 89 (GR) | | Fuel injector No. 1 | | | |
| 90 (O) | | Fuel injector No. 4 | | | |
| 83 (LG) | 94 (Y) | Intake air temperature sensor (bank 2) | Input | [Engine is running] | 0 - 4.8V Output voltage varies with intake air temperature. |

ECM

< ECU DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

| Terminal No. (Wire color) | | Description | | Condition | Value (Approx.) | |
|------------------------------|-------------|--|------------------|---|-------------------------------|-------------|
| + | -- | Signal name | Input/ Output | | | |
| 84 (B) | — | Sensor ground (Heated oxygen sensor 2, Engine coolant tem- perature sensor, Engine oil temperature sensor) | — | — | — | A B C |
| 87 (Y) | 96 (P) | Power steering pressure sensor | Output | [Engine is running] • Steering wheel: Being turned | 0.5 - 4.5V | D |
| | | | | [Engine is running] • Steering wheel: Not being turned | 0.4 - 0.8V | E |
| 91 (SB) | 95 (G) | Battery current sensor | Input | [Engine is running] • Battery: Fully charged*2 • Idle speed | 2.6 - 3.5V | F |
| 92 (G) | — | Sensor ground [Camshaft position sen- sor (PHASE) (bank 2)] | — | — | — | G |
| 93 (P) | 128 (B) | Power supply for ECM (Back-up) | Input | [Ignition switch: OFF] | BATTERY VOLTAGE (11 - 14V) | H |
| 94 (Y) | — | Sensor ground [Mass air flow sensor (bank 2)] | — | — | — | I |
| 95 (G) | — | Sensor ground (Battery current sensor) | — | — | — | J |
| 96 (P) | — | Sensor ground [Camshaft position sen- sor (PHASE) (bank 1), Manifold absolute pressure (MAP) sensor, Power steering pressure sensor] | — | — | — | HAC |
| 97 (R) | 100 (W) | Accelerator pedal posi- tion sensor 1 | Input | [Ignition switch: ON] • Engine stopped • Accelerator pedal: Fully released | 0.45 - 1.00V | K |
| | | | | [Ignition switch: ON] • Engine stopped • Accelerator pedal: Fully depressed | 4.2 - 4.8V | L |
| 98 (P) | 104 (GR) | Accelerator pedal posi- tion sensor 2 | Input | [Ignition switch: ON] • Engine stopped • Accelerator pedal: Fully released | 0.22 - 0.50V | M |
| | | | | [Ignition switch: ON] • Engine stopped • Accelerator pedal: Fully depressed | 2.1 - 2.5V | N |
| 99 (L) | 100 (W) | Sensor power supply (Accelerator pedal posi- tion sensor 1) | — | [Ignition switch: ON] | 5V | O |
| 100 (W) | — | Sensor ground (Accelerator pedal posi- tion sensor 1) | — | — | — | P |

ECM

< ECU DIAGNOSIS >

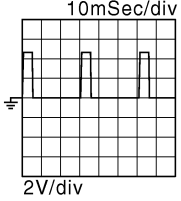
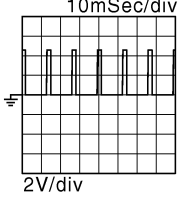
[AUTOMATIC AIR CONDITIONER]

| Terminal No. (Wire color) | | Description | Input/ Output | Condition | Value (Approx.) |
|------------------------------|-------------|---|------------------|--|--|
| + | -- | Signal name | | | |
| 101 (SB) | 108 (Y) | ICC steering switch (models with ICC sys- tem) | Input | [Ignition switch: ON] • ICC steering switch: OFF | 4.3V |
| | | | | [Ignition switch: ON] • MAIN switch: Pressed | 0V |
| | | | | [Ignition switch: ON] • CANCEL switch: Pressed | 1.3V |
| | | | | [Ignition switch: ON] • RESUME/ACCELERATE switch: Pressed | 3.7V |
| | | | | [Ignition switch: ON] • SET/COAST switch: Pressed | 3V |
| | | | | [Ignition switch: ON] • DISTANCE switch: Pressed | 2.2V |
| 101 (SB) | 108 (Y) | ASCD steering switch (models with ASCD sys- tem) | Input | [Ignition switch: ON] • ASCD steering switch: OFF | 4V |
| | | | | [Ignition switch: ON] • MAIN switch: Pressed | 0V |
| | | | | [Ignition switch: ON] • CANCEL switch: Pressed | 1V |
| | | | | [Ignition switch: ON] • RESUME/ACCELERATE switch: Pressed | 3V |
| | | | | [Ignition switch: ON] • SET/COAST switch: Pressed | 2V |
| 102 (GR) | 112 (SB) | EVAP control system pressure sensor | Input | [Ignition switch: ON] | 1.8 - 4.8V |
| 103 (G) | 104 (GR) | Sensor power supply (Accelerator pedal posi- tion sensor 2) | — | [Ignition switch: ON] | 5V |
| 104 (GR) | — | Sensor ground (Accelerator pedal posi- tion sensor 2) | — | — | — |
| 105 (L) | 116 (P) | Refrigerant pressure sensor | Input | [Engine is running] • Warm-up condition • Both A/C switch and blower fan motor switch: ON (Compressor operates) | 1.0 - 4.0V |
| 106 (W) | 128 (B) | Fuel tank temperature sensor | Input | [Engine is running] | 0 - 4.8V Output voltage varies with fuel tank temperature. |
| 107 (BR) | 112 (SB) | Sensor power supply (EVAP control system pressure sensor) | — | [Ignition switch: ON] | 5V |
| 108 (Y) | — | Sensor ground (ASCD/ICC steering switch) | — | — | — |
| 109 (G) | 128 (B) | PNP switch | Input | [Ignition switch: ON] • Selector lever: P or N (A/T), Neutral (M/ T) | BATTERY VOLTAGE (11 - 14V) |
| | | | | [Ignition switch: ON] • Selector lever: Except above | 0V |

ECM

< ECU DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

| Terminal No. (Wire color) | | Description | | Condition | Value (Approx.) |
|------------------------------|------------|--|------------------|--|---|
| + | -- | Signal name | Input/ Output | | |
| 110 (R) | 128 (B) | Engine speed output signal | Output | [Engine is running] • Warm-up condition • Idle speed NOTE: The pulse cycle changes depending on rpm at idle | 1V★  JMBIA0076GB |
| | | | | [Engine is running] • Engine speed is 2,000 rpm | 1V★  JMBIA0077GB |
| 111 (O) | 116 (P) | Sensor power supply (Refrigerant pressure sensor) | — | [Ignition switch: ON] | 5V |
| 112 (SB) | — | Sensor ground (EVAP control system pressure sensor) | — | — | — |
| 113 (P) | — | CAN communication line | Input/ Output | — | — |
| 114 (L) | — | CAN communication line | Input/ Output | — | — |
| 116 (P) | — | Sensor ground (Refrigerant pressure sensor) | — | — | — |
| 117 (V) | 128 (B) | Data link connector | Input/ Output | [Ignition switch: ON] • GST: Disconnected | 5V - BATTERY VOLTAGE (11 - 14V) |
| 121 (LG) | 128 (B) | EVAP canister vent control valve | Output | [Ignition switch: ON] | BATTERY VOLTAGE (11 - 14V) |
| 122 (P) | 128 (B) | Stop lamp switch | Input | [Ignition switch: OFF] • Brake pedal: Fully released | 0V |
| | | | | [Ignition switch: OFF] • Brake pedal: Slightly depressed | BATTERY VOLTAGE (11 - 14V) |
| 123 (B) 124 (B) | — | ECM ground | — | — | — |
| 125 (R) | 128 (B) | Power supply for ECM | Input | [Ignition switch: ON] | BATTERY VOLTAGE (11 - 14V) |
| 126 (BR) | 128 (B) | ICC brake switch (models with ICC system) ASCD brake switch (models with ASCD system) | Input | [Ignition switch: ON] • Brake pedal: Slightly depressed | 0V |
| | | | | [Ignition switch: ON] • Brake pedal: Fully released | BATTERY VOLTAGE (11 - 14V) |
| 127 (B) 128 (B) | — | ECM ground | — | — | — |

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

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

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

AUTO AMP.

< ECU DIAGNOSIS >

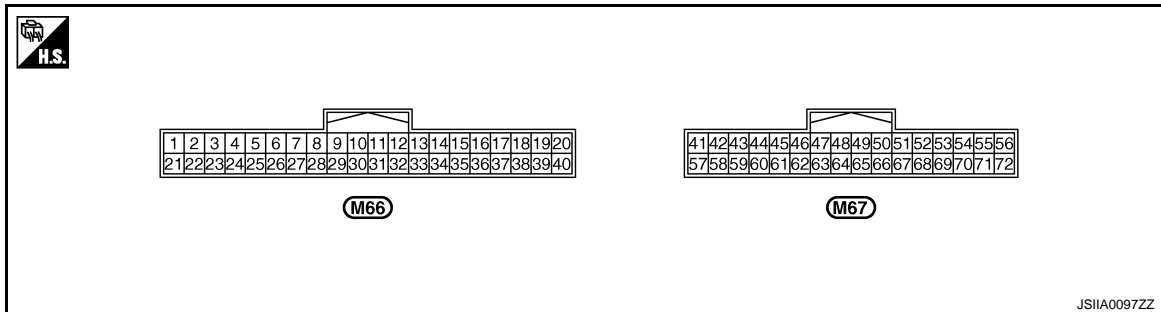
[AUTOMATIC AIR CONDITIONER]

AUTO AMP.

Reference Value

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TERMINAL LAYOUT



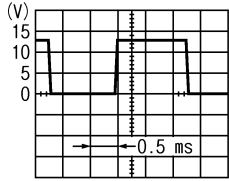
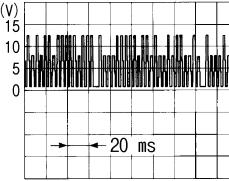
PHYSICAL VALUES

| Terminal No. (Wire color) | | Description | | Condition | Value (Approx.) |
|------------------------------|--------|-----------------------------|------------------|--|---|
| + | - | Signal name | Input/ Output | | |
| 38 (L) | Ground | Blower motor control signal | Output | <ul style="list-style-type: none"> Ignition switch ON Blower speed: 1st speed (manual) | <p style="text-align: right; font-size: small;">JSIIA0096ZZ</p> |
| 41 (V) | Ground | Power supply from ACC | — | Ignition switch ACC | Battery voltage |
| 43 (R) | Ground | Intake sensor | Input | — | — |
| 44 (LG) | Ground | In-vehicle sensor | Input | — | — |
| 45 (P) | Ground | Ambient sensor | Input | — | — |
| 46 (O) | Ground | Sunload sensor | Input | — | — |
| 53 (G) | Ground | Power supply from IGN | — | Ignition switch ON | Battery voltage |
| 54 (Y) | Ground | Power supply from BAT | — | Ignition switch OFF | Battery voltage |
| 55 (B) | Ground | Ground | — | Ignition switch ON | 0 V |
| 59 (GR) | Ground | Intake sensor ground | — | — | 0 V |
| 60 (L) | Ground | In-vehicle sensor ground | — | Ignition switch ON | 0 V |
| 61 (BR) | Ground | Ambient sensor ground | — | Ignition switch ON | 0 V |
| 62 (SB) | Ground | Sunload sensor ground | — | Ignition switch ON | 0 V |

AUTO AMP.

< ECU DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

| Terminal No. (Wire color) | | Description | | Condition | Value (Approx.) |
|------------------------------|--------|---------------------------------------|------------------|--|---|
| + | - | Signal name | Input/ Output | | |
| 65 (O) | Ground | ECV (Electrical Control Valve) signal | Output | <ul style="list-style-type: none"> Ignition switch ON Self-diagnosis. STEP-4 (Code No. 45) |  <p style="text-align: right; font-size: small;">SJIA1607E</p> |
| 69 (L) | Ground | A/C LAN signal | Input/ Output | Ignition switch ON |  <p style="text-align: right; font-size: small;">SJIA1453J</p> |
| 70 (R) | Ground | Power supply for each door motor | Output | Ignition switch ON | Battery voltage |
| 71 (B) | Ground | Ground | — | Ignition switch ON | 0 V |

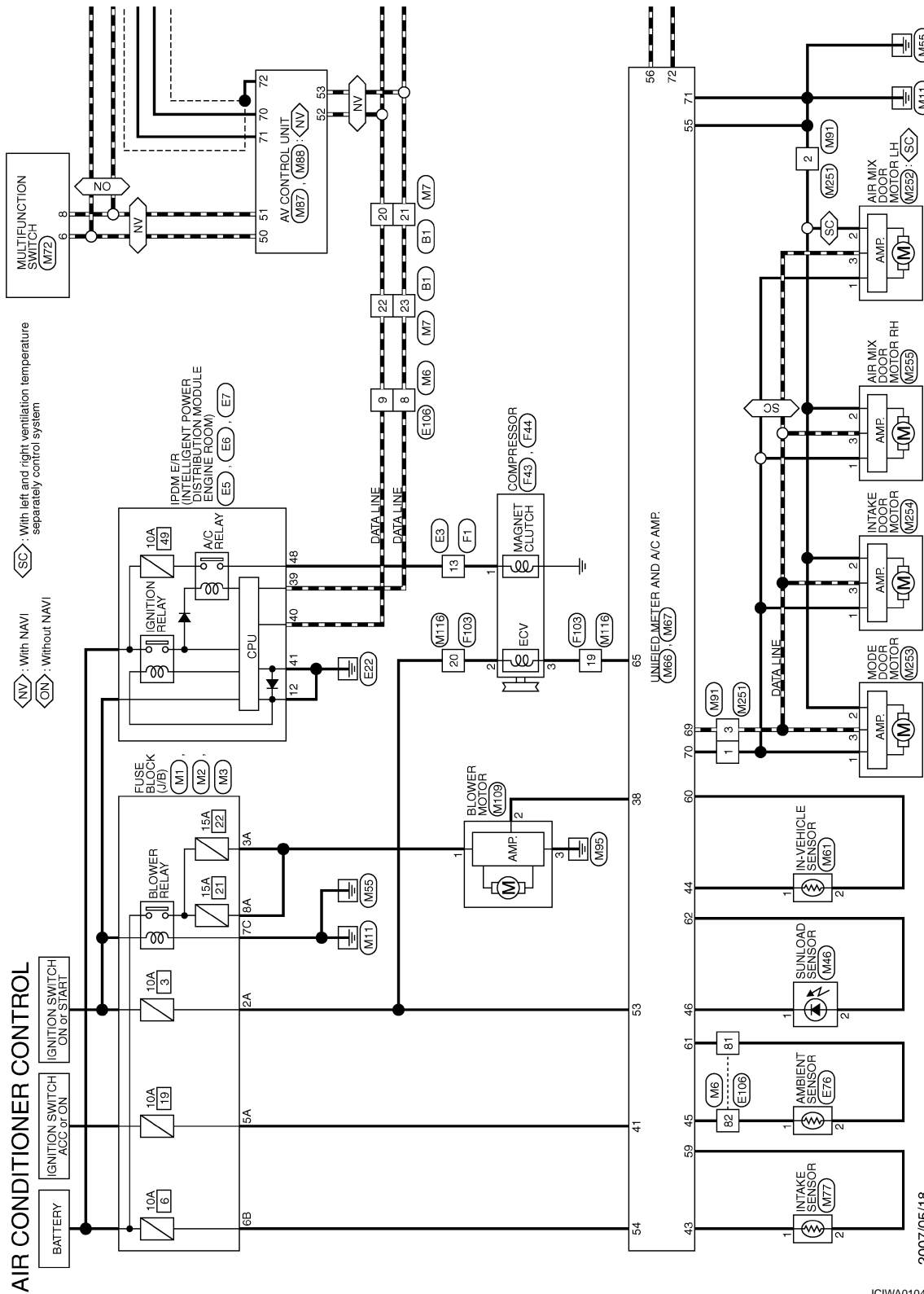
AUTO AMP.

< ECU DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

Wiring Diagram - AIR CONDITIONER CONTROL SYSTEM -

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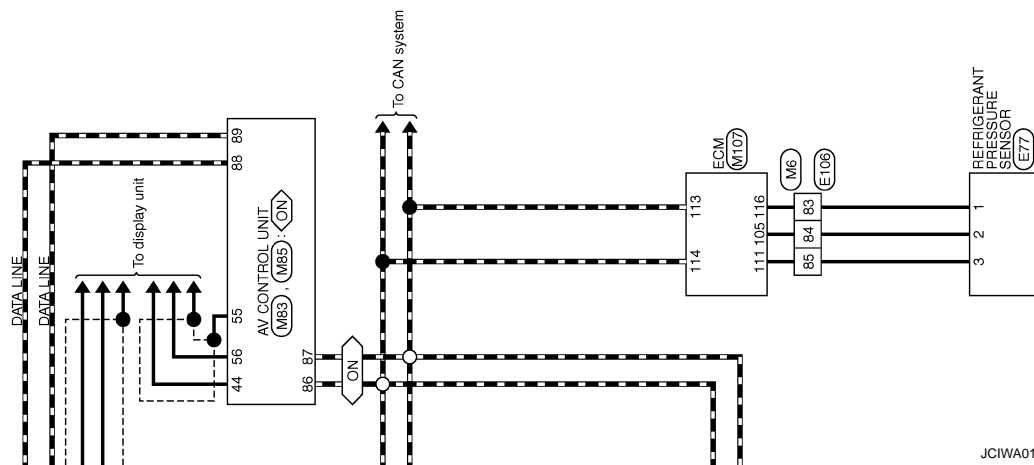
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AIR CONDITIONER CONTROL

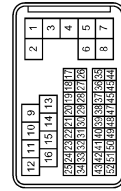
| | | | | | | |
|----------------------|--|-------------------|--|--|--|-----------------------------|
| Connector No. E1 | IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM) | TH02PW-CS12-M4 | | Terminal No. 20 21 22 23 | Color of Wire L P L P | Signal Name [Specification] |
| Connector No. E3 | WIRE TO WIRE | SAA38MB-RS3-S1Z8 | | Terminal No. 13 | Color of Wire BR | Signal Name [Specification] |
| Connector No. E5 | IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM) | TH02PW-CS12-M4-1V | | Terminal No. 12 | Color of Wire B/W | Signal Name [Specification] |
| Connector No. E6 | IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM) | TH02PW-NH | | Terminal No. 39 40 41 | Color of Wire P L B/W | Signal Name [Specification] |
| Connector No. E7 | IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM) | TH02PW-CS12-M4 | | Terminal No. 48 | Color of Wire BR | Signal Name [Specification] |
| Connector No. E16 | AMBIENT SENSOR | RS02FB | | Terminal No. 1 2 | Color of Wire G P | Signal Name [Specification] |
| Connector No. E17 | REFRIGERANT PRESSURE SENSOR | PK03FB | | Terminal No. 1 2 3 | Color of Wire V L O | Signal Name [Specification] |
| Connector No. E18 | WIRE TO WIRE | TH06PW-CS16-TM4 | | Terminal No. 8 9 81 82 83 84 85 | Color of Wire P L P G V L O | Signal Name [Specification] |

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AIR CONDITIONER CONTROL

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| Connector No. | F1 |
| Connector Name | WIRE TO WIRE |
| Connector Type | SAA38FB-RSS-SH2B |



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

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



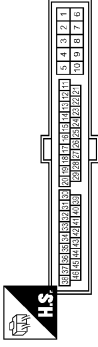
| | | | |
|-----------------------------|---|---|---|
| Terminal No. | 1 | L | - |
| Color of Wire | L | - | - |
| Signal Name [Specification] | | | |

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| Connector No. | F44 |
| Connector Name | COMPRESSOR |
| Connector Type | RK02FSY |



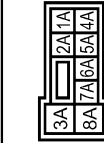
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|-----------------------------|---|---|---|
| Terminal No. | 2 | Y | - |
| Color of Wire | Y | O | - |
| Signal Name [Specification] | | | |

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| Connector No. | F103 |
| Connector Name | WIRE TO WIRE |
| Connector Type | TK38FW-NS/D |



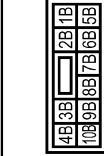
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|-----------------------------|----|---|---|
| Terminal No. | 19 | O | - |
| Color of Wire | O | Y | - |
| Signal Name [Specification] | | | |

| | |
|----------------|------------------|
| Connector No. | M1 |
| Connector Name | FUSE BLOCK (J/B) |
| Connector Type | NS08FW-M2 |



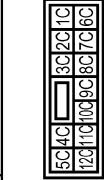
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| Terminal No. | 2A | G | - |
| Color of Wire | L | - | - |
| Signal Name [Specification] | | | |

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



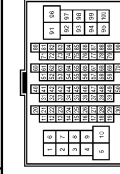
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| Terminal No. | 6B | Y | - |
| Color of Wire | Y | - | - |
| Signal Name [Specification] | | | |

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



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

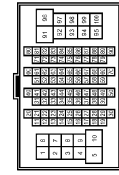
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|----------------|-----------------|
| Connector No. | M5 |
| Connector Name | WIRE TO WIRE |
| Connector Type | TR80MP-C516-TM4 |



| | | | |
|-----------------------------|---|---|---|
| Terminal No. | 8 | P | - |
| Color of Wire | L | R | - |
| Signal Name [Specification] | | | |

AIR CONDITIONER CONTROL

| | |
|----------------|------------------|
| Connector No. | M7 |
| Connector Name | WIRE TO WIRE |
| Connector Type | TH20WV-CSI 6-TM4 |



| Terminal No. | Color of Wire | Signal Name [Specification] |
|--------------|---------------|-----------------------------|
| 20 | L | - |
| 21 | P | - |
| 22 | L | - |
| 23 | P | - |

| | |
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| Connector No. | M46 |
| Connector Name | SUNLOAD SENSOR |
| Connector Type | K02EB |



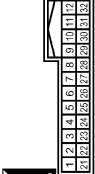
| Terminal No. | Color of Wire | Signal Name [Specification] |
|--------------|---------------|-----------------------------|
| 1 | O | - |
| 2 | SB | - |

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| Connector No. | M81 |
| Connector Name | IN-VEHICLE SENSOR |
| Connector Type | A02EW |



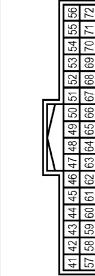
| Terminal No. | Color of Wire | Signal Name [Specification] |
|--------------|---------------|-----------------------------|
| 1 | LG | - |
| 2 | L | - |

| | |
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| Connector No. | M66 |
| Connector Name | UNIFIED METER AND A/C AMP. |
| Connector Type | TH40FW-NH |



| Terminal No. | Color of Wire | Signal Name [Specification] |
|--------------|---------------|-----------------------------|
| 33 | P | FAN PWM OUT |

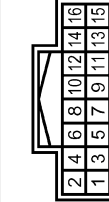
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|----------------|----------------------------|
| Connector No. | M67 |
| Connector Name | UNIFIED METER AND A/C AMP. |
| Connector Type | TH02FW-NH |



| Terminal No. | Color of Wire | Signal Name [Specification] |
|--------------|---------------|-----------------------------|
| 41 | L | ACC |
| 43 | R | INTAKE SENS |
| 44 | LG | INCAR SENS |
| 45 | V | AMB SENS |
| 46 | O | SUN SENS |
| 53 | W | IGN |
| 54 | Y | BAT |
| 55 | B | GND |
| 56 | L | CAN-H |
| 58 | GR | INTAKE SENS GND |
| 60 | L | INCAR SENS GND |

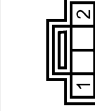
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|----|----|--------------|
| 61 | R | AMB SENS GND |
| 62 | SB | SUN SENS GND |
| 65 | O | COMP ECV |
| 69 | L | LAN SIG |
| 70 | R | VACTR |
| 71 | GR | GND |
| 72 | P | CAN-L |

| | |
|----------------|----------------------|
| Connector No. | M72 |
| Connector Name | MULTIFUNCTION SWITCH |
| Connector Type | TH16FW-NH |



| Terminal No. | Color of Wire | Signal Name [Specification] |
|--------------|---------------|-----------------------------|
| 6 | SB | AV COMM (H) |
| 8 | W | AV COMM (L) |

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| Connector No. | M77 |
| Connector Name | INTAKE SENSOR |
| Connector Type | TH03FW |



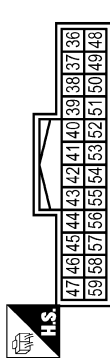
| Terminal No. | Color of Wire | Signal Name [Specification] |
|--------------|---------------|-----------------------------|
| 1 | R | - |
| 2 | GR | - |

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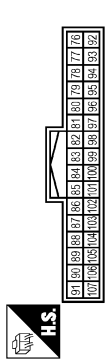
AIR CONDITIONER CONTROL

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|----------------|--------------------------------|
| Connector No. | M83 |
| Connector Name | AV CONTROL UNIT (WITHOUT NAVI) |
| Connector Type | TH24FW-NH |



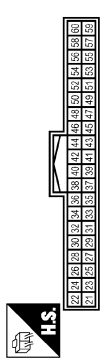
| Terminal No. | Color of Wire | Signal Name [Specification] |
|--------------|---------------|-----------------------------|
| 44 | G | COMM (DISP->CONT) |
| 55 | SHIELD | SHIELD |
| 56 | L | COMM (CONT->DISP) |

| | |
|----------------|--------------------------------|
| Connector No. | M85 |
| Connector Name | AV CONTROL UNIT (WITHOUT NAVI) |
| Connector Type | TH32FW-NH |



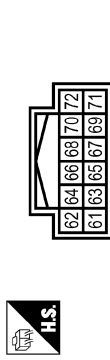
| Terminal No. | Color of Wire | Signal Name [Specification] |
|--------------|---------------|-----------------------------|
| 86 | L | GAN-H |
| 87 | P | GAN-L |
| 88 | V | AV COMM (H) |
| 89 | LG | AV COMM (L) |

| | |
|----------------|-----------------------------|
| Connector No. | M87 |
| Connector Name | AV CONTROL UNIT (WITH NAVI) |
| Connector Type | TH40FW-NH |



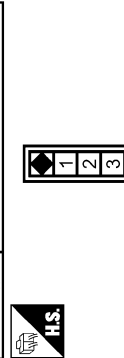
| Terminal No. | Color of Wire | Signal Name [Specification] |
|--------------|---------------|-----------------------------|
| 50 | V | AV COMM (H) |
| 51 | LG | AV COMM (L) |
| 52 | L | GAN-H |
| 53 | P | GAN-L |

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| Connector No. | M88 |
| Connector Name | AV CONTROL UNIT (WITH NAVI) |
| Connector Type | TH12FW-NH |



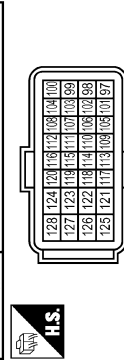
| Terminal No. | Color of Wire | Signal Name [Specification] |
|--------------|---------------|-----------------------------|
| 70 | BR | COMM (CONT->DISP) |
| 71 | Y | COMM (DISP->CONT) |
| 72 | SHIELD | SHIELD |

| | |
|----------------|--------------|
| Connector No. | M81 |
| Connector Name | WIRE TO WIRE |
| Connector Type | AC30MW-P |



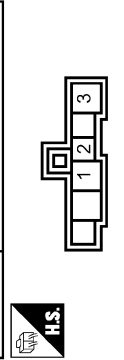
| Terminal No. | Color of Wire | Signal Name [Specification] |
|--------------|---------------|-----------------------------|
| 1 | R | - |
| 2 | B | - |
| 3 | L | - |

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



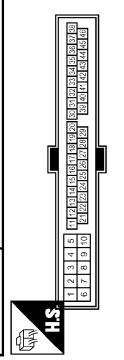
| Terminal No. | Color of Wire | Signal Name [Specification] |
|--------------|---------------|-----------------------------|
| 105 | L | PDPRESS |
| 111 | O | AVCCZ-PDPRESS |
| 113 | P | VEHCAN-L1 |
| 114 | L | VEHCAN-H1 |
| 116 | P | GNDA-PDPRES |

| | |
|----------------|--------------|
| Connector No. | M109 |
| Connector Name | BLOWER MOTOR |
| Connector Type | NS33FW-M3 |



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

| | |
|----------------|--------------|
| Connector No. | M116 |
| Connector Name | WIRE TO WIRE |
| Connector Type | TK33BMP-NS10 |


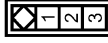


| Terminal No. | Color of Wire | Signal Name [Specification] |
|--------------|---------------|-----------------------------|
| 19 | O | - |
| 20 | Y | - |

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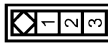
AIR CONDITIONER CONTROL

| | |
|----------------|--------------|
| Connector No. | M251 |
| Connector Name | WIRE TO WIRE |
| Connector Type | AG3FW |


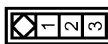
| Terminal No. | Color of Wire | Signal Name [Specification] |
|--------------|---------------|-----------------------------|
| 1 | L | - |
| 2 | B | - |
| 3 | L | - |

| | |
|----------------|-----------------------|
| Connector No. | M252 |
| Connector Name | AIR MIX DOOR MOTOR LH |
| Connector Type | AG3FW |


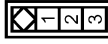
| Terminal No. | Color of Wire | Signal Name [Specification] |
|--------------|---------------|-----------------------------|
| 1 | L | - |
| 2 | B | - |
| 3 | L | - |

| | |
|----------------|-----------------|
| Connector No. | M253 |
| Connector Name | MODE DOOR MOTOR |
| Connector Type | AG3FW |


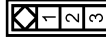
| Terminal No. | Color of Wire | Signal Name [Specification] |
|--------------|---------------|-----------------------------|
| 1 | L | - |
| 2 | B | - |
| 3 | L | - |

| | |
|----------------|-------------------|
| Connector No. | M254 |
| Connector Name | INTAKE DOOR MOTOR |
| Connector Type | AG3FW |

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

| | |
|----------------|-----------------------|
| Connector No. | M255 |
| Connector Name | AIR MIX DOOR MOTOR RH |
| Connector Type | AG3FW |

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

Fail-Safe

FAIL-SAFE FUNCTION

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

JCIWA0110GB

INFOID:000000001675739

AUTO AMP.

< ECU DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

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

AIR CONDITIONER CONTROL

[AUTOMATIC AIR CONDITIONER]

< SYMPTOM DIAGNOSIS >

SYMPTOM DIAGNOSIS

AIR CONDITIONER CONTROL

Diagnosis Chart By Symptom

INFOID:000000001675740

| Symptom | Reference | |
|---|---|--|
| A/C system does not activate. | Go to Trouble Diagnosis Procedure for A/C System. | HAC-101, "Diagnosis Procedure" |
| A/C system cannot be controlled. | Go to Preset Switch System. | AV-103, "Symptom Table" (BASE AUDIO WITHOUT NAVIGATION), AV-335, "Symptom Table" (BOSE AUDIO WITHOUT NAVIGATION) or AV-596, "Symptom Table" (BOSE AUDIO WITH NAVIGATION) |
| Air outlet does not change. | Go to Trouble Diagnosis Procedure for Mode Door Motor. (LAN) | HAC-67, "Diagnosis Procedure" |
| Mode door motor does not operate normally. | | |
| Discharge air temperature does not change. | Go to Trouble Diagnosis Procedure for Air Mix Door Motor. (LAN) | HAC-70, "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Procedure" (Without left and right ventilation temperature separately control system) or HAC-72, "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Procedure" (With left and right ventilation temperature separately control system) |
| Air mix door motor does not operate normally. | | |
| Intake door does not change. | Go to Trouble Diagnosis Procedure for Intake Door Motor. (LAN) | HAC-75, "Diagnosis Procedure" |
| Intake door motor does not operate normally. | | |
| Blower motor operation is malfunctioning. | Go to Trouble Diagnosis Procedure for Blower Motor. | HAC-77, "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Procedure" (Without left and right ventilation temperature separately control system) or HAC-81, "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Procedure" (With left and right ventilation temperature separately control system) |
| Magnet clutch does not engage. | Go to Trouble Diagnosis Procedure for Magnet Clutch. | HAC-85, "Diagnosis Procedure" |
| Insufficient cooling | Go to Trouble Diagnosis Procedure for Insufficient Cooling. | HAC-130, "Inspection procedure" |
| Insufficient heating | Go to Trouble Diagnosis Procedure for Insufficient Heating. | HAC-133, "Inspection procedure" |
| Noise | Go to Trouble Diagnosis Procedure for Noise. | HAC-135, "Inspection procedure" |
| Self-diagnosis cannot be performed. | Go to Trouble Diagnosis Procedure for Self-diagnosis. | HAC-137, "Inspection procedure" |
| Memory function does not operate. | Go to Trouble Diagnosis Procedure for Memory Function. | HAC-138, "Inspection procedure" |

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HAC

INSUFFICIENT COOLING

< SYMPTOM DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

INSUFFICIENT COOLING

Description

INFOID:000000001675741

Symptom

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

Inspection procedure

INFOID:000000001675742

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

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

Is there refrigerant?

- YES >> GO TO 2.
- NO-1 >> Check for refrigerant leakages with the refrigerant leakage detecting fluorescent leak detector. Refer to [HA-31, "Inspection"](#).
- NO-2 >> GO TO 2 after repairing or replacing the parts according to the inspection results.

2. CHECK CHARGED REFRIGERANT AMOUNT

1. Connect refrigerant recovery/recycling recharging equipment to the vehicle and discharge the refrigerant.
2. Recharge with the proper amount of refrigerant and perform the inspection with the refrigerant leakage detecting fluorescent leak detector. Refer to [HA-31, "Inspection"](#).

Is the inspection result normal?

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

3. CHECK REFRIGERANT CYCLE PRESSURE

Connect refrigerant recovery/recycling recharging equipment to the vehicle and perform the performance test. Refer to [HA-29, "Performance Chart"](#).

Is the inspection result normal?

- YES >> GO TO 4.
- NO >> Perform the diagnosis with the gauge pressure. Refer to [HA-7, "Trouble Diagnosis For Unusual Pressure"](#).

4. CHECK SETTING OF TEMPERATURE SETTING TRIMMER

Check the setting of temperature setting trimmer. Refer to [HAC-7, "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Temperature Setting Trimmer"](#) (Without left and right ventilation temperature separately control system) or [HAC-11, "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Temperature Setting Trimmer"](#) (With left and right ventilation temperature separately control system).

1. Check that the temperature setting trimmer is set to "+ direction".

NOTE:

The control temperature can be set with the setting of temperature setting trimmer.

2. Set temperature control dial to "0".

Are the symptoms solved?

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

5. PERFORM SELF-DIAGNOSIS STEP-2

Perform self-diagnosis STEP-2. Refer to [HAC-42, "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (Without left and right ventilation temperature separately control system) or [HAC-48, "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (With left and right ventilation temperature separately control system), see Nos. 1 to 2.

Does code No. 20 appear on the display?

- YES >> GO TO 6.

INSUFFICIENT COOLING

[AUTOMATIC AIR CONDITIONER]

< SYMPTOM DIAGNOSIS >

NO >> Go to appropriate malfunctioning sensor circuit. Refer to [HAC-42, "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (Without left and right ventilation temperature separately control system) or [HAC-48, "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (With left and right ventilation temperature separately control system), see No. 11.

6.PERFORM SELF-DIAGNOSIS STEP-4

Perform self-diagnosis STEP-4. Refer to [HAC-42, "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (Without left and right ventilation temperature separately control system) or [HAC-48, "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (With left and right ventilation temperature separately control system), see Nos.1 to 5.

Is it operated normally?

YES >> GO TO 7.

NO >> Perform the diagnosis applicable to each output device.

7.PERFORM SELF-DIAGNOSIS STEP-5

Perform self-diagnosis STEP-5. Refer to [HAC-42, "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (Without left and right ventilation temperature separately control system) or [HAC-48, "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (With left and right ventilation temperature separately control system), see Nos.1 to 10.

Is the inspection result normal?

YES >> GO TO 8.

NO >> Go to appropriate malfunctioning sensor circuit. Refer to [HAC-42, "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (Without left and right ventilation temperature separately control system) or [HAC-48, "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (With left and right ventilation temperature separately control system).

8.CHECK DRIVE BELT

Check the drive belt. Refer to [EM-12, "Checking"](#).

Is the inspection result normal?

YES >> GO TO 9.

NO >> Adjust or replace the drive belt.

9.CHECK AIR LEAKAGE FROM DUCT

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

Is the inspection result normal?

YES >> GO TO 10.

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

10.CHECK POWER SUPPLY FOR ECV (ELECTRIC CONTROL VALVE)

1. Disconnect compressor (ECV) connector.
2. Turn ignition switch ON.
3. Check voltage between compressor (ECV) harness connector and ground.

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

Is the inspection result normal?

YES >> GO TO 12.

NO >> GO TO 11.

11.CHECK FUSE

INSUFFICIENT COOLING

[AUTOMATIC AIR CONDITIONER]

< SYMPTOM DIAGNOSIS >

Check power supply circuit and 10A fuse [No. 3, located in the fuse block (J/B)]. Refer to [PG-91. "Fuse, Connector and Terminal Arrangement"](#).

Is the inspection result normal?

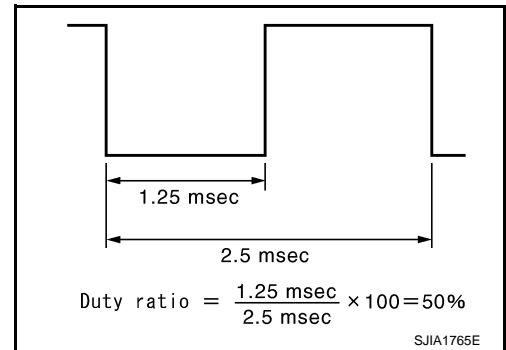
- YES >> Check harness for open circuit. Repair or replace if necessary.
- NO >> Replace fuse and check harness for short circuit. Repair or replace if necessary.

12. CHECK ECV CONTROL SIGNAL

1. Turn ignition switch OFF.
2. Reconnect compressor (ECV) connector.
3. Perform self-diagnosis. Refer to [HAC-42. "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (Without left and right ventilation temperature separately control system) or [HAC-48. "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (With left and right ventilation temperature separately control system).
4. Set in self-diagnosis STEP-4 (Code No. 45).
5. Confirm ECV control signal between unified meter and A/C amp harness connector M67 terminal 65 and ground using an oscilloscope.

Is the inspection result normal?

- YES >> Replace compressor.
- NO >> GO TO 13.



13. CHECK CIRCUIT CONTINUITY BETWEEN ECV AND UNIFIED METER AND A/C AMP.

1. Turn ignition switch OFF.
2. Disconnect compressor (ECV) connector and unified meter and A/C amp. connector.
3. Check continuity between compressor (ECV) harness connector and unified meter and A/C amp harness connector.

| Compressor (ECV) | | Unified meter and A/C amp. | | Continuity |
|------------------|----------|----------------------------|----------|------------|
| Connector | Terminal | Connector | Terminal | |
| F44 | 3 | M67 | 65 | Existed |

Is the inspection result normal?

- YES >> GO TO 14.
- NO >> Repair the harnesses or connectors.

14. CHECK ECV

Check continuity between compressor (ECV) connector.

| Compressor (ECV) | | | | Continuity |
|------------------|----------|-----------|----------|------------|
| Connector | Terminal | Connector | Terminal | |
| F44 | 2 | F44 | 3 | Existed |

Is the inspection result normal?

- YES >> Replace the unified meter and A/C amp.
- NO >> Replace the compressor.

INSUFFICIENT HEATING

< SYMPTOM DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

INSUFFICIENT HEATING

Description

INFOID:000000001675743

Symptom

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

Inspection procedure

INFOID:000000001675744

1.CHECK COOLING SYSTEM

1. Check engine coolant level and check for leakage. Refer to [CO-8, "Inspection"](#).
2. Check radiator cap. Refer to [CO-12, "RADIATOR CAP : Inspection"](#).
3. Check water flow sounds of engine coolant. Refer to [CO-9, "Refilling"](#).

Is the inspection result normal?

YES >> GO TO 2.

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

2.CHECK SETTING OF TEMPERATURE SETTING TRIMMER

1. Check the setting of temperature setting trimmer. Refer to [HAC-7, "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Temperature Setting Trimmer"](#) (Without left and right ventilation temperature separately control system) or [HAC-11, "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Temperature Setting Trimmer"](#) (With left and right ventilation temperature separately control system).
2. Check that the temperature setting trimmer is set to "– direction".

NOTE:

The control temperature can be set with the setting of temperature setting trimmer.

3. Set temperature control dial to "0".

Are the symptoms solved?

YES >> Perform the setting separately if necessary. END.

NO >> GO TO 3.

3.CHECK OPERATION

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

Is the inspection result normal?

YES >> END.

NO >> GO TO 4.

4.PERFORM SELF-DIAGNOSIS STEP-2

Perform self-diagnosis STEP-2. Refer to [HAC-42, "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (Without left and right ventilation temperature separately control system) or [HAC-48, "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (With left and right ventilation temperature separately control system), see Nos. 1 to 2.

Does code No. 20 appear on the display?

YES >> GO TO 5.

NO >> Go to appropriate malfunctioning sensor circuit. Refer to [HAC-42, "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (Without left and right ventilation temperature separately control system) or [HAC-48, "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (With left and right ventilation temperature separately control system), see No. 11.

5.PERFORM SELF-DIAGNOSIS STEP-4

Perform self-diagnosis STEP-4. Refer to [HAC-42, "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (Without left and right ventilation temperature separately control system) or [HAC-48, "WITH LEFT AND RIGHT VENTILATION TEMPERATURE](#)

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INSUFFICIENT HEATING

[AUTOMATIC AIR CONDITIONER]

< SYMPTOM DIAGNOSIS >

[SEPARATELY CONTROL SYSTEM : Diagnosis Description](#) (With left and right ventilation temperature separately control system), see Nos. 1 to 5.

Is it installed normally?

YES >> GO TO 6.

NO >> Perform the diagnosis applicable to each output device.

6.PERFORM SELF-DIAGNOSIS STEP-5

Perform self-diagnosis STEP-5. Refer to [HAC-42. "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description](#)" (Without left and right ventilation temperature separately control system) or [HAC-48. "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description](#)" (With left and right ventilation temperature separately control system).

Is the inspection result normal?

YES >> GO TO 7.

NO >> Go to appropriate malfunctioning sensor circuit. Refer to [HAC-42. "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description](#)" (Without left and right ventilation temperature separately control system) or [HAC-48. "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description](#)" (With left and right ventilation temperature separately control system).

7.CHECK AIR LEAKAGE FROM DUCT

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

Is the inspection result normal?

YES >> GO TO 8.

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

8.CHECK HEATER HOSE INSTALLATION CONDITION

Check the heater hose installation condition visually (for twist, crush, etc.).

Is the inspection result normal?

YES >> GO TO 9.

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

9.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:

The temperature inspection should be performed in a short time because the engine coolant temperature is too hot.

Is the inspection result normal?

YES >> GO TO 10.

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

10.REPLACE HEATER CORE

Replace the heater core. Refer to heater core. Refer to [VTL-42. "Exploded View"](#).

Are the symptoms solved?

YES >> END

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

NOISE**Description**

INFOID:000000001675746

Symptom

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

Inspection procedure

INFOID:000000001675746

1.CHECK OPERATION

1. Operate the A/C system and check the operation. Refer to [HAC-6. "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Description & Inspection"](#) (Without left and right ventilation temperature separately control system) or [HAC-9. "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Description & Inspection"](#) (With left and right ventilation temperature separately control system).
2. Check the parts where noise is occurring.

Can the parts where noise is occurring be checked?

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

2.CHECK BLOWER MOTOR

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

Is the inspection result normal?

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

3.REPLACE COMPRESSOR

1. Correct the refrigerant with refrigerant 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 compressor again.

Is the inspection result normal?

- YES >> END.
 NO >> Replace compressor.

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 malfunctioning part(s).

5.REPLACE EXPANSION VALVE

1. Correct the refrigerant with refrigerant 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 symptoms solved?

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

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

NOISE

[AUTOMATIC AIR CONDITIONER]

< SYMPTOM DIAGNOSIS >

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

Is the inspection result normal?

YES >> Fix the line with rubber or come vibration absorbing material.

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

7.CHECK DRIVE BELT

Check tension of the drive belt. Refer to [EM-12. "Checking"](#).

Is the inspection result normal?

YES >> Check the noise from compressor: GO TO 3.

NO >> Adjust or replace the drive belt according to the inspection results.

SELF-DIAGNOSIS CANNOT BE PERFORMED

< SYMPTOM DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

SELF-DIAGNOSIS CANNOT BE PERFORMED

Description

INFOID:000000001675747

Symptom: Self-diagnosis function does not operate normally.

Inspection procedure

INFOID:000000001675748

1. CHECK SELF-DIAGNOSIS FUNCTION

1. Turn ignition switch ON.
2. Set in self-diagnosis mode as per the following. Within 10 seconds after starting engine (ignition switch is turned ON.), press OFF switch for at least 5 seconds.

NOTE:

- If battery voltage drops below 12 V during diagnosis STEP-3, door motor speed becomes slower and as a result, the system may generate an error even when operation is normal. Start engine before performing this diagnosis to avoid this.
- Former STEP-1 (LEDs and display screen are checked) does not exist in this self-diagnosis function.
- OFF switch may not be recognized according to the timing of pressing it. Operate OFF switch after turning the intake switch LEDs (REC/FRE) ON.

Does self-diagnosis function operate?

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

2. CHECK POWER SUPPLY AND GROUND CIRCUIT OF UNIFIED METER AND A/C AMP.

Check power supply and ground circuit of unified meter and A/C amp. Refer to [HAC-101. "Diagnosis Procedure"](#).

Is the inspection result normal?

- YES >> Replace unified meter and A/C amp.
NO >> Repair or replace malfunctioning part(s).

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MEMORY FUNCTION DOES NOT OPERATE

< SYMPTOM DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

MEMORY FUNCTION DOES NOT OPERATE

Description

INFOID:000000001675749

Symptom

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

Inspection procedure

INFOID:000000001675750

1. CHECK OPERATION

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

Is the inspection result normal?

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

2. CHECK POWER SUPPLY AND GROUND CIRCUIT OF UNIFIED METER AND A/C AMP

Check power supply and ground circuit of unified meter and A/C amp. Refer to [HAC-101, "Diagnosis Procedure"](#).

Is the inspection result normal?

- YES >> Replace unified meter and A/C amp.
NO >> Repair or replace malfunctioning part(s).

PRECAUTION

PRECAUTIONS

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

INFOID:000000001714454

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

WARNING:

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

Precaution Necessary for Steering Wheel Rotation after Battery Disconnect

INFOID:000000001714455

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.

This vehicle is equipped with a push-button ignition switch and a 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 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. Carry the Intelligent Key or insert it to the key slot and 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:000000001911034

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.

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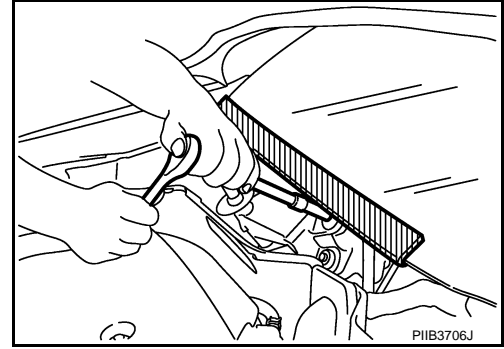
< PRECAUTION >

[AUTOMATIC AIR CONDITIONER]

Precaution for Procedure without Cowl Top Cover

INFOID:000000001714456

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



Precautions For Xenon Headlamp Service

INFOID:000000001714457

WARNING:

Comply with the following warnings to prevent any serious accident.

- Disconnect the battery cable (negative terminal) or the power supply fuse before installing, removing, or touching the xenon headlamp (bulb included). The xenon headlamp contains high-voltage generated parts.
- Never work with wet hands.
- Check the xenon headlamp ON-OFF status after assembling it to the vehicle. Never turn the xenon headlamp ON in other conditions. Connect the power supply to the vehicle-side connector. (Turning it ON outside the lamp case may cause fire or visual impairments.)
- Never touch the bulb glass immediately after turning it OFF. It is extremely hot.

CAUTION:

Comply with the following cautions to prevent any error and malfunction.

- Install the xenon bulb securely. (Insufficient bulb socket installation may melt the bulb, the connector, the housing, etc. by high-voltage leakage or corona discharge.)
- Never perform HID circuit inspection with a tester.
- Never touch the xenon bulb glass with hands. Never put oil and grease on it.
- Dispose of the used xenon bulb after packing it in thick vinyl without breaking it.
- Never wipe out dirt and contamination with organic solvent (thinner, gasoline, etc.).

Working with HFC-134a (R-134a)

INFOID:000000001714496

CAUTION:

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

CONTAMINATED REFRIGERANT

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

- Explain to the customer that environmental regulations prohibit the release of contaminated refrigerant into the atmosphere.

PRECAUTIONS

< PRECAUTION >

[AUTOMATIC AIR CONDITIONER]

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

General Refrigerant Precaution

INFOID:000000001714497

WARNING:

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

Refrigerant Connection

INFOID:000000001714498

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

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

ABOUT ONE-TOUCH JOINT

Description

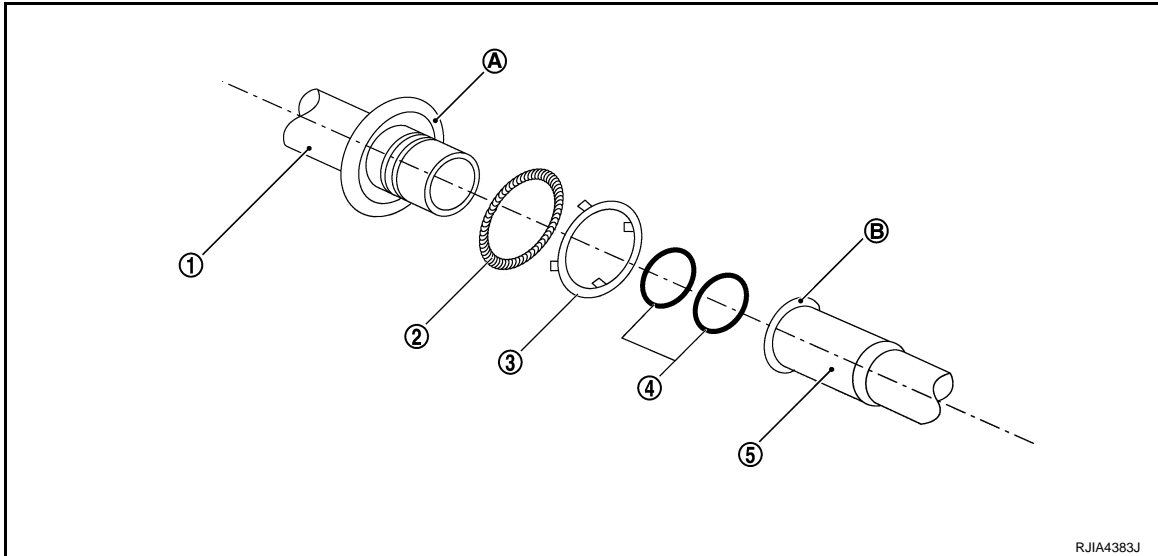
- One-touch joints are pipe joints which do not require tools during piping connection.
- Unlike conventional connection methods using union nuts and flanges, controlling tightening torque at connection point is not necessary.
- Use a disconnecter when removing a pipe joint.

PRECAUTIONS

[AUTOMATIC AIR CONDITIONER]

< PRECAUTION >

COMPONENT PARTS



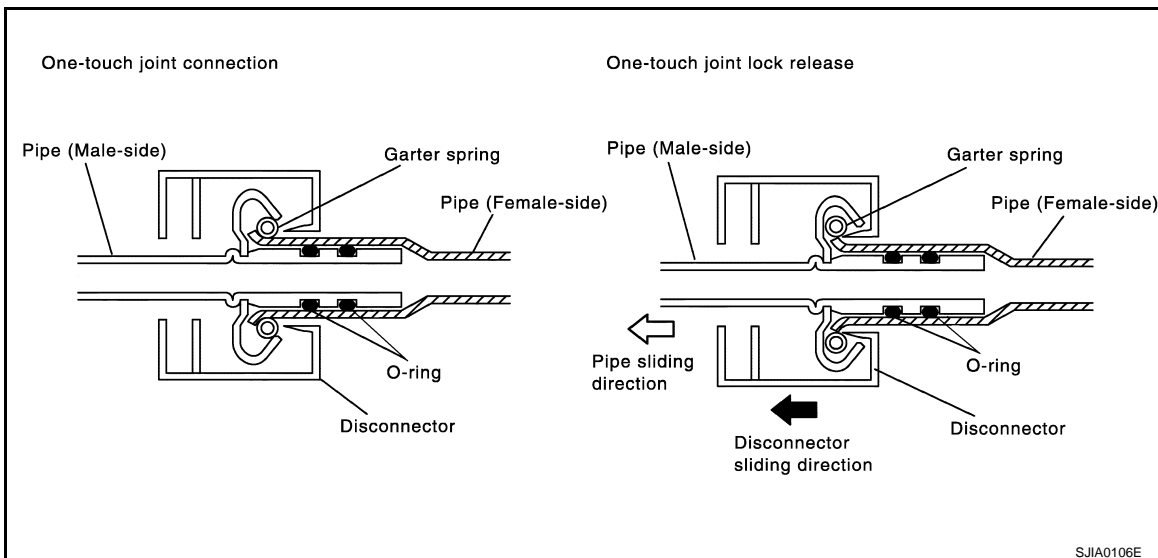
FUNCTIONS OF COMPONENT PARTS

| | | |
|---|--------------------|--|
| 1 | Pipe (Male-side) | <ul style="list-style-type: none"> Retains O-rings. Retains garter spring in cage (A). |
| 2 | Garter spring | Anchors female-side piping. |
| 3 | Indicator ring | When connection is made properly, this is ejected from male-side piping. (This part is no longer necessary after connection.) |
| 4 | O-ring | Seals connection point. (Not reusable) |
| 5 | Pipe (Female-side) | <ul style="list-style-type: none"> Seals connection by compressing O-rings. Anchors piping connection using flare (B) and garter spring. |

NOTE:

- Garter spring cannot be removed from cage of male-side piping.
- Indicator ring remains near piping connection point, however, this is not a malfunction. (This is to check piping connection during factory assembly.)

REMOVAL



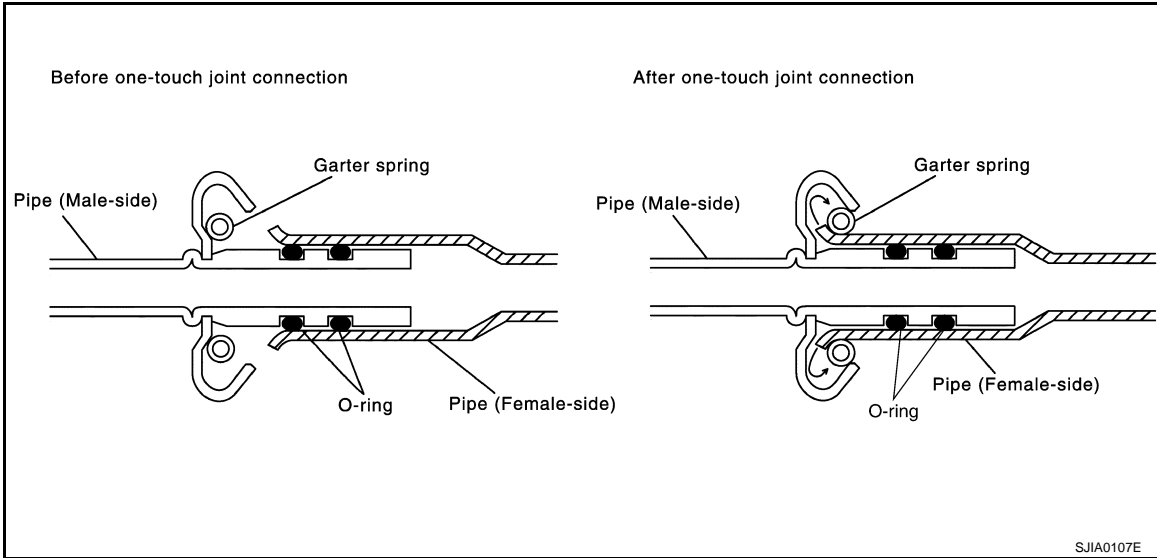
- Clean piping connection point, and set a disconnector.
- Slide disconnector in axial direction of piping, and stretch garter spring with tapered point of disconnector.
- Slide disconnector farther so that inside diameter of garter spring becomes larger than outside diameter of female-side piping flare. Then male-side piping can be disconnected.

PRECAUTIONS

< PRECAUTION >

[AUTOMATIC AIR CONDITIONER]

INSTALLATION



1. Clean piping connection points, and insert male-side piping into female-side piping.
2. Push inserted male-side piping harder so that female-side piping flare stretches garter spring.
3. Garter spring seats on flare if inside diameter of garter spring becomes larger than outside diameter of female-side piping flare. Then, it fits in between male-side piping cage and female-side piping flare to anchor piping connection point.

NOTE:

When garter spring seats on flare, and fits in between male-side piping cage and female-side piping flare, it clicks.

CAUTION:

- Female-side piping connection point is thin and easy to deform. Slowly insert the male-side piping straight in axial direction.
- Insert piping securely until a click is heard.
- After piping connection is completed, pull male-side piping by hand to make sure that connection does not come loose.

NOTE:

One-touch joint connection is used in points below.

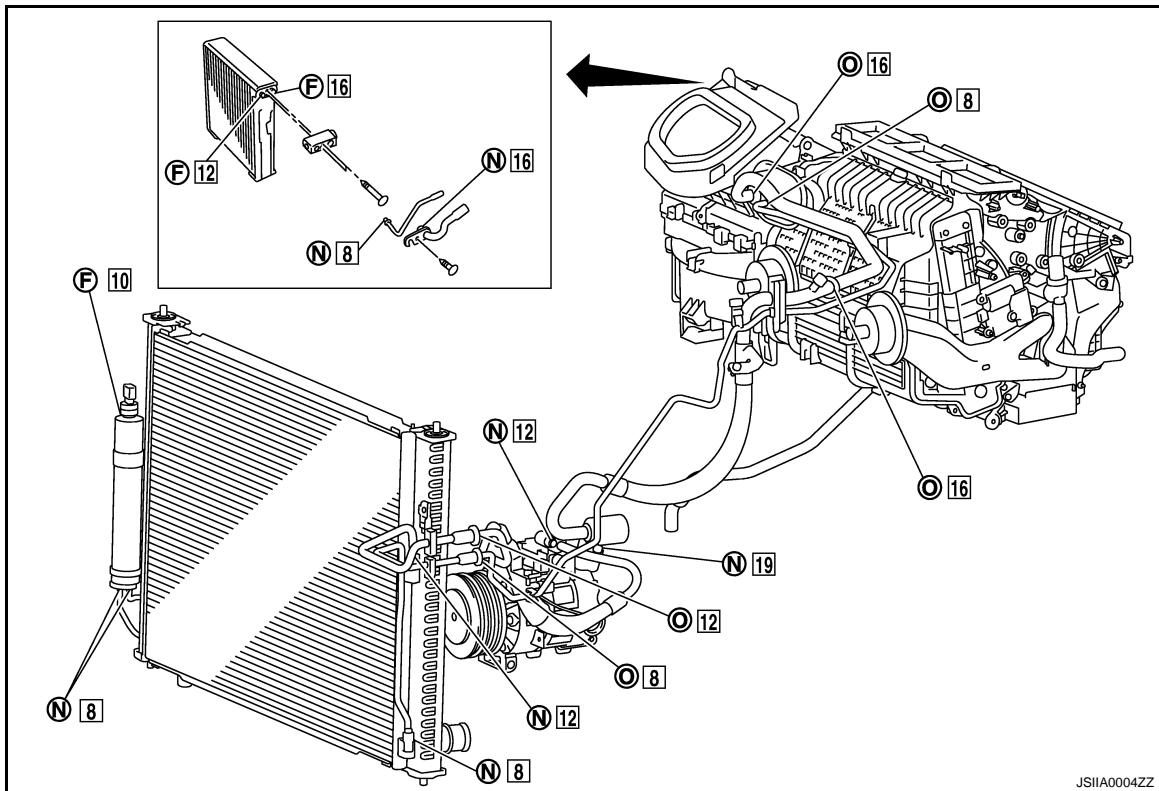
- Low-pressure flexible hose to low-pressure pipe 2 (O-ring size: 16)
- Low-pressure pipe 1 to low-pressure pipe 2 (O-ring size: 16)
- High-pressure flexible hose to condenser pipe assembly (O-ring size: 12)
- High-pressure pipe 1 to high-pressure pipe 2 (O-ring size: 8)
- High-pressure pipe 1 to condenser pipe assembly (O-ring size: 8)

O-RING AND REFRIGERANT CONNECTION

PRECAUTIONS

< PRECAUTION >

[AUTOMATIC AIR CONDITIONER]



F. Former type refrigerant connection N. New type refrigerant connection O. One-touch joint
 □: O-ring size

CAUTION:

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

O-Ring Part Numbers and Specifications

| Connection type | Piping connection point | | Part number | QTY | O-ring size |
|-----------------|--|--------|-------------|-----|-------------|
| New | Low-pressure flexible hose to low-pressure pipe 2 (One-touch joint) | | 92473 N8221 | 2 | 16 |
| | High-pressure pipe 1 to high-pressure pipe 2 (One-touch joint) | | 92471 N8221 | 2 | 8 |
| | Condenser pipe assembly to high-pressure flexible hose (One-touch joint) | | 92472 N8221 | 2 | 12 |
| | Condenser pipe assembly to high-pressure pipe 1 (One-touch joint) | | 92471 N8221 | 2 | 8 |
| | Radiator & condenser assembly to condenser pipe assembly | Inlet | 92472 N8210 | 1 | 12 |
| | | Outlet | 92471 N8210 | 1 | 8 |
| | Low-pressure pipe 1 to low-pressure pipe 2 | | 92473 N8210 | 1 | 16 |
| | Low-pressure pipe 1 to expansion valve | | 92473 N8210 | 1 | 16 |
| | High-pressure pipe 2 to expansion valve | | 92471 N8210 | 1 | 8 |
| | Compressor to low-pressure flexible hose | | 92474 N8210 | 1 | 19 |
| | Compressor to high-pressure flexible hose | | 92472 N8210 | 1 | 12 |
| | Liquid tank to radiator & condenser assembly | Inlet | 92471 N8210 | 1 | 8 |
| Outlet | | 1 | | | |

PRECAUTIONS

< PRECAUTION >

[AUTOMATIC AIR CONDITIONER]

| Connection type | Piping connection point | | Part number | QTY | O-ring size |
|-----------------|--|--------|-------------|-----|-------------|
| Former | Refrigerant pressure sensor to liquid tank | | J2476 89956 | 1 | 10 |
| | Expansion valve to evaporator | Inlet | 92475 71L00 | 1 | 12 |
| | | Outlet | 92475 72L00 | 1 | 16 |

WARNING:

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

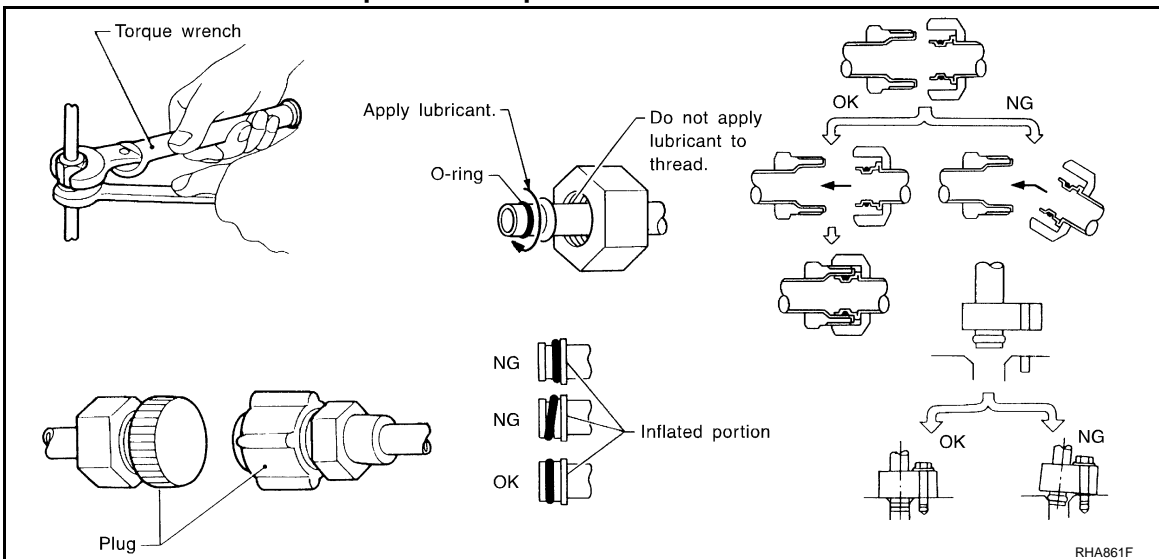
CAUTION:

Observe the following when replacing or cleaning refrigerant cycle components.

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

Name : Nissan A/C System Oil Type S

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



Service Equipment

INFOID:000000001714501

RECOVERY/RECYCLING EQUIPMENT

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

ELECTRICAL LEAK DETECTOR

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

VACUUM PUMP

PRECAUTIONS

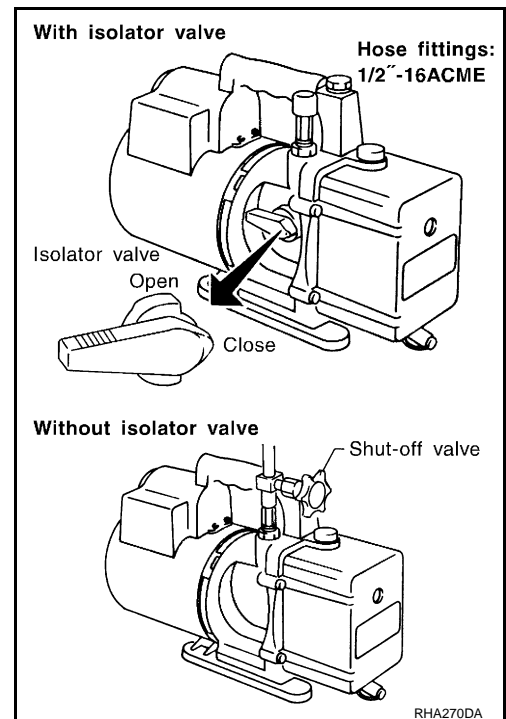
< PRECAUTION >

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

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

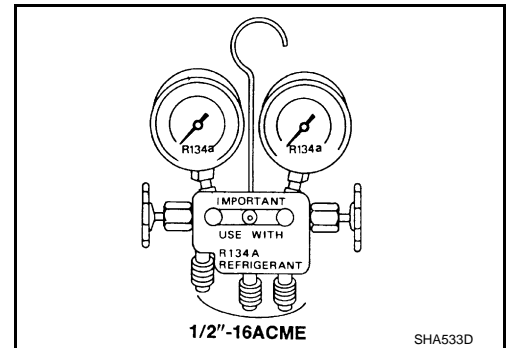
Some one-way valves open when vacuum is applied and close under no vacuum condition. Such valves may restrict the pump's ability to pull a deep vacuum and are not recommended.

[AUTOMATIC AIR CONDITIONER]



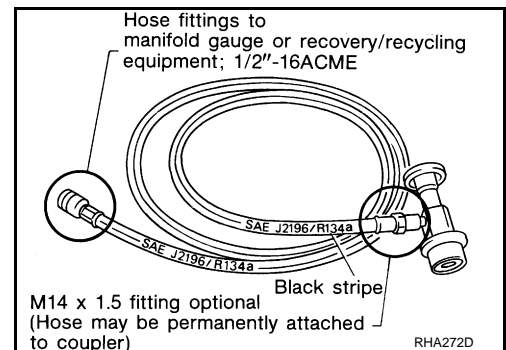
MANIFOLD GAUGE SET

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



SERVICE HOSES

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



SERVICE COUPLERS

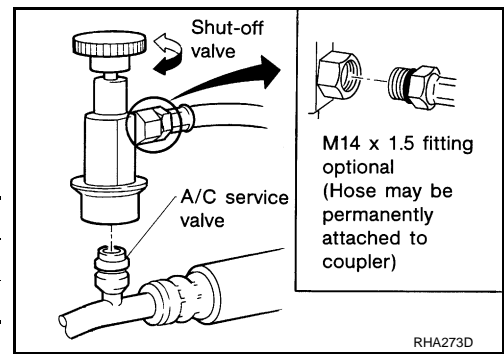
PRECAUTIONS

< PRECAUTION >

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

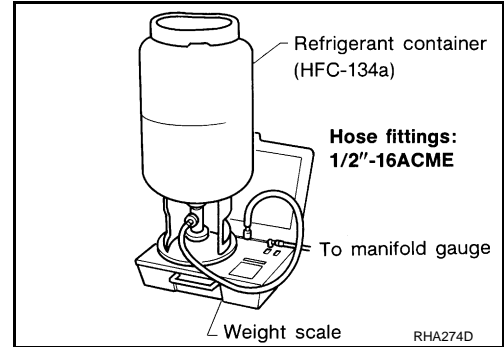
| Shut-off valve rotation | A/C service valve |
|-------------------------|-------------------|
| Clockwise | Open |
| Counterclockwise | Close |

[AUTOMATIC AIR CONDITIONER]



REFRIGERANT WEIGHT SCALE

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



CHARGING CYLINDER

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

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COMPRESSOR

General Precautions

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CAUTION:

- Plug all openings to prevent moisture and foreign matter from entering.
- Store it in the same way as it is when mounted on the car when the compressor is removed.
- Follow “Maintenance of Lubricant Quantity in Compressor” exactly when replacing or repairing compressor. Refer to [HA-26, "Maintenance of Lubricant Quantity"](#).
- Keep friction surfaces between clutch and pulley clean. Wipe it off by using a clean waste cloth moistened with thinner if the surface is contaminated with lubricant.
- Turn the compressor shaft by hand more than five turns in both directions after compressor service operation. This distributes equally lubricant inside the compressor. Let the engine idle and operate the compressor for one hour after the compressor is installed.
- Apply voltage to the new one and check for normal operation after replacing the compressor magnet clutch.

LEAK DETECTION DYE

< PRECAUTION >

[AUTOMATIC AIR CONDITIONER]

LEAK DETECTION DYE

General Precautions

INFOID:000000001714507

CAUTION:

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

IDENTIFICATION

NOTE:

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

IDENTIFICATION LABEL FOR VEHICLE

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

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