

SECTION HAC

HEATER & AIR CONDITIONING CONTROL SYSTEM

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DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

[AUTOMATIC AIR CONDITIONER]

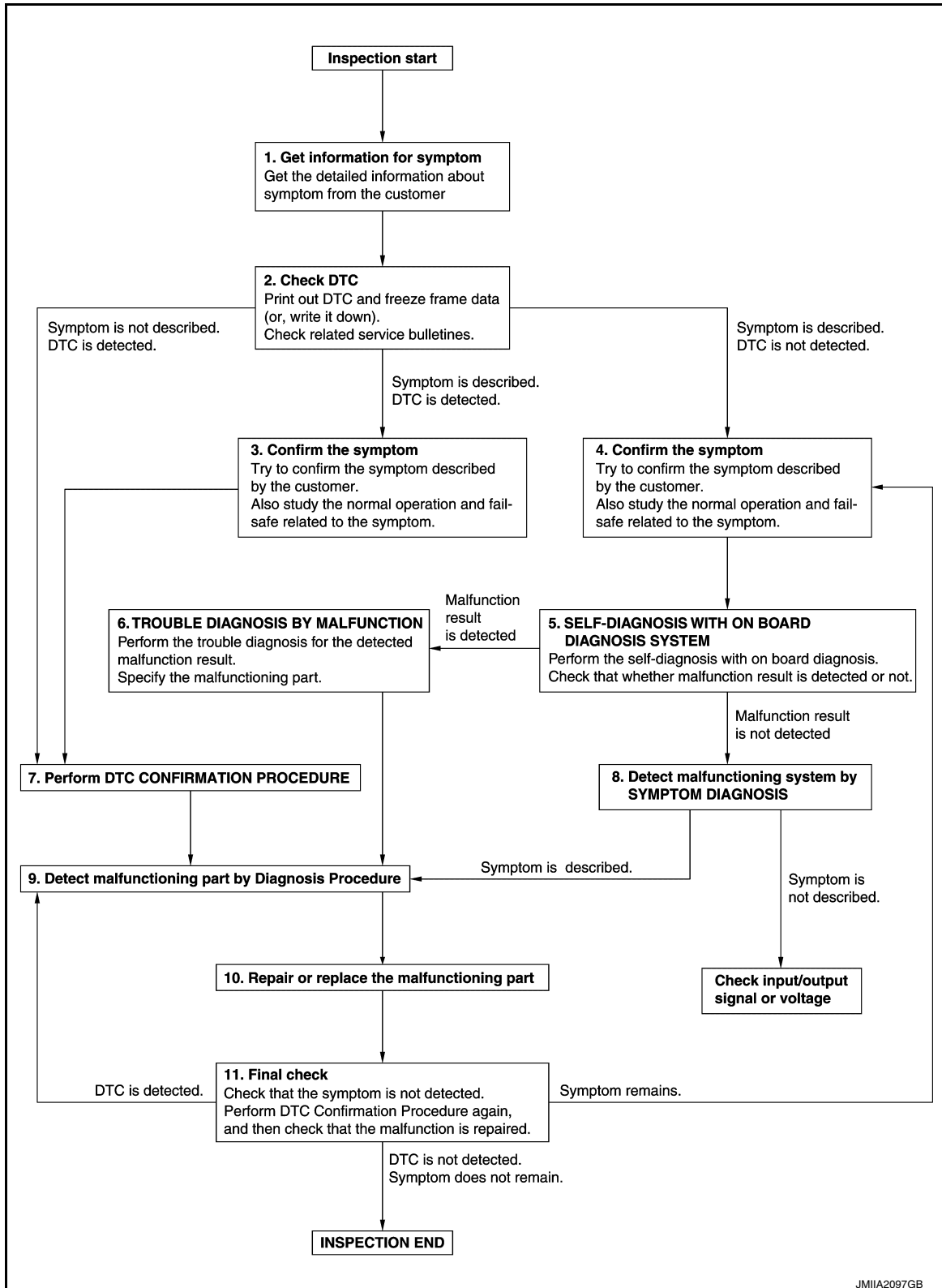
BASIC INSPECTION

DIAGNOSIS AND REPAIR WORKFLOW

Work Flow

INFOID:0000000010581326

OVERALL SEQUENCE



JMIIA2097GB

DETAILED FLOW

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

[AUTOMATIC AIR CONDITIONER]

1.GET INFORMATION FOR SYMPTOM

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

>> GO TO 2.

2.CHECK DTC

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

Are any symptoms described and any DTC detected?

Symptom is described, DTC is detected>>GO TO 3.

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

Symptom is not described, DTC is detected>>GO TO 7.

3.CONFIRM THE SYMPTOM

Try to confirm the symptom described by the customer.

Also study the normal operation and fail-safe related to the symptom.

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

>> GO TO 7.

4.CONFIRM THE SYMPTOM

Try to confirm the symptom described by the customer.

Also study the normal operation and fail-safe related to the symptom.

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

>> GO TO 5.

5.SELF-DIAGNOSIS WITH ON BOARD DIAGNOSIS SYSTEM

Perform the self-diagnosis with on board diagnosis. Check that whether malfunction result is detected or not.

Is malfunction result detected?

YES >> GO TO 6.

NO >> GO TO 8.

6.TROUBLE DIAGNOSIS BY MALFUNCTION

Perform the trouble diagnosis for the detected malfunction result. Specify the malfunctioning part.

>> GO TO 9.

7.PERFORM DTC CONFIRMATION PROCEDURE

Perform DTC CONFIRMATION PROCEDURE for the detected DTC, and then check that DTC is detected again. At this time, always connect CONSULT to the vehicle, and check self diagnostic results in real time.

If two or more DTCs are detected, refer to DTC INSPECTION PRIORITY CHART, and determine trouble diagnosis order.

NOTE:

- Freeze frame data is useful if the DTC is not detected.
- Perform Component Function Check if DTC CONFIRMATION PROCEDURE is not included on Service Manual. This simplified check procedure is an effective alternative though DTC cannot be detected during this check.

If the result of Component Function Check is NG, it is the same as the detection of DTC by DTC CONFIRMATION PROCEDURE.

Is DTC detected?

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

[AUTOMATIC AIR CONDITIONER]

YES >> GO TO 9.

NO >> Check according to [GI-47, "Intermittent Incident"](#).

8.DETECT MALFUNCTIONING SYSTEM BY SYMPTOM DIAGNOSIS

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

Is the symptom described?

YES >> GO TO 9.

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

9.DETECT MALFUNCTIONING PART BY DIAGNOSIS PROCEDURE

Inspect according to Diagnosis Procedure of the system.

Is malfunctioning part detected?

YES >> GO TO 10.

NO >> Check according to [GI-47, "Intermittent Incident"](#).

10.REPAIR OR REPLACE THE MALFUNCTIONING PART

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

>> GO TO 11.

11.FINAL CHECK

When DTC is detected in step 2, perform DTC CONFIRMATION PROCEDURE again, and then check that the malfunction is repaired securely.

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

Is DTC detected and does symptom remain?

YES-1 >> DTC is detected: GO TO 9.

YES-2 >> Symptom remains: GO TO 4.

NO >> Before returning the vehicle to the customer, always erase DTC.

INSPECTION AND ADJUSTMENT

< BASIC INSPECTION >

[AUTOMATIC AIR CONDITIONER]

INSPECTION AND ADJUSTMENT WITHOUT ACCS

WITHOUT ACCS : Description & Inspection

INFOID:0000000010581327

DESCRIPTION

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

Conditions : Engine running at normal operating temperature

INSPECTION PROCEDURE

1.CHECK MEMORY FUNCTION

1. Start the engine.
2. Turn temperature control dial (driver side) clockwise until 32.0°C (90°F) is displayed.
3. Press the OFF switch.
4. Turn the ignition switch OFF.
5. Turn the ignition switch ON.
6. Press the AUTO switch.
7. Check that the temperature setting before turning the ignition switch OFF is stored.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Memory function malfunction: [HAC-177. "Inspection procedure"](#).

2.CHECK BLOWER MOTOR SPEED

1. Start the engine.
2. Press fan (UP: +) switch. Check that the fan speed changes. Check the operation for all fan speeds.
3. Set the fan speed to max speed.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Blower motor system malfunction: [HAC-82. "Diagnosis Procedure"](#).

3.CHECK DISCHARGE AIR

1. Press the MODE switch and the DEF switch.
2. Each position indicator should change shape.
3. Confirm that discharge air comes out according to the air distribution table as follows:

Discharge air flow						
Mode position indication	Condition	Air outlet/distribution				
		VENT		FOOT		DEF
		Front	Rear	Front	Rear	
	DUAL switch: OFF Rear ventilator : OPEN	89%	11%	—	—	—
		45%	11%	26%	18%	—
		13%	11%	32%	19%	25%
		10%	10%	28%	17%	35%
		17%	—	—	—	83%

JSIIA1208GB

NOTE:

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

Is the inspection result normal?

YES >> GO TO 4.

NO >> Mode door system malfunction: [HAC-72. "Diagnosis Procedure"](#).

INSPECTION AND ADJUSTMENT

< BASIC INSPECTION >

[AUTOMATIC AIR CONDITIONER]

4. CHECK INTAKE AIR

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

NOTE:

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

Is the inspection result normal?

YES >> GO TO 5.

NO >> Intake door system malfunction: [HAC-78, "WITHOUT ACCS : Diagnosis Procedure"](#).

5. CHECK A/C SWITCH

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

Is the inspection result normal?

YES >> GO TO 6.

NO >> Magnet clutch system malfunction: [HAC-86, "Diagnosis Procedure"](#).

6. CHECK WITH TEMPERATURE SETTING LOWERED

1. Turn temperature control dial (driver side) counterclockwise until 18.0°C (60°F) is displayed.
2. Check that the cool air blows from the outlets.

Is the inspection result normal?

YES >> GO TO 7.

NO >> Insufficient cooling: [HAC-170, "Inspection procedure"](#).

7. CHECK WITH TEMPERATURE SETTING RAISED

1. Turn temperature control dial (driver side) clockwise until 32.0°C (90°F) is displayed.
2. Check that the warm air blows from the outlets.

Is the inspection result normal?

YES >> GO TO 8.

NO >> Insufficient heating: [HAC-172, "Inspection procedure"](#).

8. CHECK LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM FUNCTION

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

Is the inspection result normal?

YES >> GO TO 9.

NO >> Refer to [HAC-169, "Diagnosis Chart By Symptom"](#) and perform the appropriate diagnosis.

9. CHECK AUTO MODE

1. Press the AUTO switch, and then check that "AUTO" is shown on the display.
2. Check that the discharge air and blower speed depend on ambient temperature, in-vehicle temperature and temperature setting.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Refer to [HAC-169, "Diagnosis Chart By Symptom"](#) and perform the appropriate diagnosis.

WITHOUT ACCS : Temperature Setting Trimmer

INFOID:0000000010581328

DESCRIPTION

INSPECTION AND ADJUSTMENT

< BASIC INSPECTION >

[AUTOMATIC AIR CONDITIONER]

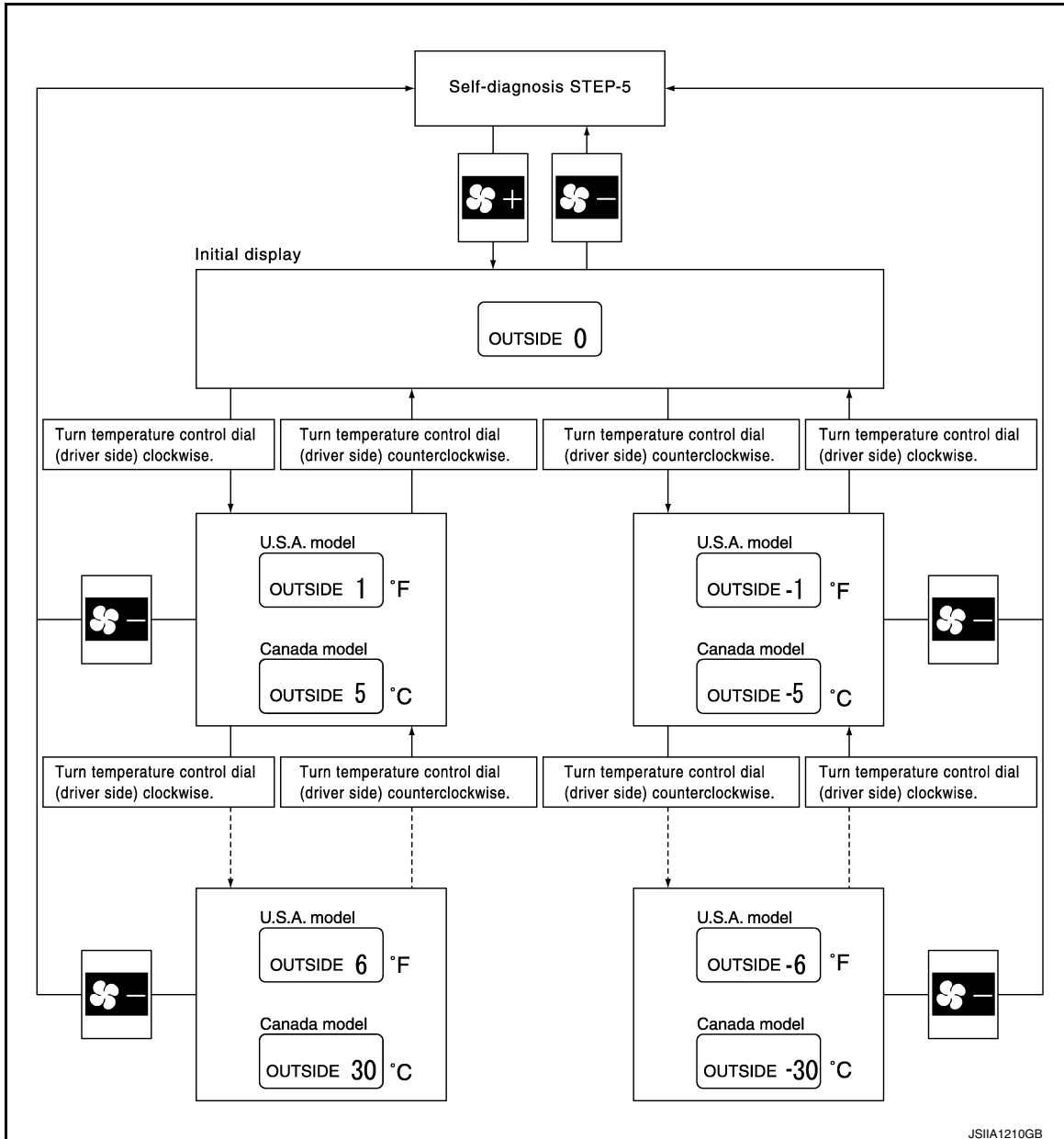
The trimmer compensates for differences in range of $\pm 3^{\circ}\text{C}$ ($\pm 6^{\circ}\text{F}$) between temperature setting (displayed digitally) and temperature felt by customer.

Operating procedures for this trimmer are as per the following:

1. Begin self-diagnosis STEP-5 mode. Refer to [HAC-59. "WITHOUT ACCS : 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.



NOTE:

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

WITHOUT ACCS : Foot Position Setting Trimmer

INFOID:0000000010581329

DESCRIPTION

Wind distribution ratio in FOOT mode can be set.

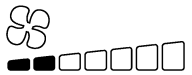
Operating procedures for this trimmer are as per the following:

INSPECTION AND ADJUSTMENT

< BASIC INSPECTION >

[AUTOMATIC AIR CONDITIONER]

1. Begin self-diagnosis STEP-5 mode. Refer to [HAC-59. "WITHOUT ACCS : Diagnosis Description"](#).
2. Press fan (UP: +) switch to set system in auxiliary mode.
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		Front	Rear	Front	Rear	
 (Initial setting)	13%	11%	32%	19%	25%	13%	11%	32%	19%	25%
	13%	11%	32%	19%	25%	17%	15%	43%	25%	—
	17%	15%	43%	25%	—	13%	11%	32%	19%	25%
	17%	15%	43%	25%	—	17%	15%	43%	25%	—

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NOTE:

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

WITHOUT ACCS : Inlet Port Memory Function

INFOID:0000000010581330

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-59. "WITHOUT ACCS : Diagnosis Description"](#).
2. Press fan (UP: +) switch to set system in auxiliary mode.
3. Press intake switch as desired.

FRE indicator	REC indicator	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 ACCS

WITH ACCS : Description & Inspection

INFOID:0000000010581331

DESCRIPTION

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

Conditions : Engine running at normal operating temperature

INSPECTION PROCEDURE

1. CHECK MEMORY FUNCTION

1. Start the engine.

INSPECTION AND ADJUSTMENT

< BASIC INSPECTION >

[AUTOMATIC AIR CONDITIONER]

- Turn temperature control dial (driver side) clockwise until 32.0°C (90°F) is displayed.
- Press the OFF switch.
- Turn the ignition switch OFF.
- Turn the ignition switch ON.
- Press the AUTO switch.
- Check that the temperature setting before turning the ignition switch OFF is stored.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Memory function malfunction: [HAC-177. "Inspection procedure"](#).

2.CHECK BLOWER MOTOR SPEED

- Start the engine.
- Press fan (UP: +) switch. Check that the fan speed changes. Check the operation for all fan speeds.
- Set the fan speed to max speed.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Blower motor system malfunction: [HAC-82. "Diagnosis Procedure"](#).

3.CHECK DISCHARGE AIR

- Press the MODE switch and the DEF switch.
- Each position indicator should change shape.
- Confirm that discharge air comes out according to the air distribution table as follows:

Discharge air flow						
Mode position indication	Condition	Air outlet/distribution				
		VENT		FOOT		DEF
		Front	Rear	Front	Rear	
	DUAL switch: OFF Rear ventilator : OPEN	89%	11%	—	—	—
		45%	11%	26%	18%	—
		13%	11%	32%	19%	25%
		10%	10%	28%	17%	35%
		17%	—	—	—	83%

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NOTE:

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

Is the inspection result normal?

YES >> GO TO 4.

NO >> Mode door system malfunction: [HAC-72. "Diagnosis Procedure"](#).

4.CHECK INTAKE AIR

- Press AUTO switch. AUTO INTAKE indicator and REC indicator turns ON (auto intake mode).
- Press intake switch. AUTO INTAKE indicator and REC indicator turns OFF (fixed FRE mode).
- Press intake switch again. REC indicator turns ON (fixed REC mode).
- Press intake switch again. AUTO INTAKE indicator and REC indicator turns ON (auto intake mode).
- Listen for intake door position change. (Slight change of blower sound can be heard.)

NOTE:

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

Is the inspection result normal?

YES >> GO TO 5.

NO >> Intake door system malfunction: [HAC-80. "WITH ACCS : Diagnosis Procedure"](#).

5.CHECK A/C SWITCH

INSPECTION AND ADJUSTMENT

< BASIC INSPECTION >

[AUTOMATIC AIR CONDITIONER]

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

Is the inspection result normal?

YES >> GO TO 6.

NO >> Magnet clutch system malfunction: [HAC-86, "Diagnosis Procedure"](#).

6. CHECK WITH TEMPERATURE SETTING LOWERED

1. Turn temperature control dial (driver side) counterclockwise until 18.0°C (60°F) is displayed.
2. Check that the cool air blows from the outlets.

Is the inspection result normal?

YES >> GO TO 7.

NO >> Insufficient cooling: [HAC-170, "Inspection procedure"](#).

7. CHECK WITH TEMPERATURE SETTING RAISED

1. Turn temperature control dial (driver side) clockwise until 32.0°C (90°F) is displayed.
2. Check that the warm air blows from the outlets.

Is the inspection result normal?

YES >> GO TO 8.

NO >> Insufficient heating: [HAC-172, "Inspection procedure"](#).

8. CHECK LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM FUNCTION

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

Is the inspection result normal?

YES >> GO TO 9.

NO >> Refer to [HAC-169, "Diagnosis Chart By Symptom"](#) and perform the appropriate diagnosis.

9. CHECK AUTO MODE

1. Press the AUTO switch, and then check that "AUTO" is shown on the display.
2. Check that the discharge air and blower speed depend on ambient temperature, in-vehicle temperature and temperature setting.

Is the inspection result normal?

YES >> GO TO 10.

NO >> Refer to [HAC-169, "Diagnosis Chart By Symptom"](#) and perform the appropriate diagnosis.

10. CHECK PLASMA CLUSTER ION CONTROL FUNCTION

1. Turn ignition switch OFF and restart the engine.
2. Ion indicator is shown on the display.
3. Press OFF switch.
4. Ion indicator is turned OFF.

Is the inspection result normal?

YES >> GO TO 11.

NO >> Refer to [HAC-104, "Diagnosis Procedure"](#).

11. CHECK ION CONTROL MODE

1. Turn ignition switch OFF and restart the engine.
2. Operate fan control dial to the blower fan lowest and highest speed. Check display of ion indicator each time blower fan is at lowest speed and at highest speed.

INSPECTION AND ADJUSTMENT

< BASIC INSPECTION >

[AUTOMATIC AIR CONDITIONER]

When blower fan speed is at lowest speed: CLEAN

When blower fan speed is at highest speed: QUICK CLEAN

Is the inspection result normal?

YES >> INSPECTION END

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

WITH ACCS : Temperature Setting Trimmer

INFOID:0000000010581332

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-64. "WITH ACCS : 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.

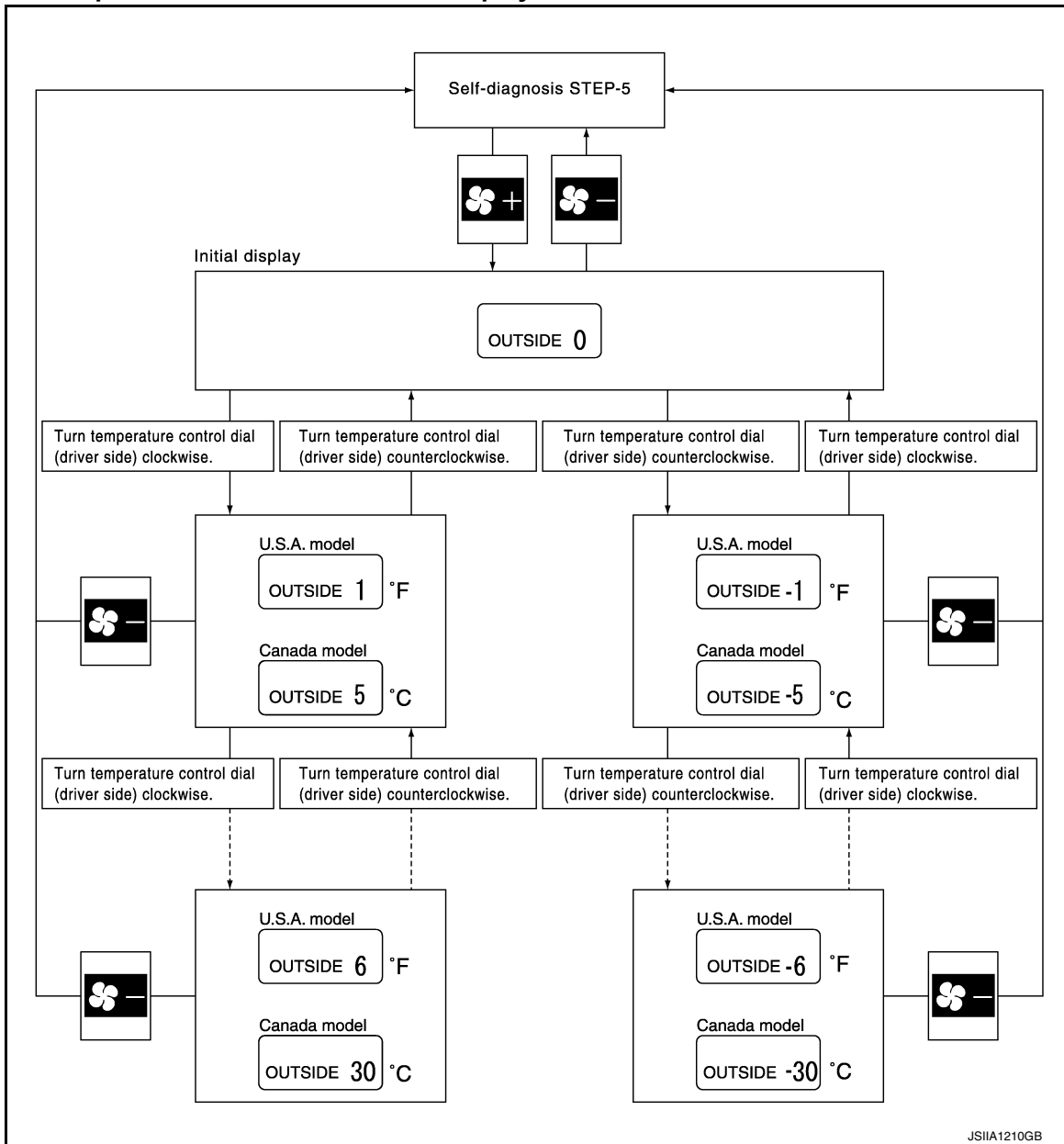
CAUTION:

INSPECTION AND ADJUSTMENT

< BASIC INSPECTION >

[AUTOMATIC AIR CONDITIONER]

A decimal point is not indicated 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.

WITH ACCS : Foot Position Setting Trimmer

INFOID:0000000010581333

DESCRIPTION

Wind distribution ratio in FOOT mode can be set.

Operating procedures for this trimmer are as per the following:

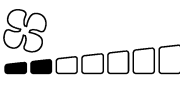
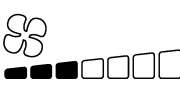
1. Begin self-diagnosis STEP-5 mode. Refer to [HAC-64, "WITH ACCS : Diagnosis Description"](#).
2. Press fan (UP: +) switch to set system in auxiliary mode.

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		Front	Rear	Front	Rear	
 (Initial setting)	13%	11%	32%	19%	25%	13%	11%	32%	19%	25%
	13%	11%	32%	19%	25%	17%	15%	43%	25%	—
	17%	15%	43%	25%	—	13%	11%	32%	19%	25%
	17%	15%	43%	25%	—	17%	15%	43%	25%	—

JSIIA1209GB

NOTE:

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

WITH ACCS : Inlet Port Memory Function

INFOID:0000000010581334

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-64, "WITH ACCS : Diagnosis Description"](#).
2. Press fan (UP: +) switch to set system in auxiliary mode.
3. Press intake switch as desired.

AUTO INTAKE indicator	REC indicator	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 ACCS : Exhaust exhaust gas/outside odor detecting/Outside Odor Detecting Sensor Sensitivity Adjustment Function

INFOID:0000000010581335

DESCRIPTION

According to customer's sense of smell, exhaust gas/outside odor detecting sensor sensitivity can be changed.

Operating procedures for this trimmer are as follows:

1. Begin self-diagnosis STEP-5 mode. Refer to [HAC-64, "WITH ACCS : Diagnosis Description"](#).
2. Press fan (UP: +) switch two times to set system in auxiliary mode.
3. Turn temperature control dial (driver side) as desired for the setting.

INSPECTION AND ADJUSTMENT

< BASIC INSPECTION >

[AUTOMATIC AIR CONDITIONER]

Display	Setting
71	Less sensitive setting than display 72 setting (the change to REC is later than display 72 operation.)
72	Less sensitive setting than normal setting (the change to REC is later than normal operation.)
73 (Initial status)	Normal
74	More sensitive setting than normal setting (the change to REC is earlier than normal operation.)
75	More sensitive setting than display 74 setting (the change to REC is earlier than display 74 operation.)

NOTE:

When battery cable is disconnected or battery voltage is below 10 V, exhaust gas/outside odor detecting sensor sensitivity adjustment function is canceled. Exhaust gas/outside odor detecting sensor sensitivity adjustment function set becomes that of initial condition.

WITH ACCS : Auto Intake Interlocking Movement Change Function

INFOID:0000000010581336

DESCRIPTION

Conditions for interlocking movement of intake switch (auto intake mode) and A/C switch can be changed. In addition, operation of the intake switch, which activates the automatic recirculation control system, can be set to become available when the A/C switch is ON.

Operating procedures for this trimmer are as follows:

1. Begin self-diagnosis STEP-5 mode. Refer to [HAC-64, "WITH ACCS : Diagnosis Description"](#).
2. Press fan (UP: +) switch three times to set system in auxiliary mode.
3. Press A/C switch and intake switch as desired.

A/C indicator	AUTO IN-TAKE indicator	Setting status
ON	ON	A/C switch indicator turns ON automatically when auto intake mode is selected with Intake switch. Auto intake mode continues after A/C switch turns OFF.
OFF	ON	A/C switch indicator stays OFF when auto intake mode is selected with Intake switch. Auto intake mode continues after A/C switch turns OFF.
ON	OFF	A/C switch indicator turns ON automatically when auto intake mode is selected with Intake switch. When A/C switch turns OFF, auto intake mode turns OFF automatically. (Initial setting)
OFF	OFF	Auto intake mode can be set only when A/C switch is ON. When A/C switch turns OFF, auto intake mode turns OFF automatically.

NOTE:

When battery cable is disconnected or battery voltage is below 10 V, auto intake interlocking movement change function is canceled. Auto intake interlocking movement change function set becomes that of initial condition.

COMPRESSOR CONTROL FUNCTION

< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]

SYSTEM DESCRIPTION

COMPRESSOR CONTROL FUNCTION WITHOUT ACCS

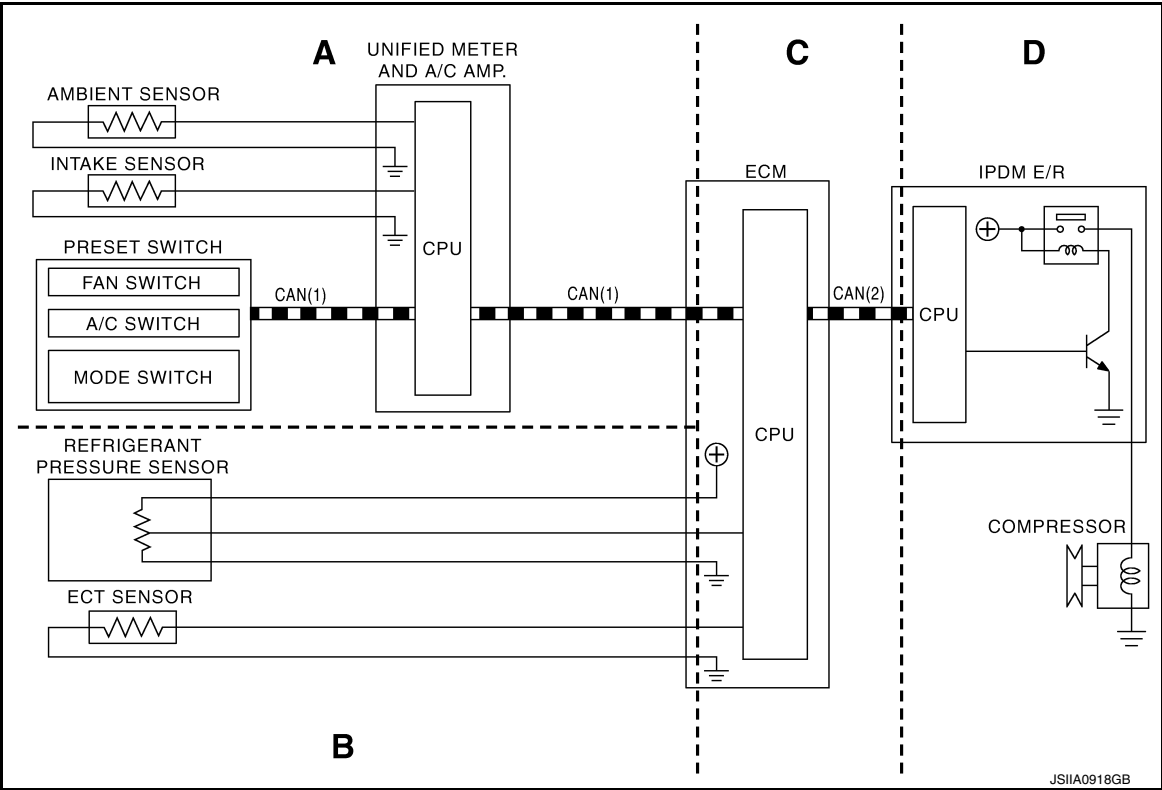
WITHOUT ACCS : Description

INFOID:0000000010581337

PRINCIPLE OF OPERATION

Compressor is not activated.

Functional circuit diagram



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

CAN(2) : A/C compressor request signal

Functional initial inspection chart

Control unit	Diagnosis Item		Location			
			A	B	C	D
Unified meter and A/C amp.	Self-diagnosis function		×	—	—	—
ECM	ENGINE	Self-diagnosis (CAN system diagnosis)	—	—	×	—
		Data monitor	×	×	×	—
IPDM E/R	IPDM E/R	Self-diagnosis (CAN system diagnosis)	—	—	—	×
		Data monitor	—	—	×	—
	Auto active test		—	—	—	×

WITHOUT ACCS : Fail-safe

INFOID:0000000010581338

FAIL-SAFE FUNCTION

COMPRESSOR CONTROL FUNCTION

< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]

- 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

WITHOUT ACCS : Component Part Location

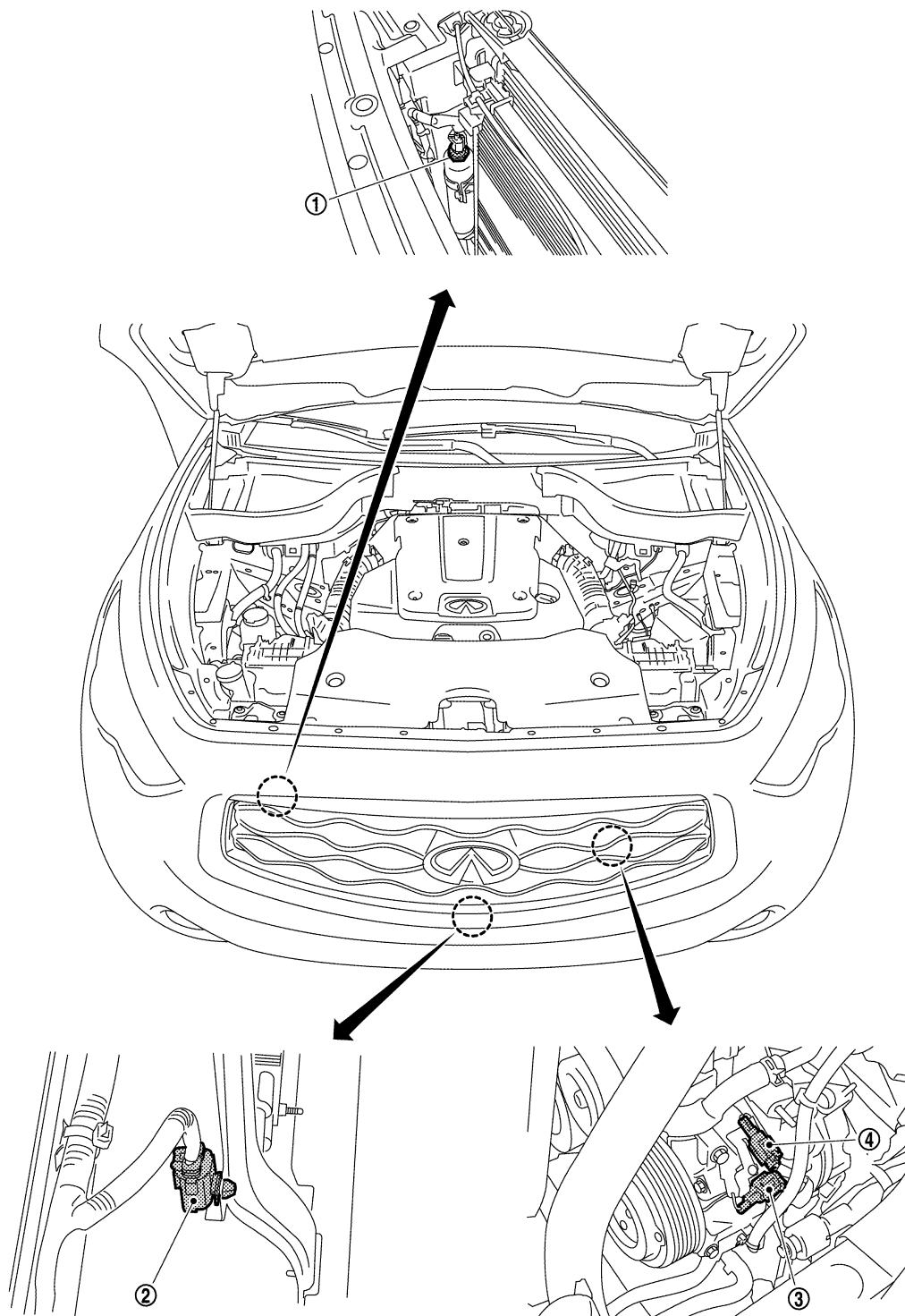
INFOID:0000000010581339

ENGINE COMPARTMENT

COMPRESSOR CONTROL FUNCTION

< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]



1. Refrigerant pressure sensor

2. Ambient sensor

3. Compressor (magnet clutch)

4. Compressor (ECV)

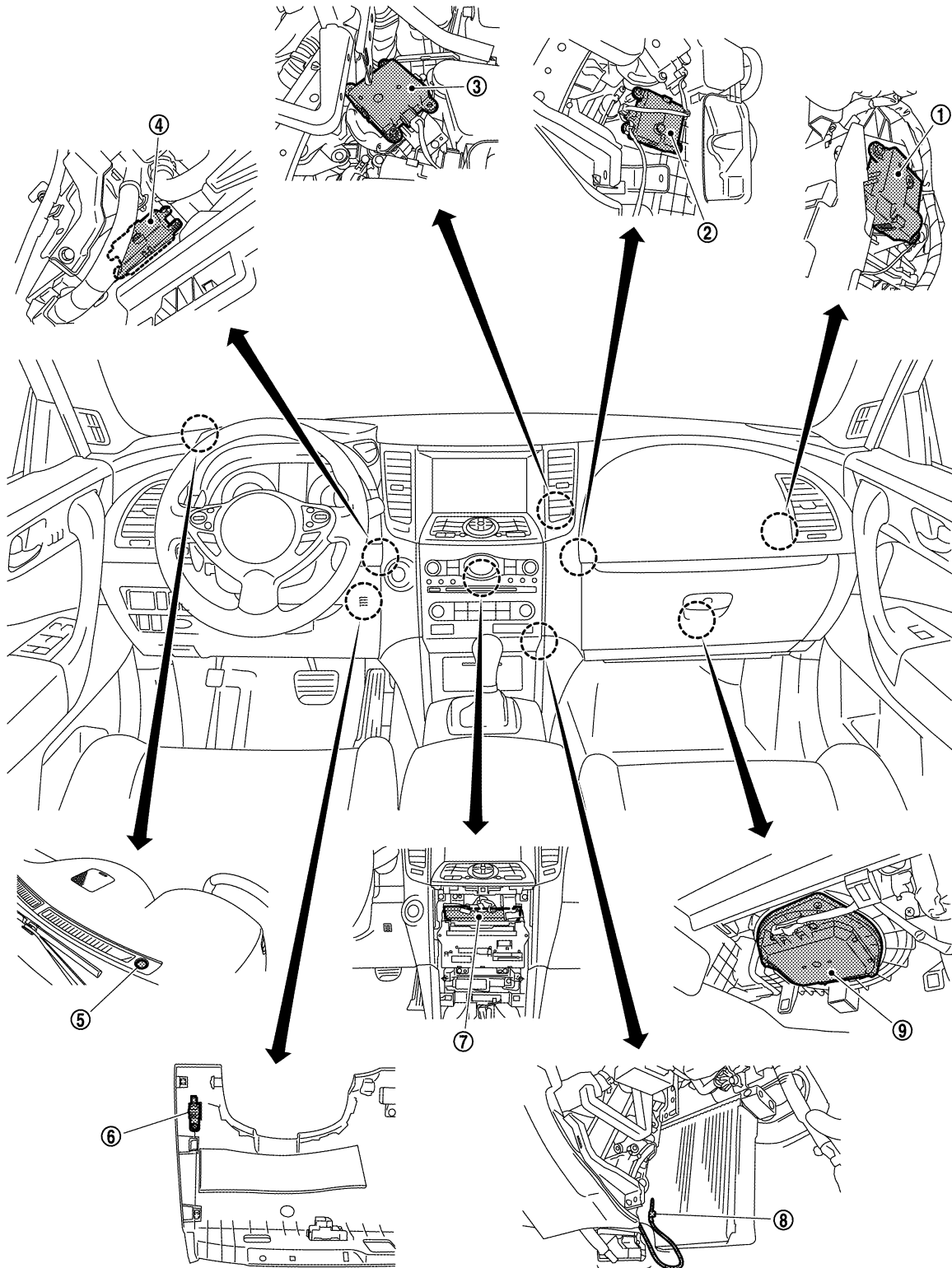
JSIIA1284ZZ

PASSENGER COMPARTMENT

COMPRESSOR CONTROL FUNCTION

< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]



JSIIA1285ZZ

- | | | |
|-------------------------------------|--|----------------------|
| 1. Intake door motor | 2. Air mix door motor (passenger side) | 3. Mode door motor |
| 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 |

COMPRESSOR CONTROL FUNCTION

< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]

WITHOUT ACCS : Component Description

INFOID:0000000010581340

Component	Reference
Air mix door motor (driver side)	HAC-74. "Description"
Air mix door motor (passenger side)	HAC-76. "Description"
Ambient sensor	HAC-90. "Description"
Blower motor	HAC-82. "Description"
Compressor (magnet clutch)	HAC-86. "Description"
Compressor (ECV)	HAC-88. "Description"
Intake door motor	HAC-78. "WITHOUT ACCS : Description"
Intake sensor	HAC-99. "Description"
In-vehicle sensor	HAC-93. "Description"
Mode door motor	HAC-72. "Description"
Refrigerant pressure sensor	• EC-525. "Description" (VQ37VHR FOR USA AND CANADA) • EC-1025. "Description" (VQ37VHR FOR MEXICO) • EC-1561. "Description" (VK50VE)
Sunload sensor	HAC-96. "Description"
Unified meter and A/C amp.	HAC-71. "Description"

WITH ACCS

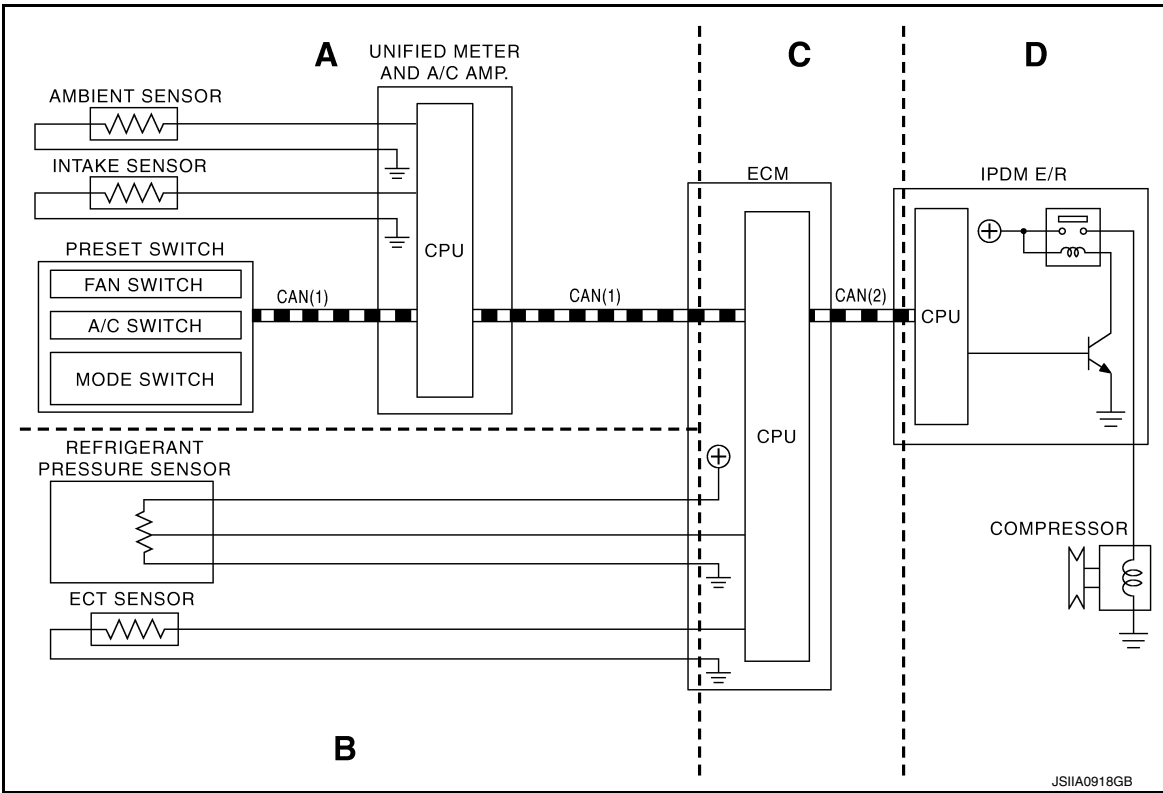
WITH ACCS : Description

INFOID:0000000010581341

PRINCIPLE OF OPERATION

Compressor is not activated.

Functional circuit diagram



COMPRESSOR CONTROL FUNCTION

< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]

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

CAN(2) : A/C compressor request signal

Functional initial inspection chart

Control unit	Diagnosis Item	Location			
		A	B	C	D
Unified meter and A/C amp.	Self-diagnosis function	×	—	—	—
ECM	Self-diagnosis (CAN system diagnosis)	—	—	×	—
	Data monitor	×	×	×	—
IPDM E/R	Self-diagnosis (CAN system diagnosis)	—	—	—	×
	Data monitor	—	—	×	—
	Auto active test	—	—	—	×

WITH ACCS : Fail-safe

INFOID:0000000010581342

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

WITH ACCS : Component Part Location

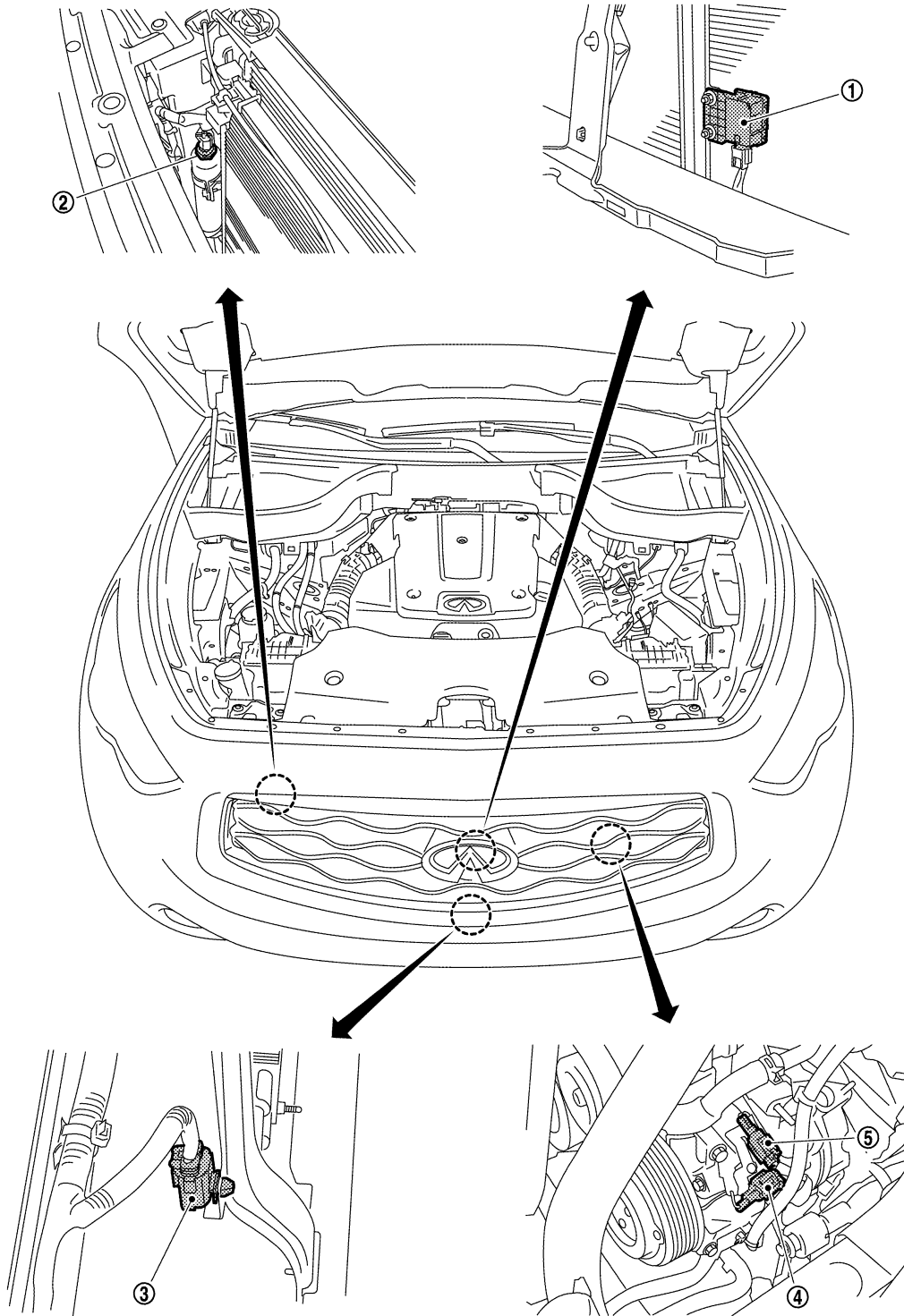
INFOID:0000000010581343

ENGINE COMPARTMENT

COMPRESSOR CONTROL FUNCTION

< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]



JSIIA1292ZZ

- | | | |
|--|--------------------------------|-------------------|
| 1. Exhaust gas/outside odor detecting sensor | 2. Refrigerant pressure sensor | 3. Ambient sensor |
| 4. Compressor (magnet clutch) | 5. Compressor (ECV) | |

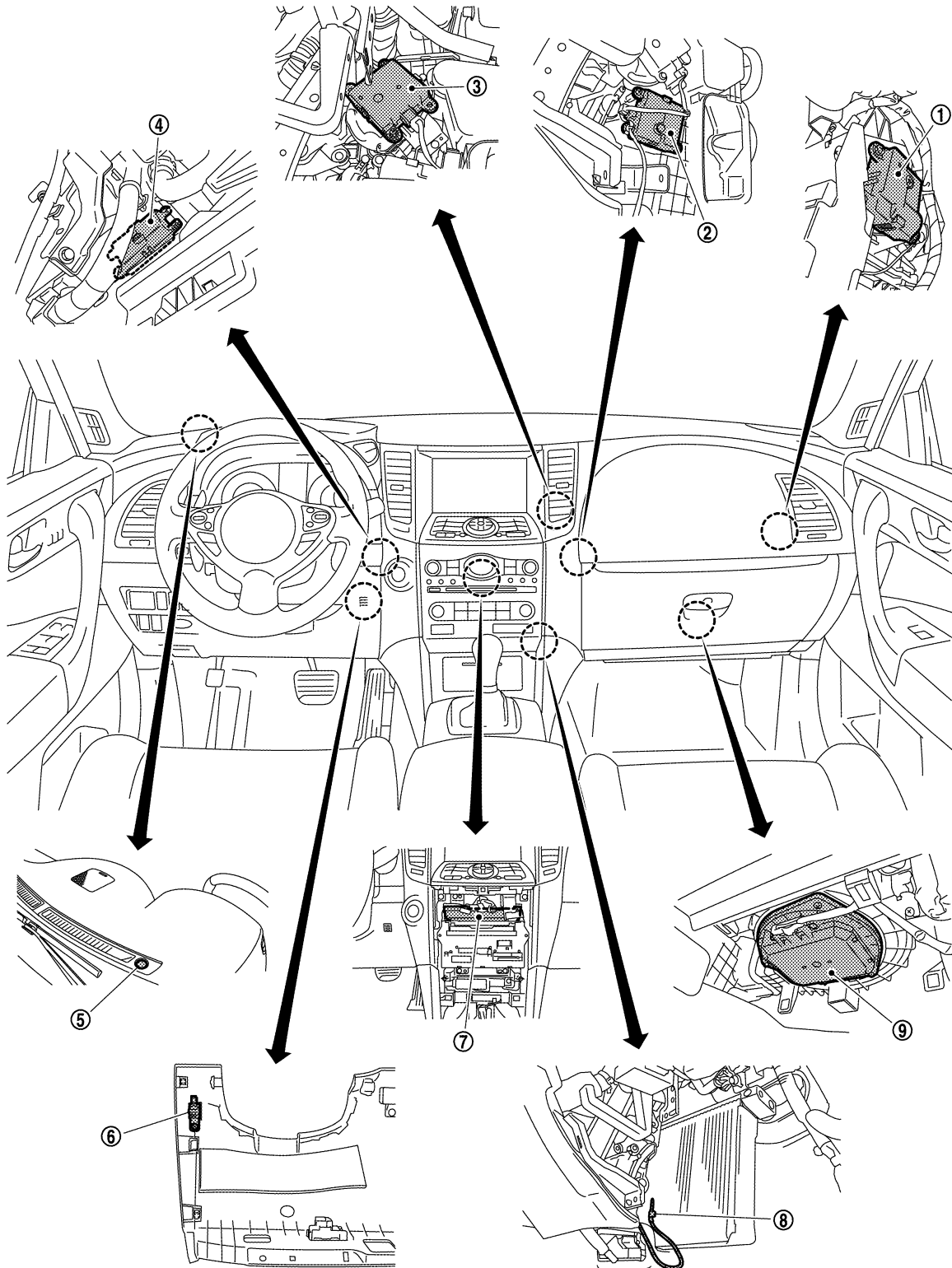
PASSENGER COMPARTMENT

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

COMPRESSOR CONTROL FUNCTION

< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]



JSIIA1285ZZ

- | | | |
|-------------------------------------|--|----------------------|
| 1. Intake door motor | 2. Air mix door motor (passenger side) | 3. Mode door motor |
| 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 ACCS : Component Description

INFOID:0000000010581344

COMPRESSOR CONTROL FUNCTION

< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]

Component	Reference
Air mix door motor (driver side)	HAC-74. "Description"
Air mix door motor (passenger side)	HAC-76. "Description"
Ambient sensor	HAC-90. "Description"
Blower motor	HAC-82. "Description"
Compressor (magnet clutch)	HAC-86. "Description"
Compressor (ECV)	HAC-88. "Description"
Exhaust gas/outside odor detecting sensor	HAC-101. "Description"
Intake door motor	HAC-79. "WITH ACCS : Description"
Intake sensor	HAC-99. "Description"
In-vehicle sensor	HAC-93. "Description"
Mode door motor	HAC-72. "Description"
Refrigerant pressure sensor	EC-1561. "Description"
Sunload sensor	HAC-96. "Description"
Unified meter and A/C amp.	HAC-71. "Description"

A

B

C

D

E

F

G

H

HAC

J

K

L

M

N

O

P

AUTOMATIC AIR CONDITIONER SYSTEM

< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]

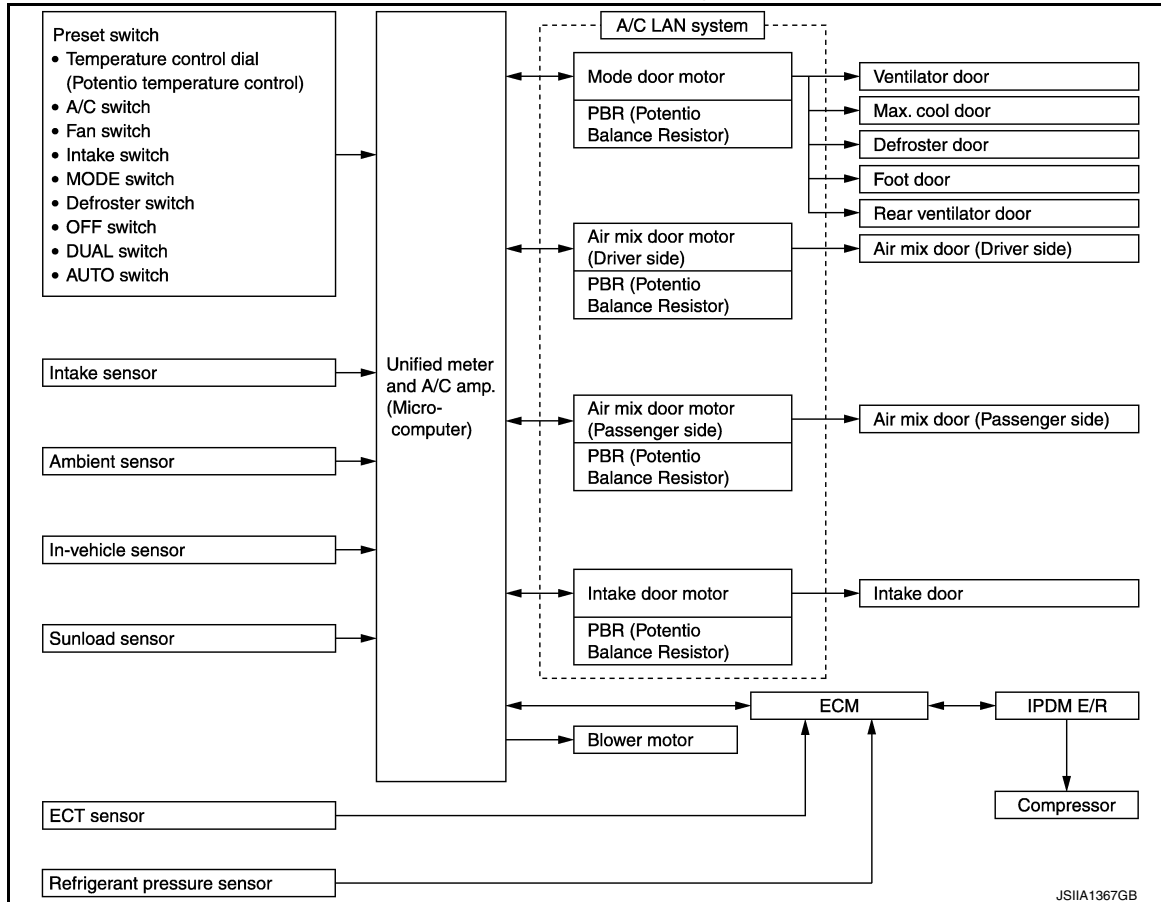
AUTOMATIC AIR CONDITIONER SYSTEM WITHOUT ACCS

WITHOUT ACCS : System Diagram

INFOID:0000000010581345

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:



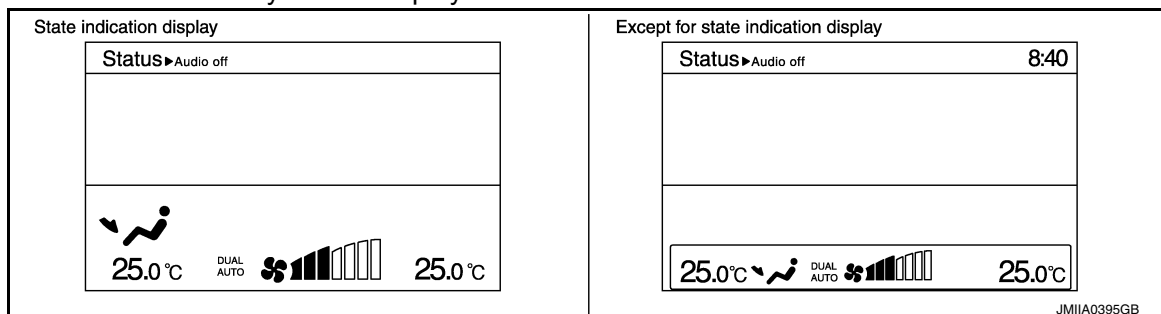
WITHOUT ACCS : System Description

INFOID:0000000010581346

CONTROL OPERATION

Display Screen

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

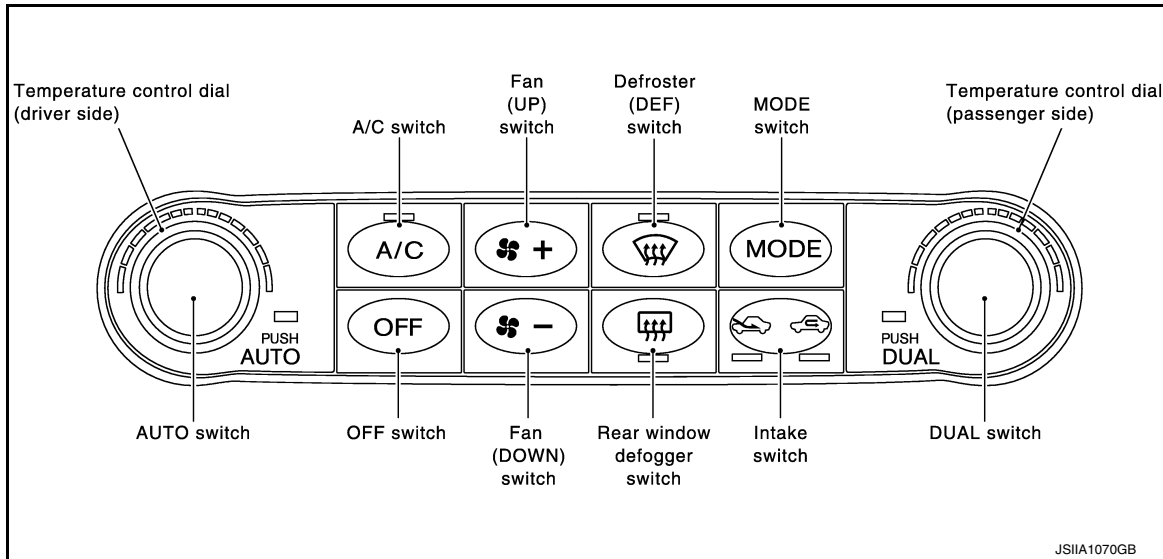


AUTOMATIC AIR CONDITIONER SYSTEM

< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]

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, DUAL switch indicator turns ON.

AUTO Switch

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

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

OFF Switch

Compressor and blower are OFF, air inlet is set to FRE, and mode position is set to foot position.

Rear Window Defogger Switch

When indicator is ON, rear window is defogged.

Intake Switch

- When intake switch is ON, FRE indicator turns ON, and air inlet is fixed to FRE.
- When intake switch is pressed again, REC indicator turns ON, and air inlet is fixed to REC.
- When intake switch is pressed for approximately 1.5 seconds or longer, FRE and REC indicators blink twice. Then, automatic control mode is entered. Inlet status is displayed by indicator even during automatic controlled.
- When FRE indicator 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).

DUAL Switch

- When the DUAL switch indicator is ON, the driver side and passenger side, temperature can each be set independently.

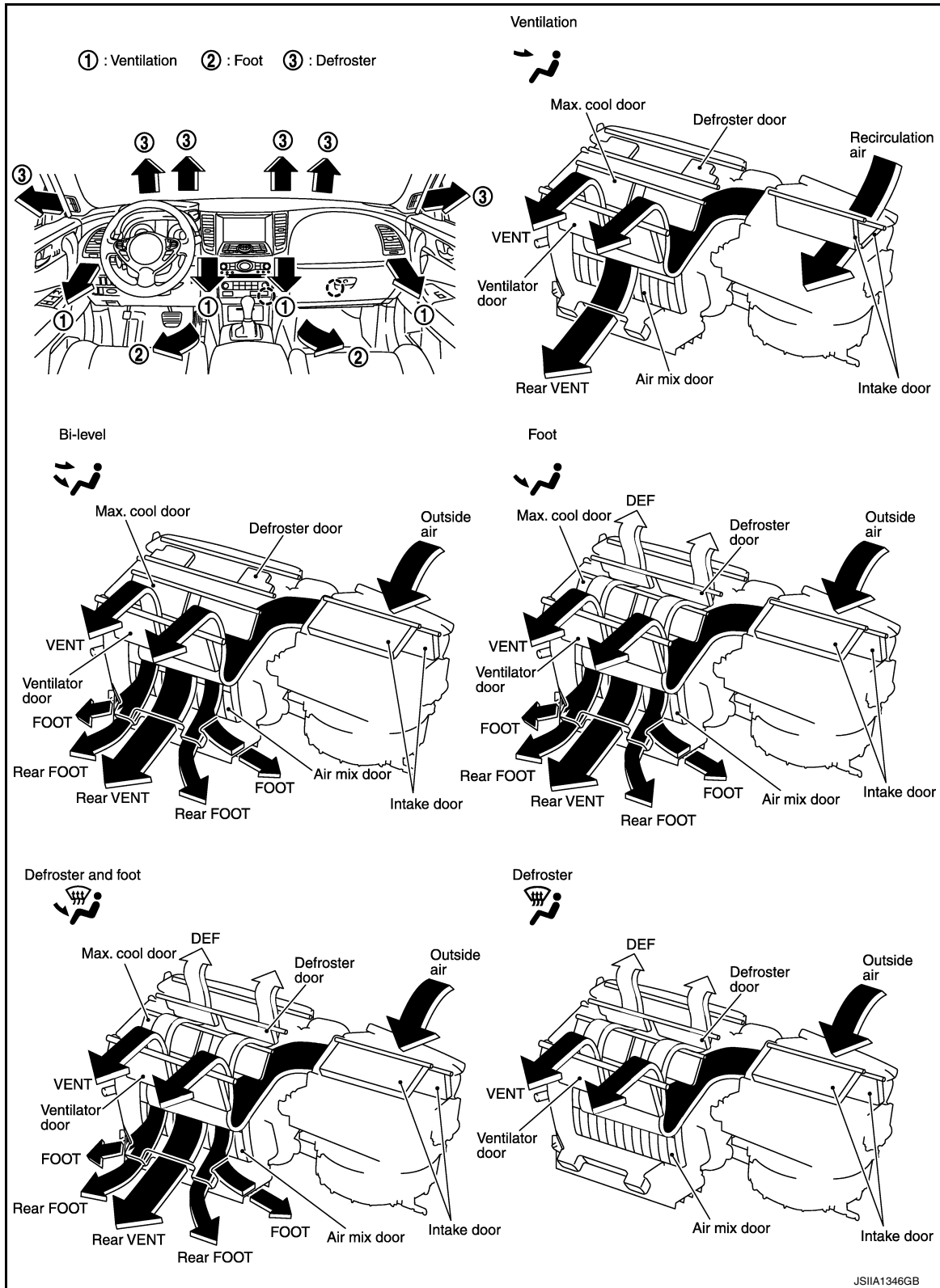
AUTOMATIC AIR CONDITIONER SYSTEM

[AUTOMATIC AIR CONDITIONER]

< SYSTEM DESCRIPTION >

- When the DUAL switch indicator is OFF, the driver side outlet and setting temperature is applied to both sides.

DISCHARGE AIR FLOW

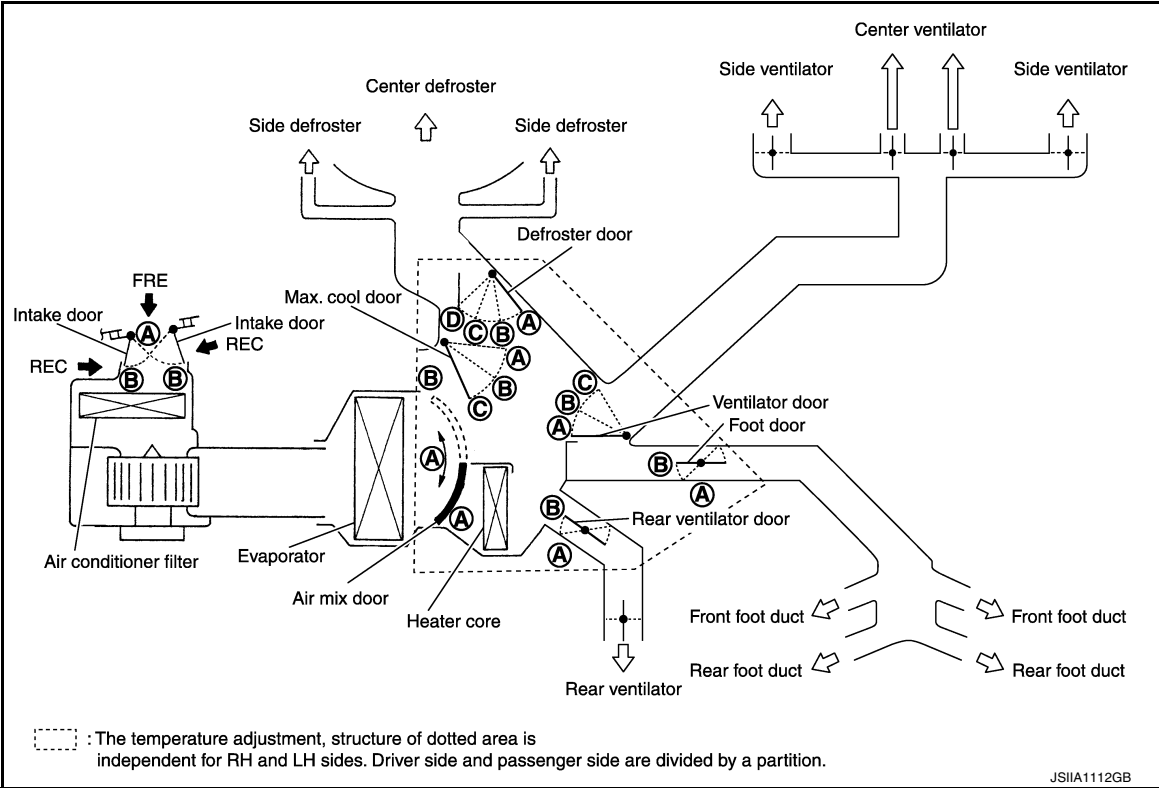


AUTOMATIC AIR CONDITIONER SYSTEM

< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]

SWITCHES AND THEIR CONTROL FUNCTION



HAC

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											18℃ (60°F)		⇄	32℃ (90°F)	18℃ (60°F)
Ventilator door	—	(A)	(B)	(C)	(C)	(C)	—	AUTO	—		—		—		(C)	
Max.cool door	—	(A)	(B)	(C)	(C)	(C)			—						(C)	
Defroster door	—	(D)	(D)	(C)	(B)	(A)			—						(C)	
Foot door	—	(B)	(B)	(B)	(B)	(A)			—		—		—		(B)	
Rear ventilator door	—	(B)	(B)	(B)	(B)	(A)			—		—		—		(B)	
Intake door	—	—			(B)	(B)			(B)*	(A)*	—		—		(B)	
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.

JSIIA1004GB

AIR CONDITIONER LAN CONTROL SYSTEM

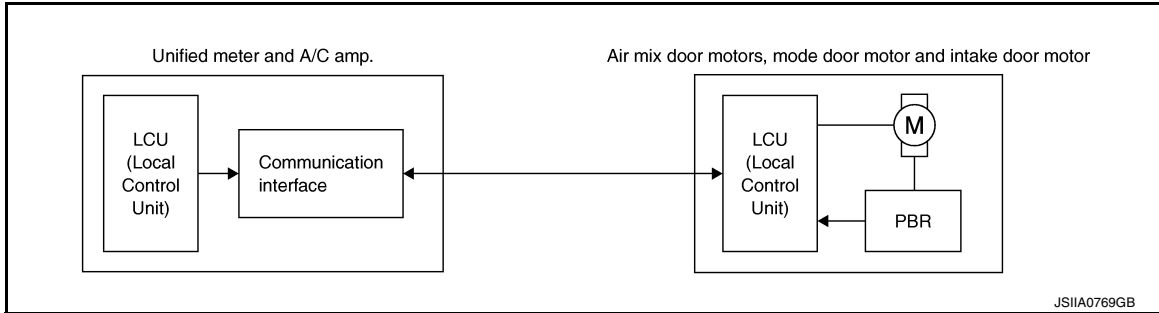
The LAN (Local Area Network) system consists of unified meter and A/C amp., mode door motor, air mix door motors and intake door motor.

AUTOMATIC AIR CONDITIONER SYSTEM

< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]

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



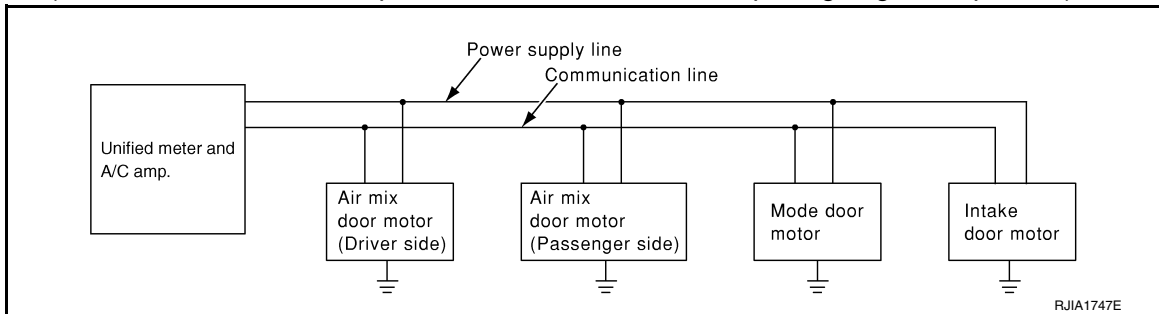
SYSTEM CONSTRUCTION

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.

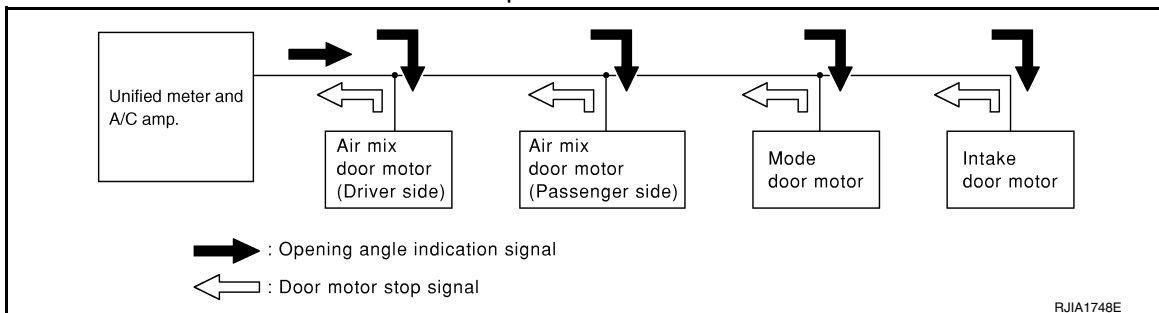
- Address
- Motor opening angle signals
- Data transmission
- Motor stop and drive decision
- Opening angle sensor (PBR function)
- Comparison
- Decision (Unified meter and A/C amp. indicated value and motor opening angle comparison)



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

< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]

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:

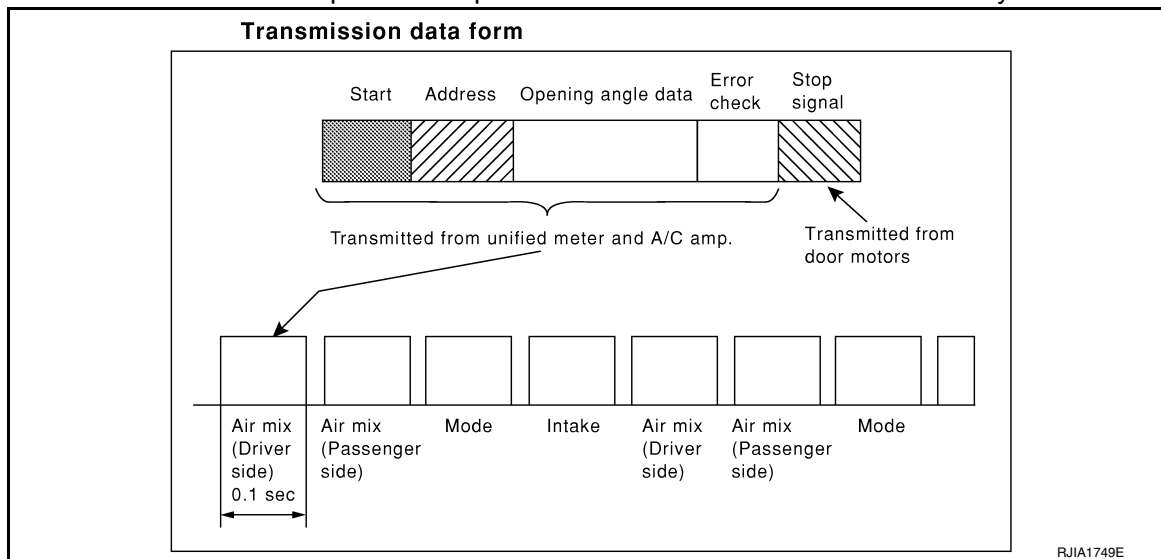
- Data that shows the indicated door opening angle of each door motor.

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.



WITHOUT ACCS : Component Part Location

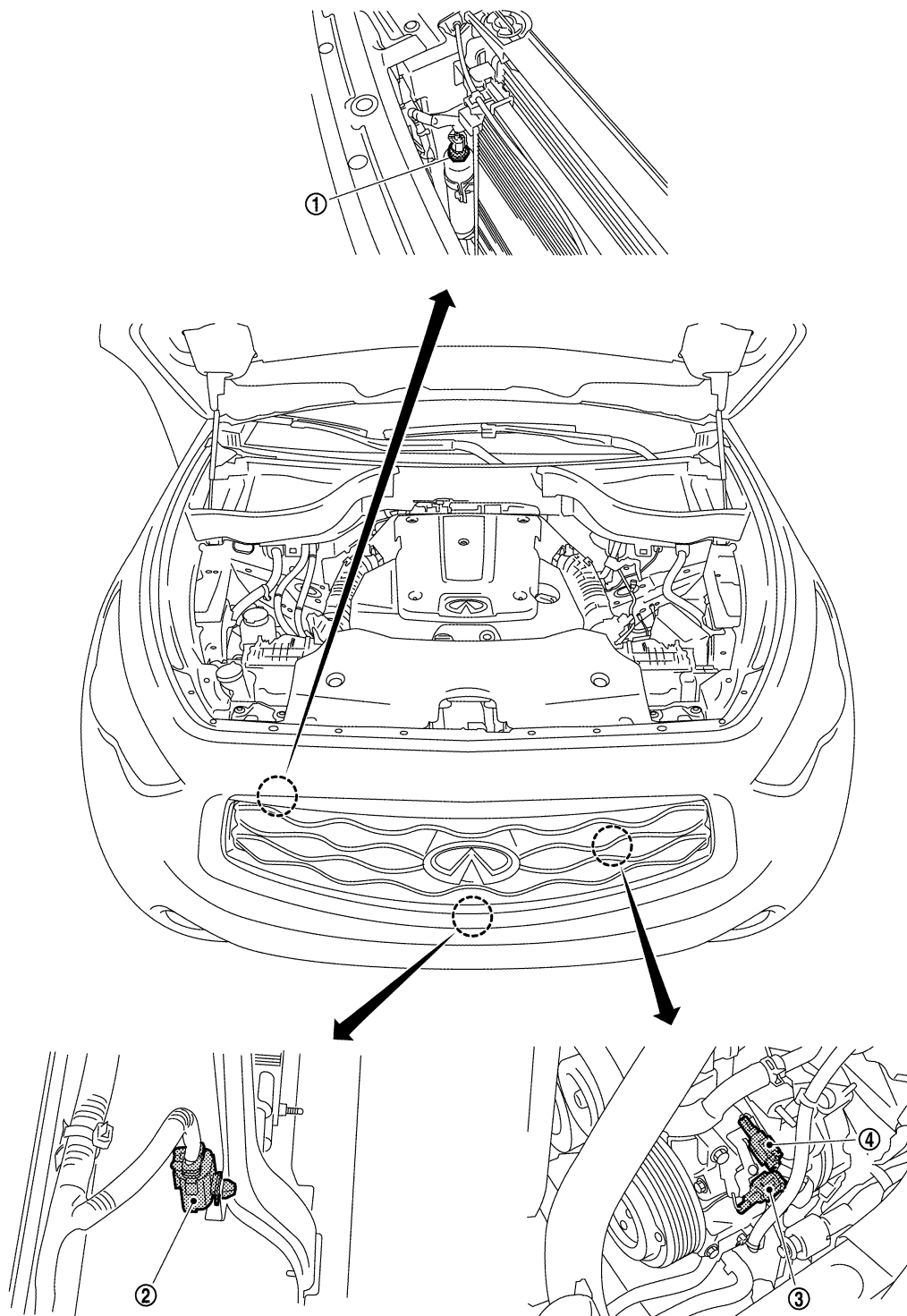
INFOID:0000000010581347

ENGINE COMPARTMENT

AUTOMATIC AIR CONDITIONER SYSTEM

< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]



JSIIA1284ZZ

1. Refrigerant pressure sensor

2. Ambient sensor

3. Compressor (magnet clutch)

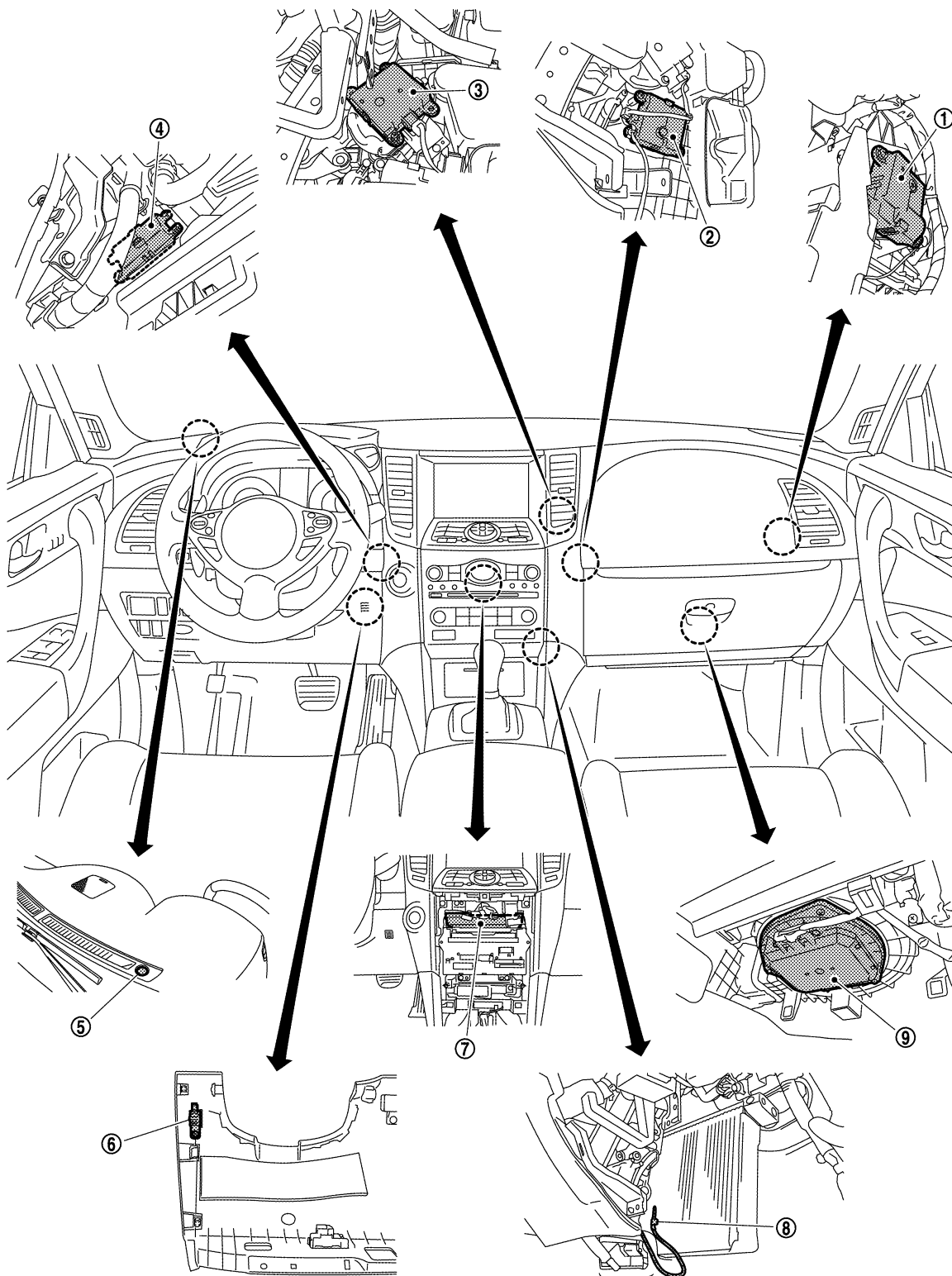
4. Compressor (ECV)

PASSENGER COMPARTMENT

AUTOMATIC AIR CONDITIONER SYSTEM

< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]



JSIIA1285ZZ

- | | | |
|-------------------------------------|--|----------------------|
| 1. Intake door motor | 2. Air mix door motor (passenger side) | 3. Mode door motor |
| 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 |

AUTOMATIC AIR CONDITIONER SYSTEM

< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]

WITHOUT ACCS : Component Description

INFOID:0000000010581348

Component	Reference
Air mix door motor (driver side)	HAC-74. "Description"
Air mix door motor (passenger side)	HAC-76. "Description"
Ambient sensor	HAC-90. "Description"
Blower motor	HAC-82. "Description"
Compressor (magnet clutch)	HAC-86. "Description"
Compressor (ECV)	HAC-88. "Description"
Intake door motor	HAC-78. "WITHOUT ACCS : Description"
Intake sensor	HAC-99. "Description"
In-vehicle sensor	HAC-93. "Description"
Mode door motor	HAC-72. "Description"
Refrigerant pressure sensor	• EC-525. "Description" (VQ37VHR FOR USA AND CANADA) • EC-1025. "Description" (VQ37VHR FOR MEXICO) • EC-1561. "Description" (VK50VE)
Sunload sensor	HAC-96. "Description"
Unified meter and A/C amp.	HAC-71. "Description"

WITH ACCS

WITH ACCS : System Diagram

INFOID:0000000010581349

CONTROL SYSTEM

- The adoption of the advanced climate control system (ACCS) enables the maintenance of clean air in the vehicle by combining the plasmacluster™ ion generation function, the automatic recirculation control function, and a high performance filter.

NOTE:

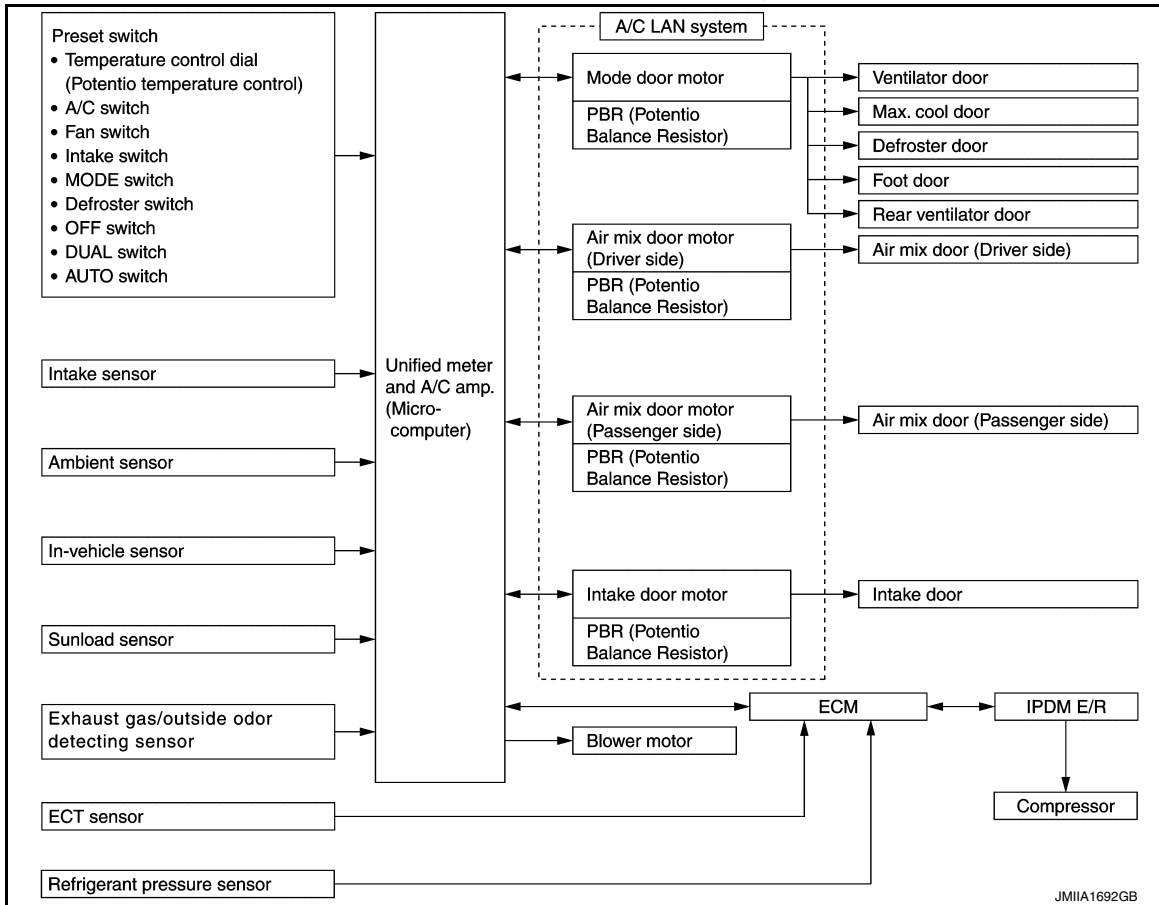
- Plasmacluster™ ion technology developed by Sharp Corporation is installed in this item.
- Plasmacluster™ is a trademark of Sharp Corporation.

AUTOMATIC AIR CONDITIONER SYSTEM

[AUTOMATIC AIR CONDITIONER]

< SYSTEM DESCRIPTION >

- 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:



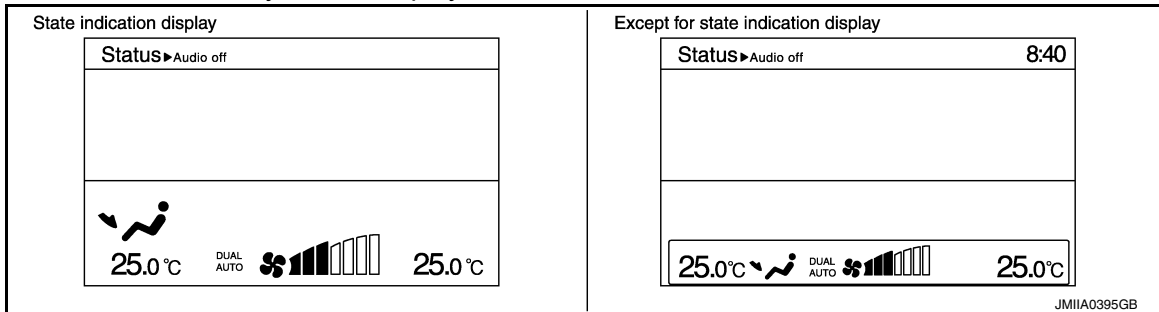
WITH ACCS : System Description

INFOID:000000010581350

CONTROL OPERATION

Display Screen

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

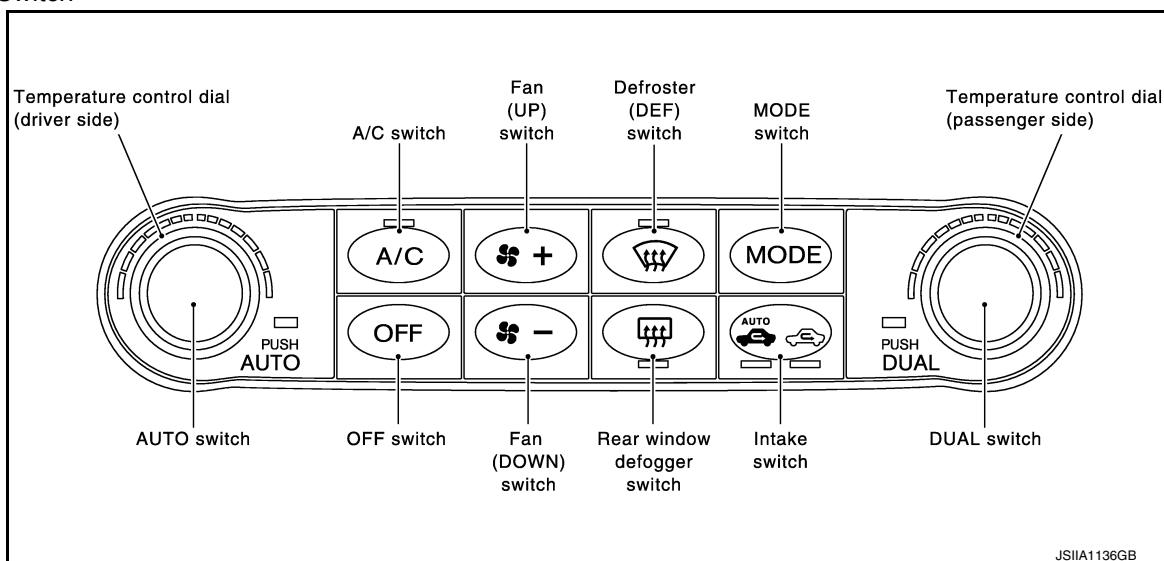


AUTOMATIC AIR CONDITIONER SYSTEM

< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]

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, DUAL switch indicator turns ON.

AUTO Switch

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

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

OFF Switch

Compressor and blower are OFF, air inlet is set to FRE, and mode position is set to foot position.

Rear Window Defogger Switch

When indicator is ON, rear window is defogged.

Intake Switch

- When AUTO switch is pressed, AUTO INTAKE indicator and REC indicator turns ON, and air inlet is automatic control.
- When intake switch is pressed, AUTO INTAKE indicator and REC indicator turns OFF, and air inlet is fixed to FRE.
- When intake switch is pressed again, REC indicator turns ON, and air inlet is fixed to REC.
- Then auto intake mode is entered, inlet status is displayed by REC indicator even during automatic controlled.
- When REC indicator is turned OFF, shifting mode position to D/F or DEF or when compressor is turned from ON to OFF, intake mode position is fixed to FRE mode.

DUAL Switch

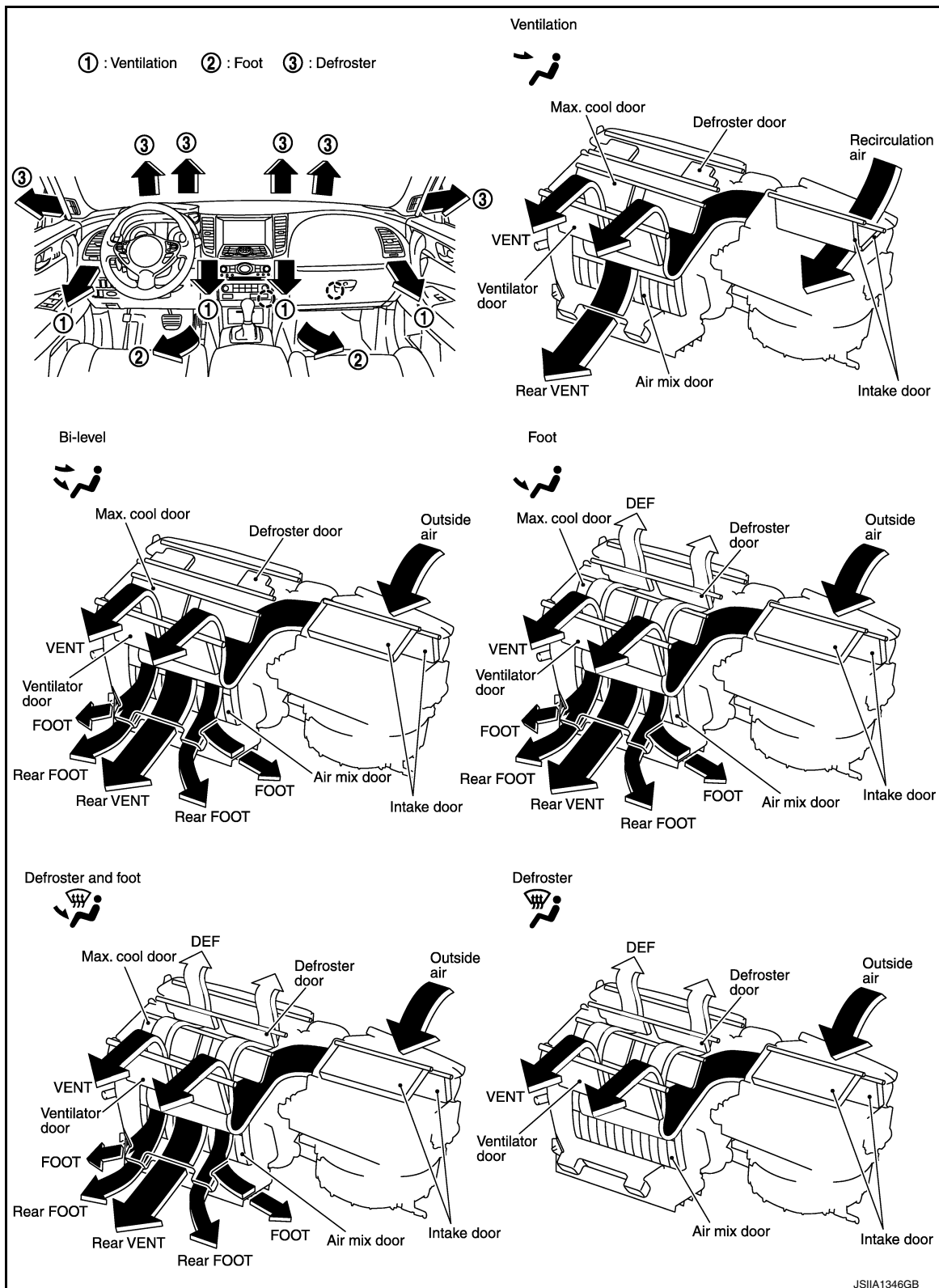
AUTOMATIC AIR CONDITIONER SYSTEM

[AUTOMATIC AIR CONDITIONER]

< SYSTEM DESCRIPTION >

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

DISCHARGE AIR FLOW

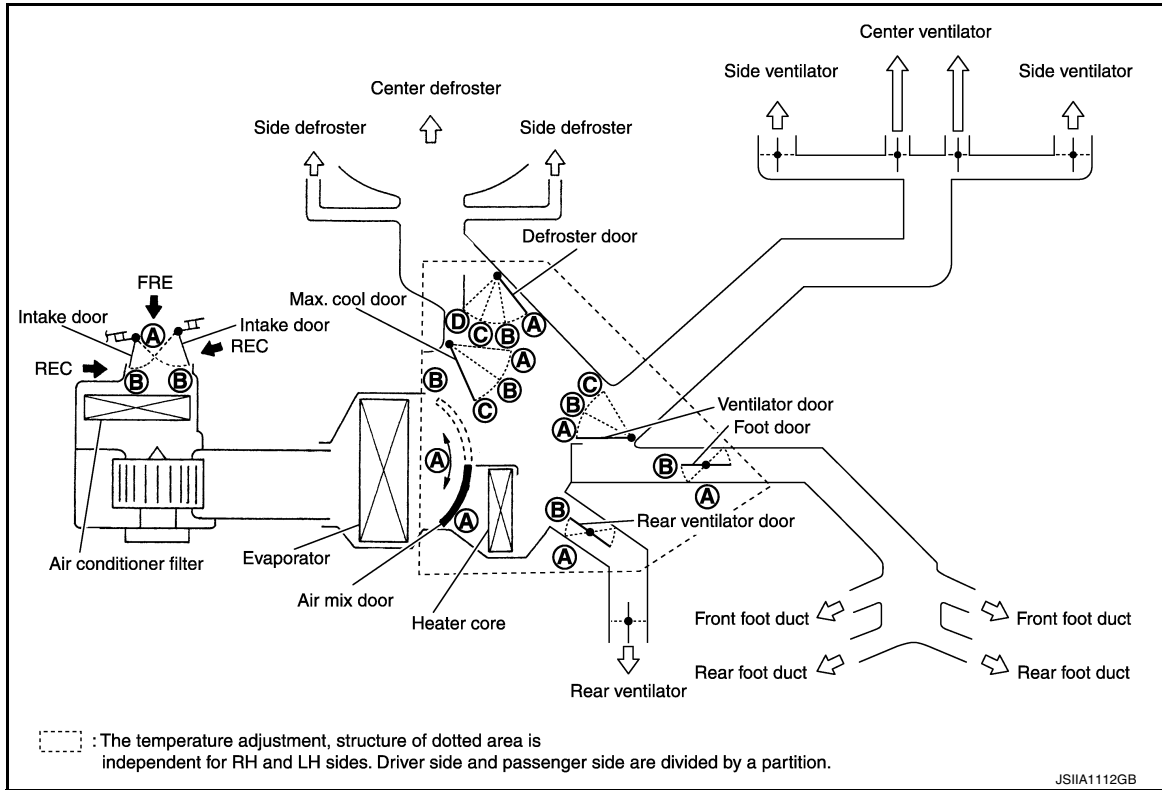


AUTOMATIC AIR CONDITIONER SYSTEM

< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]

SWITCHES AND THEIR CONTROL FUNCTION



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			AUTO	FRE	REC					OFF
		MODE									18℃ (60°F)	32℃ (90°F)	18℃ (60°F)	32℃ (90°F)	OFF
Ventilator door	—	(A)	(B)	(C)	(C)	(C)	AUTO	—	—	—	—		—		(C)
Max. cool door	—	(A)	(B)	(C)	(C)	(C)		—	—	—	—		—		(C)
Defroster door	—	(D)	(D)	(C)	(B)	(A)		—	—	—	—		—		(C)
Foot door	—	(B)	(B)	(B)	(B)	(A)		—	—	—	—		—		(B)
Rear ventilator door	—	(B)	(B)	(B)	(B)	(A)		—	—	—	—		—		(B)
Intake door	—	—				(B)		AUTO	(B)	(A)	—		—		(B)
Air mix door (Driver side)	—	—				—		—			(A)	AUTO	(B)	—	
Air mix door (Passenger side)	ON	—				—		—			—		(A)	AUTO	(B)
	OFF	—				—		—			(A)	AUTO	(B)	—	

JSIIA1344GB

AIR CONDITIONER LAN CONTROL SYSTEM

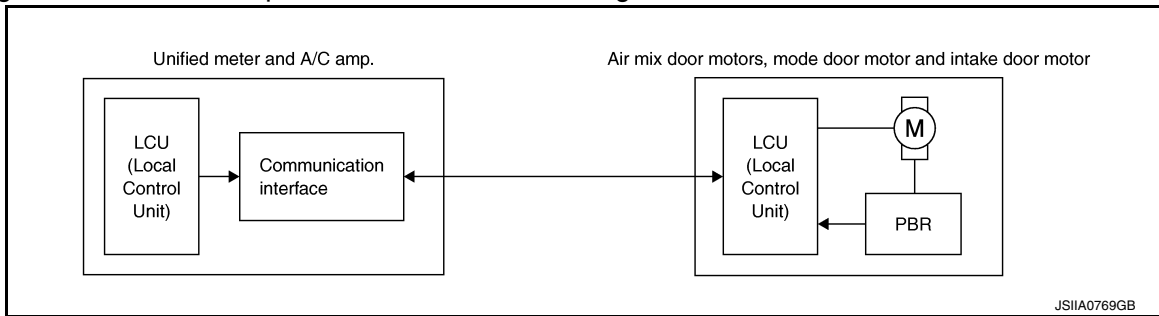
The LAN (Local Area Network) system consists of unified meter and A/C amp., mode door motor, air mix door motors and intake door motor.

AUTOMATIC AIR CONDITIONER SYSTEM

< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]

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



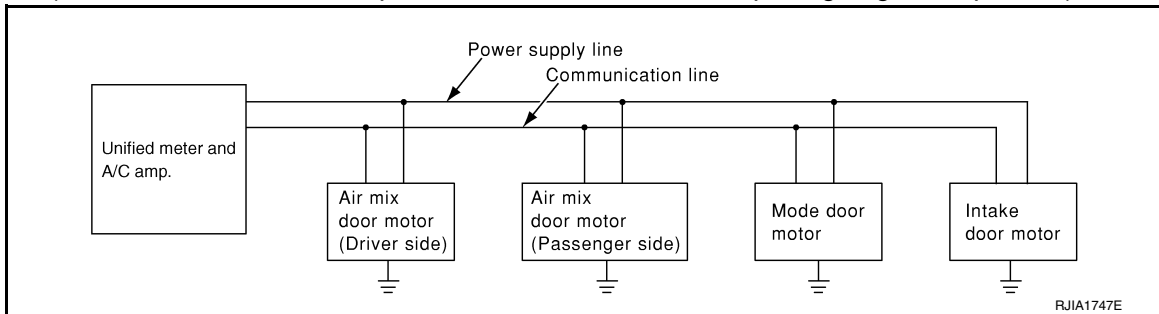
SYSTEM CONSTRUCTION

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.

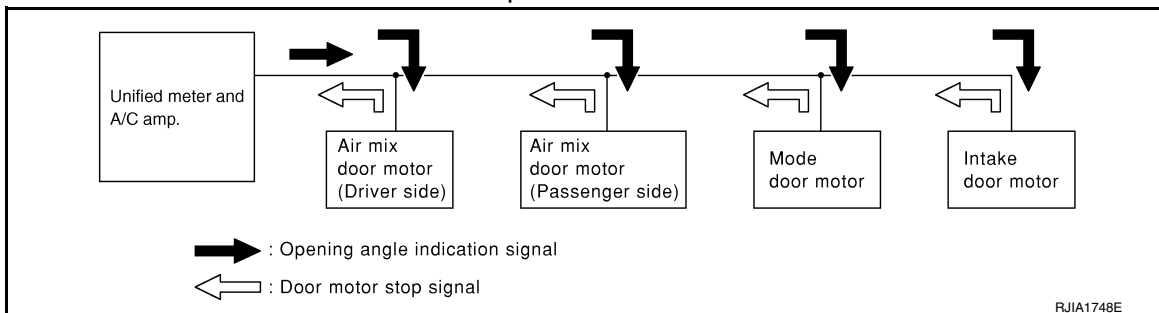
- Address
- Motor opening angle signals
- Data transmission
- Motor stop and drive decision
- Opening angle sensor (PBR function)
- Comparison
- Decision (Unified meter and A/C amp. indicated value and motor opening angle comparison)



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

< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]

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:

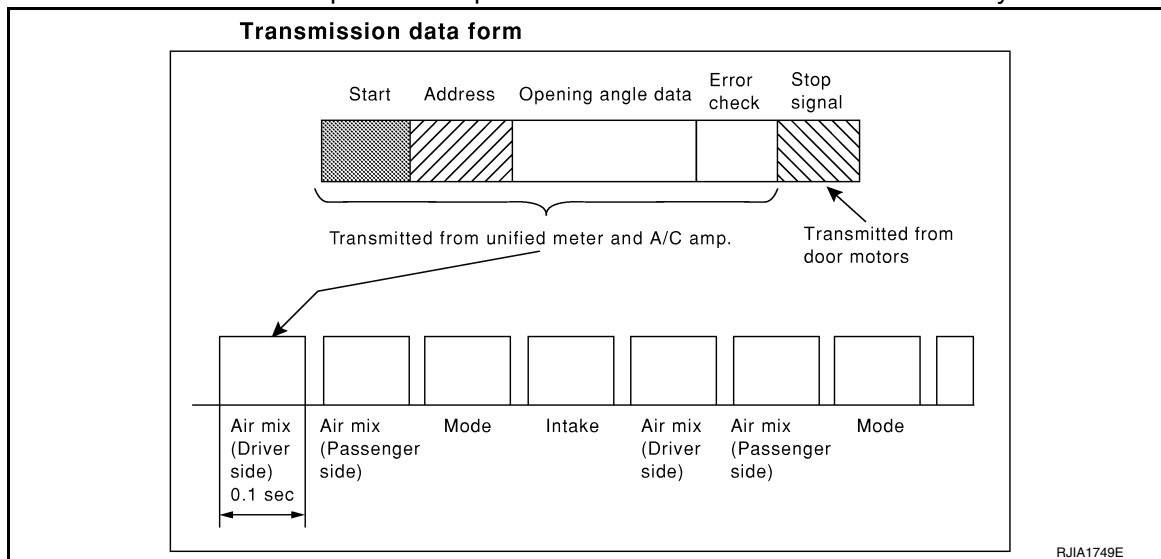
- Data that shows the indicated door opening angle of each door motor.

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 ACCS : Component Part Location

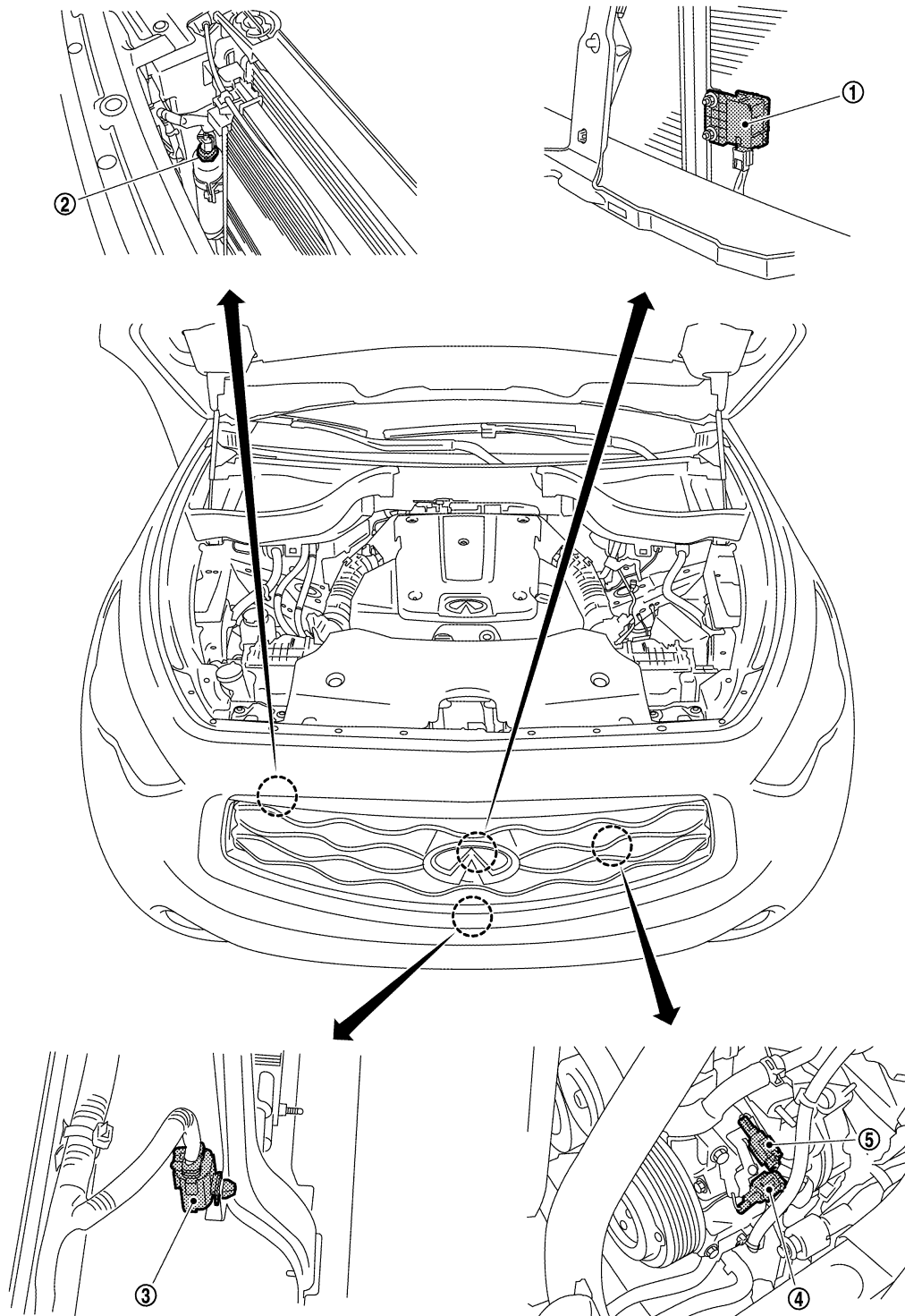
INFOID:0000000010581351

ENGINE COMPARTMENT

AUTOMATIC AIR CONDITIONER SYSTEM

< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]



- | | | |
|--|--------------------------------|-------------------|
| 1. Exhaust gas/outside odor detecting sensor | 2. Refrigerant pressure sensor | 3. Ambient sensor |
| 4. Compressor (magnet clutch) | 5. Compressor (ECV) | |

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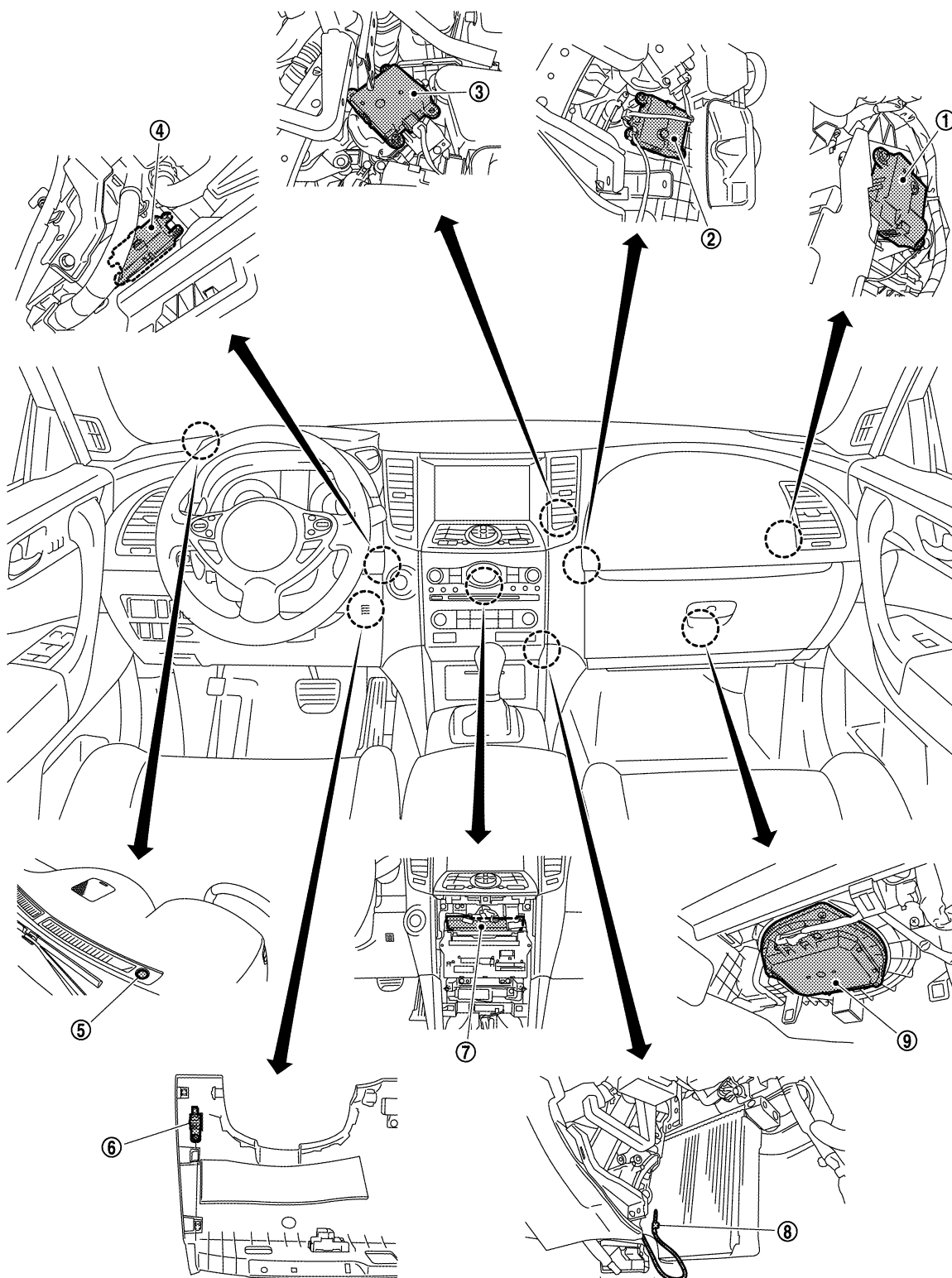
PASSENGER COMPARTMENT

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AUTOMATIC AIR CONDITIONER SYSTEM

< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]



JSIIA1285ZZ

- | | | |
|-------------------------------------|--|----------------------|
| 1. Intake door motor | 2. Air mix door motor (passenger side) | 3. Mode door motor |
| 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 ACCS : Component Description

INFOID:0000000010581352

AUTOMATIC AIR CONDITIONER SYSTEM

< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]

Component	Reference
Air mix door motor (driver side)	HAC-74. "Description"
Air mix door motor (passenger side)	HAC-76. "Description"
Ambient sensor	HAC-90. "Description"
Blower motor	HAC-82. "Description"
Compressor (magnet clutch)	HAC-86. "Description"
Compressor (ECV)	HAC-88. "Description"
Exhaust gas/outside odor detecting sensor	HAC-101. "Description"
Intake door motor	HAC-79. "WITH ACCS : Description"
Intake sensor	HAC-99. "Description"
In-vehicle sensor	HAC-93. "Description"
Mode door motor	HAC-72. "Description"
Refrigerant pressure sensor	EC-1561. "Description"
Sunload sensor	HAC-96. "Description"
Unified meter and A/C amp.	HAC-71. "Description"

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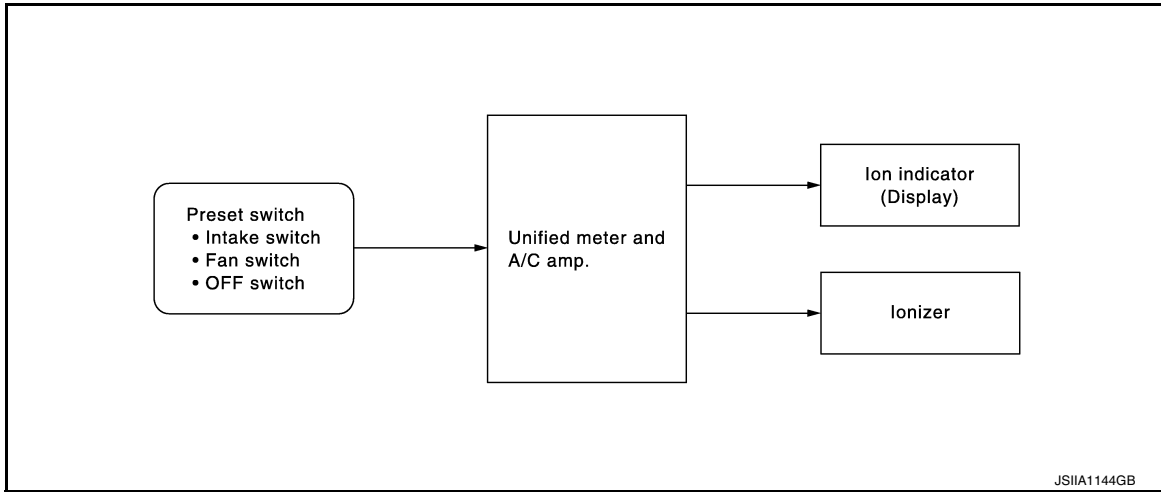
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PLASMACLUSTER SYSTEM

System Diagram

INFOID:0000000010581353



System Description

INFOID:0000000010581354

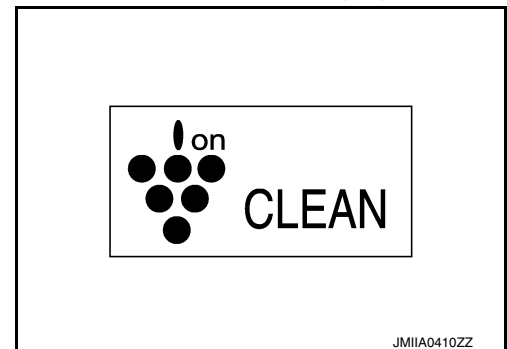
- Plasmacluster™ ion generation function, which generates ions inactivating bacteria and supplies to the passenger compartment through air blown from air conditioner, has been adopted.
- Airborne mold and bacteria in the passenger compartment are inactivated by the effect of Plasmacluster™ ion.

NOTE:

- Plasmacluster™ ion technology developed by Sharp Corporation is installed in this item.
- Plasmacluster™ is a trademark of Sharp Corporation.

OPERATION DESCRIPTION

- The Plasmacluster™ ion generation function operates synchronized with the blower motor. The Plasmacluster™ ion generation function operates when the blower motor operates.
- Operating state of Plasmacluster™ system is displayed.
- Plasmacluster™ system switches display according to air flow volume as shown in the following figure.
- When air flow is small.

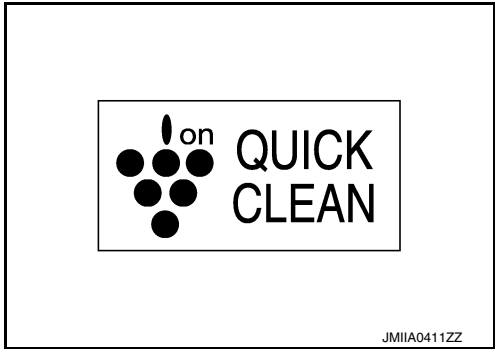


PLASMACLUSTER SYSTEM

< SYSTEM DESCRIPTION >

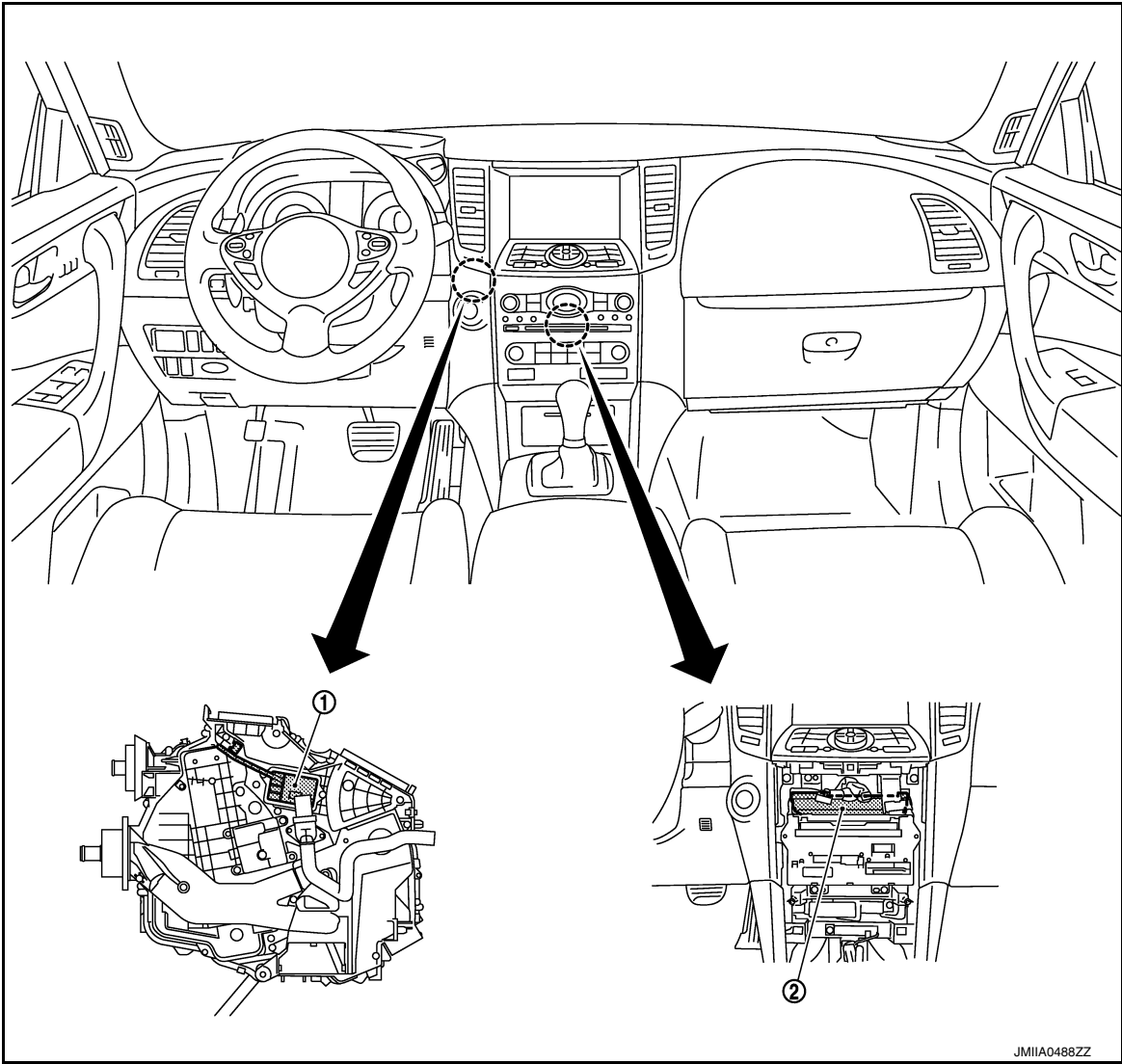
[AUTOMATIC AIR CONDITIONER]

- When air flow is large.



Component Part Location

INFOID:0000000010581355



1. Ionizer
2. Unified meter and A/C amp.

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PLASMACLUSTER SYSTEM

< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]

Component Description

INFOID:0000000010581356

Component	Description
Unified meter and A/C amp.	The unified meter and A/C amp. controls ionizer ON/OFF and shifts an ion generation function.
Ion indicator	Plasmacluster ion generation function operating condition is displayed in the ion indicator in the display.
Ionizer	HAC-104, "Description"

CAN COMMUNICATION SYSTEM

System Description

INFOID:0000000010581357

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-34, "CAN System Specification Chart"](#).

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MODE DOOR CONTROL SYSTEM

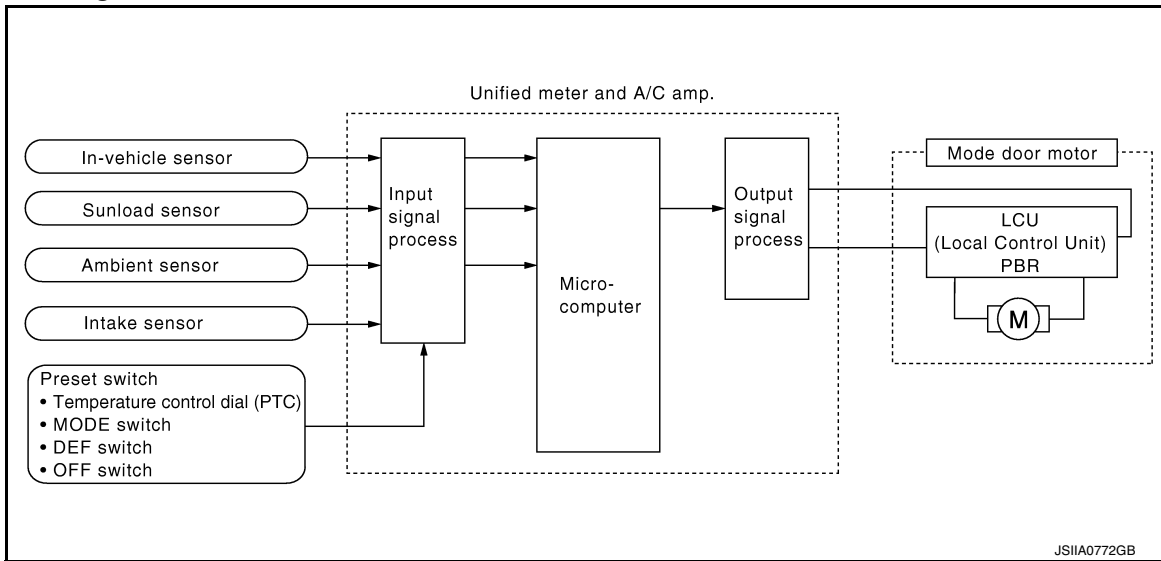
< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]

MODE DOOR CONTROL SYSTEM

System Diagram

INFOID:0000000010581358



System Description

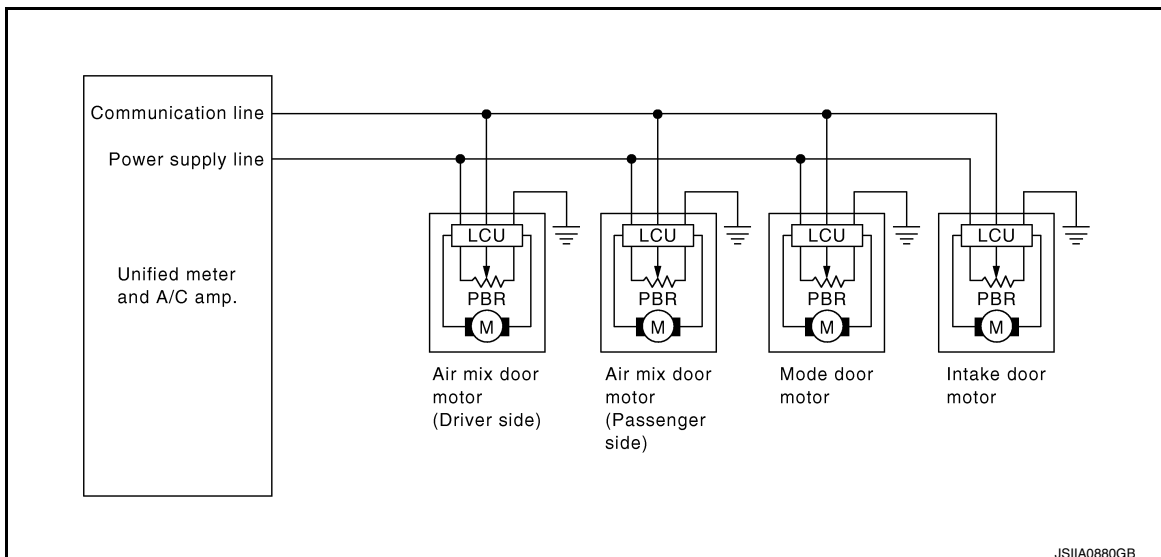
INFOID:0000000010581359

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 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



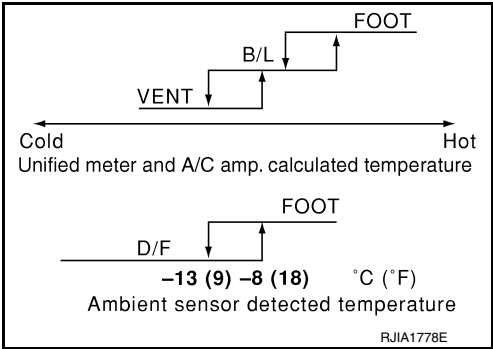
Mode Door Control Specification

MODE DOOR CONTROL SYSTEM

< SYSTEM DESCRIPTION >

[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.



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AIR MIX DOOR CONTROL SYSTEM

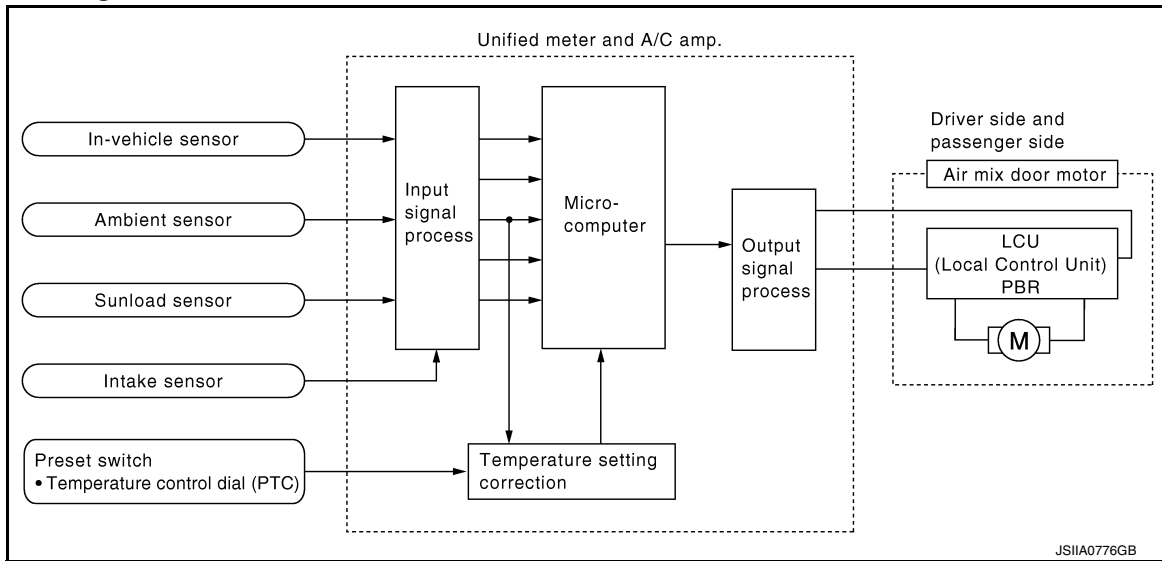
< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]

AIR MIX DOOR CONTROL SYSTEM

System Diagram

INFOID:000000010581360



System Description

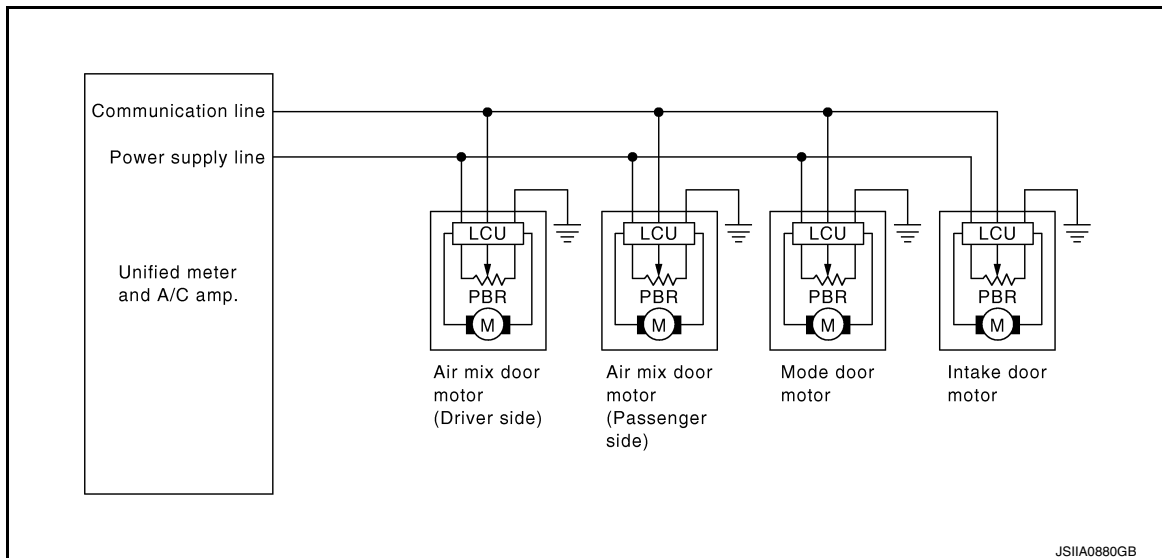
INFOID:000000010581361

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

Door Motor Circuit



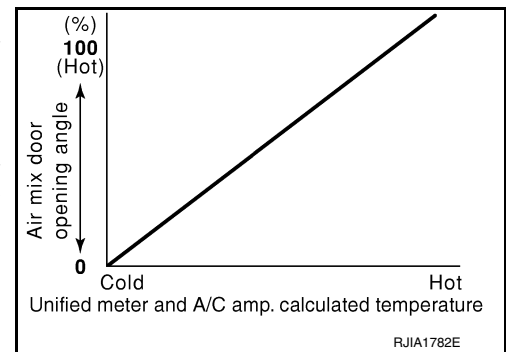
Air Mix Door Control Specification

AIR MIX DOOR CONTROL SYSTEM

< SYSTEM DESCRIPTION >

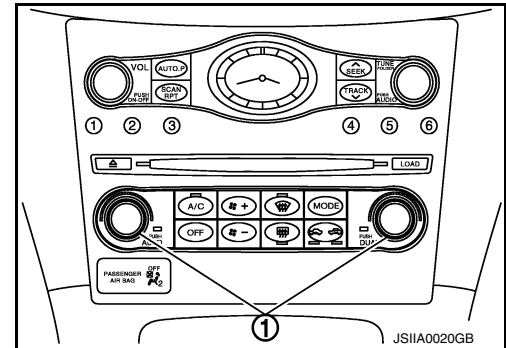
[AUTOMATIC AIR CONDITIONER]

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 18.0°C (60°F), air mix door is fixed at full cold, and when a temperature is set at 32.0°C (90°F), it is set at full hot.



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 18.0°C (60°F) to 32.0°C (90°F) temperature range by turning temperature control dial. The set temperature is displayed.



INTAKE DOOR CONTROL SYSTEM

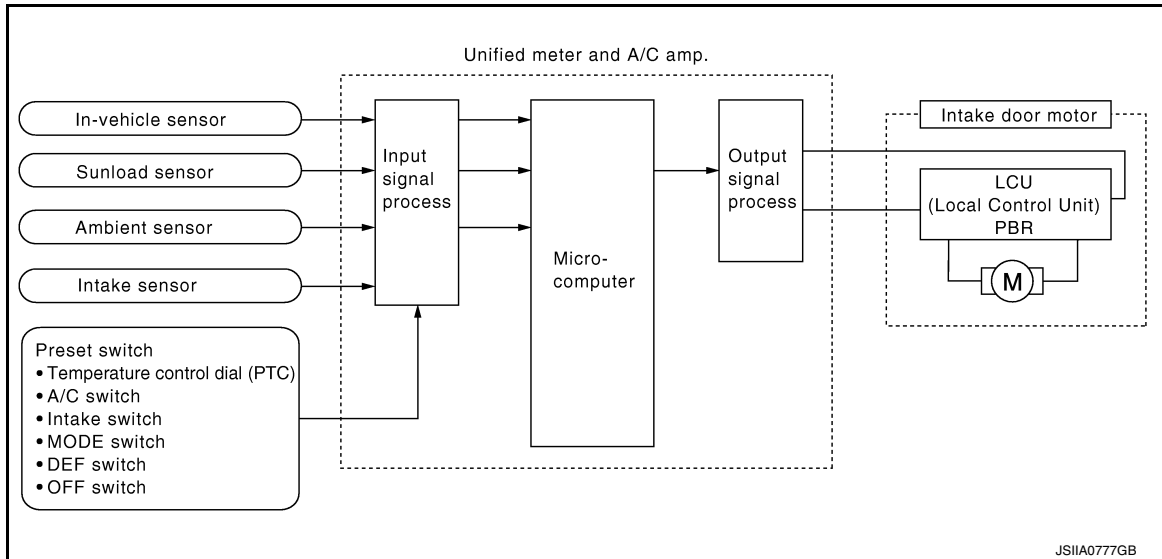
< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]

INTAKE DOOR CONTROL SYSTEM WITHOUT ACCS

WITHOUT ACCS : System Diagram

INFOID:0000000010581362



WITHOUT ACCS : System Description

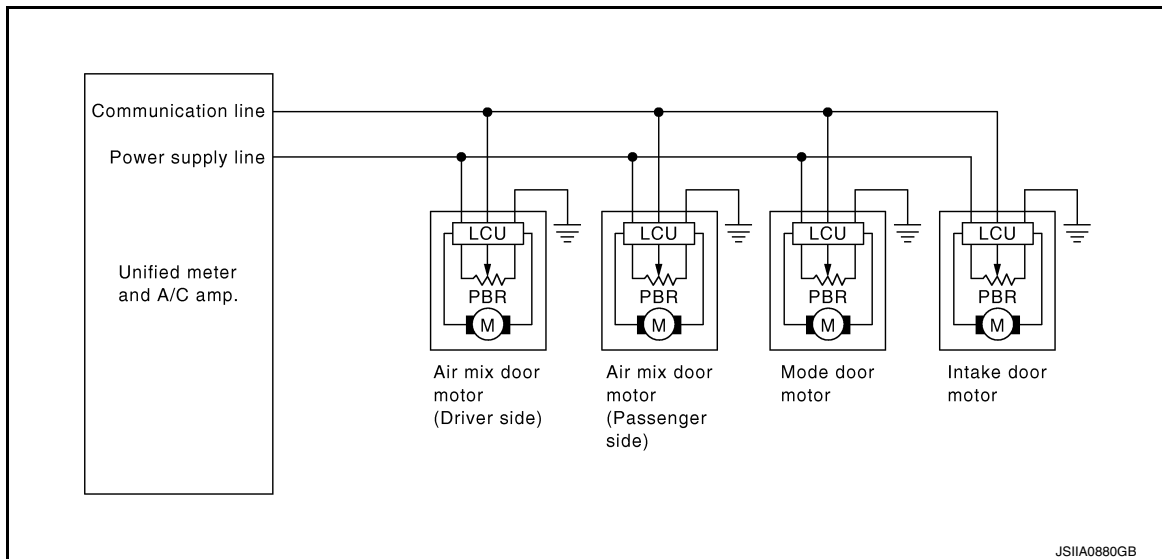
INFOID:0000000010581363

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



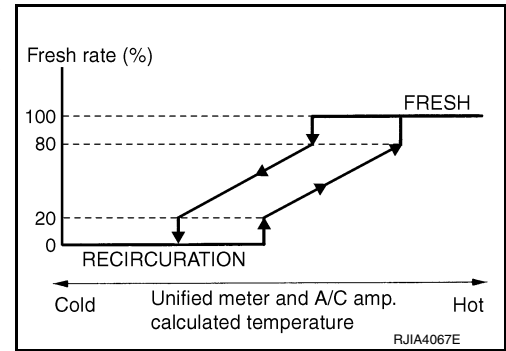
Intake Door Control Specification

INTAKE DOOR CONTROL SYSTEM

[AUTOMATIC AIR CONDITIONER]

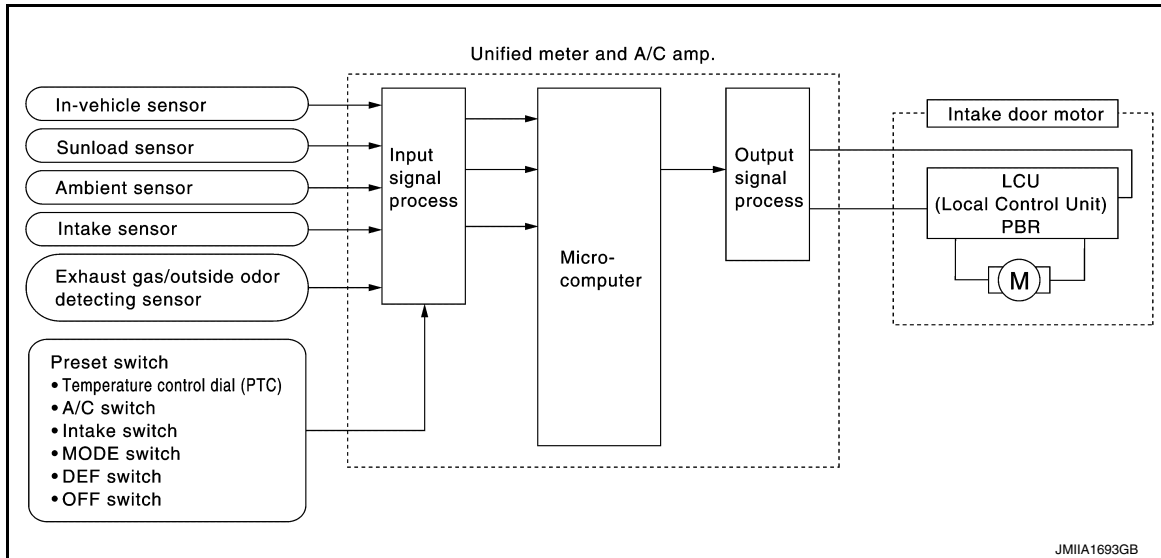
< SYSTEM DESCRIPTION >

- Intake door position is basically fixed at FRE when FRE indicator of intake switch is ON or DEF switch is ON.
- Intake door position is basically fixed at REC when REC indicator of intake switch is 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.



WITH ACCS

WITH ACCS : System Diagram



WITH ACCS : System Description

INFOID:0000000010581365

The intake door is automatically controlled by the ambient atmospheric CO, NO₂ and unpleasant odor, temperature setting, ambient temperature, in-vehicle temperature, intake temperature, amount of sunload and ON/OFF operation of the compressor.

SYSTEM OPERATION

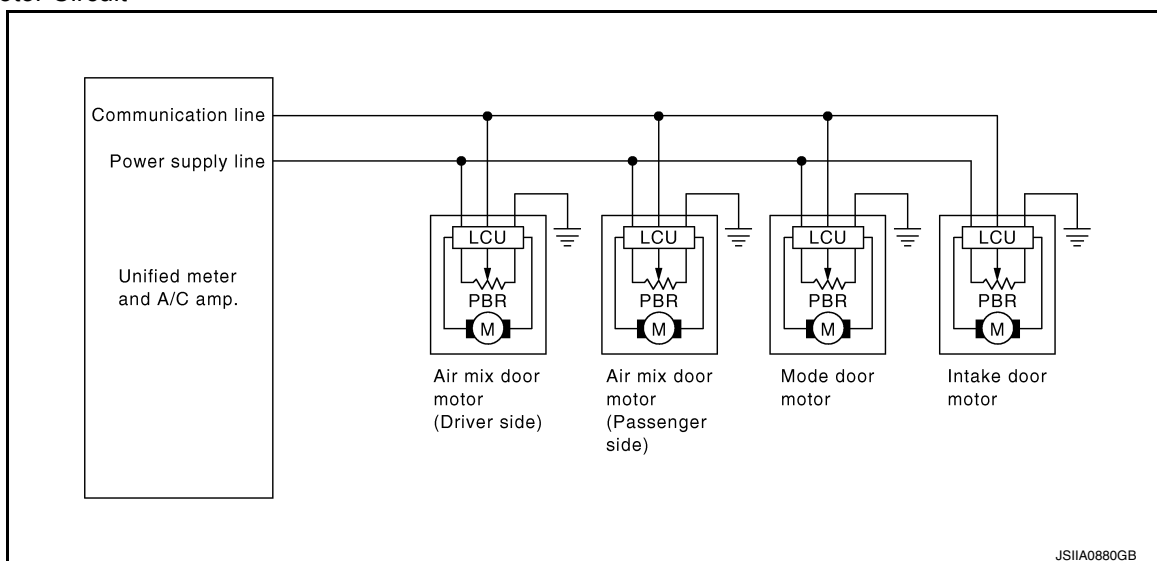
The intake door control judges intake door position based on the ambient atmospheric CO, NO₂ and unpleasant odor, ambient temperature, the intake air temperature and the in-vehicle temperature. When DEF or OFF switch is pressed, the unified meter and A/C amp. sets the intake door at the FRE position.

INTAKE DOOR CONTROL SYSTEM

< SYSTEM DESCRIPTION >

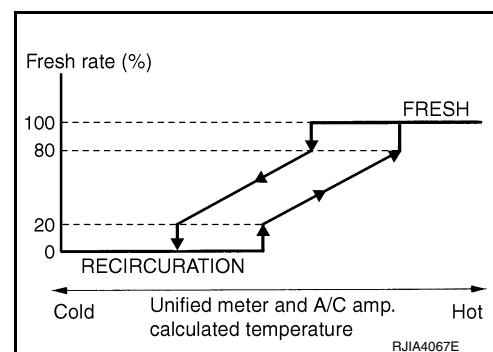
[AUTOMATIC AIR CONDITIONER]

Door Motor Circuit



Intake Door Control Specification

- Intake door position is basically fixed at FRE when FRE indicator of intake switch is OFF or DEF switch is ON.
- Intake door position is basically fixed at REC when REC indicator of intake switch is 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.



Automatic intake control (exhaust gas/outside odor detecting mechanism)

Description

- In addition to air inlet automatic control of automatic air conditioning system, unified meter and A/C amp. controls automatically air inlet according to signal from exhaust gas/outside odor detecting sensor, so that unpleasant outside odor does not enter in passenger room.

Operation Description

- When AUTO switch is pressed, AUTO intake indicator and REC indicator turn ON. Air inlet is fixed to recirculation for approximately 5 minutes, and then is switched to automatic intake control (exhaust gas/outside odor detecting mechanism).
- Air inlet switches to recirculation when exhaust gas or outside odor is detected while automatic intake control (exhaust gas/outside odor detecting mechanism) is operated. After that, air inlet switches to fresh air intake when exhaust gas or outside odor becomes not detectable.

NOTE:

- Sensitivity of exhaust gas/outside odor detecting sensor can be changed. Refer to [HAC-15, "WITH ACCS : Exhaust exhaust gas/outside odor detecting/Outside Odor Detecting Sensor Sensitivity Adjustment Function"](#).
- Automatic intake control (exhaust gas/outside odor detecting mechanism) does not operate when ambient temperature is -2°C (28°F) or less. In this case, control is only for control of automatic air inlet of automatic air conditioning system.

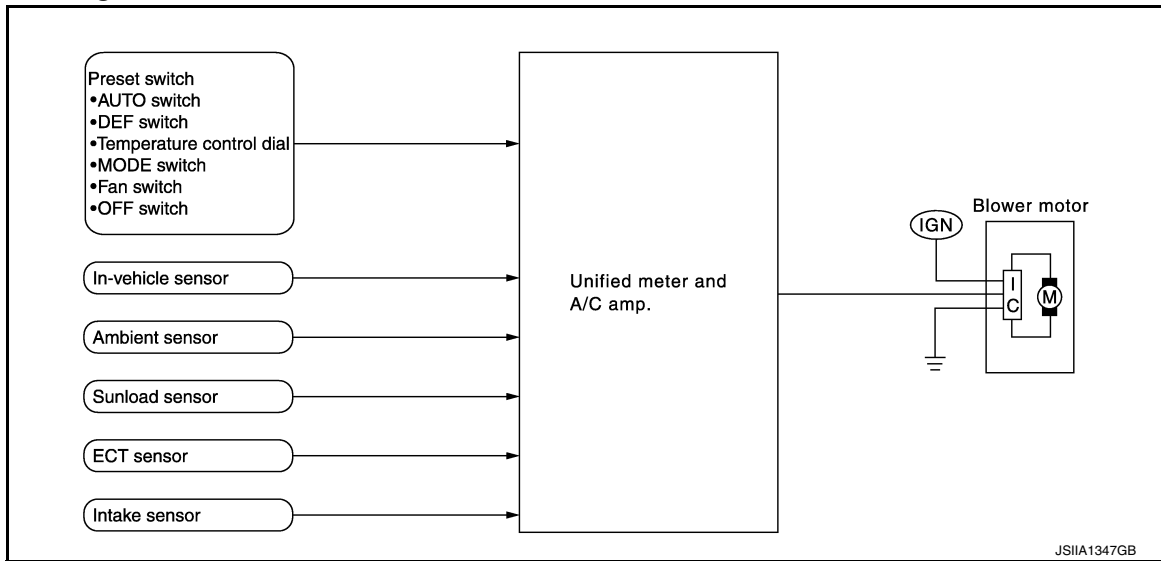
BLOWER MOTOR CONTROL SYSTEM

< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]

BLOWER MOTOR CONTROL SYSTEM

System Diagram



System Description

INFOID:000000010581367

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 gradually increase air flow volume.

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

SYSTEM OPERATION

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 motor control 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

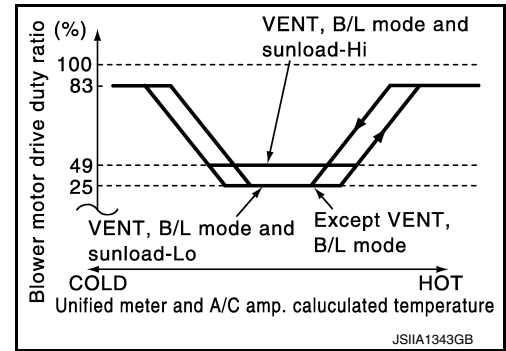
When the in-vehicle temperature and the set temperature are very close, the blower operates at low speed. The low speed varies depending on the sunload. During conditions of low or no sunload, the blower speed is at duty ratio 25%. During high sunload conditions, the unified meter and A/C amp. raise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

BLOWER MOTOR CONTROL SYSTEM

< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]

Fan Speed Control Specification



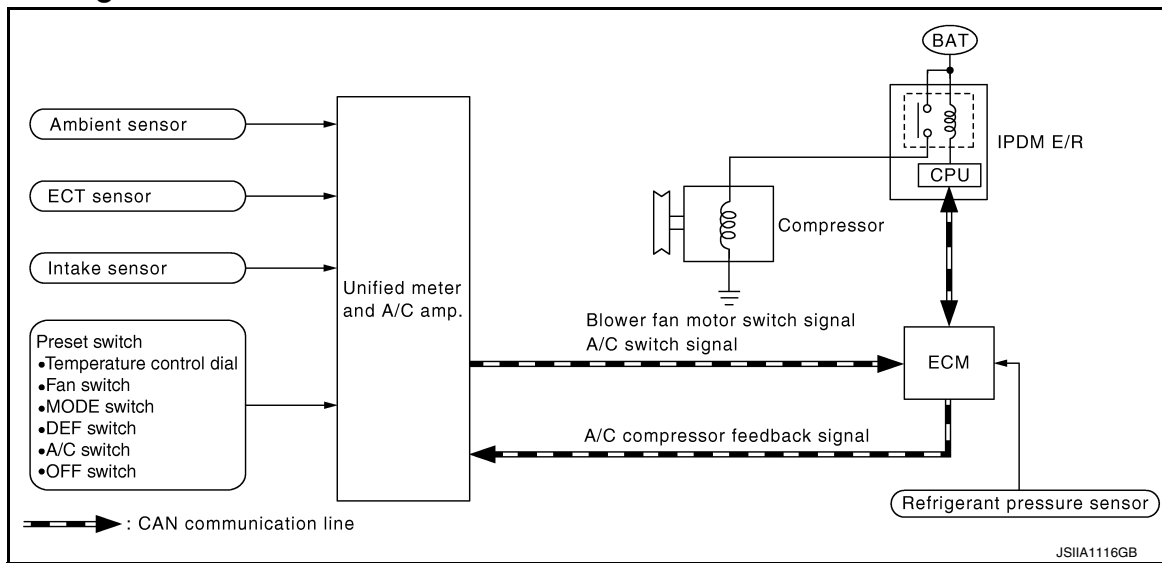
MAGNET CLUTCH CONTROL SYSTEM

< SYSTEM DESCRIPTION >

[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 is pressed or when shifting mode position D/F, unified meter and A/C amp. transmits A/C switch signal and blower fan motor switch 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 A/C compressor request signal to IPDM E/R, via CAN communication.

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

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

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

NOTE:

When the following operations are performed, compressor status is changed, but A/C switch indicator lighting status is not changed.

- Air outlet mode is set to D/F or DEF.
- Air outlet mode is set to other mode from D/F or DEF.
- AUTO switch turns ON.

Compressor Protection Control

ECM makes the A/C relay go OFF and stops the compressor when pressure on the high-pressure side detected by refrigerant pressure sensor is over approximately 3,119 kPa (31.8 kg/cm², 452 psi), or below approximately 118 kPa (1.2 kg/cm², 17 psi).

Low Temperature Protection Control

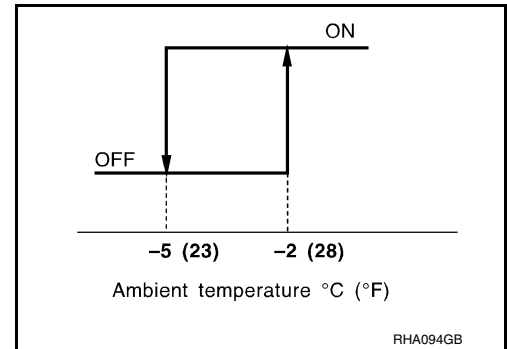
Unified meter and A/C amp. turns compressor ON or OFF as judged by a signal detected by ambient sensor and intake sensor.

MAGNET CLUTCH CONTROL SYSTEM

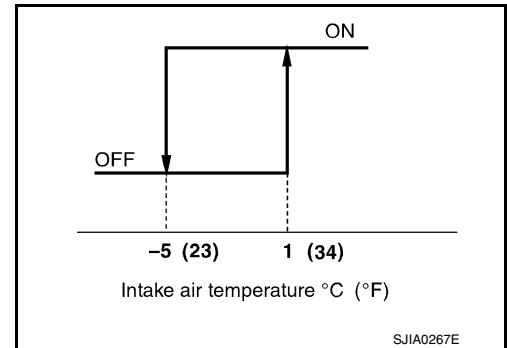
[AUTOMATIC AIR CONDITIONER]

< SYSTEM DESCRIPTION >

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).



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).



DIAGNOSIS SYSTEM (UNIFIED METER & A/C AMP.)

< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]

DIAGNOSIS SYSTEM (UNIFIED METER & A/C AMP.)

WITHOUT ACCS

WITHOUT ACCS : Diagnosis Description

INFOID:0000000010581370

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.
- Shifting from STEP-5 to AUXILIARY MECHANISM is accomplished by means of pressing fan (UP: +) switch.
- Temperature setting trimmer. Refer to [HAC-8, "WITHOUT ACCS : Temperature Setting Trimmer"](#).
- Foot position setting trimmer. Refer to [HAC-9, "WITHOUT ACCS : Foot Position Setting Trimmer"](#).

A
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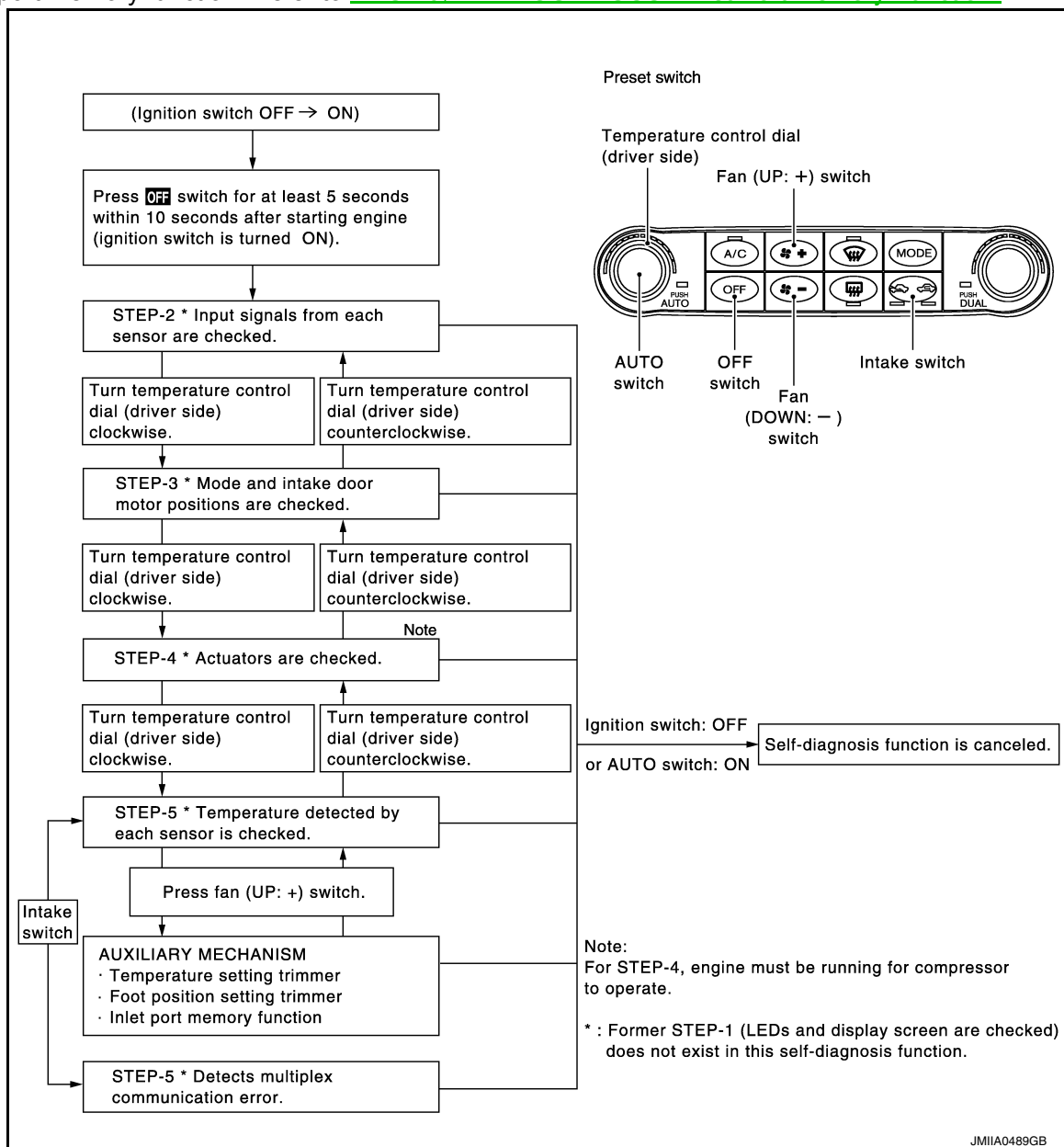
HAC

DIAGNOSIS SYSTEM (UNIFIED METER & A/C AMP.)

[AUTOMATIC AIR CONDITIONER]

< SYSTEM DESCRIPTION >

- Inlet port memory function. Refer to [HAC-10. "WITHOUT ACCS : Inlet Port Memory Function"](#).



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 (indicators 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 the intake switch indicators are turned ON.

>> GO TO 2.

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

DIAGNOSIS SYSTEM (UNIFIED METER & A/C AMP.)

< SYSTEM DESCRIPTION >

[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)

Indicates 25 seconds after "2" is indicated.

Indicates

20

SJIA1778E

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)

Indicates 50 seconds after "3" is indicated.

Indicates

30

SJIA1779E

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

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

>> GO TO 5.

Changes from "1" to "6"

Indicates

41

SJIA1780E

5.CHECK ACTUATORS

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

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. Refer to [VTL-5. "System Description"](#).

Is this inspection result normal?

YES >> GO TO 6.
NO-1 >> Air outlet does not change. Refer to [HAC-72. "Diagnosis Procedure"](#).
NO-2 >> Intake door does not change. Refer to [HAC-78. "WITHOUT ACCS : Diagnosis Procedure"](#).

DIAGNOSIS SYSTEM (UNIFIED METER & A/C AMP.)

[AUTOMATIC AIR CONDITIONER]

< SYSTEM DESCRIPTION >

- NO-3 >> Discharge air temperature (driver side) does not change. Refer to [HAC-74, "Diagnosis Procedure"](#).
- NO-4 >> Discharge air temperature (passenger side) does not change. Refer to [HAC-76, "Diagnosis Procedure"](#).
- NO-5 >> Blower motor operation is malfunctioning. Refer to [HAC-82, "Diagnosis Procedure"](#).
- NO-6 >> Magnet clutch does not engage. Refer to [HAC-86, "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.

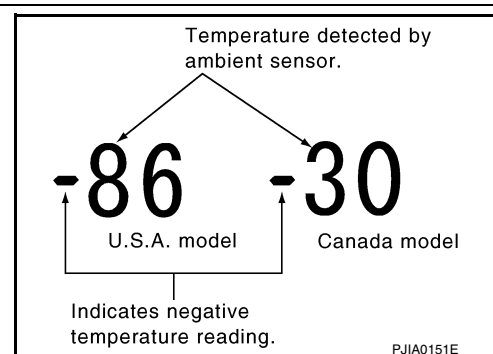
NOTE:

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-90, "Diagnosis Procedure"](#).



8.CHECK IN-VEHICLE SENSOR

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

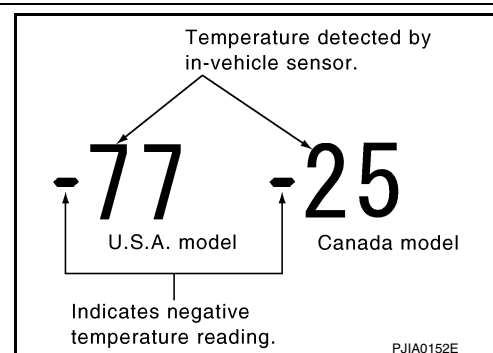
NOTE:

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-93, "Diagnosis Procedure"](#).



9.CHECK INTAKE SENSOR

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

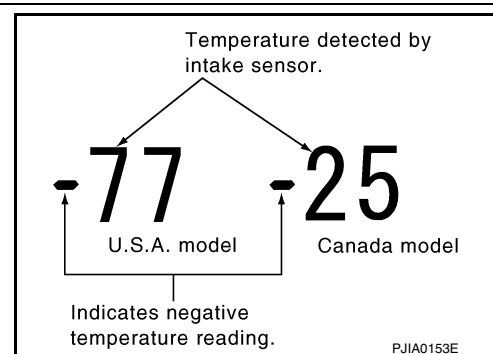
NOTE:

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-99, "Diagnosis Procedure"](#).



10.CHECK CAN COMMUNICATION ERROR

DIAGNOSIS SYSTEM (UNIFIED METER & A/C AMP.)

< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]

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-49, "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.

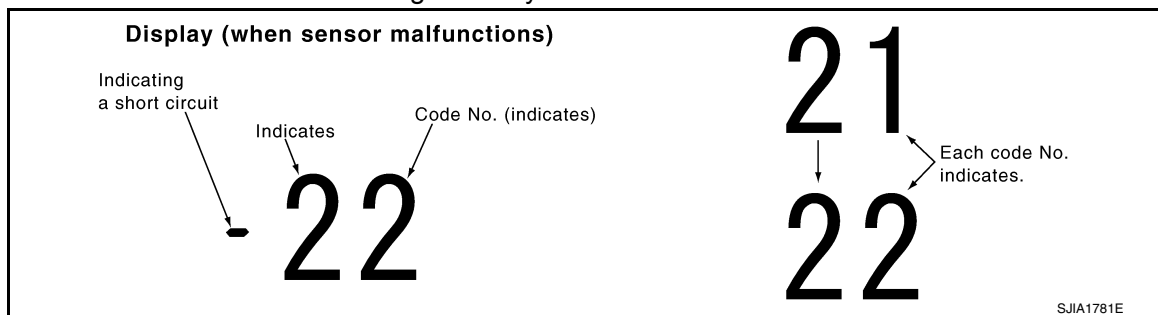
(Corresponding code Nos. indicates 1 second each if two or more sensors and door motors malfunction.)

(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-90, "Diagnosis Procedure"
22 / -22	In-vehicle sensor	HAC-93, "Diagnosis Procedure"
24 / -24	Intake sensor	HAC-99, "Diagnosis Procedure"
25 / -25	Sunload sensor *	HAC-96, "Diagnosis Procedure"
26 / -26	Air mix door motor PBR (Driver side)	HAC-74, "Diagnosis Procedure"
27 / -27	Air mix door motor PBR (Passenger side)	HAC-76, "Diagnosis Procedure"

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

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-72, "Diagnosis Procedure"
32	DEF		
37	FRE	Intake door motor	HAC-78, "WITHOUT ACCS : 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

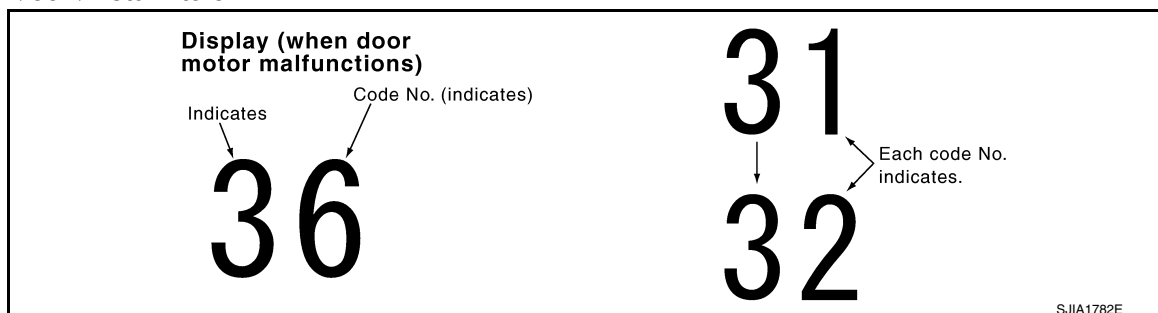
*2: The following display pattern will appear if intake door motor harness connector is disconnected.

DIAGNOSIS SYSTEM (UNIFIED METER & A/C AMP.)

< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]

37→38→39→Return to 37



>> INSPECTION END

WITHOUT ACCS : CONSULT Function

INFOID:0000000010581371

CONSULT APPLICATION ITEMS

CONSULT 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

Display Item List

Monitor Item	Condition		Value/Status
IGNITION SW	Ignition switch OFF → ON		Off → On
HEATER FAN SW	Ignition switch ON	Blower fan motor switch ON	On
		Blower fan motor switch OFF	Off
AIR COND SIG	Ignition switch ON	Compressor ON	On
		Compressor OFF	Off
REFRIGERANT PRESSURE SENSOR	• Engine is running • Warm-up condition • Both A/C switch and blower fan motor switch: ON (Compressor operates)		1.0 – 4.0 V

WITH ACCS

WITH ACCS : Diagnosis Description

INFOID:0000000010581372

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

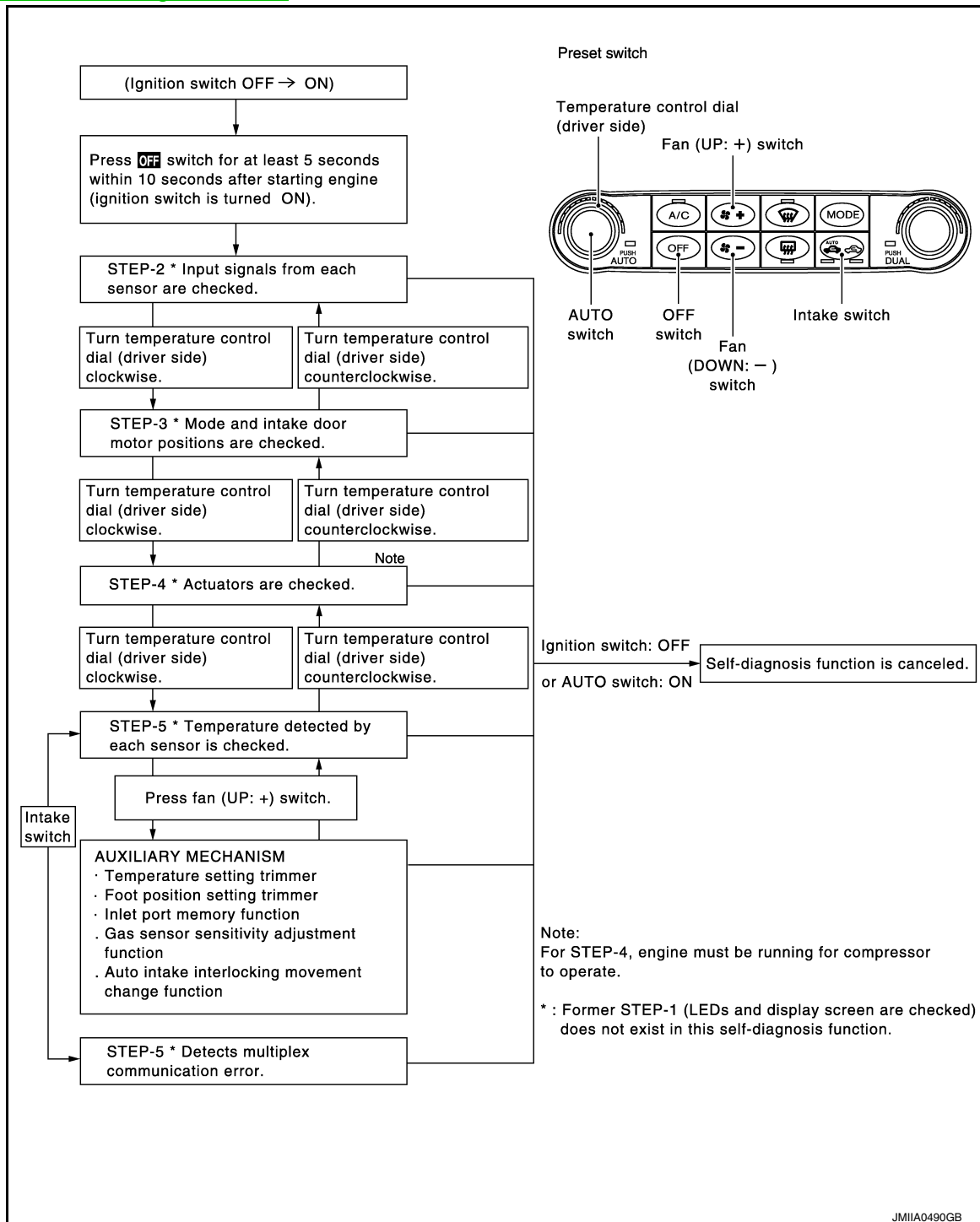
- The self-diagnosis system diagnoses sensors, door motors, blower motor, etc. by system line. Refer to applicable sections (items) for details. Shifting from normal control to the self-diagnosis system is accomplished by starting the engine (turning the ignition switch ON) and pressing OFF switch for 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.
- Shifting from STEP-5 to AUXILIARY MECHANISM is accomplished by means of pressing fan (UP: +) switch.
- Temperature setting trimmer. Refer to [HAC-13, "WITH ACCS : Temperature Setting Trimmer"](#).
- Foot position setting trimmer. Refer to [HAC-14, "WITH ACCS : Foot Position Setting Trimmer"](#).
- Inlet port memory function. Refer to [HAC-15, "WITH ACCS : Inlet Port Memory Function"](#).
- Exhaust gas/outside odor detecting sensor sensitivity adjustment function. Refer to [HAC-15, "WITH ACCS : Exhaust exhaust gas/outside odor detecting/Outside Odor Detecting Sensor Sensitivity Adjustment Function"](#).

DIAGNOSIS SYSTEM (UNIFIED METER & A/C AMP.)

[AUTOMATIC AIR CONDITIONER]

< SYSTEM DESCRIPTION >

- Auto intake interlocking movement change function. Refer to [HAC-16. "WITH ACCS : Auto Intake Interlocking Movement Change Function"](#).



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 (indicators and display screen are checked) does not exist in this self-diagnosis function.

DIAGNOSIS SYSTEM (UNIFIED METER & A/C AMP.)

[AUTOMATIC AIR CONDITIONER]

< SYSTEM DESCRIPTION >

- OFF switch may not be recognized according to the timing of pressing it. Operate OFF switch after the intake switch indicators are turned ON.

>> GO TO 2.

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

Does code No. 20 appear on the display?

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

Display (when all sensors are in good order)

Indicates
Indicates 25 seconds after "2" is indicated.



SJIA1778E

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)

Indicates
Indicates 50 seconds after "3" is indicated.



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.

Indicates
Changes from "1" to "6"



SJIA1780E

5.CHECK ACTUATORS

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

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%

DIAGNOSIS SYSTEM (UNIFIED METER & A/C AMP.)

< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]

Code No.	41	42	43	44	45	46
Ionizer	ON	ON	ON	ON	ON	OFF
Ion mode	CLEAN	QUICK CLEAN	QUICK CLEAN	QUICK CLEAN	QUICK CLEAN	OFF

Checks must be made visually, by listening the sound, or by touching air outlets with hand, etc. for improper operation. Refer to [VTL-5. "System Description"](#).

Is this inspection result normal?

YES >> GO TO 6.

NO-1 >> Air outlet does not change. Refer to [HAC-72. "Diagnosis Procedure"](#).

NO-2 >> Intake door does not change. Refer to [HAC-80. "WITH ACCS : Diagnosis Procedure"](#).

NO-3 >> Discharge air temperature (driver side) does not change. Refer to [HAC-74. "Diagnosis Procedure"](#).

NO-4 >> Discharge air temperature (passenger side) does not change. Refer to [HAC-76. "Diagnosis Procedure"](#).

NO-5 >> Blower motor operation is malfunctioning. Refer to [HAC-82. "Diagnosis Procedure"](#).

NO-6 >> Magnet clutch does not engage. Refer to [HAC-86. "Diagnosis Procedure"](#).

NO-7 >> Plasmacluster system does not operate. Refer to [HAC-104. "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.

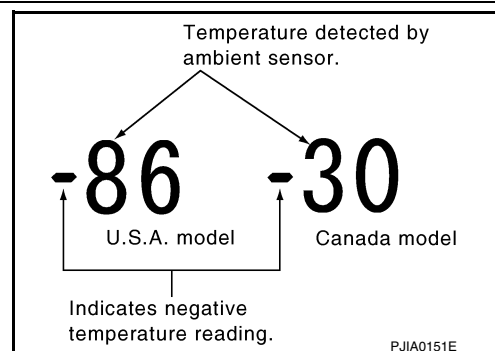
NOTE:

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-90. "Diagnosis Procedure"](#).



8.CHECK IN-VEHICLE SENSOR

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

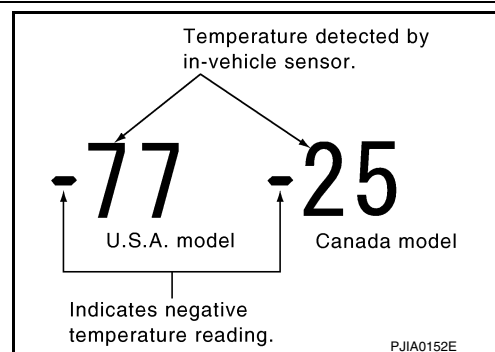
NOTE:

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-93. "Diagnosis Procedure"](#).



9.CHECK INTAKE SENSOR

DIAGNOSIS SYSTEM (UNIFIED METER & A/C AMP.)

[AUTOMATIC AIR CONDITIONER]

< SYSTEM DESCRIPTION >

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

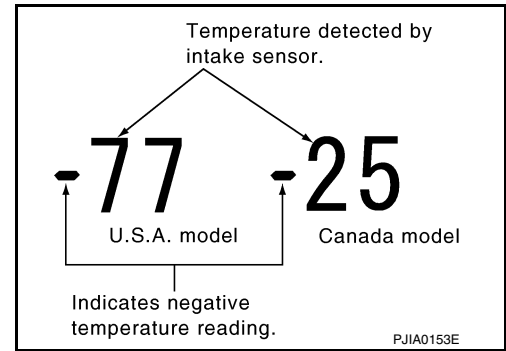
NOTE:

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-99, "Diagnosis Procedure"](#).



10.CHECK CAN COMMUNICATION ERROR

- Press intake switch.
- 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-49, "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.

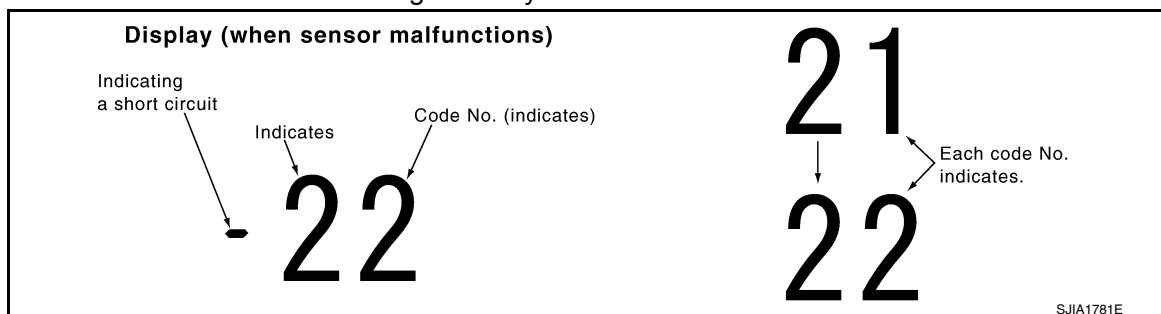
(Corresponding code Nos. indicates 1 second each if two or more sensors and door motors malfunction.)

(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-90, "Diagnosis Procedure"
22 / -22	In-vehicle sensor	HAC-93, "Diagnosis Procedure"
24 / -24	Intake sensor	HAC-99, "Diagnosis Procedure"
25 / -25	Sunload sensor *	HAC-96, "Diagnosis Procedure"
26 / -26	Air mix door motor PBR (Driver side)	HAC-74, "Diagnosis Procedure"
27 / -27	Air mix door motor PBR (Passenger side)	HAC-76, "Diagnosis Procedure"
28 / -28	Exhaust gas/outside odor detecting sensor	HAC-101, "Diagnosis Procedure"
29 / -29	Harness of exhaust gas/outside odor detecting sensor	

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

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

DIAGNOSIS SYSTEM (UNIFIED METER & A/C AMP.)

< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]

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-72. "Diagnosis Procedure"
32	DEF		
37	FRE	Intake door motor	HAC-80. "WITH ACCS : Diagnosis Procedure"
38	20% FRE		
39	REC		

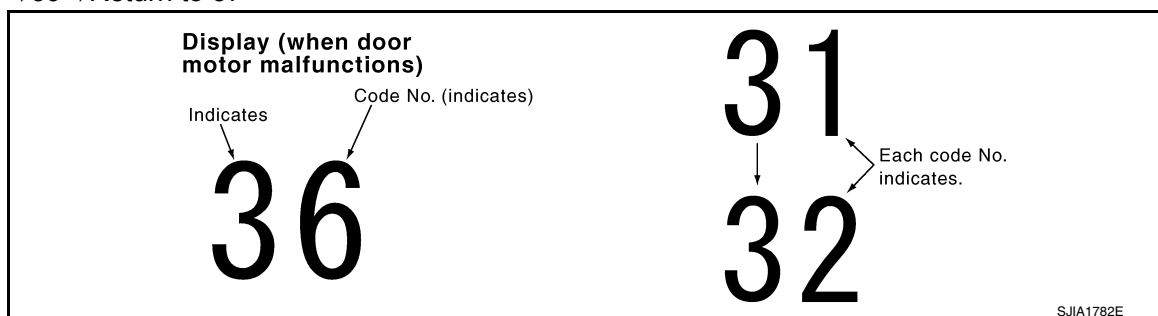
(Corresponding code Nos. indicates 1 second each if two or more mode or intake door motors malfunction.)

*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 ACCS : CONSULT Function

INFOID:0000000010581373

CONSULT APPLICATION ITEMS

CONSULT 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

Display Item List

Monitor Item	Condition		Value/Status
IGNITION SW	Ignition switch OFF → ON		Off → On
HEATER FAN SW	Ignition switch ON	Blower fan motor switch ON	On
		Blower fan motor switch OFF	Off
AIR COND SIG	Ignition switch ON	Compressor ON	On
		Compressor OFF	Off
REFRIGERANT PRESSURE SENSOR	- Engine is running - Warm-up condition - Both A/C switch and blower fan motor switch: ON (Compressor operates)		1.0 – 4.0 V

POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

DTC/CIRCUIT DIAGNOSIS

POWER SUPPLY AND GROUND CIRCUIT

UNIFIED METER AND A/C AMP.

UNIFIED METER AND A/C AMP. : Diagnosis Procedure

INFOID:0000000010581374

1. CHECK FUSE

Check 10 A fuses [Nos. 3, 6^{*1}, 11^{*2} and 19, located in the fuse block (J/B)].

NOTE:

• Refer to [PG-120. "Fuse, Connector and Terminal Arrangement"](#).

• *1: Applied to the following models

From VIN

- JN8CS1MW1DM175226

- JN8CS1MW9DM175149

- JN8CS1MU6DM142480

- JN8CS1MW4DM175205

• *2: Applied to the models of except above VIN

Is the inspection result normal?

YES >> GO TO 2.

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

2. 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	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 >> Repair harness or connector.

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	
M67	55	Existed
	71	

Is the inspection result normal?

YES >> INSPECTION END

NO >> Repair harness or connector.

UNIFIED METER AND A/C AMP.

Description

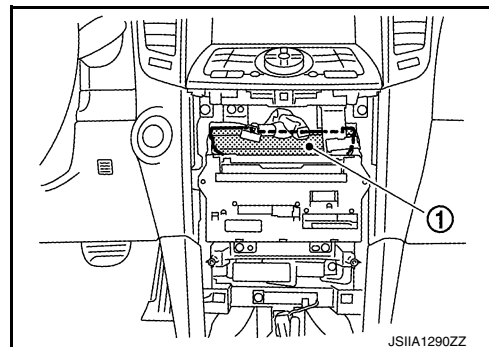
INFOID:0000000010581375

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 motors, 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.



JSIIA1290ZZ

Component Function Check

INFOID:0000000010581376

1. CONFIRM SYMPTOM BY PERFORMING THE FOLLOWING OPERATIONAL CHECK

1. Press AUTO 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 >> INSPECTION END

NO >> Go to Diagnosis Procedure. Refer to [HAC-71, "Diagnosis Procedure"](#).

HAC

Diagnosis Procedure

INFOID:0000000010581377

1. INSPECTION BY FAIL-SAFE FUNCTION

1. Turn the ignition switch ON.
2. After approximately 30 seconds, check that the air conditioner is operated by the fail-safe function (the operation display of air conditioner is not performed). Refer to [HAC-117, "Fail-safe"](#).

Is the fail-safe function operated?

YES >> GO TO 3.

NO >> GO TO 2.

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

Check unified meter and A/C amp. power supply circuit and ground circuit. Refer to [HAC-70, "UNIFIED METER AND A/C AMP. : Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 3.

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

3. CHECK PRESET SWITCH

Check preset switch. Refer to [AV-123, "Symptom Table"](#) (WITHOUT NAVIGATION), [AV-337, "Symptom Table"](#) (WITH NAVIGATION).

Is the inspection result normal?

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

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

MODE DOOR MOTOR

Description

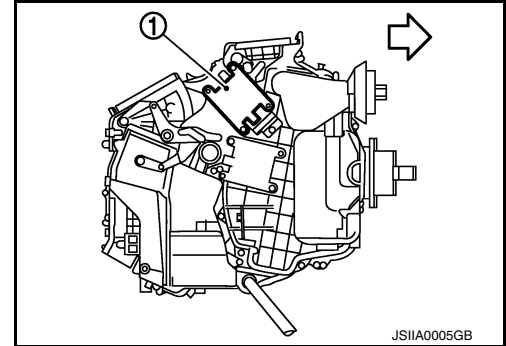
INFOID:0000000010581378

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



Component Function Check

INFOID:0000000010581379

1.CONFIRM SYMPTOM BY PERFORMING THE FOLLOWING OPERATIONAL CHECK

- Press MODE switch and DEF switch.
- Each position indicator should change shape.
- Confirm that discharge air comes out according to the air distribution table at below. Refer to [HAC-26. "WITHOUT ACCS : System Description"](#) (WITHOUT ACCS) or [HAC-35. "WITH ACCS : System Description"](#) (WITH ACCS).

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 >> INSPECTION END

NO >> Go to diagnosis procedure. Refer to [HAC-72. "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:0000000010581380

1.PERFORM SELF-DIAGNOSIS

Perform self-diagnosis function. Refer to [HAC-59. "WITHOUT ACCS : Diagnosis Description"](#) (WITHOUT ACCS) or [HAC-64. "WITH ACCS : Diagnosis Description"](#) (WITH ACCS).

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 2.

2.CHECK POWER SUPPLY FOR MODE DOOR MOTOR

Check voltage between mode door motor harness connector and ground.

(+) Mode door motor		(-)	Voltage (Approx.)
Connector	Terminal	—	
M253	1	Ground	12 V

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair harness or connector.

3.CHECK SIGNAL FOR MODE DOOR MOTOR

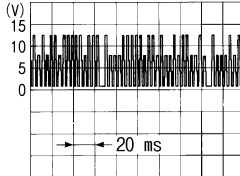
Confirm A/C LAN signal between mode door motor harness connector and ground using an oscilloscope.

MODE DOOR MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

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



SJIA1453J

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair harness or connector.

4.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.

5.CHECK MODE DOOR CONTROL LINKAGE

Check mode door control linkage is properly installed. Refer to [HAC-202. "Exploded View"](#).

Is it installed normally?

YES >> INSPECTION END

NO >> Repair or adjust control linkage.

AIR MIX DOOR MOTOR (DRIVER SIDE)

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

AIR MIX DOOR MOTOR (DRIVER SIDE)

Description

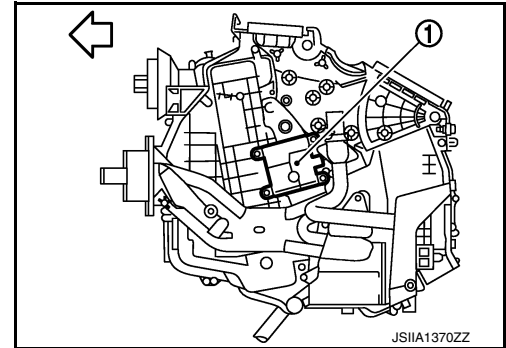
INFOID:0000000010581381

COMPONENT DESCRIPTION

Air Mix Door Motor

The air mix door motor (driver side) (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



Component Function Check

INFOID:0000000010581382

1.CONFIRM SYMPTOM BY PERFORMING THE FOLLOWING OPERATIONAL CHECK

1. Turn temperature control dial (driver side) clockwise until 32.0°C (90°F) is displayed.
2. Check for warm air at discharge air outlets.
3. Turn temperature control dial (driver side) counterclockwise until 18.0°C (60°F) is displayed.
4. Check for cool air at discharge air outlets.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to diagnosis procedure. Refer to [HAC-74, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:0000000010581383

1.PERFORM SELF-DIAGNOSIS

Perform self-diagnosis function. Refer to [HAC-59, "WITHOUT ACCS : Diagnosis Description"](#) (WITHOUT ACCS) or [HAC-64, "WITH ACCS : Diagnosis Description"](#) (WITH ACCS).

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 2.

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

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

(+) (−)		Voltage (Approx.)
Air mix door motor (driver side)		
Connector	Terminal	Ground
M252	1	
		12 V

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair harness or connector.

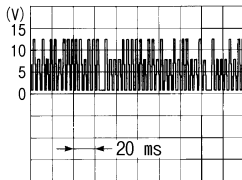
3.CHECK SIGNAL FOR AIR MIX DOOR MOTOR (DRIVER SIDE)

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

AIR MIX DOOR MOTOR (DRIVER SIDE)

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

(+)		(-)	Voltage
Air mix door motor (driver side)		—	
Connector	Terminal		
M252	3	Ground	

SJIA1453J

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair harness or connector.

4. 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

Is the inspection result normal?

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

NO >> Repair harness or connector.

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

Check air mix door motor is properly installed (driver side). Refer to [HAC-202. "Exploded View"](#).

Is it installed normally?

YES >> INSPECTION END

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

AIR MIX DOOR MOTOR (PASSENGER SIDE)

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

AIR MIX DOOR MOTOR (PASSENGER SIDE)

Description

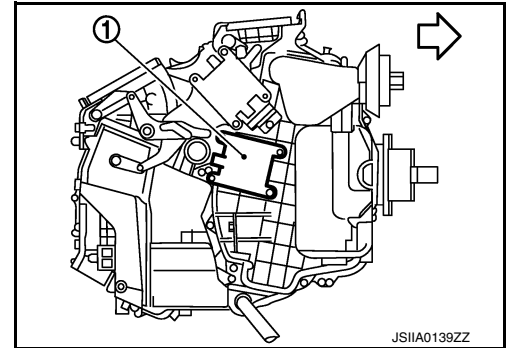
INFOID:0000000010581384

COMPONENT DESCRIPTION

Air Mix Door Motor

The air mix door motor (passenger side) (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



Component Function Check

INFOID:0000000010581385

1.CONFIRM SYMPTOM BY PERFORMING THE FOLLOWING OPERATIONAL CHECK

1. Turn temperature control dial (passenger side) clockwise until 32.0°C (90°F) is displayed.
2. Check for warm air at discharge air outlets.
3. Turn temperature control dial (passenger side) counterclockwise until 18.0°C (60°F) is displayed.
4. Check for cool air at discharge air outlets.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to diagnosis procedure. Refer to [HAC-76, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:0000000010581386

1.PERFORM SELF-DIAGNOSIS

Perform self-diagnosis function. Refer to [HAC-59, "WITHOUT ACCS : Diagnosis Description"](#) (WITHOUT ACCS) or [HAC-64, "WITH ACCS : Diagnosis Description"](#) (WITH ACCS).

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 2.

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

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

(+) (−)		Voltage (Approx.)
Air mix door motor (passenger side)		
Connector	Terminal	Ground
M255	1	
		12 V

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair harness or connector.

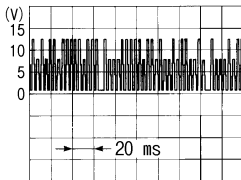
3.CHECK SIGNAL FOR AIR MIX DOOR MOTOR (PASSENGER SIDE)

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

AIR MIX DOOR MOTOR (PASSENGER SIDE)

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

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

SJIA1453J

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair harness or connector.

4. 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.

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

Check air mix door motor is properly installed (passenger side). Refer to [HAC-202. "Exploded View"](#).

Is it installed normally?

YES >> INSPECTION END

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

INTAKE DOOR MOTOR WITHOUT ACCS

WITHOUT ACCS : Description

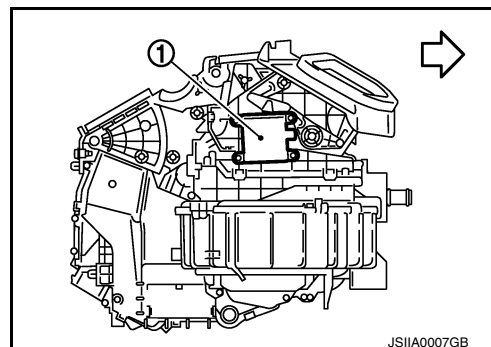
INFOID:0000000010581387

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



WITHOUT ACCS : Component Function Check

INFOID:0000000010581388

1.CONFIRM SYMPTOM BY PERFORMING THE FOLLOWING OPERATIONAL CHECK

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

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to diagnosis procedure. Refer to [HAC-78. "WITHOUT ACCS : Diagnosis Procedure"](#).

WITHOUT ACCS : Diagnosis Procedure

INFOID:0000000010581389

1.PERFORM SELF-DIAGNOSIS

Perform self-diagnosis function. Refer to [HAC-59. "WITHOUT ACCS : Diagnosis Description"](#).

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 2.

2.CHECK POWER SUPPLY FOR INTAKE DOOR MOTOR

Check voltage between intake door motor harness connector and ground.

(+) Intake door motor		(-)	Voltage (Approx.)
Connector	Terminal	—	
M254	1	Ground	12 V

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair harness or connector.

3.CHECK SIGNAL FOR INTAKE DOOR MOTOR

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

INTAKE DOOR MOTOR

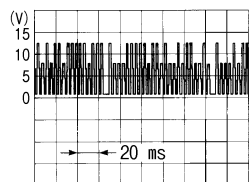
< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

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

The oscilloscope trace shows a high-frequency, high-amplitude signal. The vertical axis (V) ranges from 0 to 15 with major grid lines every 5 units. The horizontal axis represents time, with a scale bar indicating 20 ms. The signal fluctuates rapidly between approximately 0V and 15V throughout the entire time range shown.

SJIA1453J



Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair harness or connector.

4.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.

5.CHECK INTAKE DOOR CONTROL LINKAGE

Check intake door control linkage is properly installed. Refer to [HAC-202. "Exploded View"](#).

Is it installed normally?

YES >> INSPECTION END

NO >> Repair or adjust control linkage.

WITH ACCS

WITH ACCS : Description

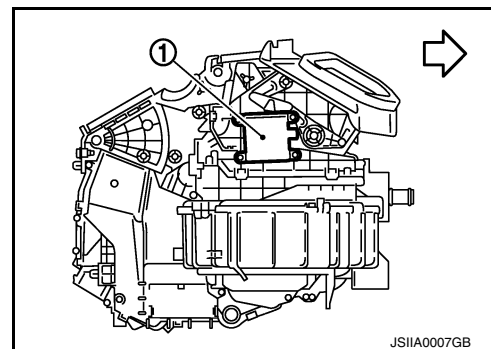
INFOID:000000010581390

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



WITH ACCS : Component Function Check

INFOID:000000010581391

1.CONFIRM SYMPTOM BY PERFORMING THE FOLLOWING OPERATIONAL CHECK

1. Press AUTO switch. AUTO INTAKE indicator and REC indicator turns ON (auto intake mode).

INTAKE DOOR MOTOR

[AUTOMATIC AIR CONDITIONER]

< DTC/CIRCUIT DIAGNOSIS >

2. Press intake switch. AUTO INTAKE indicator and REC indicator turns OFF (fixed FRE mode).
3. Press intake switch again. REC indicator turns ON (fixed REC mode).
4. Press intake switch again. AUTO INTAKE indicator and REC indicator turns ON (auto intake mode).
5. Listen for intake door position change. (Slight change of blower sound can be heard.)

NOTE:

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

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to diagnosis procedure. Refer to [HAC-80. "WITH ACCS : Diagnosis Procedure"](#).

WITH ACCS : Diagnosis Procedure

INFOID:0000000010581392

1.PERFORM SELF-DIAGNOSIS

Perform self-diagnosis function. Refer to [HAC-64. "WITH ACCS : Diagnosis Description"](#).

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 2.

2.CHECK POWER SUPPLY FOR INTAKE DOOR MOTOR

Check voltage between intake door motor harness connector and ground.

(+) (−)		Voltage (Approx.)
Intake door motor		
Connector	Terminal	—
M254	1	Ground
		12 V

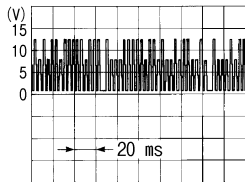
Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair harness or connector.

3.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
		

SJIA1453J

SJIA1453J

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair harness or connector.

4.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

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

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.

5.CHECK INTAKE DOOR CONTROL LINKAGE

Check intake door control linkage is properly installed. Refer to [HAC-202, "Exploded View"](#).

Is it installed normally?

YES >> INSPECTION END

NO >> Repair or adjust control linkage.

BLOWER MOTOR

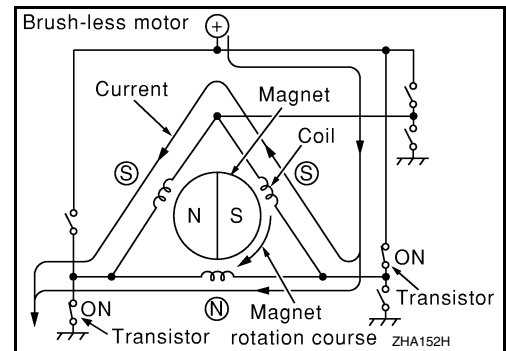
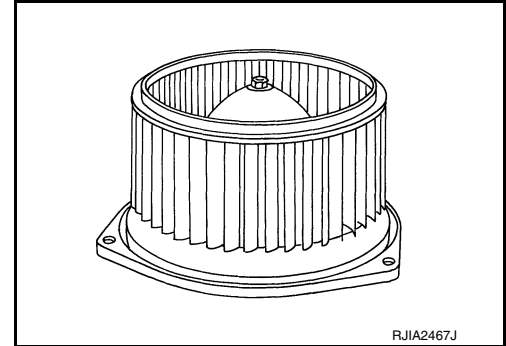
Description

INFOID:0000000010581393

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.



Component Function Check

INFOID:0000000010581394

1.CONFIRM SYMPTOM BY PERFORMING THE FOLLOWING OPERATIONAL CHECK

1. Press fan (UP: +) switch. Blower should operate on low speed.
2. Press fan (UP: +) switch, and continue checking blower speed and fan symbol until all speeds checked.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to diagnosis procedure. Refer to [HAC-82. "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:0000000010581395

1.PERFORM SELF-DIAGNOSIS

Perform self-diagnosis function STEP-4. Refer to [HAC-59. "WITHOUT ACCS : Diagnosis Description"](#) (WITHOUT ACCS) or [HAC-64. "WITH ACCS : Diagnosis Description"](#) (WITH ACCS).

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 >> INSPECTION 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.

BLOWER MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

(+) (–)		Voltage
Blower motor		
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		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

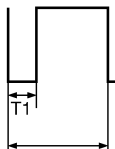
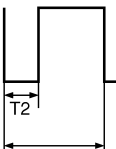
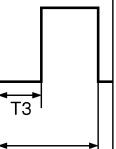
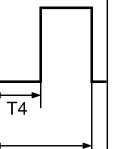
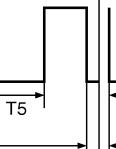
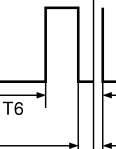
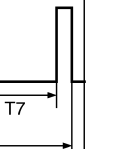
1. Reconnect blower motor connector and unified meter and A/C amp. connector.
2. Turn ignition switch ON.
3. Set MODE switch to VENT position.

BLOWER MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

- Change fan speed from Lo to Hi, and check duty ratios between blower motor harness connector 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)							
	Approx. 1.6 ms	Approx. 1.6 ms	Approx. 1.6 ms	Approx. 1.6 ms	Approx. 1.6 ms	Approx. 1.6 ms	Approx. 1.6 ms
Duty ratio	Approx. 25%	Approx. 33%	Approx. 41%	Approx. 51%	Approx. 61%	Approx. 71%	Approx. 83%

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

JSIIA0068GB

Is the inspection result normal?

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

6.CHECK POWER VOLTAGE OF BLOWER RELAY

- Turn ignition switch OFF.
- Remove blower relay. Refer to [PG-120, "Fuse, Connector and Terminal Arrangement"](#).
- Turn ignition switch ON.
- Check the voltage between blower relay fuse block terminals and ground. Refer to [PG-118, "Description"](#) for relay terminal assignment.

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

Is the inspection result normal?

- YES >> GO TO 7.
 NO >> Check ignition power supply circuit. Refer to [PG-50, "Wiring Diagram - IGNITION POWER SUPPLY -"](#).

7.CHECK BLOWER RELAY

- Turn ignition switch OFF.
- Install blower relay. Refer to [PG-120, "Fuse, Connector and Terminal Arrangement"](#).
- Check operation sound of the blower relay after switching ignition switch ON.

Is the inspection result normal?

- YES >> GO TO 8.
 NO >> Replace blower relay.

8.CHECK FUSE

Check fuse 15A [Nos. 21 and 22, located in the fuse block (J/B)]. Refer to [PG-120, "Fuse, Connector and Terminal Arrangement"](#).

Is the inspection result normal?

- YES >> Repair harness or connector.
 NO >> Be sure to eliminate cause of malfunction before installing new fuse.

BLOWER MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

Component Inspection

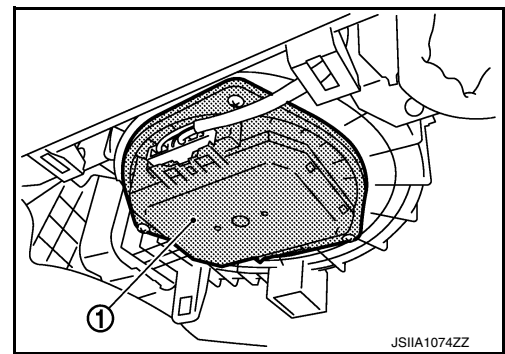
INFOID:0000000010581396

1.CHECK BLOWER MOTOR

1. Remove blower motor (1). Refer to [HA-59, "Exploded View"](#) (VQ37VHR) or [HA-116, "Exploded View"](#) (VK50VE).
2. Confirm smooth rotation of the blower motor.

Is the inspection result normal?

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



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HAC

MAGNET CLUTCH

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

MAGNET CLUTCH

Description

INFOID:0000000010581397

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

Component Function Check

INFOID:0000000010581398

1.CONFIRM SYMPTOM BY PERFORMING THE FOLLOWING OPERATIONAL CHECK

1. Press AUTO 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 >> INSPECTION END

NO >> Go to Diagnosis Procedure. Refer to [HAC-86. "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:0000000010581399

1.PERFORM SELF-DIAGNOSIS

Perform self-diagnosis function. Refer to [HAC-59. "WITHOUT ACCS : Diagnosis Description"](#) (WITHOUT ACCS) or [HAC-64. "WITH ACCS : Diagnosis Description"](#) (WITH ACCS).

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 2.

2.PERFORM IPDM E/R AUTO ACTIVE TEST

Perform IPDM E/R auto active test. Refer to [PCS-10. "Diagnosis Description"](#).

Does the magnet clutch operate?

YES-1 >> ☒ WITH CONSULT: GO TO 5.

YES-2 >> ☐ WITHOUT CONSULT: GO TO 6.

NO >> Check 10A fuse (No. 49, located in IPDM E/R), and GO TO 3.

3.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

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair harness or connector.

4.CHECK MAGNET CLUTCH CIRCUIT

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

Is the inspection result normal?

YES >> Replace IPDM E/R.

NO-1 >> VQ37VHR: Replace magnet clutch. Refer to [HA-40. "MAGNET CLUTCH : Removal and Installation of Compressor Clutch"](#).

NO-2 >> VK50VE: Replace compressor. Refer to [HA-96. "Removal and Installation"](#).

5.CHECK ECM INPUT SIGNAL-1

Check A/C switch signal in "Data monitor". Refer to [HAC-64. "WITHOUT ACCS : CONSULT Function"](#) (WITHOUT ACCS) or [HAC-69. "WITH ACCS : CONSULT Function"](#) (WITH ACCS).

MAGNET CLUTCH

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

A/C SWITCH ON : AIR COND SIG On
A/C SWITCH OFF : AIR COND SIG Off

Is the inspection result normal?

YES >> GO TO 8.
NO >> GO TO 6.

6.CHECK REFRIGERANT PRESSURE SENSOR

Ⓟ WITH CONSULT

1. Start the engine.
2. Check voltage of refrigerant pressure sensor in "Data monitor". Refer to [EC-530, "Reference Value"](#) (VQ37VHR FOR USA AND CANADA), [EC-1030, "Reference Value"](#) (VQ37VHR FOR MEXICO) or [EC-1566, "Reference Value"](#) (VK50VE).

ⓧ WITHOUT CONSULT

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

VQ35HR

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

VK50VE

(+) (–)		Condition	Voltage
ECM			
connector	Terminal	—	
F111	90	Ground	A/C switch: ON (Blower motor operates.) Approx. 1.0 - 4.0 V

Is the inspection result normal?

- YES >> • Ⓟ WITH CONSULT: GO TO 7.
• ⓧ WITHOUT CONSULT: Repair harness or connector.
- NO >> Refer to [EC-525, "Diagnosis Procedure"](#) (VQ37VHR FOR USA AND CANADA), [EC-1025, "Diagnosis Procedure"](#) (VQ37VHR FOR MEXICO) or [EC-1561, "Diagnosis Procedure"](#) (VK50VE).

7.CHECK ECM INPUT SIGNAL-2

Check blower fan motor switch signal in "Data monitor". Refer to [HAC-64, "WITHOUT ACCS : CONSULT Function"](#) (WITHOUT ACCS) or [HAC-69, "WITH ACCS : CONSULT Function"](#) (WITH ACCS).

FAN SWITCH ON : HEATER FAN SW On
FAN SWITCH OFF : HEATER FAN SW Off

Is the inspection result normal?

YES >> GO TO 8.
NO >> Repair harness or connector.

8.CHECK CAN COMMUNICATION

Check CAN communication. Refer to [LAN-25, "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).

ECV (ELECTRICAL CONTROL VALVE)

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

ECV (ELECTRICAL CONTROL VALVE)

Description

INFOID:0000000010581400

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

Diagnosis Procedure

INFOID:0000000010581401

1. CHECK FUSE

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

NOTE:

Refer to [PG-122, "Fuse, Connector and Terminal Arrangement"](#).

Is the inspection result normal?

YES >> GO TO 2.

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

2. CHECK ECV POWER SUPPLY CIRCUIT

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

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

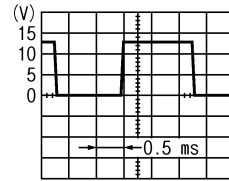
Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair the harnesses or connectors.

3. CHECK ECV CONTROL SIGNAL

1. Turn the ignition switch OFF.
2. Connect the ECV connector.
3. Perform the self-diagnosis STEP-4 (Code No. 45). Refer to [HAC-59, "WITHOUT ACCS : Diagnosis Description"](#) (WITHOUT ACCS) or [HAC-64, "WITH ACCS : Diagnosis Description"](#) (WITH ACCS).
4. Check output waveform between the unified meter and A/C amp. harness connector and ground with the oscilloscope.

(+) Unified meter and A/C amp.		(-) —	Condition	Output waveform
Connector	Terminal			
M67	65	Ground	• Ignition switch ON • Self-diagnosis. STEP-4 (Code No. 45)	Duty ratio: approx. 50 %  SJIA1607E

Is the inspection result normal?

YES >> Replace the compressor.

NO >> GO TO 4.

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

1. Turn the ignition switch OFF.

ECV (ELECTRICAL CONTROL VALVE)

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

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

ECV		Unified meter and A/C amp.		Continuity
Connector	Terminal	Connector	Terminal	
F44	3	M67	65	Existed

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

ECV		—	Continuity
Connector	Terminal		
F44	3	Ground	Not existed

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair the harnesses or connectors.

5.CHECK ECV

Check continuity between the ECV connector terminals.

ECV		Continuity
Terminal	Terminal	
2	3	Existed

Is the inspection result normal?

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

NO >> Replace the compressor.

AMBIENT SENSOR

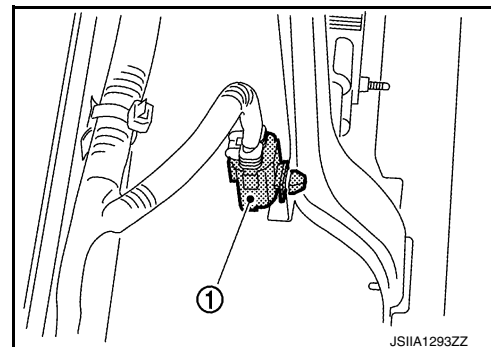
Description

INFOID:0000000010581402

COMPONENT DESCRIPTION

Ambient Sensor

The ambient sensor (1) is attached on hood lock stay assembly. It detects ambient temperature and converts it into a resistance value which is then input into the unified meter and A/C amp.



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:0000000010581403

1.PERFORM SELF-DIAGNOSIS

Perform self-diagnosis function STEP-2. Refer to [HAC-59, "WITHOUT ACCS : Diagnosis Description"](#) (WITHOUT ACCS) or [HAC-64, "WITH ACCS : Diagnosis Description"](#) (WITH ACCS).

21 or -21 is displayed.

- YES >> Go to Diagnosis Procedure. Refer to [HAC-90, "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000010581404

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		(-)	Voltage
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

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

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-91, "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:0000000010581405

1.CHECK AMBIENT SENSOR

1. Turn ignition switch OFF.
2. Disconnect ambient sensor connector. Refer to [HAC-195, "Exploded View"](#).
3. Check resistance between ambient sensor terminals.

AMBIENT SENSOR

< DTC/CIRCUIT 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 >> INSPECTION END

NO >> Replace ambient sensor.

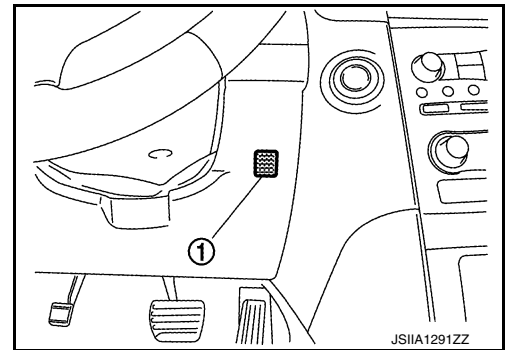
IN-VEHICLE SENSOR

Description

INFOID:0000000010581406

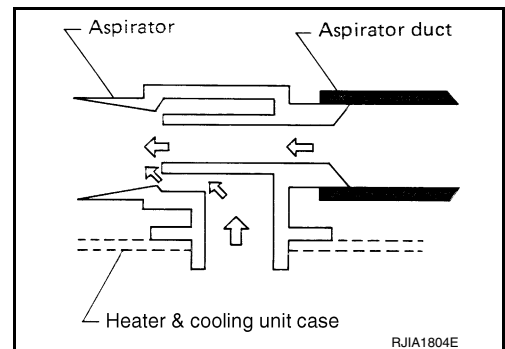
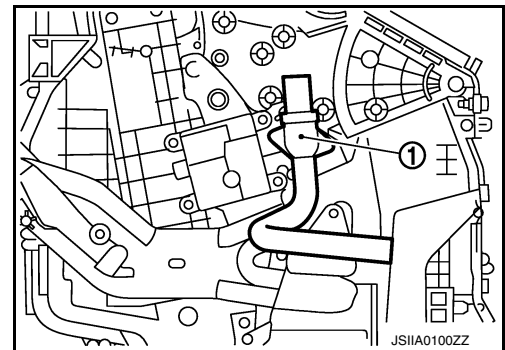
In-vehicle Sensor

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.



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:0000000010581407

1.PERFORM SELF-DIAGNOSIS

Perform self-diagnosis function STEP-2. Refer to [HAC-59, "WITHOUT ACCS : Diagnosis Description"](#) (WITHOUT ACCS) or [HAC-64, "WITH ACCS : Diagnosis Description"](#) (WITH ACCS).

22 or -22 is displayed.

- YES >> Go to Diagnosis Procedure. Refer to [HAC-93, "Diagnosis Procedure"](#).
 NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000010581408

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.

IN-VEHICLE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

(+) (–)		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-94, "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		—	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:0000000010581409

1. CHECK IN-VEHICLE SENSOR

1. Turn ignition switch OFF.
2. Disconnect in-vehicle sensor connector. Refer to [HAC-196, "Exploded View"](#).
3. Check resistance between in-vehicle sensor terminals.

IN-VEHICLE SENSOR

< DTC/CIRCUIT 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 >> INSPECTION END

NO >> Replace in-vehicle sensor.

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SUNLOAD SENSOR

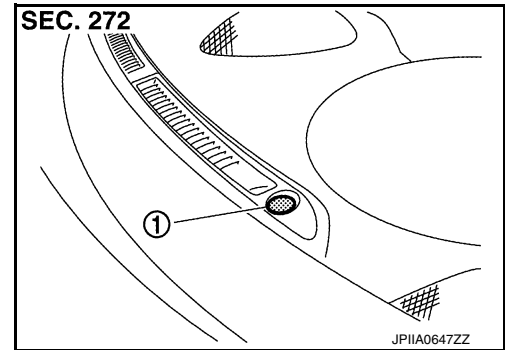
Description

INFOID:0000000010581410

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 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:0000000010581411

1.PERFORM SELF-DIAGNOSIS

Perform self-diagnosis function STEP-2. Refer to [HAC-59, "WITHOUT ACCS : Diagnosis Description"](#) (WITHOUT ACCS) or [HAC-64, "WITH ACCS : Diagnosis Description"](#) (WITH ACCS).

25 or -25 is displayed.

- YES >> Go to Diagnosis Procedure. Refer to [HAC-96, "Diagnosis Procedure"](#).
 NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000010581412

1.CHECK VOLTAGE BETWEEN SUNLOAD SENSOR AND GROUND

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

(+)		(-)	Voltage
Sunload sensor		—	
Connector	Terminal		
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.

SUNLOAD SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

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-97, "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:0000000010581413

1.CHECK SUNLOAD SENSOR

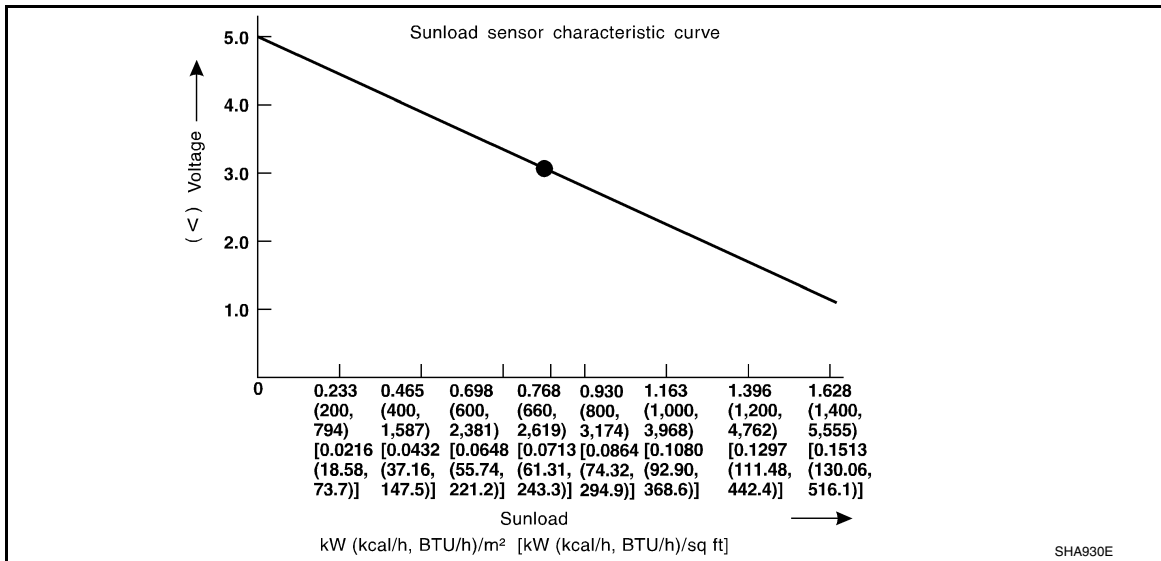
1. Turn ignition switch ON.
2. Check voltage between unified meter and A/C amp. harness connector and ground.

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

SUNLOAD SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]



NOTE:

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

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace sunload sensor.

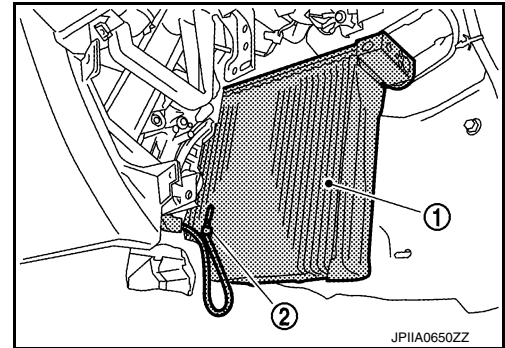
INTAKE SENSOR

Description

INFOID:0000000010581414

Intake Sensor

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



Component Function Check

INFOID:0000000010581415

1.PERFORM SELF-DIAGNOSIS

Perform self-diagnosis function STEP-2. Refer to [HAC-59, "WITHOUT ACCS : Diagnosis Description"](#) (WITHOUT ACCS) or [HAC-64, "WITH ACCS : Diagnosis Description"](#) (WITH ACCS).

24 or -24 is displayed.

- YES >> Go to Diagnosis Procedure. Refer to [HAC-99, "Diagnosis Procedure"](#).
- NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000010581416

1.CHECK VOLTAGE BETWEEN INTAKE SENSOR AND GROUND

HAC

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.

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

INTAKE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

Check intake sensor. Refer to [HAC-100, "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:0000000010581417

1.CHECK INTAKE SENSOR

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

Terminal		Condition	Resistance kΩ
		Temperature °C (°F)	
1	2	-15 (5)	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 >> INSPECTION END

NO >> Replace intake sensor.

EXHAUST GAS/OUTSIDE ODOR DETECTING SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

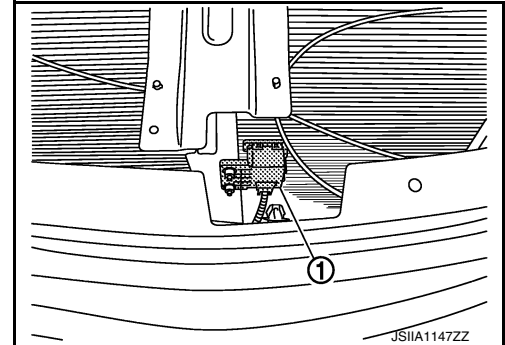
EXHAUST GAS/OUTSIDE ODOR DETECTING SENSOR

Description

INFOID:0000000010581418

COMPONENT DESCRIPTION

The exhaust gas/outside odor detecting sensor (1) is attached on the radiator core support. It detects smell of exhaust gas and unpleasant odor, and converts it into a duty ratio which is then input into the unified meter and A/C amp.



STRUCTURE AND OPERATION

Exhaust gas/outside odor detecting sensor detects ambient atmospheric CO, NO₂ and unpleasant odor, and converts them to values of resistance. The values are converted to signals with the exhaust gas/outside odor detecting sensor internal circuit, then the unified meter and A/C amp. inputs the signals.

Exhaust gas/outside odor detecting sensor has a construction that detects CO, NO₂ and unpleasant odor by exhaust gas/outside odor detecting sensor element from the air intake of the case through a filter (waterproof sheet). It sends output signals to the unified meter and A/C amp. in response to a resistance value conversion by exhaust gas/outside odor detecting sensor elements. Unified meter and A/C amp. prevent a smell of exhaust gas and ambient atmospheric unpleasant odor from getting into vehicle by performing corrections according to various driving conditions.

Component Function Check

INFOID:0000000010581419

1.PERFORM SELF-DIAGNOSIS

Perform self-diagnosis function STEP-2. Refer to [HAC-64, "WITH ACCS : Diagnosis Description"](#).

28, -28, 29 or -29 is displayed.

YES >> Go to Diagnosis Procedure. Refer to [HAC-101, "Diagnosis Procedure"](#).

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000010581420

1.ADJUST EXHAUST GAS/OUTSIDE ODOR DETECTING SENSOR SENSITIVITY

1. Turn ignition switch ON.
2. Adjust the exhaust gas/outside odor detecting sensor sensitivity. Refer to [HAC-15, "WITH ACCS : Exhaust exhaust gas/outside odor detecting/Outside Odor Detecting Sensor Sensitivity Adjustment Function"](#).

Are the symptoms solved?

YES >> INSPECTION END

NO >> GO TO 2.

2.CHECK EXHAUST GAS/OUTSIDE ODOR DETECTING SENSOR POWER SUPPLY

1. Turn ignition switch OFF.
2. Disconnect exhaust gas/outside odor detecting sensor connector.
3. Turn ignition switch ON.
4. Check voltage between exhaust gas/outside odor detecting sensor harness connector and ground.

EXHAUST GAS/OUTSIDE ODOR DETECTING SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

(+) (–)		Voltage
Exhaust gas/outside odor detecting sensor		
Connector	Terminal	
E75	1	Ground
		Battery voltage

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair harness or connector between exhaust gas/outside odor detecting sensor and fuse.

3.CHECK EXHAUST GAS/OUTSIDE ODOR DETECTING SENSOR GROUND CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Disconnect unified meter and A/C amp. connector.
3. Check continuity between exhaust gas/outside odor detecting sensor harness connector and unified meter and A/C amp. harness connector.

Exhaust gas/outside odor detecting sensor		Unified meter and A/C amp.		Continuity
Connector	Terminal	Connector	Terminal	
E75	2	M67	61	Existed

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair harness or connector.

4.CHECK EXHAUST GAS/OUTSIDE ODOR DETECTING SENSOR SIGNAL CIRCUIT

1. Reconnect unified meter and A/C amp. connector.
2. Turn ignition switch ON.
3. Check voltage between exhaust gas/outside odor detecting sensor harness connector and ground using an oscilloscope.

(+) (–)		Voltage (Approx.)
Exhaust gas/outside odor detecting sensor		
Connector	Terminal	
E75	3	Ground
		5 V

Is the inspection result normal?

YES >> Replace exhaust gas/outside odor detecting sensor. Refer to [HAC-200, "Removal and Installation"](#).

NO >> GO TO 5.

5.CHECK EXHAUST GAS/OUTSIDE ODOR DETECTING SENSOR SIGNAL CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Disconnect unified meter and A/C amp. connector.
3. Check continuity between exhaust gas/outside odor detecting sensor harness connector and unified meter and A/C amp. harness connector.

Exhaust gas/outside odor detecting sensor		Unified meter and A/C amp.		Continuity
Connector	Terminal	Connector	Terminal	
E75	3	M67	47	Existed

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair harness or connector.

EXHAUST GAS/OUTSIDE ODOR DETECTING SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

6. CHECK EXHAUST GAS/OUTSIDE ODOR DETECTING SENSOR SIGNAL CIRCUIT FOR SHORT

Check continuity between exhaust gas/outside odor detecting sensor harness connector and ground.

Exhaust gas/outside odor detecting sensor		—	Continuity
Connector	Terminal		
E75	3	Ground	Not existed

Is the inspection result normal?

- YES >> Replace unified meter and A/C amp. Refer to [HAC-194, "Removal and Installation"](#).
NO >> Repair harness or connector.

A
B
C
D
E
F
G
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J
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P

HAC

IONIZER

Description

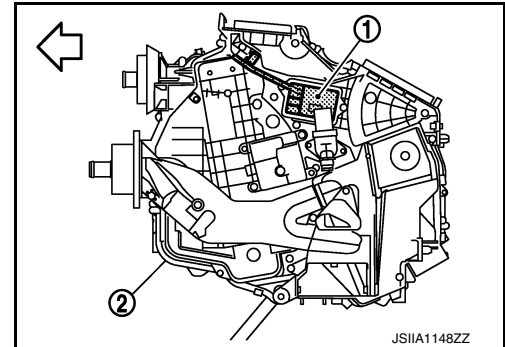
INFOID:0000000010581421

Ionizer (1) is attached to the heater & cooling unit assembly (2).

↩ Vehicle front

Ionizer has two types of operation mode and emits ions into the air

- Clean mode: Emits positive and negative ions at the same ratio.
- Ion control mode: Emits more negative ions.



Component Function Check

INFOID:0000000010581422

1.CHECK IONIZER OPERATION SOUND

1. Turn ignition switch ON.
2. Press AUTO switch.
3. Ion indicator is shown on the display.
4. Check the ionizer operation sound (whirring sound) in the duct by putting an ear to the center ventilator grille (LH) outlet.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to Diagnosis Procedure. Refer to [HAC-104. "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:0000000010581423

1.CHECK POWER SUPPLY FOR IONIZER

1. Turn ignition switch OFF.
2. Disconnect ionizer connector.
3. Turn ignition switch ON.
4. Press fan (UP: +) switch.
5. Check voltage between ionizer harness connector and ground.

(+) Ionizer		(-)	Voltage
Connector	Terminal	—	
M57	1	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 2.

NO >> Check 10A fuse (No. 3, located in the fuse block). Refer to [PG-120. "Fuse, Connector and Terminal Arrangement"](#).

- If fuse is OK, check harness for open circuit. Repair or replace if necessary.
- If fuse is NG, replace fuse and check for short circuit. Repair or replace if necessary.

2.CHECK CIRCUIT CONTINUITY BETWEEN IONIZER AND GROUND

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

Ionizer		—	Continuity
Connector	Terminal		
M57	3	Ground	Existed

IONIZER

[AUTOMATIC AIR CONDITIONER]

< DTC/CIRCUIT DIAGNOSIS >

Is the inspection result normal?

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

3.CHECK ION ON/OFF SIGNAL

Check voltage between ionizer harness connector and ground.

(+) (Ionizer)		(-) (Ground)	Condition	Voltage
Connector	Terminal	—		
M57	4	Ground	Blower motor: OFF	12 V
			Blower motor: ON	0 V

Is the inspection result normal?

- YES >> Replace ionizer.
NO >> GO TO 4.

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

- Turn ignition switch OFF.
- Disconnect unified meter and A/C amp. connector.
- Check continuity between unified meter and A/C amp. harness connector and ionizer harness connector.

Ionizer		Unified meter and A/C amp.		Continuity
Connector	Terminal	Connector	Terminal	
M57	4	M66	20	Existed

4. Check continuity between ionizer harness connector and ground.

Ionizer		—	Continuity
Connector	Terminal		
M57	4	Ground	Not existed

Is the inspection result normal?

- YES >> Replace unified meter and A/C amp.
NO >> Repair harnesses or connectors.

UNIFIED METER AND A/C AMP.

< ECU DIAGNOSIS INFORMATION >

[AUTOMATIC AIR CONDITIONER]

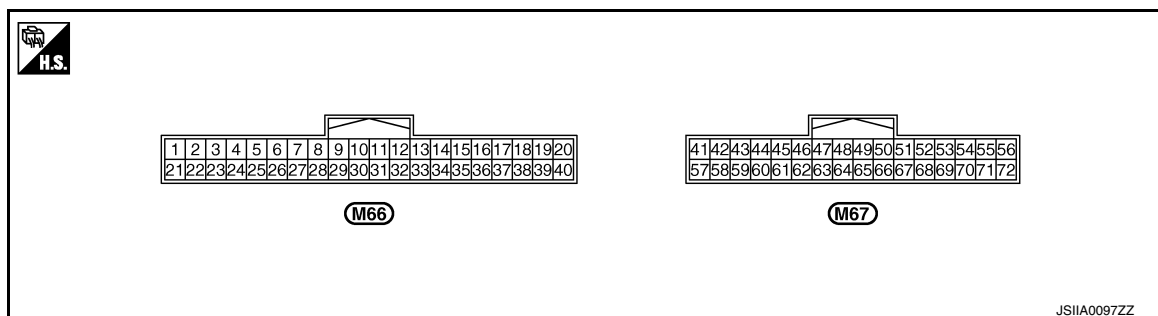
ECU DIAGNOSIS INFORMATION

UNIFIED METER AND A/C AMP.

Reference Value

INFOID:000000010581424

TERMINAL LAYOUT



PHYSICAL VALUES

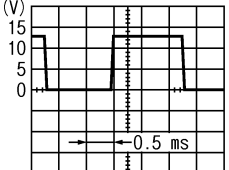
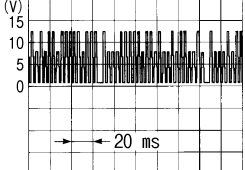
Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	–	Signal name	Input/ Output		
20* (L)	Ground	ION ON/OFF signal	Output	Blower fan: ON	0 V
				Blower fan: OFF	12 V
38 (L)	Ground	Blower motor control signal	Output	- Ignition switch ON - Blower speed: 1st speed (manual)	
41 (V)	Ground	ACC power supply	—	Ignition switch ACC	Battery voltage
43 (R)	Ground	Intake sensor signal	Input	Ignition switch ON	0 – 4.8 V Output voltage varies with intake temperature.
44 (LG)	Ground	In-vehicle sensor signal	Input	Ignition switch ON	0 – 4.8 V Output voltage varies with in-vehicle temperature.
45 (P)	Ground	Ambient sensor signal	Input	Ignition switch ON	0 – 4.8 V Output voltage varies with ambient temperature.
46 (BG)	Ground	Sunload sensor signal	Input	Ignition switch ON	0 – 4.8 V Output voltage varies with amount of sunload.
47* (V)	Ground	Exhaust gas/outside odor detecting sensor signal	Input	NOTE: The signal is different by measurement environment of a vehicle	

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UNIFIED METER AND A/C AMP.

< ECU DIAGNOSIS INFORMATION >

[AUTOMATIC AIR CONDITIONER]

Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	—	Signal name	Input/ Output		
53 (G)	Ground	IGN power supply	—	Ignition switch ON	Battery voltage
54 (BG)	Ground	BAT power supply	—	Ignition switch OFF	Battery voltage
55 (B)	Ground	Ground	—	Ignition switch ON	0 V
56 (L)	Ground	CAN-H	—	—	—
59 (GR)	Ground	Intake sensor ground	—	Ignition switch ON	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
63* (R)	Ground	—	—	—	—
65 (BG)	Ground	ECV (Electrical Control Valve) signal	Output	- Ignition switch ON - Self-diagnosis. STEP-4 (Code No. 45)	 SJIA1607E
69 (L)	Ground	A/C LAN signal	Input/ Output	Ignition switch ON	 SJIA1453J
70 (R)	Ground	Each door motor power supply	Output	Ignition switch ON	12 V
71 (B)	Ground	Ground	—	Ignition switch ON	0 V
72 (P)	Ground	CAN-L	—	—	—

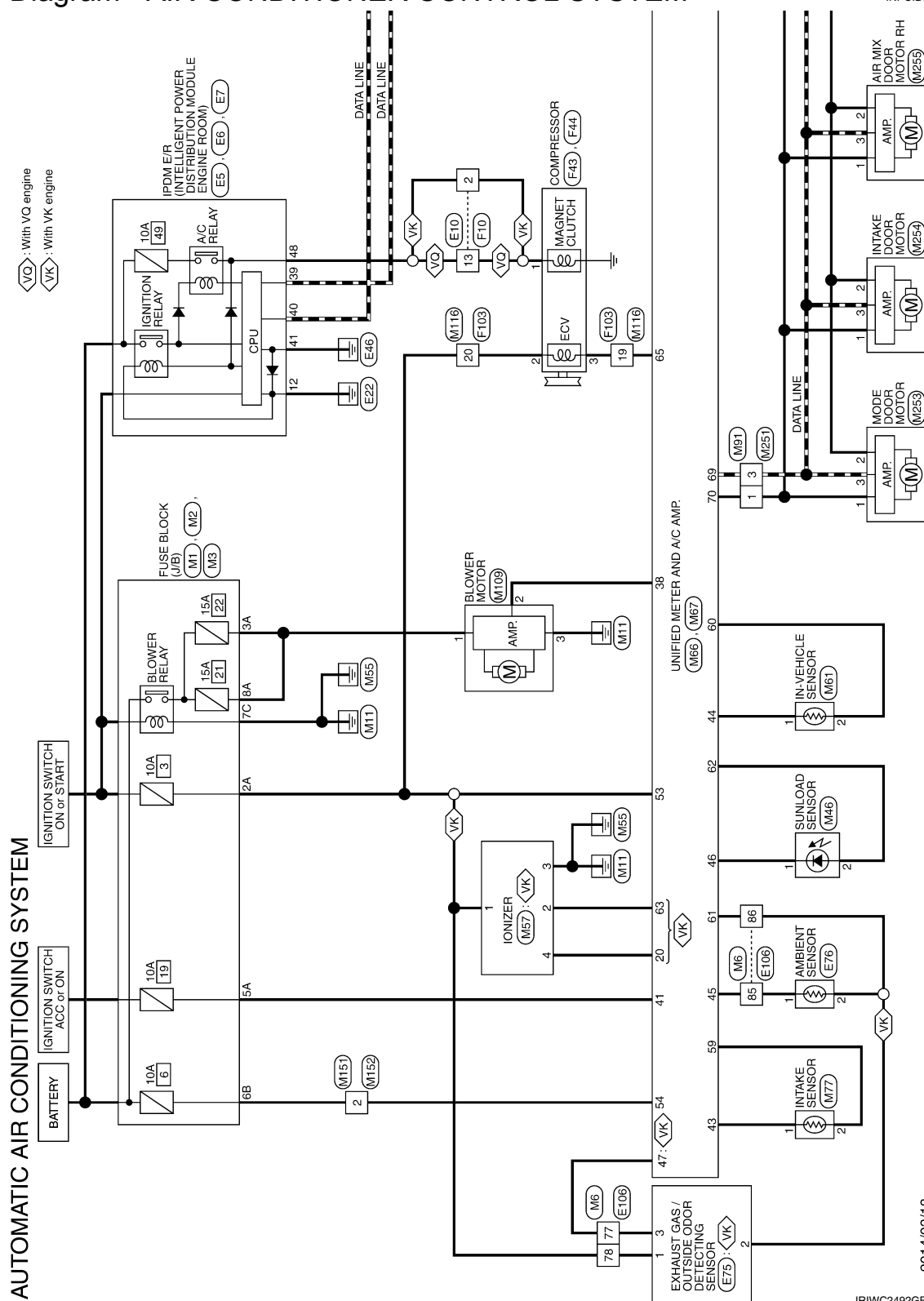
*1: With ACCS

*2: Unified meter and A/C amp. does not use this terminal for control.

[AUTOMATIC AIR CONDITIONER]

Wiring Diagram - AIR CONDITIONER CONTROL SYSTEM -

2014/03/18

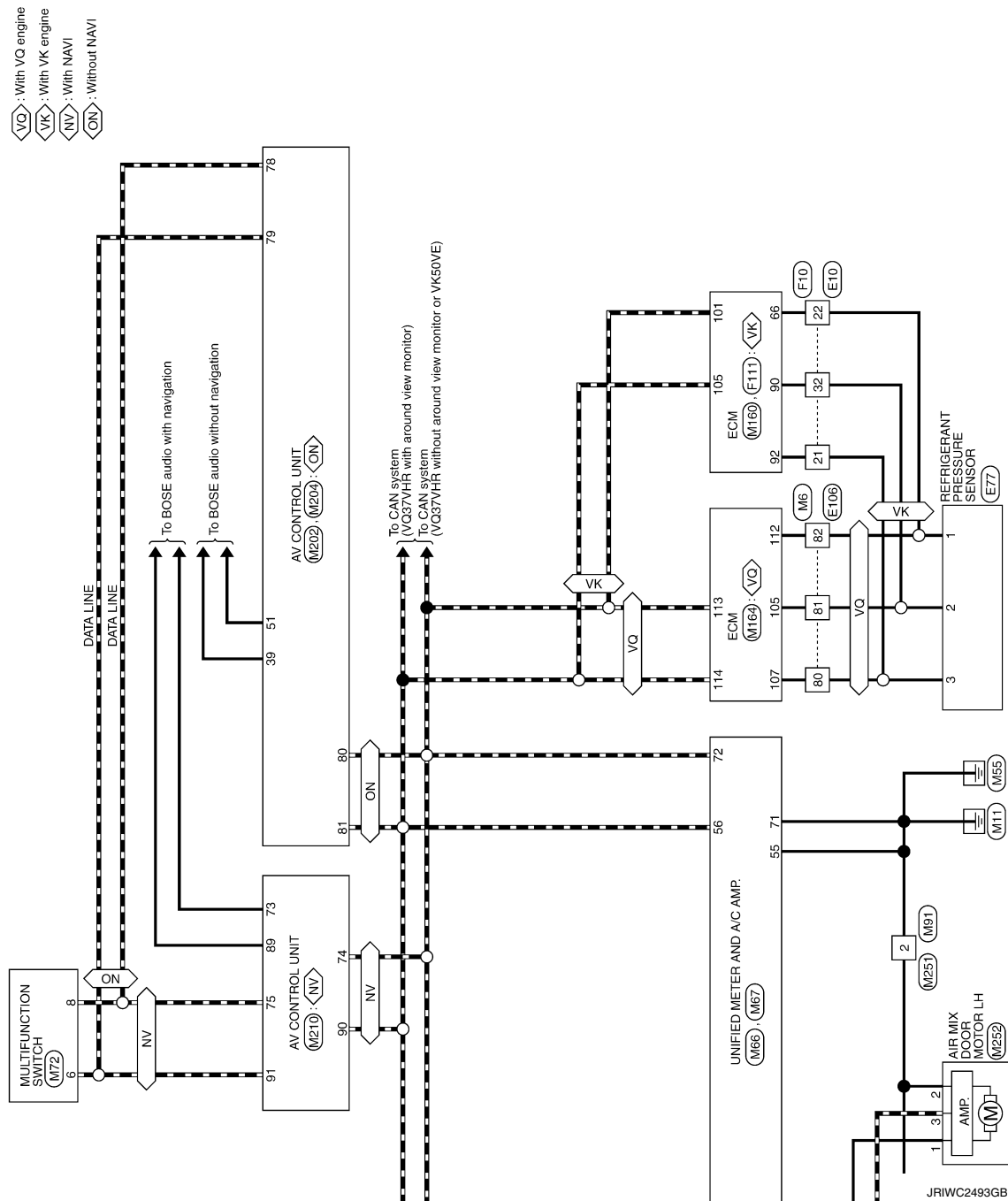


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UNIFIED METER AND A/C AMP.

< ECU DIAGNOSIS INFORMATION >

[AUTOMATIC AIR CONDITIONER]



UNIFIED METER AND A/C AMP.

< ECU DIAGNOSIS INFORMATION >

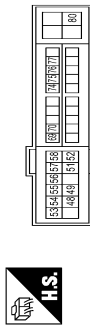
[AUTOMATIC AIR CONDITIONER]

AUTOMATIC AIR CONDITIONING SYSTEM

Connector No.	E5
Connector Name	IPOMER INTELLIGENT POWER DISTRIBUTION MODULE (ENGINE ROOM)
Connector Type	TH20FW-CS12-M4-1V

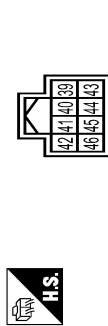


Connector No.	E7
Connector Name	IPOMER INTELLIGENT POWER DISTRIBUTION MODULE (ENGINE ROOM)
Connector Type	TH20FW-CS12-M4



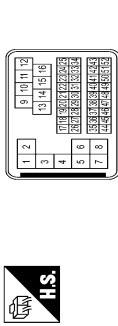
Terminal No.	Color Of Wire	Signal Name [Specification]
4	V	-
5	L	-
7	R	-
10	SB	-
12	B	-
13	Y	-
16	LG	-
19	W	-
25	G	-
26	R	-
27	Y	-
28	BG	-
30	GR	-
36	G	-

Connector No.	E6
Connector Name	IPOMER INTELLIGENT POWER DISTRIBUTION MODULE (ENGINE ROOM)
Connector Type	TH38FW-NH



Terminal No.	Color Of Wire	Signal Name [Specification]
39	P	-
40	L	-
41	B	-
42	Y	-
43	SB	-

Connector No.	E10
Connector Name	WIRE TO WIRE
Connector Type	SAAG36MB-RS9-SH23



Terminal No.	Color Of Wire	Signal Name [Specification]
1	G	- [With VQ engine]
2	SHIELD	- [With VK engine]
3	SHIELD	- [With VK engine]
4	BR	- [With VK engine]
5	G	- [With VK engine]
6	SHIELD	- [With VK engine]
7	BR	- [With VK engine]
8	R	- [With VK engine]
9	G	- [With VK engine]
10	SHIELD	- [With VK engine]
11	W	- [With VK engine]
12	BR	- [With VK engine]
13	L	- [With VK engine]
14	LG	- [With VK engine]
15	BG	- [With VK engine]
16	V	- [With VK engine]
17	W	- [With VK engine]
18	P	- [With VK engine]
19	W	- [With VK engine]
20	BR	- [With VK engine]
21	SB	- [With VK engine]

21	Y	- [With VQ engine]
22	G	- [With VQ engine]
23	W	- [With VQ engine]
24	R	- [With VQ engine]
25	V	- [With VQ engine]
26	G	- [With VQ engine]
27	Y	- [With VQ engine]
28	LG	- [With VQ engine]
29	LG	- [With VQ engine]
30	G	- [With VK engine]
31	GR	- [With VK engine]
32	V	- [With VK engine]
33	W	- [With VK engine]
34	BG	- [With VK engine]
35	R	- [With VK engine]
36	SHIELD	- [With VK engine]
37	SHIELD	- [With VK engine]
38	Y	- [With VK engine]
39	L	- [With VK engine]
40	SHIELD	- [With VK engine]
41	P	- [With VK engine]
42	W	- [With VK engine]
43	G	- [With VK engine]
44	G	- [With VK engine]
45	L	- [With VK engine]
46	G	- [With VK engine]
47	SHIELD	- [With VK engine]
48	B	- [With VK engine]
49	W	- [With VK engine]
50	BR	- [With VK engine]
51	R	- [With VK engine]
52	G	- [With VK engine]
53	L	- [With VK engine]
54	LG	- [With VK engine]
55	BG	- [With VK engine]
56	V	- [With VK engine]
57	W	- [With VK engine]
58	P	- [With VK engine]
59	W	- [With VK engine]
60	BR	- [With VK engine]
61	SB	- [With VK engine]

UNIFIED METER AND A/C AMP.

< ECU DIAGNOSIS INFORMATION >

[AUTOMATIC AIR CONDITIONER]

AUTOMATIC AIR CONDITIONING SYSTEM

Terminal No.	Wire	Signal Name [Specification]
50	B	- [With VQ engine]
51	G	- [With VK engine]
52	R	- [With VQ engine]



Connector No.	Signal Name [Specification]
E75	REFRIGERANT PRESSURE SENSOR

Terminal No.	Wire	Signal Name [Specification]
1	W	-
2	L	-
3	SB	-



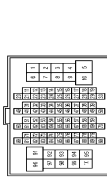
Terminal No.	Wire	Signal Name [Specification]
1	Y	AGS POWER
2	P	AGS S GND
3	W	AGS S OUTPUT

Connector No.	Signal Name [Specification]
E76	AMBIENT SENSOR

Terminal No.	Wire	Signal Name [Specification]
1	G	-
2	P	-



Terminal No.	Wire	Signal Name [Specification]
18	P	-
19	G	-
20	W	- [With ICC]
21	BR	- [Without ICC]
22	R	- [With ICC]
23	V	- [Without ICC]
24	G	-
25	L	- [With ICC]
26	P	- [Without ICC]
27	Y	- [With ICC]
28	SHIELD	-
29	LG	-
30	BR	-
31	GR	-
32	W	-
33	Y	-
34	RG	-
35	Y	-
36	W	-
37	Y	-
38	GR	-
39	LG	-
40	LG	-
41	LG	-
42	V	-
43	R	-
44	G	-
45	GR	-
46	W	-
47	L	-
48	P	-
49	SB	-
50	BR	-
51	B	-
52	Y	-
53	BG	-
54	R	-
55	SB	-
56	P	-
57	W	-
58	SB	-
59	P	-
60	SB	-
61	V	-
62	P	-
63	LG	-
64	L	-
65	BG	-
66	L	-
67	LG	-
68	R	-
69	BR	-
70	SHIELD	-
71	G	-
72	W	-
73	R	-
74	BR	-



Terminal No.	Wire	Signal Name [Specification]
1	G	-
2	BG	-
3	SB	-
4	LG	-
5	Y	-
6	W	-
7	G	-
8	V	-
9	R	-
10	BR	-
11	B	-
12	G	-
13	R	-
14	W	-
15	SHIELD	-
16	SB	-
17	L	-

Terminal No.	Wire	Signal Name [Specification]
76	L	-
77	W	-
78	Y	-
80	SB	-
81	L	-
82	W	-
83	LG	-
84	GR	-
85	G	-
86	P	-
87	W	-
88	BG	-
89	LG	-
90	BR	-
91	GR	-
92	BR	-
93	SB	-
94	Y	-
96	W	-
97	W	-
98	SHIELD	-
100	Y	-

Connector No.	Signal Name [Specification]
F10	WIRE TO WIRE



Terminal No.	Wire	Signal Name [Specification]
1	G	- [With VQ engine]
2	SHIELD	- [With VQ engine]
3	Y	- [With VQ engine]
4	BR	- [With VQ engine]
5	G	- [With VQ engine]
6	BR	- [With VQ engine]
7	SHIELD	- [With VQ engine]
8	B	- [With VQ engine]
9	BR	- [With VQ engine]
10	R	- [With VQ engine]
11	W	- [With VQ engine]

UNIFIED METER AND A/C AMP.

< ECU DIAGNOSIS INFORMATION >

[AUTOMATIC AIR CONDITIONER]

AUTOMATIC AIR CONDITIONING SYSTEM

7	R	- [With VQ engine]
8	SHIELD	- [With VK engine]
9	W	- [With VQ engine]
10	G	-
11	R	- [With VQ engine]
12	P	- [With VK engine]
13	L	- [With VQ engine]
14	L	- [With VK engine]
15	O	- [With VQ engine]
16	R	- [With VK engine]
17	GR	- [With VQ engine]
18	G	-
19	O	-
20	R	-
21	V	- [With VK engine]
22	B	- [With VQ engine]
23	LG	- [With VK engine]
24	LG	- [With VQ engine]
25	V	- [With VK engine]
26	O	-
27	GR	- [With VQ engine]
28	BR	- [With VK engine]
29	L	- [With VQ engine]
30	P	- [With VK engine]
31	BR	- [With VQ engine]
32	G	- [With VK engine]
33	L	- [With VQ engine]
34	O	- [With VK engine]
35	P	-
36	SHIELD	- [With VQ engine]
37	SHIELD	-

37	Y	- [With VK engine]
38	SHIELD	- [With VQ engine]
39	W	- [With VK engine]
40	G	- [With VQ engine]
41	B	- [With VK engine]
42	GR	- [With VQ engine]
43	R	- [With VK engine]
44	LG	- [With VQ engine]
45	L	-
46	G	- [With VK engine]
47	B	- [With VQ engine]
48	W	- [With VK engine]
49	G	- [With VQ engine]
50	B	- [With VK engine]
51	B	- [With VQ engine]
52	R	-

Connector No.	F43
Connector Name	COMPRESSOR
Connector Type	RS01FB



Terminal No.	Signal Name [Specification]
1	- [With VQ engine]
1	- [With VK engine]

Connector No.	F44
Connector Name	COMPRESSOR
Connector Type	RK02FGY



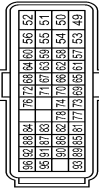
Terminal No.	Signal Name [Specification]
2	Y
3	O

Connector No.	F103
Connector Name	WIRE TO WIRE
Connector Type	TK36FM-NS10



35	BR	-
36	W	-
37	Y	-
38	Y	-
43	P	-
44	L	-
45	Y	-
46	V	-

Connector No.	F111
Connector Name	ECM
Connector Type	RH40FBR-R284-LH-Z



Terminal No.	Color Of Wire	Signal Name [Specification]
49	V	THROTTLE CONTROL MOTOR POWER SUPPLY (BANK 1)
50	G	THROTTLE CONTROL MOTOR (BANK 1) (OPEN)
51	O	INTAKE VALVE TIMING CONTROL SOLENOID VALVE (BANK 1)
52	L	INTAKE VALVE TIMING CONTROL SOLENOID VALVE (BANK 2)
53	BR	THROTTLE CONTROL MOTOR (BANK 1) (CLOSE)
54	B	ECM GROUND
55	P	HEATED OXYGEN SENSOR 2-HEATER (BANK 2)
56	R	HEATED OXYGEN SENSOR 2-HEATER (BANK 1)
57	Y	EXHAUST VALVE TIMING CONTROL SOLENOID VALVE (BANK 2)
58	B	SENSOR GROUND
59	W	CAKSHAFT POSITION SENSOR (BANK 1)
60	G	EXHAUST VALVE TIMING CONTROL POSITION SENSOR (BANK 1)
61	G	EXHAUST VALVE TIMING CONTROL SOLENOID VALVE (BANK 1)
62	L	SENSOR GROUND
63	G	CAKSHAFT POSITION SENSOR (BANK 2)
64	P	EXHAUST VALVE TIMING CONTROL POSITION SENSOR (BANK 2)
65	LG	INTAKE VALVE TIMING CONTROL SOLENOID VALVE (BANK 1)
66	GR	SENSOR GROUND
67	Y	CRANKSHAFT POSITION SENSOR
68	B	SENSOR GROUND
69	W	MANIFOLD ABSOLUTE PRESSURE SENSOR
70	B	SENSOR GROUND
71	R	SENSOR GROUND
72	Y	SENSOR GROUND
73	L	THROTTLE POSITION SENSOR 1 (BANK 1)
74	R	THROTTLE POSITION SENSOR 2 (BANK 2)

JRIWC2496GB

UNIFIED METER AND A/C AMP.

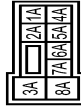
< ECU DIAGNOSIS INFORMATION >

[AUTOMATIC AIR CONDITIONER]

AUTOMATIC AIR CONDITIONING SYSTEM

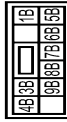
Connector No.	Connector Name	Signal Name [Specification]
76	G	BATTERY CURRENT SENSOR
77	B	THROTTLE POSITION SENSOR 1 (BANK 2)
78	Y	THROTTLE POSITION SENSOR 2 (BANK 1)
81	V	AF SENSOR 1 (BANK 1)
82	LG	AF SENSOR 1 (BANK 1)
83	SB	POWER STEERING PRESSURE SENSOR
84	B	SENSOR POWER SUPPLY
85	Y	AF SENSOR 1 (BANK 2)
86	O	AF SENSOR 1 (BANK 2)
87	R	SENSOR POWER SUPPLY
88	Y	SENSOR POWER SUPPLY
89	P	ENG COMMUNICATION LINE
90	G	REFRIGERANT PRESSURE SENSOR
91	R	SENSOR POWER SUPPLY
92	W	SENSOR POWER SUPPLY
93	LG	ENG COMMUNICATION LINE
95	Y	SENSOR POWER SUPPLY
96	L	SENSOR POWER SUPPLY

Connector No.	Connector Name	Signal Name [Specification]
M1	FUSE BLOCK (J/B)	
NS04FW-M2		



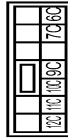
Terminal No.	Color Of Wire	Signal Name [Specification]
1A	BG	-
2A	G	-
3A	L	-
4A	R	-
5A	V	-
6A	Y	-
7A	R	-
8A	L	-

Connector No.	Connector Name	Signal Name [Specification]
M2	FUSE BLOCK (J/B)	
NS10FW-CS		



Terminal No.	Color Of Wire	Signal Name [Specification]
1B	LG	-
3B	P	-
4B	G	-
5B	BG	-
6B	Y	-
7B	L	-
8B	R	-
9B	BR	-

Connector No.	Connector Name	Signal Name [Specification]
M3	FUSE BLOCK (J/B)	
NS12FW-CS		



Terminal No.	Color Of Wire	Signal Name [Specification]
10C	L	-
11C	LG	-
12C	R	-
6C	P	-
7C	B	-
9C	BG	-

Connector No.	Connector Name	Signal Name [Specification]
M6	WIRE TO WIRE	
TH00MW-CS16-TM4		



Terminal No.	Color Of Wire	Signal Name [Specification]
1	G	-
2	BG	-
3	LG	- [Without Auto aircon seat]
4	SB	- [With Auto aircon seat]
5	BG	-
6	GR	-
7	G	-
8	W	-
9	P	-
10	BR	-
11	B	-
12	G	-
13	R	-
14	W	-
15	SHIELD	-
16	BR	-
17	L	-
18	P	-
19	G	-
20	GR	- [Without ICC]
21	W	- [With ICC]
22	BR	- [Without ICC]
23	R	- [With ICC]
24	L	- [Without ICC]
25	G	- [With ICC]
26	P	- [Without ICC]
27	W	- [With ICC]
28	SHIELD	-
29	GR	-
30	BG	-
32	W	-

Terminal No.	Color Of Wire	Signal Name [Specification]
33	Y	-
34	L	-
37	G	-
38	R	-
39	G	-
41	L	-
42	W	-
43	R	-
44	LG	-
45	GR	-
46	W	-
47	L	-
48	P	-
49	BG	-
50	LG	-
51	SB	-
52	Y	-
53	BG	-
54	BR	-
55	SB	-
59	SB	-
60	SB	-
61	V	-
62	P	-
63	R	-
64	L	-
65	BG	-
69	V	-
70	SHIELD	-
71	BG	-
72	GR	-
73	W	-
74	SB	-
76	V	-
77	V	-
78	Y	-
80	BG	-
81	L	-
82	W	-
83	Y	-
84	L	-
85	P	-
86	BR	-
87	P	-
88	V	-
89	G	-
90	P	-
91	R	-
92	R	-
93	GR	-

UNIFIED METER AND A/C AMP.

< ECU DIAGNOSIS INFORMATION >

[AUTOMATIC AIR CONDITIONER]

AUTOMATIC AIR CONDITIONING SYSTEM

95	G	-
96	W	-
97	W	-
98	SHELD	-
100	Y	-

Connector No.	M46
Connector Name	SUNLOAD SENSOR
Connector Type	K02FB



Terminal No.	Signal Name [Specification]
1	BG
2	SB

Connector No.	M57
Connector Name	IONZER
Connector Type	TH04FW-LNH



Terminal No.	Signal Name [Specification]
1	Y
2	R
3	BR
4	L

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



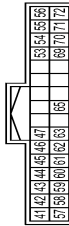
Terminal No.	Signal Name [Specification]
1	LG
2	L

Connector No.	M66
Connector Name	UNIFIED METER AND A/C AMP.
Connector Type	TH06FW-LNH



Terminal No.	Signal Name [Specification]
5	L
6	BG
7	GR
8	L
9	SB
10	W
11	G
14	BR
20	L
23	Y
25	V
26	G
27	LG
28	R
30	V
34	Y
38	L

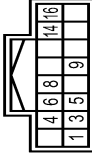
Connector No.	M67
Connector Name	UNIFIED METER AND A/C AMP.
Connector Type	TH02FW-LNH



Terminal No.	Signal Name [Specification]
41	V
42	Y
43	R
44	LG
45	P
46	BG
47	V
53	G
54	BG
55	B
56	L
57	W
58	B
59	GR
60	L
61	BR
62	SB
63	R
65	BG
69	L
70	R
71	B
72	P

Terminal No.	Signal Name [Specification]
1	B
3	V
4	R
5	R
6	SB
8	LG
9	BR
14	SB
16	G

Connector No.	M72
Connector Name	MULTIFUNCTION SWITCH
Connector Type	TH18FW-LNH



Terminal No.	Signal Name [Specification]
1	B
3	V
4	R
5	R
6	SB
8	LG
9	BR
14	SB
16	G

Connector No.	M77
Connector Name	INTAKE SENSOR
Connector Type	TK04FW



Terminal No.	Signal Name [Specification]
1	R
2	GR

UNIFIED METER AND A/C AMP.

< ECU DIAGNOSIS INFORMATION >

[AUTOMATIC AIR CONDITIONER]

AUTOMATIC AIR CONDITIONING SYSTEM

Connector No.	M161
Connector Name	WIRE TO WIRE
Connector Type	A03MW-P

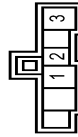


Connector No.	M116
Connector Name	WIRE TO WIRE
Connector Type	TK36MW-NS10



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

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



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

Connector No.	M151
Connector Name	WIRE TO WIRE
Connector Type	M03FW-LC



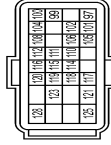
Terminal No.	Color Of Wire	Signal Name [Specification]
1	W	-
2	Y	-
3	R	-

Connector No.	M152
Connector Name	WIRE TO WIRE
Connector Type	M03MW-LC



Terminal No.	Color Of Wire	Signal Name [Specification]
1	W	-
2	Y	-
3	R	-

Connector No.	M160
Connector Name	ECM
Connector Type	RH24FGY-R28-LH-Z



Terminal No.	Color Of Wire	Signal Name [Specification]
97	R	ENGINE SPEED SIGNAL OUTPUT
98	G	SENSOR POWER SUPPLY
99	L	SENSOR POWER SUPPLY
100	L	CAN COMMUNICATION LINE
101	P	CAN COMMUNICATION LINE
102	SB	ASCD/CC STEERING SWITCH
104	R	ACCELERATOR PEDAL POSITION SENSOR 1
105	L	CAN COMMUNICATION LINE
106	L	IGNITION SWITCH
108	P	ACCELERATOR PEDAL POSITION SENSOR 2
110	P	STOP LAMP SWITCH
111	V	SENSOR GROUND
112	LG	FUEL PUMP CONTROL MODULE (FPCM) CHECK
114	GR	DATA LINK CONNECTOR
115	GR	SENSOR GROUND
116	G	TRANSMISSION RANGE SWITCH
117	BR	ASCD/CC BRAKE SWITCH
118	R	POWER SUPPLY FOR ECM (BACK-UP)
119	W	SENSOR GROUND
120	W	FUEL TANK TEMPERATURE SENSOR
121	GR	POWER SUPPLY FOR ECM
123	B	ECM GROUND
125	R	FUEL PUMP CONTROL MODULE (FPCM)
128	B	ECM GROUND

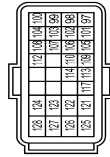
UNIFIED METER AND A/C AMP.

< ECU DIAGNOSIS INFORMATION >

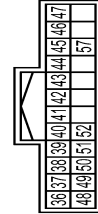
[AUTOMATIC AIR CONDITIONER]

AUTOMATIC AIR CONDITIONING SYSTEM

Connector No.	M164
Connector Name	ECM
Connector Type	RH24FGY-R28-R-LHZ



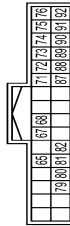
Connector No.	M202
Connector Name	AV CONTROL UNIT
Connector Type	TH24FW-AH



Terminal No.	Color	Wire	Signal Name [Specification]
97	R	ACCELERATOR PEDAL POSITION SENSOR 1	
98	P	ACCELERATOR PEDAL POSITION SENSOR 2 (WITH NAVI)	
99	Y	ACCELERATOR PEDAL POSITION SENSOR 3 (WITH NAVI)	
99	G	SENSOR POWER SUPPLY (WITH NAVI)	
99	L	SENSOR POWER SUPPLY (Without NAVI)	
100	W	SENSOR GROUND	
101	SB	ASD/ICC STEERING SWITCH	
102	LG	EVAP CONTROL SYSTEM PRESSURE SENSOR	
103	G	SENSOR POWER SUPPLY (Without NAVI)	
103	L	SENSOR POWER SUPPLY (With NAVI)	
104	BR	SENSOR GROUND (Without NAVI)	
104	GR	SENSOR GROUND (With NAVI)	
105	L	REFRIGERANT PRESSURE SENSOR	
106	W	FUEL TANK TEMPERATURE SENSOR	
107	BG	SENSOR POWER SUPPLY	
108	V	SENSOR GROUND	
109	G	PNP SIGNAL	
110	R	ENGINE SPEED OUTPUT SIGNAL	
112	V	IMPERIAL GROUND (FOR EVAP CONTROL SYSTEM PRESSURE SENSOR)	
112	W	EVAP GROUND (FOR EVAP CONTROL SYSTEM PRESSURE SENSOR)	
113	P	CAN COMMUNICATION LINE	
114	L	CAN COMMUNICATION LINE	
117	GR	DATA LINK CONNECTOR	
121	LG	EVAP CANISTER VENT CONTROL VALVE	
122	P	STOP LAMP SWITCH	
123	B	ECM GROUND	
124	B	ECM GROUND	
125	GR	POWER SUPPLY FOR ECM	
126	BR	ASD/ICC BRAKE SWITCH	
127	B	ECM GROUND	
128	B	ECM GROUND	

Terminal No.	Color	Wire	Signal Name [Specification]
76	LG	AV COMM (L)	
77	SB	AV COMM (H)	
78	LG	AV COMM (L)	
79	SB	AV COMM (H)	
80	P	CAN-L	
81	L	CAN-H	
82	BR	SW GND	
86	SHIELD	SHIELD	
87	L	TEL VOICE SIGNAL (+)	
88	P	TEL VOICE SIGNAL (-)	
92	R	VEHICLE SPEED SIGNAL (8-PULSE)	
93	V	PARKING BRAKE SIGNAL	
94	BG	REVERSE SIGNAL	
95	G	IGNITION SIGNAL	
96	SB	DISK EFFECT SIGNAL	
102	B	AUX GND	
103	W	AUX AUDIO LH+	
104	R	AUX AUDIO RH+	

Connector No.	M210
Connector Name	AV CONTROL UNIT
Connector Type	TH24FW-AH



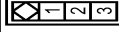
Terminal No.	Color	Wire	Signal Name [Specification]
65	V	PARKING BRAKE SIGNAL	
67	B	COMPOSITE IMAGE SIGNAL GND	
68	R	COMPOSITE IMAGE SIGNAL	
71	SHIELD	MICROPHONE SHIELD	
72	G	MICROPHONE VCC	
73	R	COMM (CONT->DISP)	
74	P	CAN-L	
75	LG	AV COMM (L)	
76	LG	AV COMM (L)	
79	R	ILLUMINATION	
80	G	IGNITION SIGNAL	
80	BG	REVERSE SIGNAL	
82	R	VEHICLE SPEED SIGNAL (8-PULSE)	
87	R	MICROPHONE SIGNAL	

Connector No.	M204
Connector Name	AV CONTROL UNIT
Connector Type	TH24FW-AH



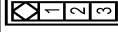
88	B	SHIELD
89	G	COMM (DISP->CONT)
90	L	CAN-H
91	SB	AV COMM (H)
92	SB	AV COMM (H)

Connector No.	M251
Connector Name	WIRE TO WIRE
Connector Type	A03FW



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

Connector No.	M252
Connector Name	AIR MIX DOOR MOTOR LH
Connector Type	A03FW



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

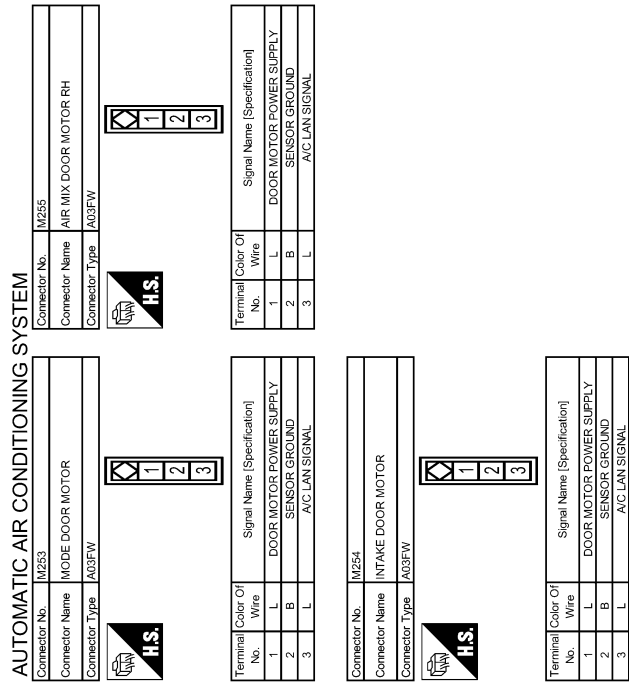
JRIWC2500GB

UNIFIED METER AND A/C AMP.

< ECU DIAGNOSIS INFORMATION >

[AUTOMATIC AIR CONDITIONER]

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



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:

UNIFIED METER AND A/C AMP.

< ECU DIAGNOSIS INFORMATION >

[AUTOMATIC AIR CONDITIONER]

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

ECM

VQ37VHR FOR USA AND CANADA

VQ37VHR FOR USA AND CANADA : Reference Value

INFOID:0000000011009664

VALUES ON THE DIAGNOSIS TOOL

NOTE:

- The following table includes information (items) inapplicable to this vehicle. For information (items) applicable to this vehicle, refer to CONSULT display items.
- Numerical values in the following table are reference values.
- These values are input/output values that ECM receives/transmits and may differ from actual operations.
Example: The ignition timing shown by the timing light may differ from the ignition timing displayed on the data monitor.
This occurs because the timing light shows a value calculated by ECM according to signals received from the camshaft position sensor and other sensors related to ignition timing.
- For outlines of following items, refer to [EC-157, "CONSULT Function"](#).

CONSULT MONITOR ITEM

Monitor Item	Condition		Values/Status
ENG SPEED	• Run engine and compare CONSULT value with the tachometer indication.		Almost the same speed as the tachometer indication
MAS A/F SE-B1	See EC-167, "Description" .		
MAS A/F SE-B2	See EC-167, "Description" .		
B/FUEL SCHDL	See EC-167, "Description" .		
A/F ALPHA-B1	See EC-167, "Description" .		
A/F ALPHA-B2	See EC-167, "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)	• Revving engine from idle up to 3,000 rpm quickly after the following conditions are met. - 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 - 0.3 V ↔ Approx. 0.6 - 1.0 V
HO2S2 (B2)	• Revving engine from idle up to 3,000 rpm quickly after the following conditions are met. - 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 - 0.3 V ↔ Approx. 0.6 - 1.0 V
HO2S2 MNTR (B1)	• Revving engine from idle up to 3,000 rpm quickly after the following conditions are met. - 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)	• Revving engine from idle up to 3,000 rpm quickly after the following conditions are met. - 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 value with the speedometer indication.		Almost the same speed as speedometer indication
BATTERY VOLT	• Ignition switch: ON (Engine stopped)		11 - 14 V
ACCEL SEN 1	• Ignition switch: ON (Engine stopped)	Accelerator pedal: Fully released	0.45 - 1.00 V
		Accelerator pedal: Fully depressed	4.4 - 4.8 V

ECM

< ECU DIAGNOSIS INFORMATION >

[AUTOMATIC AIR CONDITIONER]

Monitor Item	Condition		Values/Status
ACCEL SEN 2*1	Ignition switch: ON (Engine stopped)	Accelerator pedal: Fully released	0.45 - 1.00 V
		Accelerator pedal: Fully depressed	4.3 - 4.8 V
TP SEN 1-B1	- Ignition switch: ON (Engine stopped) - Selector lever: D	Accelerator pedal: Fully released	More than 0.36 V
		Accelerator pedal: Fully depressed	Less than 4.75 V
TP SEN 2-B1*1	- Ignition switch: ON (Engine stopped) - Selector lever: D	Accelerator pedal: Fully released	More than 0.36 V
		Accelerator pedal: Fully depressed	Less than 4.75 V
FUEL T/TMP SE	Ignition switch: ON		Indicates fuel tank temperature
INT/A TEMP SE	Ignition switch: ON		Indicates intake air temperature
EVAP SYS PRES	Ignition switch: ON		Approx. 1.8 - 4.8 V
FUEL LEVEL SE	Ignition switch: ON		Depending on fuel level of fuel tank
START SIGNAL	Ignition switch: ON → START → ON		OFF → ON → OFF
CLSD THL POS	Ignition switch: ON (Engine stopped)	Accelerator pedal: Fully released	ON
		Accelerator pedal: Slightly depressed	OFF
AIR COND SIG	Engine: After warming up, idle the engine	Air conditioner switch: OFF	OFF
		Air conditioner switch: ON (Compressor operates.)	ON
P/N POSI SW	Ignition switch: ON	Selector lever: P or N	ON
		Selector lever: Except above	OFF
PW/ST SIGNAL	Engine: After warming up, idle the engine	Steering wheel: Not being turned	OFF
		Steering wheel: Being turned	ON
LOAD SIGNAL	Ignition switch: ON	Rear window defogger switch: ON and/or Lighting switch: 2nd position	ON
		Rear window defogger switch and lighting switch: OFF	OFF
IGNITION SW	Ignition switch: ON → OFF → ON		ON → OFF → ON
HEATER FAN SW	Engine: After warming up, idle the engine	Heater fan switch: ON	ON
		Heater fan switch: OFF	OFF
BOOST VCUM SW	This item is displayed but is not applicable to this model.		
BRAKE SW	Ignition switch: ON	Brake pedal: Fully released	OFF
		Brake pedal: Slightly depressed	ON
INJ PULSE-B1	- Engine: After warming up - Selector lever: P or N - Air conditioner switch: OFF - No load	Idle	2.0 - 3.0 msec
		2,000 rpm	1.9 - 2.9 msec
INJ PULSE-B2	- Engine: After warming up - Selector lever: P or N - Air conditioner switch: OFF - No load	Idle	2.0 - 3.0 msec
		2,000 rpm	1.9 - 2.9 msec
IGN TIMING	- Engine: After warming up - Selector lever: P or N - Air conditioner switch: OFF - No load	Idle	7° BTDC
		2,000 rpm	25° - 45° BTDC
CAL/LD VALUE	- Engine: After warming up - Selector lever: P or N - Air conditioner switch: OFF - No load	Idle	5% - 35%
		2,500 rpm	5% - 35%

ECM

< ECU DIAGNOSIS INFORMATION >

[AUTOMATIC AIR CONDITIONER]

Monitor Item	Condition	Values/Status
MASS AIRFLOW	- Engine: After warming up - Selector lever: P or N - Air conditioner switch: OFF - No load Idle	2.0 - 6.0 g/s
	2,500 rpm	7.0 - 20.0 g/s
PURG VOL C/V	- Engine: After warming up - Selector lever: P or N - Air conditioner switch: OFF - No load Idle (Accelerator pedal: Not depressed even slightly, after engine starting.)	0%
	2,000 rpm	—
INT/V TIM (B1)	- Engine: After warming up - Selector lever: P or N - Air conditioner switch: OFF - No load Idle	-5°C A - 5°C A
	2,000 rpm	Approx. 0°C A - 30°C A
INT/V TIM (B2)	- Engine: After warming up - Selector lever: P or N - Air conditioner switch: OFF - No load Idle	-5°C A - 5°C A
	2,000 rpm	Approx. 0°C A - 30°C A
INT/V SOL (B1)	- Engine: After warming up - Selector lever: P or N - Air conditioner switch: OFF - No load Idle	0% - 2%
	2,000 rpm	Approx. 0% - 50%
INT/V SOL (B2)	- Engine: After warming up - Selector lever: P or N - Air conditioner switch: OFF - No load Idle	0% - 2%
	2,000 rpm	Approx. 0% - 50%
TP SEN 1-B2	- Ignition switch: ON (Engine stopped) - Selector lever: D Accelerator pedal: Fully released	More than 0.36 V
	Accelerator pedal: Fully depressed	Less than 4.75 V
TP SEN 2-B2*1	- Ignition switch: ON (Engine stopped) - Selector lever: D Accelerator pedal: Fully released	More than 0.36 V
	Accelerator pedal: Fully depressed	Less than 4.75 V
AIR COND RLY	Engine: After warming up, idle the engine Air conditioner switch: OFF	OFF
	Air conditioner switch: ON (Compressor operates)	ON
FUEL PUMP RLY	- For 1 second after turning ignition switch: ON - Engine running or cranking	ON
	Except above	OFF
VENT CONT/V	Ignition switch: ON	OFF
THRTL RELAY	Ignition switch: ON	ON
HO2S2 HTR (B1)	- 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	ON
	Engine speed: Above 3,600 rpm	OFF
HO2S2 HTR (B2)	- 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	ON
	Engine speed: Above 3,600 rpm	OFF
I/P PULLY SPD	Vehicle speed: More than 20 km/h (12 MPH)	Almost the same speed as the tachometer indication
VEHICLE SPEED	Turn drive wheels and compare CONSULT value with the speedometer indication.	Almost the same speed as the speedometer indication

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< ECU DIAGNOSIS INFORMATION >

[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
SNOW MODE SW	• Ignition switch: ON	Snow mode switch: ON	ON
		Snow mode switch: OFF	OFF
ENG OIL TEMP	• Engine: After warming up		More than 70°C (158°F)
TRVL AFTER MIL	• Ignition switch: ON	Vehicle has traveled after MIL has illuminated.	0 - 65,535 km (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 - 4.0 V
VHCL SPEED SE	• Turn drive wheels and compare CONSULT value with the speedometer indication.		Almost the same speed as the speedometer indication
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
CRUISE LAMP	• Ignition switch: ON	MAIN switch: Pressed at the 1st time → at the 2nd time	ON → OFF
BAT CUR SEN	• Engine speed: Idle • Battery: Fully charged*2 • Selector lever: P or N • Air conditioner switch: OFF • No load		Approx. 2,600 - 3,500 mV
ALT DUTY	• Engine: Idle		0 - 80%
ATOM PRES SEN	• This item is displayed but is not applicable to this model.		
BRAKE BST PRES SE	• This item is displayed but is not applicable to this model.		
VVEL POSITION SEN-B1	• Engine: After warming up • Selector lever: P or N • Air conditioner switch: OFF • No load	Idle	Approx. 0.25 - 1.40 V
		When revving engine up to 2,000 rpm quickly	Approx. 0.25 - 4.75 V
VVEL POSITION SEN-B2	• Engine: After warming up • Selector lever: P or N • Air conditioner switch: OFF • No load	Idle	Approx. 0.25 - 1.40 V
		When revving engine up to 2,000 rpm quickly	Approx. 0.25 - 4.75 V

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< ECU DIAGNOSIS INFORMATION >

[AUTOMATIC AIR CONDITIONER]

Monitor Item	Condition		Values/Status
VVEL TIM-B1	- Engine: After warming up - Selector lever: P or N - 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 - 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 - 0.80 V
VVEL SEN LEARN-B2	VVEL learning has already been performed successfully		Approx. 0.30 - 0.80 V
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
EVAP LEAK DIAG	Ignition switch: ON		Depending on condition of EVAP leak diagnosis
EVAP DIAG READY	Ignition switch: ON (READY)		Depending on ready condition of EVAP leak diagnosis
HO2 S2 DIAG1 (B1)	DTC P0139 self-diagnosis (delayed response) has not been performed yet.		INCMP
	DTC P0139 self-diagnosis (delayed response) has already been performed successfully.		CMPLT
HO2 S2 DIAG1 (B2)	DTC P0159 self-diagnosis (delayed response) has not been performed yet.		INCMP
	DTC P0159 self-diagnosis (delayed response) has already been performed successfully.		CMPLT
HO2 S2 DIAG2 (B1)	DTC P0139 self-diagnosis (slow response) has not been performed yet.		INCMP
	DTC P0139 self-diagnosis (slow response) has already been performed successfully.		CMPLT
HO2 S2 DIAG2 (B2)	DTC P0159 self-diagnosis (slow response) has not been performed yet.		INCMP
	DTC P0159 self-diagnosis (slow response) has already been performed successfully.		CMPLT
A/F SEN1 DIAG1 (B1)	DTC P015A and P015B self-diagnosis incomplete.		INCMP
	DTC P015A and P015B self-diagnosis is complete.		CMPLT
A/F SEN1 DIAG1 (B2)	DTC P015C and P015D self-diagnosis incomplete.		INCMP
	DTC P015C and P015D self-diagnosis is complete.		CMPLT
A/F SEN1 DIAG2 (B1)	DTC P014C and P014D self-diagnosis incomplete.		INCMP
	DTC P014C and P014D self-diagnosis is complete.		CMPLT
A/F SEN1 DIAG2 (B2)	DTC P014E and P014F self-diagnosis incomplete.		INCMP
	DTC P014E and P014F self-diagnosis is complete.		CMPLT
A/F SEN1 DIAG3 (B1)	The vehicle condition is not within the diagnosis range of DTC P014C, P014D, P015A or P015B.		ABSNT
	The vehicle condition is within the diagnosis range of DTC P014C, P014D, P015A or P015B.		PRSNT

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< ECU DIAGNOSIS INFORMATION >

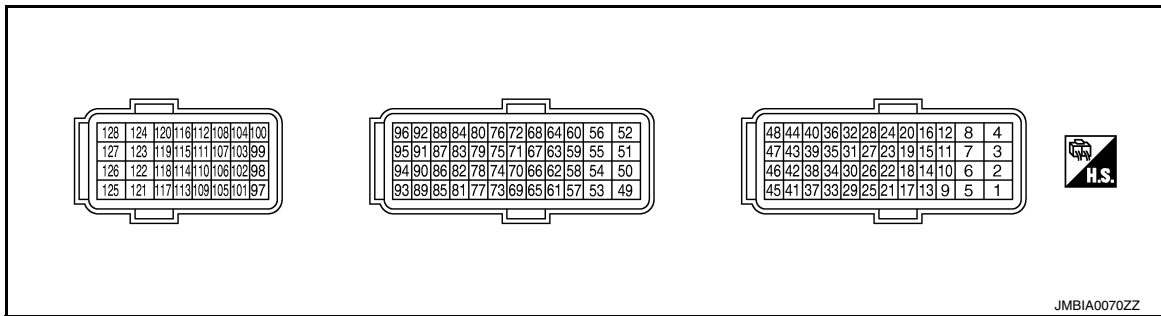
[AUTOMATIC AIR CONDITIONER]

Monitor Item	Condition	Values/Status
A/F SEN1 DIAG3 (B2)	The vehicle condition is not within the diagnosis range of DTC P014E, P014F, P015C or P015D.	ABSNT
	The vehicle condition is within the diagnosis range of DTC P014E, P014F, P015C or P015D.	PRSNT
A/F-S ATMSPHRC CRCT B1	Engine: After warming up, idle the engine	Varies depending on vehicle environment.
A/F-S ATMSPHRC CRCT B2	Engine: After warming up, idle the engine	Varies depending on vehicle environment.
A/F-S ATMSPHRC CRCT UP B1	Engine: Running	Varies depending on the number of updates.
A/F-S ATMSPHRC CRCT UP B2	Engine: Running	Varies depending on the number of updates.

*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:

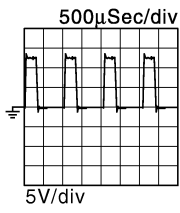
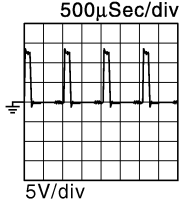
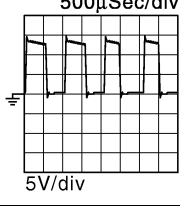
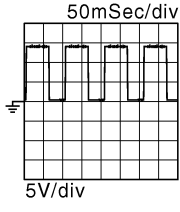
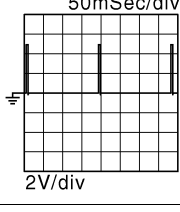
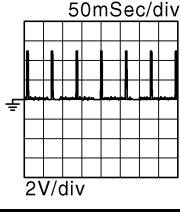
- ECM is located behind the instrument assist lower panel. For this inspection, remove passenger side instrument lower panel.
- Specification data are reference values and are measured between each terminal and ground.
- Pulse signal is measured by CONSULT.

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 - 8.8 V★ JMBIA0030GB

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< ECU DIAGNOSIS INFORMATION >

[AUTOMATIC AIR CONDITIONER]

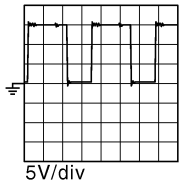
Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	—	Signal name	Input/ Output		
2 (G)	128 (B)	Throttle control motor (Open) (bank 1)	Output	[Ignition switch: ON] • Engine stopped • Selector lever: D • Accelerator pedal: Fully depressed	0 - 14 V★ 
				[Ignition switch: ON] • Engine stopped • Selector lever: D • Accelerator pedal: Fully released	0 - 14 V★ 
3 (R)	128 (B)	Throttle control motor power supply (bank 1)	Input	[Ignition switch: ON]	BATTERY VOLTAGE (11 - 14 V)
4 (BR)	128 (B)	Throttle control motor (Close) (bank 1)	Output	[Ignition switch: ON] • Engine stopped • Selector lever: D • Accelerator pedal: In the middle of re- leasing operation	0 - 14 V★ 
5 (W)	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 - 8.8 V★ 
8 (B)	—	ECM ground	—	—	—
11 (GR)	128 (B)	Ignition signal No. 4	Output	[Engine is running] • Warm-up condition • Idle speed NOTE: The pulse cycle changes depending on rpm at idle	0 - 0.2 V★ 
12 (L)		Ignition signal No. 3			
15 (V)		Ignition signal No. 5			
16 (G)		Ignition signal No. 2			
19 (SB)		Ignition signal No. 6			
20 (Y)		Ignition signal No. 1		[Engine is running] • Warm-up condition • Engine speed: 2,000 rpm	0.1 - 0.4 V★ 

Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	—	Signal name	Input/ Output		
17 (P)	128 (B)	Heated oxygen sensor 2 heater (bank 1)	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	10 V★
				[Ignition switch: ON] - Engine stopped [Engine is running] - Engine speed: Above 3,600 rpm	BATTERY VOLTAGE (11 - 14 V)
18 (W)	128 (B)	Intake valve timing control solenoid valve (bank 1)	Output	[Engine is running] - Warm-up condition - Idle speed	BATTERY VOLTAGE (11 - 14 V)
				[Engine is running] - Warm-up condition - Engine speed: 2,000rpm	7 - 12 V★
21 (GR)	128 (B)	EVAP canister purge vol- ume control solenoid valve	Output	[Engine is running] - Idle speed - Accelerator pedal: Not depressed even slightly, after engine starting	BATTERY VOLTAGE (11 - 14 V)★
				[Engine is running] Engine speed: About 2,000 rpm (More than 100 seconds after starting engine)	BATTERY VOLTAGE (11 - 14 V)★
22 (R)	128 (B)	Fuel pump relay	Output	[Ignition switch: ON] For 1 second after turning ignition switch ON [Engine is running]	0 - 1.5 V
				[Ignition switch: ON] More than 1 second after turning ignition switch ON	BATTERY VOLTAGE (11 - 14 V)

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< ECU DIAGNOSIS INFORMATION >

[AUTOMATIC AIR CONDITIONER]

Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	—	Signal name	Input/ Output		
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 - 1.5 V
				[Ignition switch: OFF] • More than a few seconds after turning ignition switch OFF	BATTERY VOLTAGE (11 - 14 V)
25 (O)	128 (B)	Throttle control motor relay	Output	[Ignition switch: ON → OFF]	0 - 1.0 V ↓ BATTERY VOLTAGE (11 - 14 V) ↓ 0 V
				[Ignition switch: ON]	0 - 1.0 V
28 (BR)	128 (B)	VVEL actuator motor relay abort signal [VVEL control module]	Output	[Engine is running] • Warm-up condition • Idle speed	0 V
29 (G)	128 (B)	Intake valve timing control solenoid valve (bank 2)	Output	[Engine is running] • Warm-up condition • Idle speed	BATTERY VOLTAGE (11 - 14 V)
				[Engine is running] • Warm-up condition • Engine speed: 2,000rpm	7 - 12 V★ 
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 0.36 V
				[Ignition switch: ON] • Engine stopped • Selector lever: D (A/T) or 1st (M/T) • Accelerator pedal: Fully depressed	Less than 4.75 V
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 0.36 V
				[Ignition switch: ON] • Engine stopped • Selector lever: D (A/T) or 1st (M/T) • Accelerator pedal: Fully depressed	Less than 4.75 V

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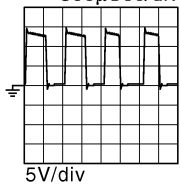
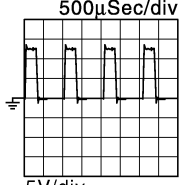
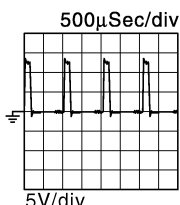
[AUTOMATIC AIR CONDITIONER]

Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	—	Signal name	Input/ Output		
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	10 V★
				[Ignition switch: ON] - Engine stopped [Engine is running] - Engine speed: Above 3,600 rpm	BATTERY VOLTAGE (11 - 14 V)
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 4.75 V
				[Ignition switch: ON] - Engine stopped - Selector lever: D (A/T) or 1st (M/T) - Accelerator pedal: Fully depressed	More than 0.36 V
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 4.75 V
				[Ignition switch: ON] - Engine stopped - Selector lever: D (A/T) or 1st (M/T) - Accelerator pedal: Fully depressed	More than 0.36 V
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 V★
				[Engine is running] Engine speed: 2,000 rpm	4.0 - 5.0 V★
38 (O)	96 (P)	Manifold absolute pressure (MAP) sensor	Input	[Engine is running] - Warm-up condition - Idle speed	1.2 V
				[Engine is running] - Warm-up condition - Engine speed: 2,000 rpm	1.5 V
40 (R)	—	Sensor ground [Throttle position sensor (bank 1)]	—	—	—

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< ECU DIAGNOSIS INFORMATION >

[AUTOMATIC AIR CONDITIONER]

Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	—	Signal name	Input/ Output		
43 (G)	48 (B)	Sensor power supply [Throttle position sensor (bank 2)]	—	[Ignition switch: ON]	5 V
44 (L)	40 (R)	Sensor power supply [Throttle position sensor (bank 1)]	—	[Ignition switch: ON]	5 V
46 (R)	128 (B)	Sensor power supply [Crankshaft position sensor (POS)]	—	[Ignition switch: ON]	5 V
47 (Y)	—	Sensor ground [Crankshaft position sensor (POS)]	—	—	—
48 (B)	—	Sensor ground [Throttle position sensor (bank 2)]	—	—	—
49 (GR)	128 (B)	Throttle control motor (Close) (bank 2)	Output	[Ignition switch: ON] • Engine stopped • Selector lever: D • Accelerator pedal: In the middle of releasing operation	0 - 14 V★ 
50 (V)	128 (B)	Throttle control motor (Open) (bank 2)	Output	[Ignition switch: ON] • Engine stopped • Selector lever: D • Accelerator pedal: Fully depressed	0 - 14 V★ 
				[Ignition switch: ON] • Engine stopped • Selector lever: D • Accelerator pedal: Fully released	0 - 14 V★ 
52 (R)	128 (B)	Throttle control motor power supply (bank 2)	Input	[Ignition switch: ON]	BATTERY VOLTAGE (11 - 14 V)
53 (W)	128 (B)	Ignition switch	Input	[Ignition switch: OFF]	0 V
				[Ignition switch: ON]	BATTERY VOLTAGE (11 - 14 V)
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]	2.2 V

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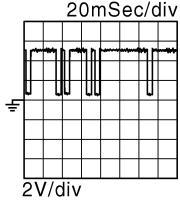
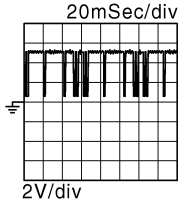
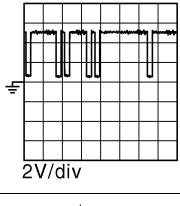
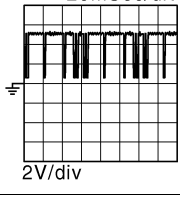
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< ECU DIAGNOSIS INFORMATION >

[AUTOMATIC AIR CONDITIONER]

Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	—	Signal name	Input/ Output		
59 (O)	128 (B)	Camshaft position sensor (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 V★ 
				[Engine is running] • Engine speed: 2,000 rpm	3.0 - 5.0 V★ 
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]	5 V
61 (R)	128 (B)	A/F sensor 1 (bank 1)	Input	[Engine is running] • Warm-up condition • Engine speed: 2,000 rpm	1.8 V 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 V★ 
				[Engine is running] • Engine speed: 2,000 rpm	3.0 - 5.0 V★ 
64 (SB)	128 (B)	Sensor power supply [Camshaft position sensor (PHASE) (bank 2), Battery current sensor]	—	[Ignition switch: ON]	5 V
65 (LG)	128 (B)	A/F sensor 1 (bank 2)	Input	[Ignition switch: ON]	2.2 V
66 (V)	128 (B)	A/F sensor 1 (bank 2)	Input	[Engine is running] • Warm-up condition • Engine speed: 2,000 rpm	1.8 V Output voltage varies with air fuel ratio.
67 (P)	128 (B)	Intake air temperature sensor	Input	[Engine is running]	0 - 4.8 V Output voltage varies with intake air temperature.

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< ECU DIAGNOSIS INFORMATION >

[AUTOMATIC AIR CONDITIONER]

Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	—	Signal name	Input/ Output		
68 (LG)	—	Sensor ground [Mass air flow sensor (bank 1), Intake air tem- perature sensor]	—	—	—
69 (W)	128 (B)	Knock sensor (bank 2)	Input	[Engine is running] • Idle speed	2.5 V*1
71 (Y)	128 (B)	Engine coolant tempera- ture sensor	Input	[Engine is running]	0 - 4.8 V 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	2.5 V*1
76 (W)	84 (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 - 1.0 V
77 (SB)	68 (LG)	Mass air flow sensor (bank 1)	Input	[Engine is running] • Warm-up condition • Idle speed	0.7 - 1.2 V
				[Engine is running] • Warm-up condition • Engine speed: 2,500 rpm	1.3 - 1.7 V
78 (G)	84 (B)	Engine oil temperature sensor	Input	[Engine is running]	0 - 4.8 V 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 - 1.2 V
				[Engine is running] • Warm-up condition • Engine speed: 2,500 rpm	1.3 - 1.7 V
80 (O)	84 (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 - 1.0 V

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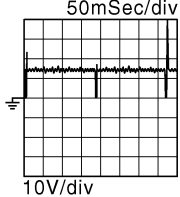
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< ECU DIAGNOSIS INFORMATION >

[AUTOMATIC AIR CONDITIONER]

Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	—	Signal name	Input/ Output		
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 - 14 V)★ 
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			
84 (B)	—	Sensor ground (Heated oxygen sensor 2, Engine coolant temperature sensor, Engine oil temperature sensor)	—	—	—
87 (Y)	96 (P)	Power steering pressure sensor	Output	[Engine is running] • Steering wheel: Being turned [Engine is running] • Steering wheel: Not being turned	0.5 - 4.5 V 0.4 - 0.8 V
91 (SB)	95 (G)	Battery current sensor	Input	[Engine is running] • Battery: Fully charged*2 • Idle speed	2.6 - 3.5 V
92 (G)	—	Sensor ground [Camshaft position sensor (PHASE) (bank 2)]	—	—	—
93 (P)	128 (B)	Power supply for ECM (Back-up)	Input	[Ignition switch: OFF]	BATTERY VOLTAGE (11 - 14 V)
94 (Y)	—	Sensor ground [Mass air flow sensor (bank 2)]	—	—	—
95 (G)	—	Sensor ground (Battery current sensor)	—	—	—
96 (P)	—	Sensor ground [Camshaft position sensor (PHASE) (bank 1), Manifold absolute pressure (MAP) sensor, Power steering pressure sensor]	—	—	—
97 (R)	100 (W)	Accelerator pedal position sensor 1	Input	[Ignition switch: ON] • Engine stopped • Accelerator pedal: Fully released [Ignition switch: ON] • Engine stopped • Accelerator pedal: Fully depressed	0.45 - 1.00 V 4.2 - 4.8 V

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< ECU DIAGNOSIS INFORMATION >

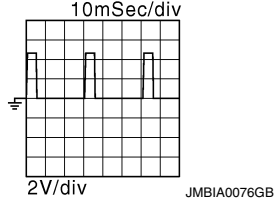
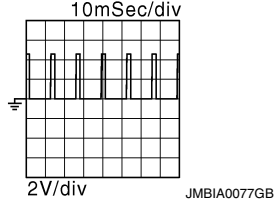
[AUTOMATIC AIR CONDITIONER]

Terminal No. (Wire color)		Description		Condition	Value (Approx.)	
+	—	Signal name	Input/ Output			
98 (P)*3 (Y)*4	104 (GR)*3 (BR)*4	Accelerator pedal position sensor 2	Input	[Ignition switch: ON] • Engine stopped • Accelerator pedal: Fully released	0.22 - 0.50 V	A
				[Ignition switch: ON] • Engine stopped • Accelerator pedal: Fully depressed	2.1 - 2.5 V	B
99 (L)*3 (G)*4	100 (W)	Sensor power supply (Accelerator pedal posi- tion sensor 1)	—	[Ignition switch: ON]	5 V	C
100 (W)	—	Sensor ground (Accelerator pedal posi- tion sensor 1)	—	—	—	D
101 (SB)	108 (V)	ICC steering switch (models with ICC system)	Input	[Ignition switch: ON] • ICC steering switch: OFF	4.3 V	E
				[Ignition switch: ON] • MAIN switch: Pressed	0 V	F
				[Ignition switch: ON] • CANCEL switch: Pressed	1.3 V	G
				[Ignition switch: ON] • RESUME/ACCELERATE switch: Pressed	3.7 V	H
				[Ignition switch: ON] • SET/COAST switch: Pressed	3 V	HAC
				[Ignition switch: ON] • DISTANCE switch: Pressed	2.2 V	
101 (SB)	108 (V)	ASCD steering switch (models with ASCD sys- tem)	Input	[Ignition switch: ON] • ASCD steering switch: OFF	4 V	J
				[Ignition switch: ON] • MAIN switch: Pressed	0 V	K
				[Ignition switch: ON] • CANCEL switch: Pressed	1 V	L
				[Ignition switch: ON] • RESUME/ACCELERATE switch: Pressed	3 V	M
				[Ignition switch: ON] • SET/COAST switch: Pressed	2 V	
102 (LG)	112 (V)	EVAP control system pressure sensor	Input	[Ignition switch: ON]	1.8 - 4.8 V	N
103 (G)*3 (L)*4	104 (GR)*3 (BR)*4	Sensor power supply (Accelerator pedal posi- tion sensor 2)	—	[Ignition switch: ON]	5 V	O
104 (GR)*3 (BR)*4	—	Sensor ground (Accelerator pedal posi- tion sensor 2)	—	—	—	P
105 (L)	112 (V)	Refrigerant pressure sen- sor	Input	[Engine is running] • Warm-up condition • Both A/C switch and blower fan motor switch: ON (Compressor operates)	1.0 - 4.0 V	
106 (W)	128 (B)	Fuel tank temperature sensor	Input	[Engine is running]	0 - 4.8 V Output voltage varies with fuel tank temperature.	

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< ECU DIAGNOSIS INFORMATION >

[AUTOMATIC AIR CONDITIONER]

Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	—	Signal name	Input/ Output		
107 (BG)	112 (V)	Sensor power supply (EVAP control system pressure sensor, Refriger- ant pressure sensor)	—	[Ignition switch: ON]	5 V
108 (V)	—	Sensor ground (ASCD/ICC steering switch)	—	—	—
109 (G)	128 (B)	PNP signal	Input	[Ignition switch: ON] • Selector lever: P or N	BATTERY VOLTAGE (11 - 14 V)
				[Ignition switch: ON] • Selector lever: Except above	0 V
110 (R)	128 (B)	Engine speed output sig- nal	Output	[Engine is running] • Warm-up condition • Idle speed NOTE: The pulse cycle changes depending on rpm at idle	1 V★ 
				[Engine is running] • Engine speed is 2,000 rpm	1 V★ 
112 (V)	—	Sensor ground (EVAP control system pressure sensor, Refriger- ant pressure sensor)	—	—	—
113 (P)	—	CAN communication line	Input/ Output	—	—
114 (L)	—	CAN communication line	Input/ Output	—	—
117 (GR)	128 (B)	Data link connector	Input/ Output	—	—
121 (LG)	128 (B)	EVAP canister vent con- trol valve	Output	[Ignition switch: ON]	BATTERY VOLTAGE (11 - 14 V)
122 (P)	128 (B)	Stop lamp switch	Input	[Ignition switch: OFF] • Brake pedal: Fully released	0 V
				[Ignition switch: OFF] • Brake pedal: Slightly depressed	BATTERY VOLTAGE (11 - 14 V)
123 (B) 124 (B)	—	ECM ground	—	—	—
125 (GR)	128 (B)	Power supply for ECM	Input	[Ignition switch: ON]	BATTERY VOLTAGE (11 - 14 V)

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< ECU DIAGNOSIS INFORMATION >

[AUTOMATIC AIR CONDITIONER]

Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	—	Signal name	Input/ Output		
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	0 V
				[Ignition switch: ON] • Brake pedal: Fully released	BATTERY VOLTAGE (11 - 14 V)
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"](#).

*3: Without navigation system

*4: With navigation system

VQ37VHR FOR MEXICO

VQ37VHR FOR MEXICO : Reference Value

INFOID:0000000011009665

VALUES ON THE DIAGNOSIS TOOL

NOTE:

- The following table includes information (items) inapplicable to this vehicle. For information (items) applicable to this vehicle, refer to CONSULT display items.
- Numerical values in the following table are reference values.
- These values are input/output values that ECM receives/transmits and may differ from actual operations.
Example: The ignition timing shown by the timing light may differ from the ignition timing displayed on the data monitor.
This occurs because the timing light shows a value calculated by ECM according to signals received from the camshaft position sensor and other sensors related to ignition timing.
- For outlines of following items, refer to [EC-750, "CONSULT Function"](#).

CONSULT MONITOR ITEM

Monitor Item	Condition		Values/Status
ENG SPEED	• Run engine and compare CONSULT value with the tachometer indication.		Almost the same speed as the tachometer indication
MAS A/F SE-B1	See EC-758, "Description" .		
MAS A/F SE-B2	See EC-758, "Description" .		
B/FUEL SCHDL	See EC-758, "Description" .		
A/F ALPHA-B1	See EC-758, "Description" .		
A/F ALPHA-B2	See EC-758, "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)	- Revvng engine from idle up to 3,000 rpm quickly after the following conditions are met. - 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 - 0.3 V ↔ Approx. 0.6 - 1.0 V

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< ECU DIAGNOSIS INFORMATION >

[AUTOMATIC AIR CONDITIONER]

Monitor Item	Condition		Values/Status
HO2S2 (B2)	• Revving engine from idle up to 3,000 rpm quickly after the following conditions are met. - 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 - 0.3 V ↔ Approx. 0.6 - 1.0 V
HO2S2 MNTR (B1)	• Revving engine from idle up to 3,000 rpm quickly after the following conditions are met. - 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)	• Revving engine from idle up to 3,000 rpm quickly after the following conditions are met. - 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 value with the speedometer indication.		Almost the same speed as speedometer indication
BATTERY VOLT	• Ignition switch: ON (Engine stopped)		11 - 14 V
ACCEL SEN 1	• Ignition switch: ON (Engine stopped)	Accelerator pedal: Fully released	0.45 - 1.00 V
		Accelerator pedal: Fully depressed	4.4 - 4.8 V
ACCEL SEN 2*1	• Ignition switch: ON (Engine stopped)	Accelerator pedal: Fully released	0.45 - 1.00 V
		Accelerator pedal: Fully depressed	4.3 - 4.8 V
TP SEN 1-B1	• Ignition switch: ON (Engine stopped) • Selector lever: D	Accelerator pedal: Fully released	More than 0.36 V
		Accelerator pedal: Fully depressed	Less than 4.75 V
TP SEN 2-B1*1	• Ignition switch: ON (Engine stopped) • Selector lever: D	Accelerator pedal: Fully released	More than 0.36 V
		Accelerator pedal: Fully depressed	Less than 4.75 V
FUEL T/TMP SE	• Ignition switch: ON		Indicates fuel tank temperature
INT/A TEMP SE	• Ignition switch: ON		Indicates intake air temperature
FUEL LEVEL SE	• Ignition switch: ON		Depending on fuel level of fuel tank
START SIGNAL	• Ignition switch: ON → START → ON		OFF → ON → OFF
CLSD THL POS	• Ignition switch: ON (Engine stopped)	Accelerator pedal: Fully released	ON
		Accelerator pedal: Slightly depressed	OFF
AIR COND SIG	• Engine: After warming up, idle the engine	Air conditioner switch: OFF	OFF
		Air conditioner switch: ON (Compressor operates.)	ON
P/N POSI SW	• Ignition switch: ON	Selector lever: P or N	ON
		Selector lever: Except above	OFF
PW/ST SIGNAL	• Engine: After warming up, idle the engine	Steering wheel: Not being turned	OFF
		Steering wheel: Being turned	ON
LOAD SIGNAL	• Ignition switch: ON	Rear window defogger switch: ON and/or Lighting switch: 2nd position	ON
		Rear window defogger switch and lighting switch: OFF	OFF
IGNITION SW	• Ignition switch: ON → OFF → ON		ON → OFF → ON
HEATER FAN SW	• Engine: After warming up, idle the engine	Heater fan switch: ON	ON
		Heater fan switch: OFF	OFF

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< ECU DIAGNOSIS INFORMATION >

[AUTOMATIC AIR CONDITIONER]

Monitor Item	Condition	Values/Status
BOOST VCUM SW	• This item is displayed but is not applicable to this model.	
BRAKE SW	• Ignition switch: ON	Brake pedal: Fully released OFF
		Brake pedal: Slightly depressed ON
INJ PULSE-B1	• Engine: After warming up • Selector lever: P or N • Air conditioner switch: OFF • No load	Idle 2.0 - 3.0 msec
		2,000 rpm 1.9 - 2.9 msec
INJ PULSE-B2	• Engine: After warming up • Selector lever: P or N • Air conditioner switch: OFF • No load	Idle 2.0 - 3.0 msec
		2,000 rpm 1.9 - 2.9 msec
IGN TIMING	• Engine: After warming up • Selector lever: P or N • Air conditioner switch: OFF • No load	Idle 7° BTDC
		2,000 rpm 25° - 45° BTDC
CAL/LD VALUE	• Engine: After warming up • Selector lever: P or N • Air conditioner switch: OFF • No load	Idle 5% - 35%
		2,500 rpm 5% - 35%
MASS AIRFLOW	• Engine: After warming up • Selector lever: P or N • Air conditioner switch: OFF • No load	Idle 2.0 - 6.0 g/s
		2,500 rpm 7.0 - 20.0 g/s
PURG VOL C/V	• Engine: After warming up • Selector lever: P or N • Air conditioner switch: OFF • No load	Idle (Accelerator pedal: Not depressed even slightly, after engine starting.) 0%
		2,000 rpm —
INT/V TIM (B1)	• Engine: After warming up • Selector lever: P or N • Air conditioner switch: OFF • No load	Idle -5°C A - 5°C A
		2,000 rpm Approx. 0°C A - 30°C A
INT/V TIM (B2)	• Engine: After warming up • Selector lever: P or N • Air conditioner switch: OFF • No load	Idle -5°C A - 5°C A
		2,000 rpm Approx. 0°C A - 30°C A
INT/V SOL (B1)	• Engine: After warming up • Selector lever: P or N • Air conditioner switch: OFF • No load	Idle 0% - 2%
		2,000 rpm Approx. 0% - 50%
INT/V SOL (B2)	• Engine: After warming up • Selector lever: P or N • Air conditioner switch: OFF • No load	Idle 0% - 2%
		2,000 rpm Approx. 0% - 50%
TP SEN 1-B2	• Ignition switch: ON (Engine stopped) • Selector lever: D	Accelerator pedal: Fully released More than 0.36 V
		Accelerator pedal: Fully depressed Less than 4.75 V
TP SEN 2-B2*1	• Ignition switch: ON (Engine stopped) • Selector lever: D	Accelerator pedal: Fully released More than 0.36 V
		Accelerator pedal: Fully depressed Less than 4.75 V
AIR COND RLY	• Engine: After warming up, idle the engine	Air conditioner switch: OFF OFF
		Air conditioner switch: ON (Compressor operates) ON
FUEL PUMP RLY	• For 1 second after turning ignition switch: ON • Engine running or cranking	ON
	• Except above	OFF
VENT CONT/V	• Ignition switch: ON	OFF

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< ECU DIAGNOSIS INFORMATION >

[AUTOMATIC AIR CONDITIONER]

Monitor Item	Condition		Values/Status
THRTL RELAY	• Ignition switch: ON		ON
HO2S2 HTR (B1)	• 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		ON
	• Engine speed: Above 3,600 rpm		OFF
HO2S2 HTR (B2)	• 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		ON
	• Engine speed: Above 3,600 rpm		OFF
I/P PULLY SPD	• Vehicle speed: More than 20 km/h (12 MPH)		Almost the same speed as the tachometer indication
VEHICLE SPEED	• Turn drive wheels and compare CONSULT value with the speedometer indication.		Almost the same speed as the speedometer indication
IDL A/V LEARN	• Engine: Running	Idle air volume learning has not been performed yet.	YET
		Idle air volume learning has already been performed successfully.	CMPLT
SNOW MODE SW	• Ignition switch: ON	Snow mode switch: ON	ON
		Snow mode switch: OFF	OFF
ENG OIL TEMP	• Engine: After warming up		More than 70°C (158°F)
TRVL AFTER MIL	• Ignition switch: ON	Vehicle has traveled after MIL has illuminated.	0 - 65,535 km (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 - 4.0 V
VHCL SPEED SE	• Turn drive wheels and compare CONSULT value with the speedometer indication.		Almost the same speed as the speedometer indication
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 (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
CRUISE LAMP	• Ignition switch: ON	MAIN switch: Pressed at the 1st time → at the 2nd time	ON → OFF

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< ECU DIAGNOSIS INFORMATION >

[AUTOMATIC AIR CONDITIONER]

Monitor Item	Condition		Values/Status
BAT CUR SEN	- Engine speed: Idle - Battery: Fully charged*2 - Selector lever: P or N - Air conditioner switch: OFF - No load		Approx. 2,600 - 3,500 mV
ALT DUTY	Engine: Idle		0 - 80%
ATOM PRES SEN	This item is displayed but is not applicable to this model.		
BRAKE BST PRES SE	This item is displayed but is not applicable to this model.		
VVEL POSITION SEN-B1	- Engine: After warming up - Selector lever: P or N - Air conditioner switch: OFF - No load	Idle	Approx. 0.25 - 1.40 V
		When revving engine up to 2,000 rpm quickly	Approx. 0.25 - 4.75 V
VVEL POSITION SEN-B2	- Engine: After warming up - Selector lever: P or N - Air conditioner switch: OFF - No load	Idle	Approx. 0.25 - 1.40 V
		When revving engine up to 2,000 rpm quickly	Approx. 0.25 - 4.75 V
VVEL TIM-B1	- Engine: After warming up - Selector lever: P or N - 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 - 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 - 0.80 V
VVEL SEN LEARN-B2	VVEL learning has already been performed successfully		Approx. 0.30 - 0.80 V
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
HO2 S2 DIAG1 (B1)	DTC P0139 self-diagnosis (delayed response) has not been performed yet.		INCMP
	DTC P0139 self-diagnosis (delayed response) has already been performed successfully.		CMPLT
HO2 S2 DIAG1 (B2)	DTC P0159 self-diagnosis (delayed response) has not been performed yet.		INCMP
	DTC P0159 self-diagnosis (delayed response) has already been performed successfully.		CMPLT
HO2 S2 DIAG2 (B1)	DTC P0139 self-diagnosis (slow response) has not been performed yet.		INCMP
	DTC P0139 self-diagnosis (slow response) has already been performed successfully.		CMPLT
HO2 S2 DIAG2 (B2)	DTC P0159 self-diagnosis (slow response) has not been performed yet.		INCMP
	DTC P0159 self-diagnosis (slow response) has already been performed successfully.		CMPLT
A/F SEN1 DIAG2 (B1)	This item is displayed but is not applicable to this model.		
A/F SEN1 DIAG2 (B2)	This item is displayed but is not applicable to this model.		
A/F-S ATMSPHRC CRCT B1	Engine: After warming up, idle the engine		Varies depending on vehicle environment.

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< ECU DIAGNOSIS INFORMATION >

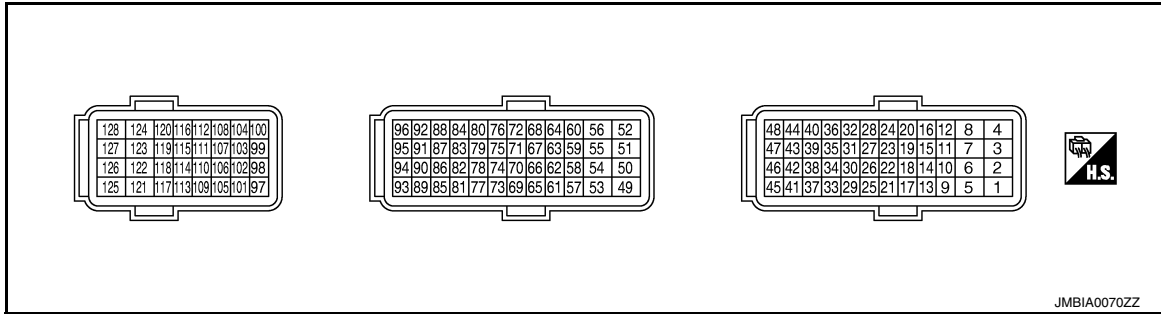
[AUTOMATIC AIR CONDITIONER]

Monitor Item	Condition	Values/Status
A/F-S ATMSPHRC CRCT B2	Engine: After warming up, idle the engine	Varies depending on vehicle environment.
A/F-S ATMSPHRC CRCT UP B1	Engine: Running	Varies depending on the number of updates.
A/F-S ATMSPHRC CRCT UP B2	Engine: Running	Varies depending on the number of updates.

*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:

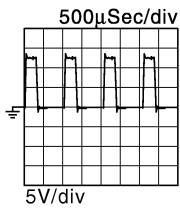
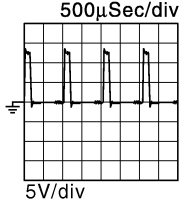
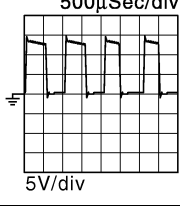
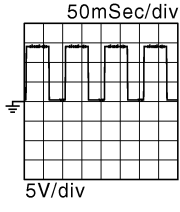
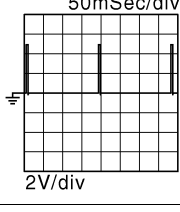
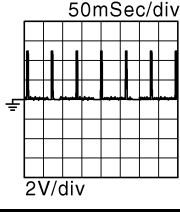
- ECM is located behind the instrument assist lower panel. For this inspection, remove passenger side instrument lower panel.
- Specification data are reference values and are measured between each terminal and ground.
- Pulse signal is measured by CONSULT.

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 - 8.8 V★

ECM

< ECU DIAGNOSIS INFORMATION >

[AUTOMATIC AIR CONDITIONER]

Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	—	Signal name	Input/ Output		
2 (G)	128 (B)	Throttle control motor (Open) (bank 1)	Output	[Ignition switch: ON] • Engine stopped • Selector lever: D • Accelerator pedal: Fully depressed	0 - 14 V★ 
				[Ignition switch: ON] • Engine stopped • Selector lever: D • Accelerator pedal: Fully released	0 - 14 V★ 
3 (R)	128 (B)	Throttle control motor power supply (bank 1)	Input	[Ignition switch: ON]	BATTERY VOLTAGE (11 - 14 V)
4 (BR)	128 (B)	Throttle control motor (Close) (bank 1)	Output	[Ignition switch: ON] • Engine stopped • Selector lever: D • Accelerator pedal: In the middle of re- leasing operation	0 - 14 V★ 
5 (W)	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 - 8.8 V★ 
8 (B)	—	ECM ground	—	—	—
11 (GR)	128 (B)	Ignition signal No. 4	Output	[Engine is running] • Warm-up condition • Idle speed NOTE: The pulse cycle changes depending on rpm at idle	0 - 0.2 V★ 
12 (L)		Ignition signal No. 3			
15 (V)		Ignition signal No. 5		[Engine is running] • Warm-up condition • Engine speed: 2,000 rpm	0.1 - 0.4 V★ 
16 (G)		Ignition signal No. 2			
19 (SB)		Ignition signal No. 6			
20 (Y)		Ignition signal No. 1			

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< ECU DIAGNOSIS INFORMATION >

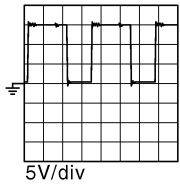
[AUTOMATIC AIR CONDITIONER]

Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	—	Signal name	Input/ Output		
17 (P)	128 (B)	Heated oxygen sensor 2 heater (bank 1)	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	10 V★
				[Ignition switch: ON] - Engine stopped [Engine is running] - Engine speed: Above 3,600 rpm	BATTERY VOLTAGE (11 - 14 V)
18 (W)	128 (B)	Intake valve timing control solenoid valve (bank 1)	Output	[Engine is running] - Warm-up condition - Idle speed	BATTERY VOLTAGE (11 - 14 V)
				[Engine is running] - Warm-up condition - Engine speed: 2,000rpm	7 - 12 V★
21 (GR)	128 (B)	EVAP canister purge vol- ume control solenoid valve	Output	[Engine is running] - Idle speed - Accelerator pedal: Not depressed even slightly, after engine starting	BATTERY VOLTAGE (11 - 14 V)★
				[Engine is running] Engine speed: About 2,000 rpm (More than 100 seconds after starting engine)	BATTERY VOLTAGE (11 - 14 V)★
22 (R)	128 (B)	Fuel pump relay	Output	[Ignition switch: ON] For 1 second after turning ignition switch ON [Engine is running]	0 - 1.5 V
				[Ignition switch: ON] More than 1 second after turning ignition switch ON	BATTERY VOLTAGE (11 - 14 V)

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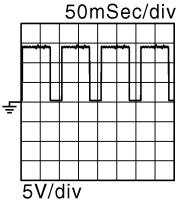
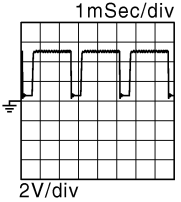
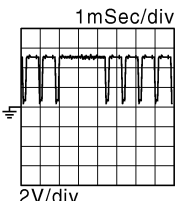
< ECU DIAGNOSIS INFORMATION >

[AUTOMATIC AIR CONDITIONER]

Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	—	Signal name	Input/ Output		
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 - 1.5 V
				[Ignition switch: OFF] • More than a few seconds after turning ignition switch OFF	BATTERY VOLTAGE (11 - 14 V)
25 (O)	128 (B)	Throttle control motor relay	Output	[Ignition switch: ON → OFF]	0 - 1.0 V ↓ BATTERY VOLTAGE (11 - 14 V) ↓ 0 V
				[Ignition switch: ON]	0 - 1.0 V
28 (BR)	128 (B)	VVEL actuator motor relay abort signal [VVEL control module]	Output	[Engine is running] • Warm-up condition • Idle speed	0 V
29 (G)	128 (B)	Intake valve timing control solenoid valve (bank 2)	Output	[Engine is running] • Warm-up condition • Idle speed	BATTERY VOLTAGE (11 - 14 V)
				[Engine is running] • Warm-up condition • Engine speed: 2,000rpm	7 - 12 V★ 
30 (Y)	40 (R)	Throttle position sensor 1 (bank 1)	Input	[Ignition switch: ON] • Engine stopped • Selector lever: D • Accelerator pedal: Fully released	More than 0.36 V
				[Ignition switch: ON] • Engine stopped • Selector lever: D • Accelerator pedal: Fully depressed	Less than 4.75 V
31 (R)	48 (B)	Throttle position sensor 1 (bank 2)	Input	[Ignition switch: ON] • Engine stopped • Selector lever: D • Accelerator pedal: Fully released	More than 0.36 V
				[Ignition switch: ON] • Engine stopped • Selector lever: D • Accelerator pedal: Fully depressed	Less than 4.75 V

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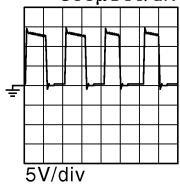
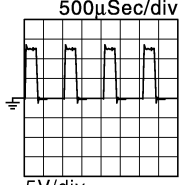
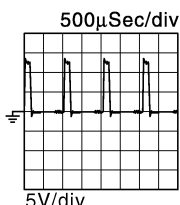
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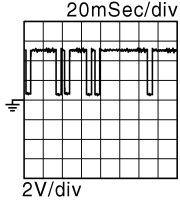
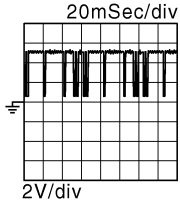
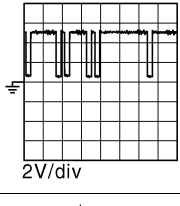
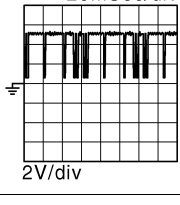
Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	—	Signal name	Input/ Output		
33 (SB)	128 (B)	Heated oxygen sensor 2 heater (bank 2)	Output	[Engine is running] - Engine speed: Below 3,600 rpm after the following conditions are met - Engine: after warming up - Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load	10 V★ 
				[Ignition switch: ON] - Engine stopped [Engine is running] - Engine speed: Above 3,600 rpm	BATTERY VOLTAGE (11 - 14 V)
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 4.75 V
				[Ignition switch: ON] - Engine stopped - Selector lever: D (A/T) or 1st (M/T) - Accelerator pedal: Fully depressed	More than 0.36 V
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 4.75 V
				[Ignition switch: ON] - Engine stopped - Selector lever: D (A/T) or 1st (M/T) - Accelerator pedal: Fully depressed	More than 0.36 V
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 V★ 
				[Engine is running] Engine speed: 2,000 rpm	4.0 - 5.0 V★ 
38 (O)	96 (P)	Manifold absolute pressure (MAP) sensor	Input	[Engine is running] - Warm-up condition - Idle speed	1.2 V
				[Engine is running] - Warm-up condition - Engine speed: 2,000 rpm	1.5 V
40 (R)	—	Sensor ground [Throttle position sensor (bank 1)]	—	—	—

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< ECU DIAGNOSIS INFORMATION >

[AUTOMATIC AIR CONDITIONER]

Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	—	Signal name	Input/ Output		
43 (G)	48 (B)	Sensor power supply [Throttle position sensor (bank 2)]	—	[Ignition switch: ON]	5 V
44 (L)	40 (R)	Sensor power supply [Throttle position sensor (bank 1)]	—	[Ignition switch: ON]	5 V
46 (R)	128 (B)	Sensor power supply [Crankshaft position sensor (POS)]	—	[Ignition switch: ON]	5 V
47 (Y)	—	Sensor ground [Crankshaft position sensor (POS)]	—	—	—
48 (B)	—	Sensor ground [Throttle position sensor (bank 2)]	—	—	—
49 (GR)	128 (B)	Throttle control motor (Close) (bank 2)	Output	[Ignition switch: ON] • Engine stopped • Selector lever: D • Accelerator pedal: In the middle of releasing operation	0 - 14 V★ 
50 (V)	128 (B)	Throttle control motor (Open) (bank 2)	Output	[Ignition switch: ON] • Engine stopped • Selector lever: D • Accelerator pedal: Fully depressed	0 - 14 V★ 
				[Ignition switch: ON] • Engine stopped • Selector lever: D • Accelerator pedal: Fully released	0 - 14 V★ 
52 (R)	128 (B)	Throttle control motor power supply (bank 2)	Input	[Ignition switch: ON]	BATTERY VOLTAGE (11 - 14 V)
53 (W)	128 (B)	Ignition switch	Input	[Ignition switch: OFF]	0 V
				[Ignition switch: ON]	BATTERY VOLTAGE (11 - 14 V)
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]	2.2 V

Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	—	Signal name	Input/ Output		
59 (O)	128 (B)	Camshaft position sensor (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 V★  20mSec/div 2V/div JMBIA0045GB
				[Engine is running] • Engine speed: 2,000 rpm	3.0 - 5.0 V★  20mSec/div 2V/div JMBIA0046GB
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]	5 V
61 (R)	128 (B)	A/F sensor 1 (bank 1)	Input	[Engine is running] • Warm-up condition • Engine speed: 2,000 rpm	1.8 V 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 V★  20mSec/div 2V/div JMBIA0045GB
				[Engine is running] • Engine speed: 2,000 rpm	3.0 - 5.0 V★  20mSec/div 2V/div JMBIA0046GB
64 (SB)	128 (B)	Sensor power supply [Camshaft position sensor (PHASE) (bank 2), Battery current sensor]	—	[Ignition switch: ON]	5 V
65 (LG)	128 (B)	A/F sensor 1 (bank 2)	Input	[Ignition switch: ON]	2.2 V
66 (V)	128 (B)	A/F sensor 1 (bank 2)	Input	[Engine is running] • Warm-up condition • Engine speed: 2,000 rpm	1.8 V Output voltage varies with air fuel ratio.
67 (P)	128 (B)	Intake air temperature sensor	Input	[Engine is running]	0 - 4.8 V Output voltage varies with intake air temperature.

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< ECU DIAGNOSIS INFORMATION >

[AUTOMATIC AIR CONDITIONER]

Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	—	Signal name	Input/ Output		
68 (LG)	—	Sensor ground [Mass air flow sensor (bank 1), Intake air tem- perature sensor]	—	—	—
69 (W)	128 (B)	Knock sensor (bank 2)	Input	[Engine is running] • Idle speed	2.5 V*1
71 (Y)	128 (B)	Engine coolant tempera- ture sensor	Input	[Engine is running]	0 - 4.8 V 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	2.5 V*1
76 (W)	84 (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 - 1.0 V
77 (SB)	68 (LG)	Mass air flow sensor (bank 1)	Input	[Engine is running] • Warm-up condition • Idle speed	0.7 - 1.2 V
				[Engine is running] • Warm-up condition • Engine speed: 2,500 rpm	1.3 - 1.7 V
78 (G)	84 (B)	Engine oil temperature sensor	Input	[Engine is running]	0 - 4.8 V 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 - 1.2 V
				[Engine is running] • Warm-up condition • Engine speed: 2,500 rpm	1.3 - 1.7 V
80 (O)	84 (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 - 1.0 V

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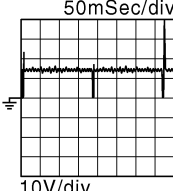
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< ECU DIAGNOSIS INFORMATION >

[AUTOMATIC AIR CONDITIONER]

Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	—	Signal name	Input/ Output		
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 - 14 V)★ 
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			
84 (B)	—	Sensor ground (Heated oxygen sensor 2, Engine coolant temperature sensor, Engine oil temperature sensor)	—	—	—
87 (Y)	96 (P)	Power steering pressure sensor	Output	[Engine is running] • Steering wheel: Being turned [Engine is running] • Steering wheel: Not being turned	0.5 - 4.5 V 0.4 - 0.8 V
91 (SB)	95 (G)	Battery current sensor	Input	[Engine is running] • Battery: Fully charged*2 • Idle speed	2.6 - 3.5 V
92 (G)	—	Sensor ground [Camshaft position sensor (PHASE) (bank 2)]	—	—	—
93 (P)	128 (B)	Power supply for ECM (Back-up)	Input	[Ignition switch: OFF]	BATTERY VOLTAGE (11 - 14 V)
94 (Y)	—	Sensor ground [Mass air flow sensor (bank 2)]	—	—	—
95 (G)	—	Sensor ground (Battery current sensor)	—	—	—
96 (P)	—	Sensor ground [Camshaft position sensor (PHASE) (bank 1), Manifold absolute pressure (MAP) sensor, Power steering pressure sensor]	—	—	—
97 (R)	100 (W)	Accelerator pedal position sensor 1	Input	[Ignition switch: ON] • Engine stopped • Accelerator pedal: Fully released [Ignition switch: ON] • Engine stopped • Accelerator pedal: Fully depressed	0.45 - 1.00 V 4.2 - 4.8 V

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< ECU DIAGNOSIS INFORMATION >

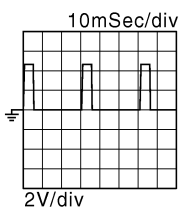
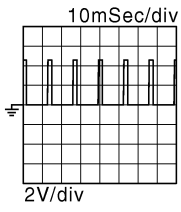
[AUTOMATIC AIR CONDITIONER]

Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	—	Signal name	Input/ Output		
98 (Y)	104 (BR)	Accelerator pedal position sensor 2	Input	[Ignition switch: ON] • Engine stopped • Accelerator pedal: Fully released	0.22 - 0.50 V
				[Ignition switch: ON] • Engine stopped • Accelerator pedal: Fully depressed	2.1 - 2.5 V
99 (G)	100 (W)	Sensor power supply (Accelerator pedal posi- tion sensor 1)	—	[Ignition switch: ON]	5 V
100 (W)	—	Sensor ground (Accelerator pedal posi- tion sensor 1)	—	—	—
101 (SB)	108 (V)	ASCD steering switch	Input	[Ignition switch: ON] • ASCD steering switch: OFF	4 V
				[Ignition switch: ON] • MAIN switch: Pressed	0 V
				[Ignition switch: ON] • CANCEL switch: Pressed	1 V
				[Ignition switch: ON] • RESUME/ACCELERATE switch: Pressed	3 V
				[Ignition switch: ON] • SET/COAST switch: Pressed	2 V
103 (L)	104 (BR)	Sensor power supply (Accelerator pedal posi- tion sensor 2)	—	[Ignition switch: ON]	5 V
104 (BR)	—	Sensor ground (Accelerator pedal posi- tion sensor 2)	—	—	—
105 (L)	112 (W)	Refrigerant pressure sen- sor	Input	[Engine is running] • Warm-up condition • Both A/C switch and blower fan motor switch: ON (Compressor operates)	1.0 - 4.0 V
106 (W)	128 (B)	Fuel tank temperature sensor	Input	[Engine is running]	0 - 4.8 V Output voltage varies with fuel tank temperature.
107 (BG)	112 (W)	Sensor power supply (Refrigerant pressure sen- sor)	—	[Ignition switch: ON]	5 V
108 (V)	—	Sensor ground (ASCD steering switch)	—	—	—
109 (G)	128 (B)	PNP signal	Input	[Ignition switch: ON] • Selector lever: P or N	BATTERY VOLTAGE (11 - 14 V)
				[Ignition switch: ON] • Selector lever: Except above	0 V

ECM

< ECU DIAGNOSIS INFORMATION >

[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	1 V★  JMBIA0076GB
				[Engine is running] • Engine speed is 2,000 rpm	1 V★  JMBIA0077GB
112 (W)	—	Sensor ground (Refrigerant pressure sensor)	—	—	—
113 (P)	—	CAN communication line	Input/ Output	—	—
114 (L)	—	CAN communication line	Input/ Output	—	—
117 (GR)	128 (B)	Data link connector	Input/ Output	—	—
122 (P)	128 (B)	Stop lamp switch	Input	[Ignition switch: OFF] • Brake pedal: Fully released	0 V
				[Ignition switch: OFF] • Brake pedal: Slightly depressed	BATTERY VOLTAGE (11 - 14 V)
123 (B) 124 (B)	—	ECM ground	—	—	—
125 (GR)	128 (B)	Power supply for ECM	Input	[Ignition switch: ON]	BATTERY VOLTAGE (11 - 14 V)
126 (BR)	128 (B)	ASCD brake switch	Input	[Ignition switch: ON] • Brake pedal: Slightly depressed	0 V
				[Ignition switch: ON] • Brake pedal: Fully released	BATTERY VOLTAGE (11 - 14 V)
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"](#).

VK50VE

VK50VE : Reference Value

INFOID:000000011009666

VALUES ON THE DIAGNOSIS TOOL

NOTE:

- The following table includes information (items) inapplicable to this vehicle. For information (items) applicable to this vehicle, refer to CONSULT display items.
- Numerical values in the following table are reference values.
- These values are input/output values that ECM receives/transmits and may differ from actual operations.
Example: The ignition timing shown by the timing light may differ from the ignition timing displayed on the data monitor.

This occurs because the timing light shows a value calculated by ECM according to signals received from the camshaft position sensor and other sensors related to ignition timing.

- For outlines of following items, refer to [EC-1264, "CONSULT Function"](#).

CONSULT MONITOR ITEM

Monitor Item	Condition		Values/Status
ENG SPEED	• Run engine and compare CONSULT value with the tachometer indication.		Almost the same speed as the tachometer indication
MAS A/F SE-B1	See EC-1275, "Description" .		
MAS A/F SE-B2	See EC-1275, "Description" .		
B/FUEL SCHDL	See EC-1275, "Description" .		
A/F ALPHA-B1	See EC-1275, "Description" .		
A/F ALPHA-B2	See EC-1275, "Description" .		
COOLANT 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)	• Revving engine from idle up to 3,000 rpm quickly after the following conditions are met. - 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 - 0.3 V ↔ Approx. 0.6 - 1.0 V
HO2S2 (B2)	• Revving engine from idle up to 3,000 rpm quickly after the following conditions are met. - 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 - 0.3 V ↔ Approx. 0.6 - 1.0 V
HO2S2 MNTR (B1)	• Revving engine from idle up to 3,000 rpm quickly after the following conditions are met. - 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)	• Revving engine from idle up to 3,000 rpm quickly after the following conditions are met. - 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 value with the speedometer indication.		Almost the same speed as speedometer indication
BATTERY VOLT	• Ignition switch: ON (Engine stopped)		11 - 14 V
ACCEL SEN 1	• Ignition switch: ON (Engine stopped)	Accelerator pedal: Fully released	0.45 - 1.0 V
		Accelerator pedal: Fully depressed	4.4 - 4.8 V
ACCEL SEN 2*1	• Ignition switch: ON (Engine stopped)	Accelerator pedal: Fully released	0.45 - 1.0 V
		Accelerator pedal: Fully depressed	4.3 - 4.8 V
TP SEN 1-B1	• Ignition switch: ON (Engine stopped) • Selector lever: D position	Accelerator pedal: Fully released	More than 0.36 V
		Accelerator pedal: Fully depressed	Less than 4.75 V

ECM

< ECU DIAGNOSIS INFORMATION >

[AUTOMATIC AIR CONDITIONER]

Monitor Item	Condition		Values/Status
TP SEN 2-B1*1	- Ignition switch: ON (Engine stopped) - Selector lever: D position	Accelerator pedal: Fully released	More than 0.36 V
		Accelerator pedal: Fully depressed	Less than 4.75 V
FUEL T/TMP SE	Ignition switch: ON		Indicates fuel tank temperature
EVAP SYS PRES	Ignition switch: ON		Approx. 1.8 - 4.8 V
FUEL LEVEL SE	Ignition switch: ON		Depending on fuel level of fuel tank
START SIGNAL	Ignition switch: ON → START → ON		OFF → ON → OFF
CLSD THL POS	Ignition switch: ON (Engine stopped)	Accelerator pedal: Fully released	ON
		Accelerator pedal: Slightly depressed	OFF
AIR COND SIG	Engine: After warming up, idle the engine	Air conditioner switch: OFF	OFF
		Air conditioner switch: ON (Compressor operates.)	ON
PW/ST SIGNAL	Engine: After warming up, idle the engine	Steering wheel: Not being turned	OFF
		Steering wheel: Being turned	ON
LOAD SIGNAL	Ignition switch: ON	Rear window defogger switch: ON and/or Lighting switch: 2nd position	ON
		Rear window defogger switch and lighting switch: OFF	OFF
IGNITION SW	Ignition switch: ON → OFF → ON		ON → OFF → ON
HEATER FAN SW	Engine: After warming up, idle the engine	Heater fan switch: ON	ON
		Heater fan switch: OFF	OFF
BRAKE SW	Ignition switch: ON	Brake pedal: Fully released	OFF
		Brake pedal: Slightly depressed	ON
INJ PULSE-B1	- Engine: After warming up - Selector lever: P or N position - A/C switch: OFF - No load	Idle	2.0 - 3.0 msec
		2,000 rpm	1.9 - 2.9 msec
INJ PULSE-B2	- Engine: After warming up - Selector lever: P or N position - A/C switch: OFF - No load	Idle	2.0 - 3.0 msec
		2,000 rpm	1.9 - 2.9 msec
IGN TIMING	- Engine: After warming up - Selector lever: P or N position - A/C switch: OFF - No load	Idle	12 - 22°BTDC
		2,000 rpm	25 - 45°BTDC
CAL/LD VALUE	- Engine: After warming up - Selector lever: P or N position - A/C switch: OFF - No load	Idle	5 - 35%
		2,500 rpm	5 - 35%
MASS AIRFLOW	- Engine: After warming up - Selector lever: P or N position - A/C switch: OFF - No load	Idle	2.0 - 6.0 g/s
		2,500 rpm	7.0 - 20.0 g/s
PURG VOL C/V	- Engine: After warming up - Selector lever: P or N position - A/C switch: OFF - No load	Idle (Accelerator pedal: Not depressed even slightly, after engine starting.)	0%
		2,000 rpm	—

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< ECU DIAGNOSIS INFORMATION >

[AUTOMATIC AIR CONDITIONER]

Monitor Item	Condition		Values/Status
EXH/V TIM B1	- Engine: After warming up - Selector lever: P or N position - A/C switch: OFF - No load	Idle	-5° - 5°C
		Around 2,500 rpm while the engine speed is rising	Approx. 0 - 30°C
EXH/V TIM B2	- Engine: After warming up - Selector lever: P or N position - A/C switch: OFF - No load	Idle	-5 - 5°C
		Around 2,500 rpm while the engine speed is rising	Approx. 0 - 30°C
INT/V SOL (B1)	- Engine: After warming up - Selector lever: P or N position - A/C switch: OFF - No load	Idle	0 - 2%
		2,000 rpm	Approx. 0 - 50%
INT/V SOL (B2)	- Engine: After warming up - Selector lever: P or N position - A/C switch: OFF - No load	Idle	0 - 2%
		2,000 rpm	Approx. 0 - 50%
AIR COND RLY	Engine: After warming up, idle the engine	A/C switch: OFF	OFF
		A/C switch: ON (Compressor operates)	ON
VENT CONT/V	Ignition switch: ON		OFF
THRTL RELAY	Ignition switch: ON		ON
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%
HO2S2 HTR (B1)	- 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		ON
	Engine speed: Above 3,600 rpm		OFF
HO2S2 HTR (B2)	- 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		ON
	Engine speed: Above 3,600 rpm		OFF
ALT DUTY SIG	Power generation voltage variable control: Operating		ON
	Power generation voltage variable control: Not operating		OFF
I/P PULLY SPD	Vehicle speed: More than 20 km/h (12 MPH)		Almost the same speed as the tachometer indication
VEHICLE SPEED	Turn drive wheels and compare CONSULT value with the speedometer indication.		Almost the same speed as the speedometer indication
IDL A/V LEARN	Engine: Running	Idle air volume learning has not been performed yet.	YET
		Idle air volume learning has already been performed successfully.	CMPLT
TRVL AFTER MIL	Ignition switch: ON	Vehicle has traveled after MIL has illuminated.	0 - 65,535 km (0 - 40,723 miles)
SNOW MODE SW	Ignition switch: ON	Snow mode switch: ON	ON
		Snow mode switch: OFF	OFF
ENG OIL TEMP	Engine: After warming up		More than 70°C (158°F)
VHCL SPEED SE	Turn drive wheels and compare CONSULT value with the speedometer indication.		Almost the same speed as the speedometer indication

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< ECU DIAGNOSIS INFORMATION >

[AUTOMATIC AIR CONDITIONER]

Monitor Item	Condition		Values/Status
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 (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
EXH V/T LEARN	• Engine: Running	Exhaust Valve Timing Control Learning has not been performed yet.	YET
		Exhaust Valve Timing Control Learning has not been performed yet.	CMPLT
FAN DUTY	• Engine: Running		0 - 100%
ALT DUTY	• Engine: Idle		0 - 80%
BAT CUR SEN	• Engine speed: Idle • Battery: Fully charged*2 • Selector lever: P or N position • A/C switch: OFF • No load		Approx. 2,600 - 3,500 mV
A/F ADJ-B1	• Engine: Running		-0.330 - 0.330
A/F ADJ-B2	• Engine: Running		-0.330 - 0.330
TP SEN 1-B2	• Ignition switch: ON (Engine stopped) • Selector lever: D position	Accelerator pedal: Fully released	More than 0.36 V
		Accelerator pedal: Fully depressed	Less than 4.75 V
TP SEN 2-B2*1	• Ignition switch: ON (Engine stopped) • Selector lever: D position	Accelerator pedal: Fully released	More than 0.36 V
		Accelerator pedal: Fully depressed	Less than 4.75 V
P/N POSI SW	• Ignition switch: ON	Selector lever: P or N	ON
		Selector lever: Except above position	OFF

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< ECU DIAGNOSIS INFORMATION >

[AUTOMATIC AIR CONDITIONER]

Monitor Item	Condition		Values/Status
INT/A TEMP SE	• Ignition switch: ON		Indicates intake air temperature
AC PRESS SEN	• Engine: Idle • Both A/C switch and blower fan switch: ON (Compressor operates)		1.0 - 4.0 V
VTC DTY EX B1	• Engine: After warming up • Selector lever: P or N position • A/C switch: OFF • No load	Idle	0% - 2%
		Around 2,500 rpm while the engine speed is rising	Approx. 0% - 70%
VTC DTY EX B2	• Engine: After warming up • Selector lever: P or N position • A/C switch: OFF • No load	Idle	0 - 2%
		Around 2,500 rpm while the engine speed is rising	Approx. 0 - 70%
INT/V TIM (B1)	• Engine: After warming up • Selector lever: P or N position • A/C switch: OFF • No load	Idle	-5 - 5°C
		2,000 rpm	Approx. 0 - 30°C
INT/V TIM (B2)	• Engine: After warming up • Selector lever: P or N position • A/C switch: OFF • No load	Idle	-5 - 5°C
		2,000 rpm	Approx. 0 - 30°C
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 - 0.80 V
VVEL SEN LEARN-B2	• VVEL learning has already been performed successfully		Approx. 0.30 - 0.80 V
VVEL POSITION SEN-B1	• Engine: After warming up • Selector lever: P or N position • A/C switch: OFF • No load	Idle	Approx. 0.25 - 1.40 V
		When revving engine up to 2,000 rpm quickly	Approx. 0.25 - 4.75 V
VVEL POSITION SEN-B2	• Engine: After warming up • Selector lever: P or N position • Air conditioner switch: OFF • No load	Idle	Approx. 0.25 - 1.40 V
		When revving engine up to 2,000 rpm quickly	Approx. 0.25 - 4.75 V
VVEL TIM-B1	• Engine: After warming up • Selector lever: P or N position • A/C 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 position • A/C switch: OFF • No load	Idle	Approx. 0 - 20 deg
		When revving engine up to 2,000 rpm quickly	Approx. 0 - 90 deg
FPCM	• Engine: Cranking		HI
	• Engine: Idle • Engine coolant temperature: More than 10°C (50°F)		LOW
THRTL STK CNT B1	The item is indicated, but not used.		—
THRTL STK CNT B2			
EVAP LEAK DIAG	• Ignition switch: ON		Indicates the condition of EVAP leak diagnosis.
EVAP DIAG READY	• Ignition switch: ON		Indicates the ready condition of EVAP leak diagnosis.
HO2 S2 DIAG1 (B1)	DTC P0139 self-diagnosis (delayed response) has not been performed yet.		INCMP
	DTC P0139 self-diagnosis (delayed response) has already been performed successfully.		CMPLT

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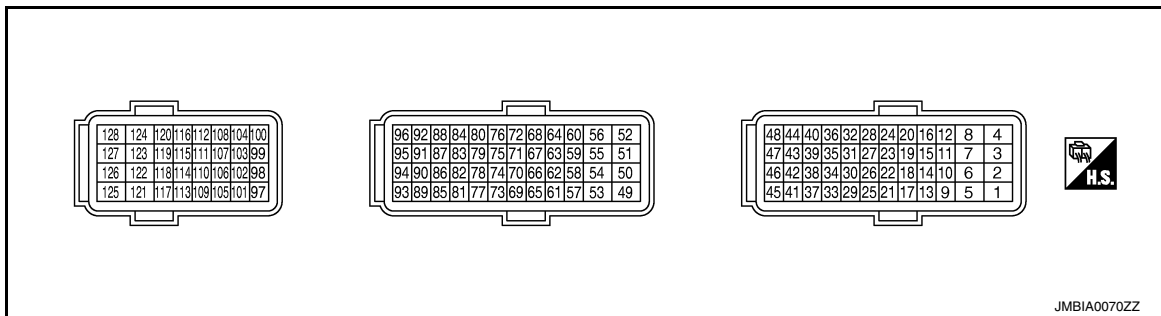
P

Monitor Item	Condition	Values/Status
HO2 S2 DIAG1 (B2)	DTC P0159 self-diagnosis (delayed response) has not been performed yet.	INCMP
	DTC P0159 self-diagnosis (delayed response) has already been performed successfully.	CMPLT
HO2 S2 DIAG2 (B1)	DTC P0139 self-diagnosis (slow response) has not been performed yet.	INCMP
	DTC P0139 self-diagnosis (slow response) has already been performed successfully.	CMPLT
HO2 S2 DIAG2 (B2)	DTC P0159 self-diagnosis (slow response) has not been performed yet.	INCMP
	DTC P0159 self-diagnosis (slow response) has already been performed successfully.	CMPLT
SYSTEM 1 DIAGNOSIS A B1	DTC P219A self-diagnosis is incomplete.	INCMP
	DTC P219A self-diagnosis is complete.	CMPLT
SYSTEM 1 DIAGNOSIS A B2	DTC P219B self-diagnosis is incomplete.	INCMP
	DTC P219B self-diagnosis is complete.	CMPLT
SYSTEM 1 DIAGNOSIS B B1	DTC P219A self-diagnosis is on standby.	ABSENT
	DTC P219A self-diagnosis is under diagnosis.	PRSENT
SYSTEM 1 DIAGNOSIS B B2	DTC P219B self-diagnosis is on standby.	ABSENT
	DTC P219B self-diagnosis is under diagnosis.	PRSENT
A/F-S ATMSPHRC CRCT B1	Engine: After warming up, idle the engine	Varies depending on vehicle environment.
A/F-S ATMSPHRC CRCT B2	Engine: After warming up, idle the engine	Varies depending on vehicle environment.
A/F-S ATMSPHRC CRCT UP B1	Engine: Running	Varies depending on the number of updates.
A/F-S ATMSPHRC CRCT UP B2	Engine: Running	Varies depending on the number of updates.

*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"](#).

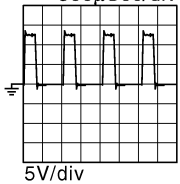
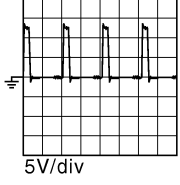
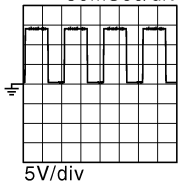
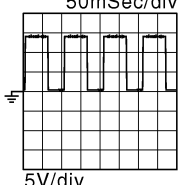
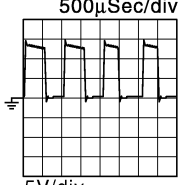
TERMINAL LAYOUT



PHYSICAL VALUES

NOTE:

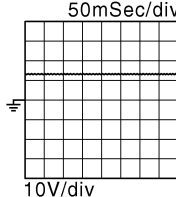
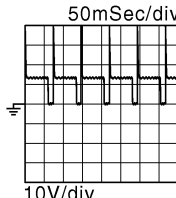
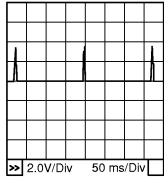
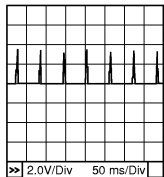
- ECM is located behind the instrument assist lower panel. For this inspection, remove passenger side instrument lower panel.
- Specification data are reference values and are measured between each terminals.
- Pulse signal is measured by CONSULT.

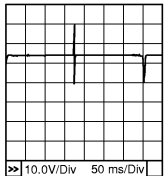
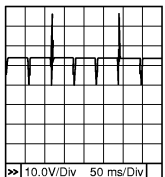
Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	-	Signal name	Input/ Output		
1 (P)	128 (B)	Throttle control motor power supply (bank 2)	Input	[Ignition switch: ON]	BATTERY VOLTAGE (11 - 14 V)
2 (L)	128 (B)	Throttle control motor (bank 2) (Open)	Output	[Ignition switch: ON] • Engine: Stopped • Selector lever: D position • Accelerator pedal: Fully depressed	0 - 14 V★ 500μSec/div  5V/div JMBIA0031GB
				[Ignition switch: ON] • Engine: Stopped • Selector lever: D position • Accelerator pedal: Fully released	0 - 14 V★ 500μSec/div  5V/div JMBIA0032GB
3 (Y)	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 - 8.8 V★ 50mSec/div  5V/div JMBIA0030GB
4 (G)	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 - 8.8 V★ 50mSec/div  5V/div JMBIA0030GB
5 (R)	128 (B)	Throttle control motor (bank 2) (Close)	Output	[Ignition switch: ON] • Engine: Stopped • Selector lever: D position • Accelerator pedal: In the middle of releasing operation	0 - 14 V★ 500μSec/div  5V/div JMBIA0033GB
6 (GR)	—	ECM ground	—	—	—

ECM

< ECU DIAGNOSIS INFORMATION >

[AUTOMATIC AIR CONDITIONER]

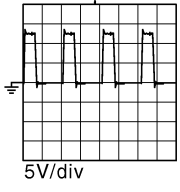
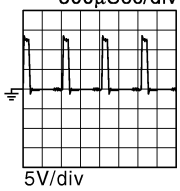
Terminal No. (Wire color)		Description		Condition	Value (Approx.)	
+	−	Signal name	Input/ Output			
8 (W)	128 (B)	EVAP canister purge volume control solenoid valve	Output	[Engine is running] - Idle speed - Accelerator pedal: Not depressed even slightly, after engine starting	BATTERY VOLTAGE (11 - 14 V)★  JMBIA0039GB	
				[Engine is running] Engine speed: About 2,000 rpm (More than 100 seconds after starting engine)	BATTERY VOLTAGE (11 - 14 V)★  JMBIA0040GB	
9 (G)	128 (B)	Ignition signal No. 2	Output	[Engine is running] - Warm-up condition - Idle speed NOTE: The pulse cycle changes depending on rpm at idle	0 - 0.2 V★  PBIB0044E	
10 (Y)		Ignition signal No. 1				0.1 - 0.4 V★  PBIB0045E
13 (V)		Ignition signal No. 3		[Engine is running] - Warm-up condition - Engine speed: 2,000 rpm		
14 (GR)		Ignition signal No. 4				
18 (SB)		Ignition signal No. 5				
22 (LG)		Ignition signal No. 6				
26 (L)		Ignition signal No. 7				
30 (Y)		Ignition signal No. 8				
15 (O)	128 (B)	ECM relay (Self shut-off)	Output	[Engine is running] [Ignition switch: OFF] A few seconds after turning ignition switch OFF	0 - 1.5 V	
				[Ignition switch: OFF] More than a few seconds after turning ignition switch OFF	BATTERY VOLTAGE (11 - 14 V)	

Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	-	Signal name	Input/ Output		
17 (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 - 14 V)★  10.0V/Div 50 ms/Div PBIB0042E
21 (W)		Fuel injector No. 2			
25 (P)		Fuel injector No. 1		[Engine is running] • Warm-up condition • Engine speed: 2,000 rpm	BATTERY VOLTAGE (11 - 14 V)★  10.0V/Div 50 ms/Div PBIB0043E
29 (O)		Fuel injector No. 7			
33 (G)		Fuel injector No. 8			
37 (BR)		Fuel injector No. 4			
41 (W)		Fuel injector No. 5			
45 (V)		Fuel injector No. 6			
19 (L)	128 (B)	Throttle control motor relay	Output	[Ignition switch: ON → OFF]	0 - 1.0 V ↓ BATTERY VOLTAGE (11 - 14 V) ↓ 0 V
				[Ignition switch: ON]	0 - 1.0 V
23 (BR)	—	Sensor ground (Engine coolant temperature sensor)	—	—	—
24 (Y)	23 (BR)	Engine coolant temperature sensor	Input	[Engine is running]	0 - 4.8 V Output voltage varies with engine coolant temperature.
31 (B)	—	Sensor ground (Heated oxygen sensor 2)	—	—	—
32 (W)	31 (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 - 1.0 V
34 (V)	—	Sensor ground (Engine oil temperature sensor)	—	—	—
35 (B/W)	—	Sensor ground (Knock sensor)	—	—	—

ECM

< ECU DIAGNOSIS INFORMATION >

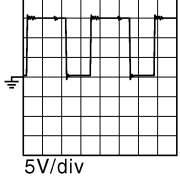
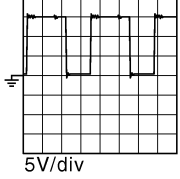
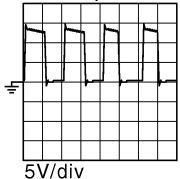
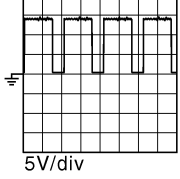
[AUTOMATIC AIR CONDITIONER]

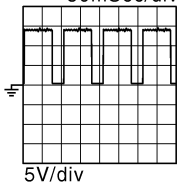
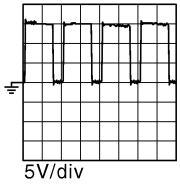
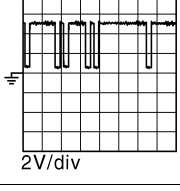
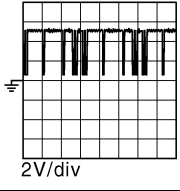
Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	-	Signal name	Input/ Output		
36 (LG)	31 (B)	Heated oxygen sensor 2 (bank 2)	Input	[Engine is running] • Revving engine from idle to 3,000 rpm quickly after the following conditions are met - Engine: after warming up - Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load	0 - 1.0 V
38 (GR)	—	Sensor ground [Mass air flow sensor (bank 2)]	—	—	—
39 (R)	34 (V)	Engine oil temperature sensor	Input	[Engine is running]	0 - 4.8 V Output voltage varies with engine oil temperature.
40 (W)	35 (B/W)	Knock sensor (bank 1)	Input	[Engine is running] • Idle speed	2.5 V*1
42 (B)	—	Sensor ground [Mass air flow sensor (bank 1)/ Intake air temperature sensor]	—	—	—
43 (SB)	38 (GR)	Mass air flow sensor (bank 2)	Input	[Engine is running] • Warm-up condition • Idle speed	0.8 - 1.1 V
				[Engine is running] • Warm-up condition • Engine speed: 2,500 rpm	1.3 - 1.6 V
44 (W)	35 (B/W)	Knock sensor (bank 2)	Input	[Engine is running] • Idle speed	2.5 V*1
47 (L)	42 (B)	Mass air flow sensor (bank 1)	Input	[Engine is running] • Warm-up condition • Idle speed	0.8 - 1.1 V
				[Engine is running] • Warm-up condition • Engine speed: 2,500 rpm	1.3 - 1.6 V
48 (Y)	42 (B)	Intake air temperature sensor	Input	[Engine is running]	0 - 4.8 V Output voltage varies with intake air temperature.
49 (V)	128 (B)	Throttle control motor power supply (bank 1)	Input	[Ignition switch: ON]	BATTERY VOLTAGE (11 - 14 V)
50 (G)	128 (B)	Throttle control motor (bank 1) (Open)	Output	[Ignition switch: ON] • Engine: Stopped • Selector lever: D position • Accelerator pedal: Fully depressed	0 - 14 V★ 
				[Ignition switch: ON] • Engine: Stopped • Selector lever: D position • Accelerator pedal: Fully released	0 - 14 V★ 

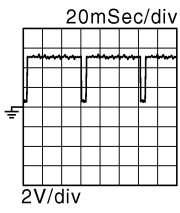
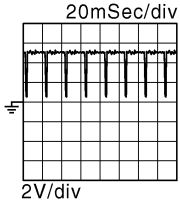
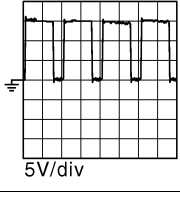
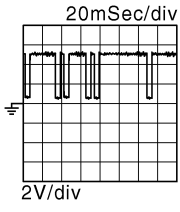
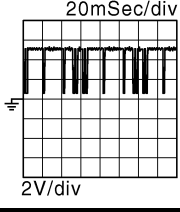
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< ECU DIAGNOSIS INFORMATION >

[AUTOMATIC AIR CONDITIONER]

Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	—	Signal name	Input/ Output		
51 (O)	128 (B)	Intake valve timing control solenoid valve (bank 1)	Output	[Engine is running] • Warm-up condition • Idle speed	BATTERY VOLTAGE (11 - 14 V)
				[Engine is running] • Warm-up condition • Engine speed: 2,000rpm	7 - 12 V★ 
52 (L)	128 (B)	Intake valve timing control solenoid valve (bank 2)	Output	[Engine is running] • Warm-up condition • Idle speed	BATTERY VOLTAGE (11 - 14 V)
				[Engine is running] • Warm-up condition • Engine speed: 2,000rpm	7 - 12V★ 
53 (BR)	128 (B)	Throttle control motor (bank 1) (Close)	Output	[Ignition switch: ON] • Engine: Stopped • Selector lever: D position • Accelerator pedal: In the middle of releasing operation	0 - 14 V★ 
54 (B)	—	ECM ground	—	—	—
55 (P)	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	10 V★ 
				[Ignition switch: ON] • Engine: Stopped [Engine is running] • Engine speed: Above 3,600 rpm	BATTERY VOLTAGE (11 - 14 V)

Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	-	Signal name	Input/ Output		
56 (R)	128 (B)	Heated oxygen sensor 2 heater (bank 1)	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	10 V★ 
				[Ignition switch: ON] - Engine: Stopped [Engine is running] - Engine speed: Above 3,600 rpm	BATTERY VOLTAGE (11 - 14 V)
57 (Y)	128 (B)	Exhaust valve timing control solenoid valve (bank 2)	Output	[Engine is running] - Warm-up condition - Idle speed	BATTERY VOLTAGE (11 - 14 V)
				[Engine is running] - Warm-up condition - Around 2,500 rpm while the engine speed is rising	7 - 12 V★ 
58 (B)	—	Sensor ground [Camshaft position sensor (bank 1)/ Exhaust valve timing control position sensor (bank 1)]	—	—	—
59 (W)	58 (B)	Camshaft position sensor (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 V★ 
				[Engine is running] Engine speed: 2,000 rpm	3.0 - 5.0 V★ 

Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	-	Signal name	Input/ Output		
60 (G)	58 (B)	Exhaust valve timing control position sensor (bank 1)	Input	[Engine is running] • Warm-up condition • Idle speed NOTE: The pulse cycle changes depending on rpm at idle	4.0 - 5.0 V★  20mSec/div 2V/div JMBIA0043GB
				[Engine is running] • Warm-up condition • Engine speed: 2,000 rpm	4.0 - 5.0 V★  20mSec/div 2V/div JMBIA0044GB
61 (G)	128 (B)	Exhaust valve timing control solenoid valve (bank 1)	Output	[Engine is running] • Warm-up condition • Idle speed	BATTERY VOLTAGE (11 - 14 V)
				[Engine is running] • Warm-up condition • Around 2,500 rpm while the engine speed is rising	7 - 12 V★  5V/div JMBIA0034GB
62 (L)	—	Sensor ground [Camshaft position sensor (bank 2)/ Exhaust valve timing control position sensor (bank 2)]	—	—	—
63 (G)	62 (L)	Camshaft position sensor (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 V★  20mSec/div 2V/div JMBIA0045GB
				[Engine is running] • Engine speed: 2,000 rpm	3.0 - 5.0 V★  20mSec/div 2V/div JMBIA0046GB

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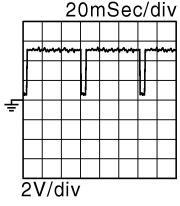
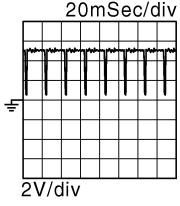
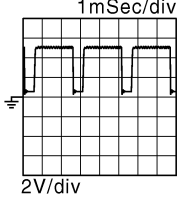
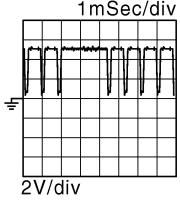
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< ECU DIAGNOSIS INFORMATION >

[AUTOMATIC AIR CONDITIONER]

Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	—	Signal name	Input/ Output		
64 (P)	62 (L)	Exhaust valve timing control position sensor (bank 2)	Input	[Engine is running] • Warm-up condition • Idle speed NOTE: The pulse cycle changes depending on rpm at idle	4.0 - 5.0 V★ 
				[Engine is running] • Warm-up condition • Engine speed: 2,000 rpm	4.0 - 5.0 V★ 
65 (LG)	128 (B)	VVEL actuator motor relay abort signal (VVEL control module)	Output	[Engine is running] • Warm-up condition • Idle speed	0 V
66 (GR)	—	Sensor ground (Power steering pressure sen- sor/ Refrigerant pressure sen- sor)	—	—	—
67 (Y)	68 (B)	Crankshaft position sensor	Input	[Engine is running] • Warm-up condition • Idle speed NOTE: The pulse cycle changes depending on rpm at idle	4.0 - 5.0 V★ 
				[Engine is running] • Engine speed: 2,000 rpm	4.0 - 5.0 V★ 
68 (B)	—	Sensor ground (Crankshaft position sensor)	—	—	—
69 (W)	70 (B)	Manifold absolute pressure sensor	Input	[Engine is running] • Warm-up condition • Idle speed	1.2 V
				[Engine is running] • Warm-up condition • Engine speed: 2,000 rpm	1.5 V
70 (B)	—	Sensor ground [Battery current sensor / Man- ifold absolute pressure sen- sor]	—	—	—
71 (R)	—	Sensor ground [Throttle position sensor (bank 1)]	—	—	—

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< ECU DIAGNOSIS INFORMATION >

[AUTOMATIC AIR CONDITIONER]

Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	—	Signal name	Input/ Output		
72 (Y)	—	Sensor ground [Throttle position sensor (bank 2)]	—	—	—
73 (L)	71 (R)	Throttle position sensor 1 (bank 1)	Input	[Ignition switch: ON] • Engine: Stopped • Selector lever: D position • Accelerator pedal: Fully released	More than 0.36 V
				[Ignition switch: ON] • Engine: Stopped • Selector lever: D position • Accelerator pedal: Fully depressed	Less than 4.75 V
74 (R)	72 (Y)	Throttle position sensor 2 (bank 2)	Input	[Ignition switch: ON] • Engine: Stopped • Selector lever: D position • Accelerator pedal: Fully released	Less than 4.75 V
				[Ignition switch: ON] • Engine: Stopped • Selector lever: D position • Accelerator pedal: Fully depressed	More than 0.36 V
76 (G)	70 (B)	Battery current sensor	Input	[Engine is running] • Battery: Fully charged*3 • Idle speed	2.6 - 3.5 V
77 (B)	72 (Y)	Throttle position sensor 1 (bank 2)	Input	[Ignition switch: ON] • Engine: Stopped • Selector lever: D position • Accelerator pedal: Fully released	More than 0.36 V
				[Ignition switch: ON] • Engine: Stopped • Selector lever: D position • Accelerator pedal: Fully depressed	Less than 4.75 V
78 (Y)	71 (R)	Throttle position sensor 2 (bank 1)	Input	[Ignition switch: ON] • Engine: Stopped • Selector lever: D position • Accelerator pedal: Fully released	Less than 4.75 V
				[Ignition switch: ON] • Engine: Stopped • Selector lever: D position • Accelerator pedal: Fully depressed	More than 0.36 V
81 (V)	128 (B)	A/F sensor 1 (bank 1)	Input	[Ignition switch: ON]	2.2 V
82 (LG)	128 (B)	A/F sensor 1 (bank 1)	Input	[Engine is running] • Warm-up condition • Engine speed: 2,000 rpm	1.8 V Output voltage varies with air fuel ratio.
83 (SB)	66 (GR)	Power steering pressure sensor	Output	[Engine is running] • Steering wheel: Being turned	0.5 - 4.5 V
				[Engine is running] • Steering wheel: Not being turned	0.4 - 0.8 V
84 (B)	71 (R)	Sensor power supply [Throttle position sensor (bank 1)]	—	[Ignition switch: ON]	5 V
85 (Y)	128 (B)	A/F sensor 1 (bank 2)	Input	[Ignition switch: ON]	2.2 V

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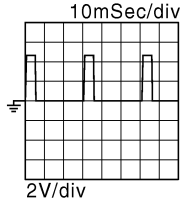
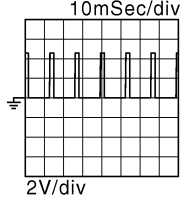
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< ECU DIAGNOSIS INFORMATION >

[AUTOMATIC AIR CONDITIONER]

Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	—	Signal name	Input/ Output		
86 (O)	128 (B)	A/F sensor 1 (bank 2)	Input	[Engine is running] • Warm-up condition • Engine speed: 2,000 rpm	1.8 V Output voltage varies with air fuel ratio.
87 (R)	68 (B)	Sensor power supply (Crankshaft position sensor)	—	[Ignition switch: ON]	5 V
88 (Y)	62 (L)	Sensor power supply [Camshaft position sensor (bank 2)/ Exhaust valve timing control position sensor (bank 2)]	—	[Ignition switch: ON]	5 V
89 (P)	—	ENG communication line (VVEL control module)	Input/ Output	—	—
90 (G)	66 (GR)	Refrigerant pressure sensor	Input	[Engine is running] • Warm-up condition • Both A/C switch and blower fan motor switch: ON (Compressor operates)	1.0 - 4.0 V
91 (R)	58 (B)	Sensor power supply [Camshaft position sensor (bank 1)/ Exhaust valve timing control position sensor (bank 1)]	—	[Ignition switch: ON]	5 V
92 (W)	66 (GR)	Sensor power supply (Power steering pressure sensor/ Refrigerant pressure sensor)	—	[Ignition switch: ON]	5 V
93 (LG)	—	ENG communication line (VVEL control module)	Input/ Output	—	—
95 (Y)	70 (B)	Sensor power supply [Battery current sensor / Manifold absolute pressure sensor]	—	[Ignition switch: ON]	5 V
96 (L)	72 (Y)	Sensor power supply [Throttle position sensor (bank 2)]	—	[Ignition switch: ON]	5 V
97 (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	1 V★ 
				[Engine is running] • Engine speed is 2,000 rpm	1 V★ 
99 (G)	115 (GR)	Sensor power supply (Accelerator pedal position sensor 2)	—	[Ignition switch: ON]	5 V

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< ECU DIAGNOSIS INFORMATION >

[AUTOMATIC AIR CONDITIONER]

Terminal No. (Wire color)		Description		Condition	Value (Approx.)	
+	—	Signal name	Input/ Output			
100 (L)	119 (W)	Sensor power supply (Accelerator pedal position sensor 1)	—	[Ignition switch: ON]	5 V	B
101 (P)	—	CAN communication line	Input/ Output	—	—	C
102 (SB)	111 (V)	ASCD steering switch	Input	[Ignition switch: ON] • ASCD steering switch: OFF	4 V	D
				[Ignition switch: ON] • MAIN switch: Pressed	0 V	E
				[Ignition switch: ON] • CANCEL switch: Pressed	1 V	F
				[Ignition switch: ON] • RESUME/ACCELERATE switch: Pressed	3 V	G
				[Ignition switch: ON] • SET/COAST switch: Pressed	2 V	H
104 (R)	119 (W)	Accelerator pedal position sensor 1	Input	[Ignition switch: ON] • Engine: Stopped • Accelerator pedal: Fully released	0.45 - 1.0 V	HAC
				[Ignition switch: ON] • Engine: Stopped • Accelerator pedal: Fully depressed	4.4 - 4.8 V	
105 (L)	—	CAN communication line	Input/ Output	—	—	J
106 (L)	128 (B)	Ignition switch	Input	[Ignition switch: OFF]	0 V	K
				[Ignition switch: ON]	BATTERY VOLTAGE (11 - 14 V)	
108 (P)	115 (GR)	Accelerator pedal position sensor 2	Input	[Ignition switch: ON] • Engine: Stopped • Accelerator pedal: Fully released	0.22 - 0.5 V	L
				[Ignition switch: ON] • Engine: Stopped • Accelerator pedal: Fully depressed	2.1 - 2.5 V	
110 (P)	128 (B)	Stop lamp switch	Input	[Ignition switch: OFF] • Brake pedal: Fully released	0 V	M
				[Ignition switch: OFF] • Brake pedal: Slightly depressed	BATTERY VOLTAGE (11 - 14 V)	
111 (V)	—	Sensor ground (ASCD steering switch)	—	—	—	N
112 (LG)	128 (B)	Fuel pump control module (FPCM) check	Input	[When cranking engine]	0 V	O
				[Engine is running] • Warm-up condition • Idle speed	4 - 6 V	
114 (GR)	—	Data link connector	Input/ Output	—	—	P
115 (GR)	—	Sensor ground (Accelerator pedal position sensor 2)	—	—	—	

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< ECU DIAGNOSIS INFORMATION >

[AUTOMATIC AIR CONDITIONER]

Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	—	Signal name	Input/ Output		
116 (G)	128 (B)	PNP switch	Input	[Ignition switch: ON] • Selector lever: P or N position	BATTERY VOLTAGE (11 - 14 V)
				[Ignition switch: ON] • Selector lever: Except above position	0 V
117 (BR)	128 (B)	ASCD brake switch	Input	[Ignition switch: ON] • Brake pedal: Slightly depressed	0 V
				[Ignition switch: ON] • Brake pedal: Fully released	BATTERY VOLTAGE (11 - 14 V)
118 (R)	128 (B)	Power supply for ECM (Back-up)	Input	[Ignition switch: OFF]	BATTERY VOLTAGE (11 - 14 V)
119 (W)	—	Sensor ground (Accelerator pedal position sensor 1)	—	—	—
120 (W)	128 (B)	Fuel tank temperature sensor	Input	[Engine is running]	0 - 4.8 V Output voltage varies with fuel tank temperature.
121 (GR)	128 (B)	Power supply for ECM	Input	[Ignition switch: ON]	BATTERY VOLTAGE (11 - 14 V)
123 (B)	—	ECM ground	—	—	—
125 (R)	128 (B)	Fuel pump control module (FPCM)	Output	[When cranking engine]	0 - 0.5 V
				[Engine is running] • Warm-up condition • Idle speed	8 - 12 V
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"](#).

AIR CONDITIONER CONTROL

< SYMPTOM DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

SYMPTOM DIAGNOSIS

AIR CONDITIONER CONTROL

Diagnosis Chart By Symptom

INFOID:0000000010581430

Symptom	Reference	
A/C system does not activate.	Go to Trouble Diagnosis Procedure for A/C System.	HAC-71. "Diagnosis Procedure"
A/C system cannot be controlled.	Go to Preset Switch System.	AV-123. "Symptom Table" (WITHOUT NAVIGATION), AV-337. "Symptom Table" (WITH NAVIGATION)
Air outlet does not change.	Go to Trouble Diagnosis Procedure for Mode Door Motor. (LAN)	HAC-72. "Diagnosis Procedure"
Mode door motor does not operate normally.		
Discharge air temperature (driver side) does not change.	Go to Trouble Diagnosis Procedure for Air Mix Door Motor (driver side). (LAN)	HAC-74. "Diagnosis Procedure"
Air mix door motor (driver side) does not operate normally.		
Discharge air temperature (passenger side) does not change.	Go to Trouble Diagnosis Procedure for Air Mix Door Motor (passenger side). (LAN)	HAC-76. "Diagnosis Procedure"
Air mix door motor (passenger side) does not operate normally.		
Intake door does not change.	Go to Trouble Diagnosis Procedure for Intake Door Motor. (LAN)	HAC-78. "WITHOUT ACCS : Diagnosis Procedure" (WITHOUT ACCS) or HAC-80. "WITH ACCS : Diagnosis Procedure" (WITH ACCS)
Intake door motor does not operate normally.		
Blower motor operation is malfunctioning.	Go to Trouble Diagnosis Procedure for Blower Motor.	HAC-82. "Diagnosis Procedure"
Magnet clutch does not engage.	Go to Trouble Diagnosis Procedure for Magnet Clutch.	HAC-86. "Diagnosis Procedure"
Insufficient cooling	Go to Trouble Diagnosis Procedure for Insufficient Cooling.	HAC-170. "Inspection procedure"
No cool air comes out. (Air flow volume is normal.)		
Insufficient heating	Go to Trouble Diagnosis Procedure for Insufficient Heating.	HAC-172. "Inspection procedure"
No warm air comes out. (Air flow volume is normal.)		
Noise	Go to Trouble Diagnosis Procedure for Noise.	HAC-174. "Inspection procedure"
Self-diagnosis cannot be performed.	Go to Trouble Diagnosis Procedure for Self-diagnosis.	HAC-176. "Inspection procedure"
Memory function does not operate.	Go to Trouble Diagnosis Procedure for Memory Function.	HAC-177. "Inspection procedure"
Plasmacluster system does not operate.*	Go to Trouble Diagnosis Procedure for Plasmacluster system.	HAC-104. "Diagnosis Procedure"

*: With advanced climate control system (ACCS)

INSUFFICIENT COOLING

Description

INFOID:0000000010581431

Symptom

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

Inspection procedure

INFOID:0000000010581432

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

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

Is there refrigerant?

- YES >> GO TO 2.
- NO-1 >> Check for refrigerant leakages with the refrigerant leakage detecting fluorescent leak detector. Refer to [HA-34, "Inspection"](#) (VQ37VHR) or [HA-92, "Inspection"](#) (VK50VE).
- NO-2 >> GO TO 2 after repairing or replacing the parts according to the inspection results.

2.CHECK CHARGED REFRIGERANT AMOUNT

1. Connect recovery/recycling recharging equipment to the vehicle and discharge the refrigerant. Refer to [HA-25, "Collection and Charge"](#) (VQ37VHR) or [HA-83, "Collection and Charge"](#) (VK50VE).
2. Recharge with the proper amount of refrigerant. Refer to [HA-25, "Collection and Charge"](#) (VQ37VHR) or [HA-83, "Collection and Charge"](#) (VK50VE).
3. Perform the inspection with the refrigerant leakage detecting fluorescent leak detector. Refer to [HA-35, "Inspection"](#) (VQ37VHR) or [HA-93, "Inspection"](#) (VK50VE).

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.PERFORM THE PERFORMANCE TEST

Connect recovery/recycling recharging equipment to the vehicle and perform the performance test. Refer to [HA-32, "Performance Chart"](#) (VQ37VHR) or [HA-90, "Performance Chart"](#) (VK50VE).

Is the inspection result normal?

- YES >> GO TO 4.
- NO >> Perform the diagnosis with the gauge pressure. Refer to [HA-8, "Trouble Diagnosis For Unusual Pressure"](#) (VQ37VHR) or [HA-66, "Trouble Diagnosis For Unusual Pressure"](#) (VK50VE).

4.CHECK SETTING OF TEMPERATURE SETTING TRIMMER

Check the setting of temperature setting trimmer. Refer to [HAC-8, "WITHOUT ACCS : Temperature Setting Trimmer"](#) (WITHOUT ACCS) or [HAC-13, "WITH ACCS : Temperature Setting Trimmer"](#) (WITH ACCS).

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 >> INSPECTION END
- NO >> GO TO 5.

5.PERFORM SELF-DIAGNOSIS

Perform self-diagnosis function. Refer to [HAC-59, "WITHOUT ACCS : Diagnosis Description"](#) (WITHOUT ACCS) or [HAC-64, "WITH ACCS : Diagnosis Description"](#) (WITH ACCS).

Is the inspection result normal?

- YES >> GO TO 6.
- NO >> Repair or replace parts according to the inspection results.

6.CHECK DRIVE BELT

INSUFFICIENT COOLING

< SYMPTOM DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

Check tension of the drive belt. Refer to [EM-15. "Checking"](#) (VQ37VHR) or [EM-173. "Checking"](#) (VK50VE).

Is the inspection result normal?

YES >> GO TO 7.

NO >> Adjust or replace drive belt.

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 ECV

Perform the ECV diagnosis procedure. Refer to [HAC-88. "Diagnosis Procedure"](#).

Is the inspection result normal?

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

NO >> Replace the compressor.

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INSUFFICIENT HEATING

Description

INFOID:0000000010581433

Symptom

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

Inspection procedure

INFOID:0000000010581434

1.CHECK COOLING SYSTEM

1. Check engine coolant level and check for leakage. Refer to [CO-10, "Inspection"](#) (VQ37VHR) or [CO-37, "Inspection"](#) (VK50VE).
2. Check radiator cap. Refer to [CO-14, "RADIATOR CAP : Inspection"](#) (VQ37VHR) or [CO-41, "RADIATOR CAP : Inspection"](#) (VK50VE).
3. Check water flow sounds of engine coolant. Refer to [CO-11, "Refilling"](#) (VQ37VHR) or [CO-38, "Refilling"](#) (VK50VE).

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-8, "WITHOUT ACCS : Temperature Setting Trimmer"](#) (WITHOUT ACCS) or [HAC-13, "WITH ACCS : Temperature Setting Trimmer"](#) (WITH ACCS).

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. INSPECTION END.

NO >> GO TO 3.

3.CHECK OPERATION

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

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 4.

4.PERFORM SELF-DIAGNOSIS

Perform self-diagnosis function. Refer to [HAC-59, "WITHOUT ACCS : Diagnosis Description"](#) (WITHOUT ACCS) or [HAC-64, "WITH ACCS : Diagnosis Description"](#) (WITH ACCS).

Is the inspection result normal?

YES >> GO TO 5.

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

5.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 6.

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

6.CHECK HEATER HOSE INSTALLATION CONDITION

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

Is the inspection result normal?

INSUFFICIENT HEATING

< SYMPTOM DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

YES >> GO TO 7.

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

7. 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 8.

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

8. REPLACE HEATER CORE

Replace the heater core. Refer to [HA-53. "Exploded View"](#) (VQ37VHR) or [HA-110. "Exploded View"](#) (VK50VE).

Are the symptoms solved?

YES >> INSPECTION END

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

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NOISE

Description

INFOID:0000000010581435

Symptom

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

Inspection procedure

INFOID:0000000010581436

1.CHECK OPERATION

1. Operate the A/C system and check the operation. Refer to [HAC-7, "WITHOUT ACCS : Description & Inspection"](#) (WITHOUT ACCS) or [HAC-10, "WITH ACCS : Description & Inspection"](#) (WITH ACCS).

2. Check the parts where noise is occurring.

Can the parts where noise is occurring be checked?

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

2.CHECK BLOWER MOTOR

1. Remove blower motor.
2. Remove 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 >> INSPECTION END
 NO >> Replace blower motor.

3.REPLACE COMPRESSOR

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

Is the inspection result normal?

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

4.CHECK WITH GAUGE PRESSURE

Perform the diagnosis with the gauge pressure. Refer to [HA-8, "Trouble Diagnosis For Unusual Pressure"](#) (VQ37VHR) or [HA-66, "Trouble Diagnosis For Unusual Pressure"](#) (VK50VE).

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 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 >> INSPECTION END
 NO >> Replace expansion valve.

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

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).

NOISE

< SYMPTOM DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

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-15. "Checking"](#) (VQ37VHR) or [EM-173. "Checking"](#) (VK50VE).

Is the inspection result normal?

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

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

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SELF-DIAGNOSIS CANNOT BE PERFORMED

< SYMPTOM DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

SELF-DIAGNOSIS CANNOT BE PERFORMED

Description

INFOID:0000000010581437

Symptom: Self-diagnosis function does not operate normally.

Inspection procedure

INFOID:0000000010581438

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 (indicators 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 the intake switch indicators are turned ON.

Does self-diagnosis function operate?

- YES >> INSPECTION 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-70, "UNIFIED METER AND A/C AMP.: Diagnosis Procedure"](#).

Is the inspection result normal?

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

MEMORY FUNCTION DOES NOT OPERATE

< SYMPTOM DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

MEMORY FUNCTION DOES NOT OPERATE

Description

INFOID:0000000010581439

Symptom

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

Inspection procedure

INFOID:0000000010581440

1.CHECK OPERATION

1. Set temperature control dial to 32.0°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 >> INSPECTION 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-70, "UNIFIED METER AND A/C AMP. : 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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PRECAUTION

PRECAUTIONS

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

INFOID:0000000010581441

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

WARNING:

Always observe the following items for preventing accidental activation.

- To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision that would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.
- Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see "SRS AIR BAG".
- Never use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.

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

WARNING:

Always observe the following items for preventing accidental activation.

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

Precautions Necessary for Steering Wheel Rotation After Battery Disconnection

INFOID:0000000010581442

CAUTION:

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

- Before removing and installing any control units, first turn the 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 to perform self-diagnosis as a part of each function inspection after finishing work. If a DTC is detected, perform trouble diagnosis according to self-diagnosis results.

For vehicle with steering lock unit, if the battery is disconnected or discharged, the steering wheel will lock and cannot be turned.

If turning the steering wheel is required with the battery disconnected or discharged, follow the operation procedure below before starting the repair operation.

OPERATION PROCEDURE

1. Connect both battery cables.

NOTE:

Supply power using jumper cables if battery is discharged.

2. Turn the 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.

PRECAUTIONS

< PRECAUTION >

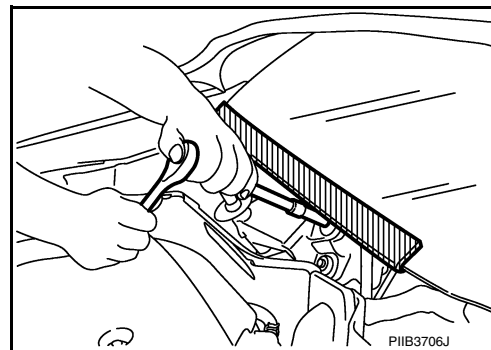
[AUTOMATIC AIR CONDITIONER]

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 ignition switch from ACC position to ON position, then to LOCK position. (The steering wheel will lock when the ignition switch is turned to LOCK position.)
6. Perform self-diagnosis check of all control units using CONSULT.

Precaution for Procedure without Cowl Top Cover

INFOID:000000010581443

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



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

INFOID:000000010581444

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.
- 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:000000010581445

WARNING:

PRECAUTIONS

< PRECAUTION >

[AUTOMATIC AIR CONDITIONER]

- 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 recharging 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:0000000010581446

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

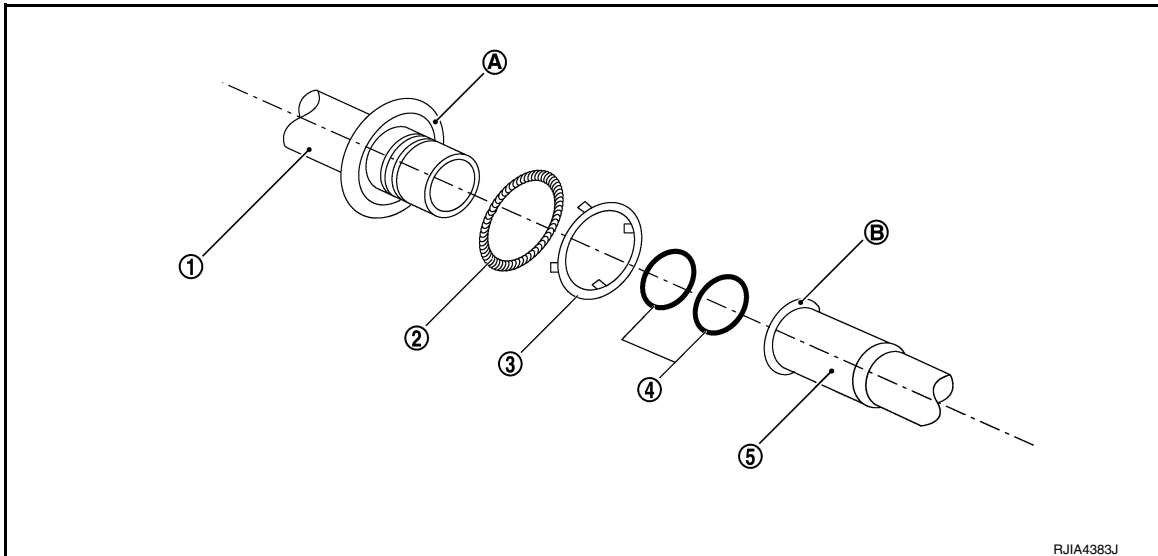
- Expansion valve to evaporator
- Refrigerant pressure sensor to liquid tank

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.

COMPONENT PARTS



FUNCTIONS OF COMPONENT PARTS

1	Pipe (Male-side)	• Retains O-rings. • Retains garter spring in cage (A).
2	Garter spring	Anchors female-side piping.

PRECAUTIONS

< PRECAUTION >

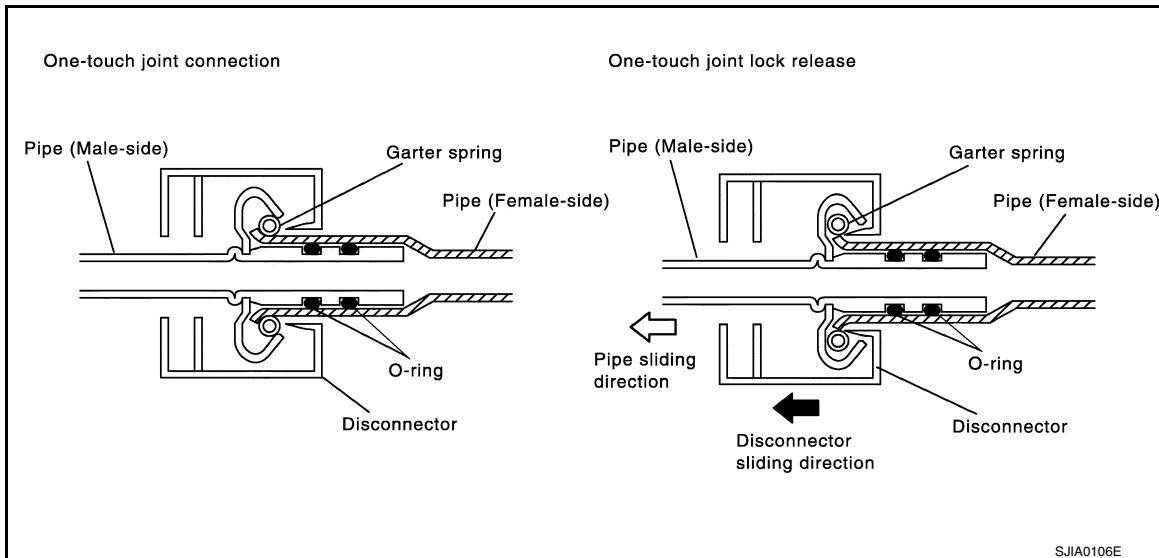
[AUTOMATIC AIR CONDITIONER]

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)	- Seals connection by compressing O-rings. - Anchors piping connection using flare (B) and garter spring.

NOTE:

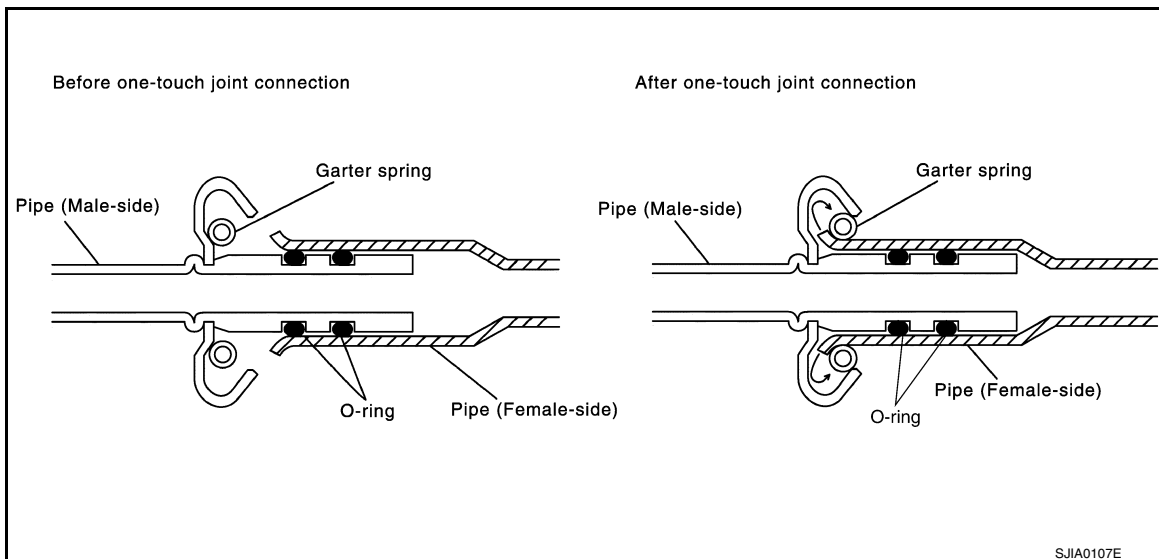
- Garter spring cannot be removed from cage of male-side piping.
- Indicator ring remains near piping connection point, however, this is not a malfunction. (This is to check piping connection during factory assembly.)

REMOVAL



1. Clean piping connection point, and set a disconnecter.
2. Slide disconnecter in axial direction of piping, and stretch garter spring with tapered point of disconnecter.
3. Slide disconnecter 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.

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.

PRECAUTIONS

< PRECAUTION >

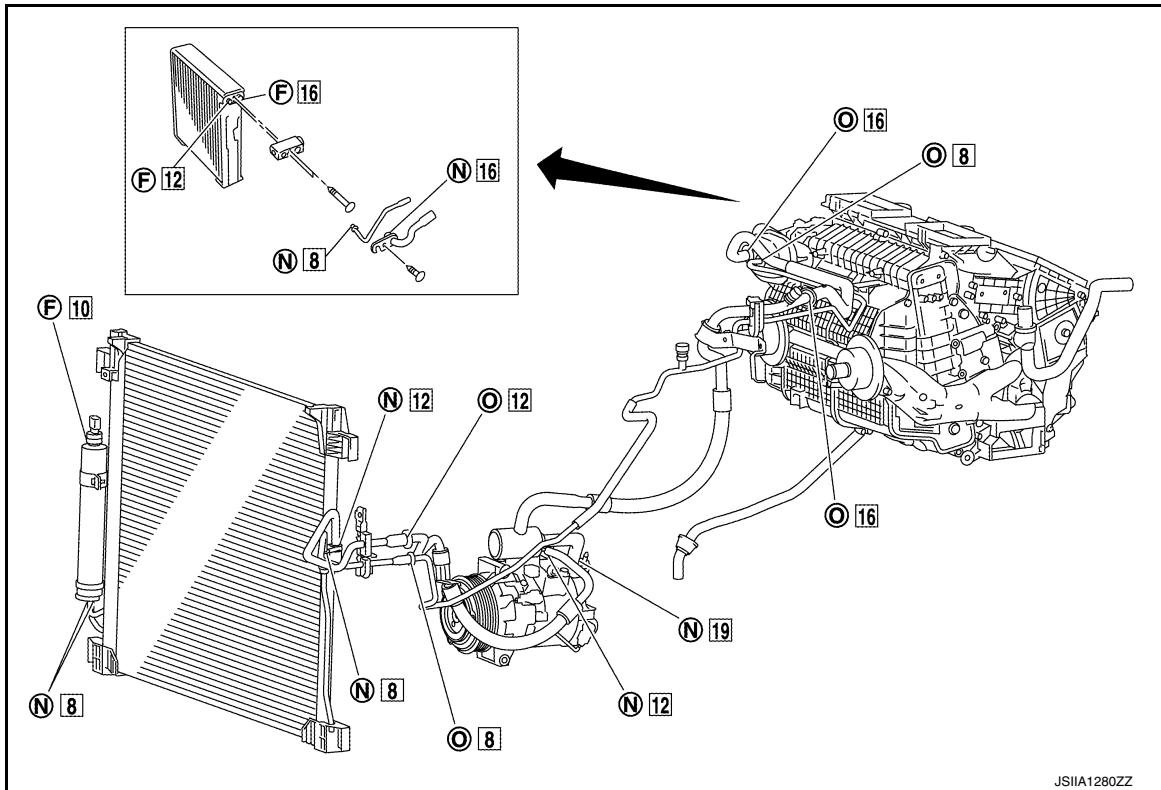
[AUTOMATIC AIR CONDITIONER]

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.

O-RING AND REFRIGERANT CONNECTION

VQ35HR



F. Former type refrigerant connection N. New type refrigerant connection O. One-touch joint

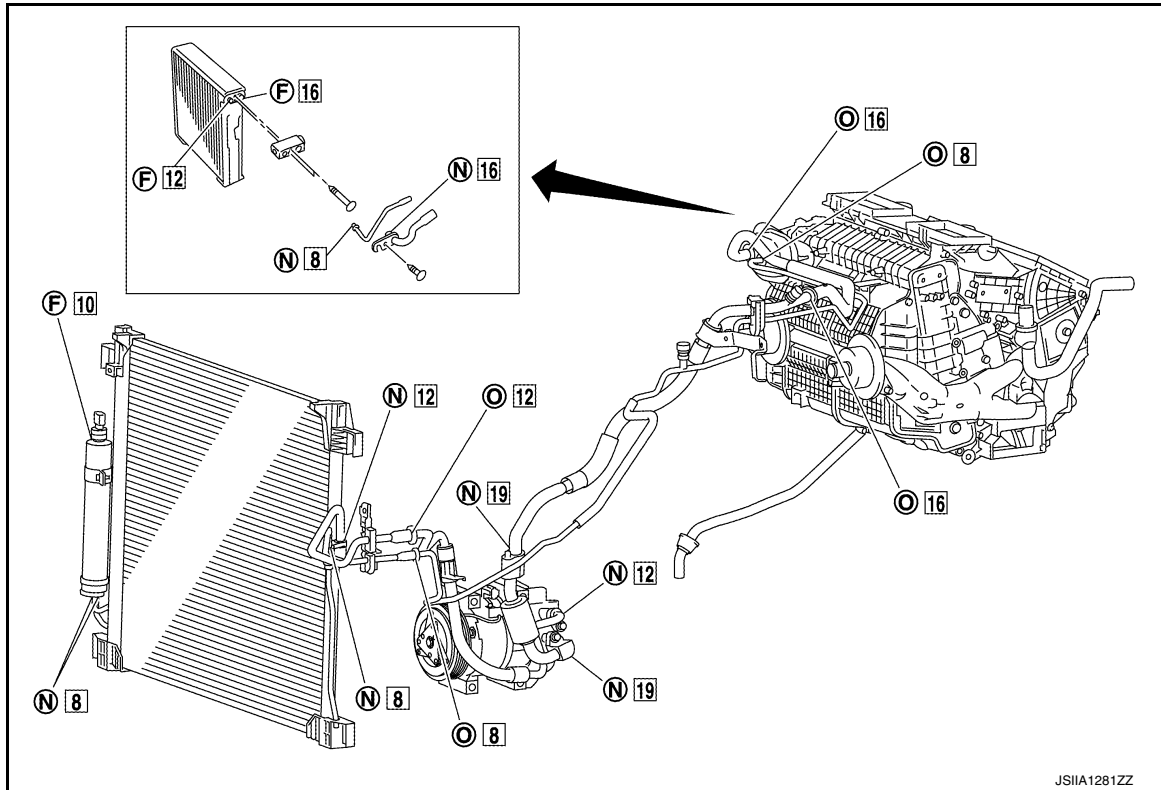
□: O-ring size

PRECAUTIONS

< PRECAUTION >

[AUTOMATIC AIR CONDITIONER]

VK50VE



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
One-touch joint	Low-pressure pipe 1 to low-pressure pipe 2		92473 N8221	2	16
	Low-pressure flexible hose to low-pressure pipe 2		92473 N8221	2	16
	High-pressure pipe 1 to high-pressure pipe 2		92471 N8221	2	8
	Condenser pipe assembly to high-pressure flexible hose		92472 N8221	2	12
	Condenser pipe assembly to high-pressure pipe 1		92471 N8221	2	8
New	Condenser to condenser pipe assembly	Inlet	92472 N8210	1	12
		Outlet	92471 N8210	1	8
	Low-pressure pipe 1 to expansion valve		92473 N8210	1	16
	High-pressure pipe 2 to expansion valve		92471 N8210	1	8
	Low-pressure flexible hose to low-pressure pipe 3 (VK50VE)		92474 N8210	1	19
	Compressor to low-pressure pipe 3 (VK50VE)		92474 N8210	1	19
	Compressor to low-pressure flexible hose (VQ35HR)		92474 N8210	1	19
	Compressor to high-pressure flexible hose		92472 N8210	1	12
	Liquid tank to Condenser	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.

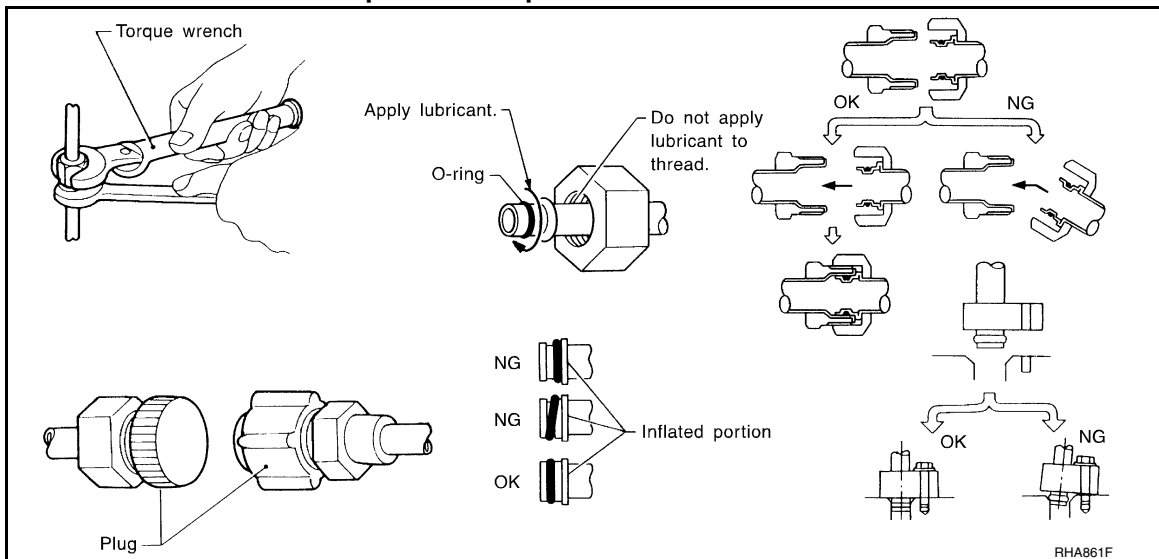
CAUTION:

Observe the following when replacing or cleaning refrigerant cycle components.

- Store it in the same way at it is when mounted on the car when the compressor is removed. Failure to do so will cause lubricant to enter the low-pressure chamber.
- 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

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RECOVERY/RECYCLING RECHARGING 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.

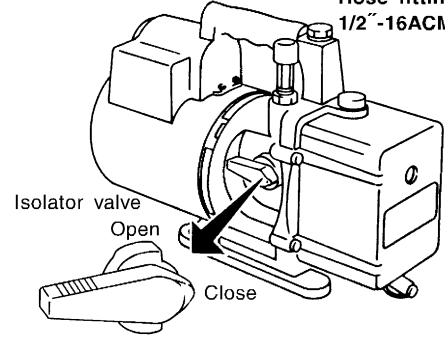
- Vacuum pumps usually have a manual isolator valve as part of the pump. Close this valve to isolate the service hose from the pump.
- Use a hose equipped with a manual shut-off valve near the pump end for pumps without an isolator. Close the valve to isolate the hose from the pump.
- Disconnect the 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.

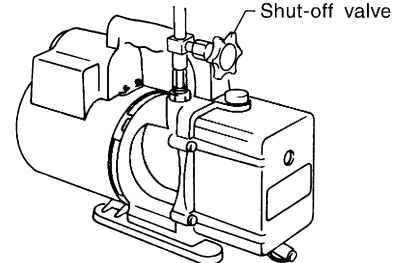
[AUTOMATIC AIR CONDITIONER]

With isolator valve

Hose fittings:
1/2"-16ACME



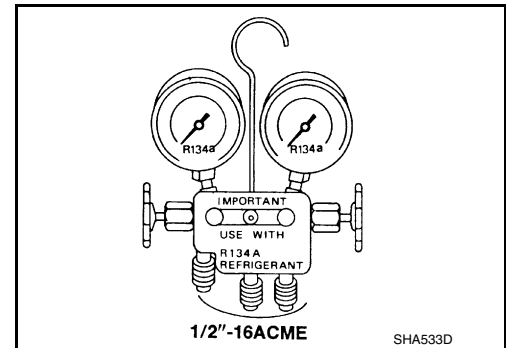
Without isolator valve



RHA270DA

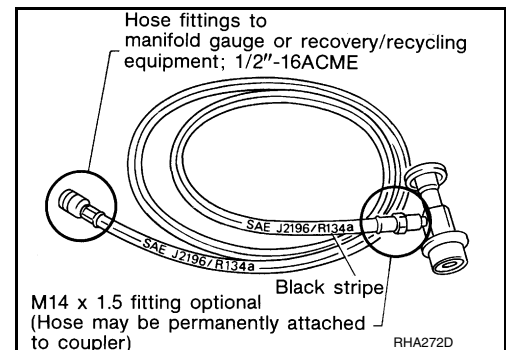
MANIFOLD GAUGE SET

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

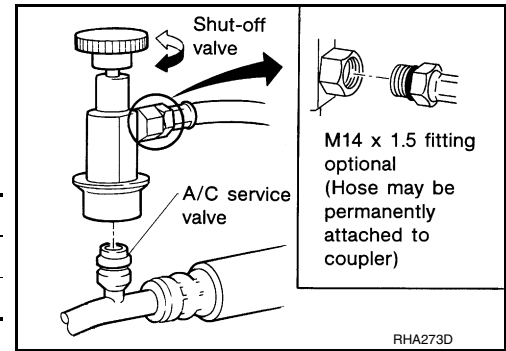
PRECAUTIONS

< PRECAUTION >

Never attempt to connect HFC-134a (R-134a) service couplers to the 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.

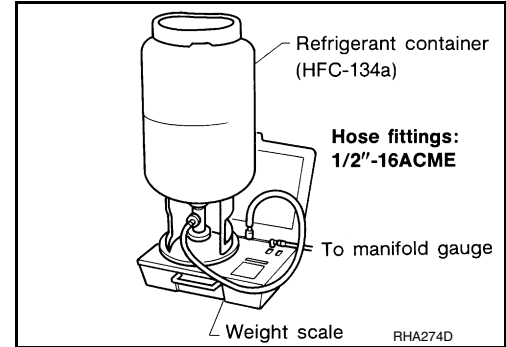
Shut-off valve rotation	A/C service valve
Clockwise	Open
Counterclockwise	Close

[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.

< PRECAUTION >

COMPRESSOR

VQ37VHR

VQ37VHR : General Precautions

INFOID:0000000010581448

CAUTION:

- Plug all openings to prevent moisture and foreign matter from entering.
- Store it in the same way at it is when mounted on the car when the compressor is removed.
- Follow "Maintenance of Lubricant Quantity in Compressor" exactly when replacing or repairing compressor. Refer to [HA-29, "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.

VK50VE

VK50VE : General Precautions

INFOID:0000000010581449

CAUTION:

- Plug all openings to prevent moisture and foreign matter from entering.
- Store it in the same way at it is when mounted on the car when the compressor is removed.
- Follow "Maintenance of Lubricant Quantity in Compressor" exactly when replacing or repairing compressor. Refer to [HA-87, "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

General Precautions

INFOID:0000000010581450

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 or more years unless a compressor malfunction occurs.

IDENTIFICATION

NOTE:

Vehicles with factory installed fluorescent dye have a green label.

Vehicles without factory installed fluorescent dye have a blue label.

IDENTIFICATION LABEL FOR VEHICLE

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

PREPARATION

PREPARATION

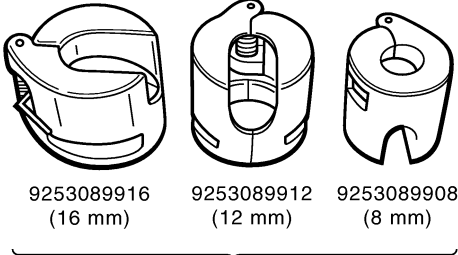
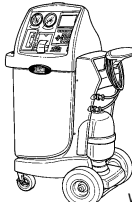
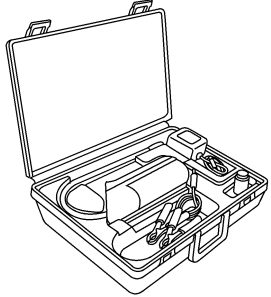
Special Service Tool

INFOID:0000000010581451

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

HFC-134a (R-134a) Service Tool and Equipment

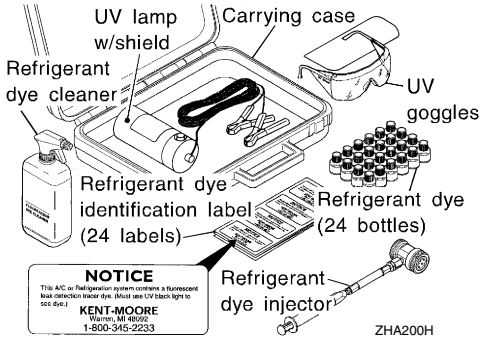
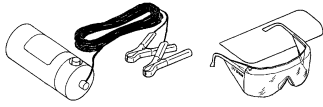
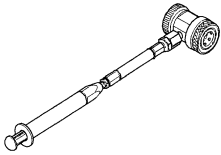
- Never mix HFC-134a (R-134a) refrigerant and/or its specified lubricant with CFC-12 (R-12) refrigerant and/or its lubricant.
- Separate and non-interchangeable service equipment must be used for handling each type of refrigerant/lubricant.
- Refrigerant container fittings, service hose fittings and service equipment fittings (equipment which handles refrigerant and/or lubricant) are different between CFC-12 (R-12) and HFC-134a (R-134a). This is to avoid mixed use of the refrigerants/lubricant.
- Never use adapters that convert one size fitting to another: refrigerant/lubricant contamination occurs and compressor malfunction may result.

Tool number (Kent-Moore No.) Tool name		Description
9253089908 (for high-pressure pipe 1) (-) 9253089912 (for high-pressure flexible hose) (-) 9253089916 (for low-pressure pipe 2 and low-pressure flexible hose) (-) Disconnecter tool set (J-45815)	 9253089916 (16 mm) 9253089912 (12 mm) 9253089908 (8 mm) Disconnecter tool set : J-45815 SJIA1274E	Disconnect one-touch joint connection
(ACR2005-NI) ACR5 A/C Service Center	 WJIA0293E	Function: Refrigerant recovery, recycling and recharging
(J-41995) Electrical leak detector	 AHA281A	Power supply: DC 12 V (Battery terminal)

PREPARATION

< PREPARATION >

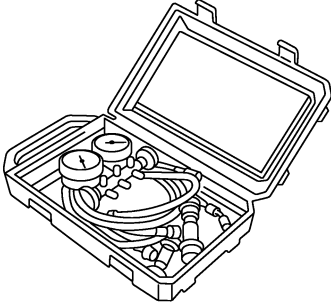
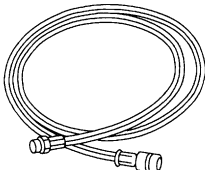
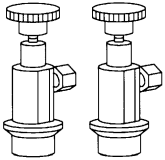
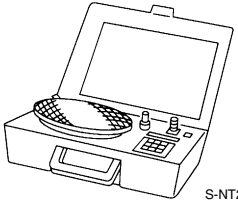
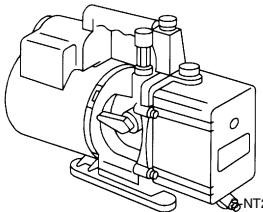
[AUTOMATIC AIR CONDITIONER]

Tool number (Kent-Moore No.) Tool name	Description
(J-43926) Refrigerant dye leak detection kit Kit includes: (J-42220) UV lamp and UV safety goggles (J-41459) HFC-134a (R-134a) dye injector Use with J-41447, 1/4 ounce bottle (J-41447) HFC-134a (R-134a) fluorescent leak detection dye (Box of 24, 1/4 ounce bottles) (J-43872) Refrigerant dye cleaner  NOTICE This A/C or Refrigeration system contains a fluorescent leak detection dye. Read and UV light signs to see dye. KENT-MOORE Warren, MI 48092 1-800-545-2233 UV lamp w/shield Carrying case UV goggles Refrigerant dye cleaner Refrigerant dye identification label (24 labels) Refrigerant dye (24 bottles) Refrigerant dye injector ZHA200H	Power supply: DC 12 V (Battery terminal)
(J-42220) UV lamp and UV safety goggles  SHA438F	Power supply: DC 12 V (Battery terminal) For checking refrigerant leakage when fluorescent dye is equipped in A/C system Includes: UV lamp and UV safety goggles
(J-41447) HFC-134a (R-134a) fluorescent leak detection dye (Box of 24, 1/4 ounce bottles)  Refrigerant dye (24 bottles) SHA439F	Application: For HFC-134a (R-134a) PAG oil Container: 1/4 ounce (7.4 cc) bottle (Includes self-adhesive dye identification labels for affixing to vehicle after charging system with dye.)
(J-41459) HFC-134a (R-134a) dye injector Use with J-41447, 1/4 ounce bottle  SHA440F	For injecting 1/4 ounce of fluorescent leak detection dye into A/C system
(J-43872) Refrigerant dye cleaner  SHA441F	For cleaning dye spills

PREPARATION

< PREPARATION >

[AUTOMATIC AIR CONDITIONER]

Tool number (Kent-Moore No.) Tool name	Description	A
(J-39183) Manifold gauge set (with hoses and couplers)	 Identification: - The gauge face indicates HFC-134a (R-134a). Fitting size: Thread size 1/2"-16 ACME	B C D
Service hoses - High-pressure side hose (J-39501-72) - Low-pressure side hose (J-39502-72) - Utility hose (J-39476-72)	 Hose color: - Low-pressure side hose: Blue with black stripe - High-pressure side hose: Red with black stripe - Utility hose: Yellow with black stripe or green with black stripe Hose fitting to gauge: 1/2"-16 ACME	E F G
Service couplers - High-pressure side coupler (J-39500-20) - Low-pressure side coupler (J-39500-24)	 Hose fitting to service hose: M14 x 1.5 fitting is optional or permanently attached.	H HAC
(J-39650) Refrigerant weight scale	 For measuring of refrigerant Fitting size: Thread size 1/2"-16 ACME	J K L
(J-39649) Vacuum pump (Including the isolator valve)	 Capacity: - Air displacement: 4 CFM - Micron rating: 20 microns - Oil capacity: 482 g (17 oz.) Fitting size: Thread size 1/2"-16 ACME	M N O P

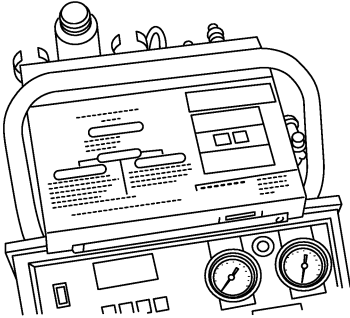
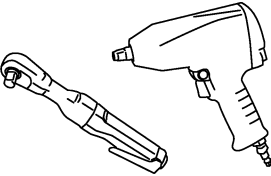
PREPARATION

< PREPARATION >

[AUTOMATIC AIR CONDITIONER]

Commercial Service Tool

INFOID:0000000010581452

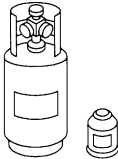
Tool name	Description
Refrigerant identifier equipment  RJIA0197E	Checking for refrigerant purity and system contamination
Power tool  PBIC0190E	For loosening bolts and nuts

Sealant or/and Lubricant

INFOID:0000000010581453

HFC-134a (R-134a) Service Tool and Equipment

- Never mix HFC-134a (R-134a) refrigerant and/or its specified lubricant with CFC-12 (R-12) refrigerant and/or its lubricant.
- Separate and non-interchangeable service equipment must be used for handling each type of refrigerant/lubricant.
- Refrigerant container fittings, service hose fittings and service equipment fittings (equipment which handles refrigerant and/or lubricant) are different between CFC-12 (R-12) and HFC-134a (R-134a). This is to avoid mixed use of the refrigerants/lubricant.
- Never use adapters that convert one size fitting to another: refrigerant/lubricant contamination occurs and compressor malfunction may result.

Tool name	Description
HFC-134a (R-134a) refrigerant  S-NT196	Container color: Light blue Container marking: HFC-134a (R-134a) Fitting size: Thread size • Large container 1/2"-16 ACME
NISSAN A/C System Oil Type S (DH-PS)  S-NT197	Type: Polyalkylene glycol oil (PAG), type S (DH-PS) Application: HFC-134a (R-134a) swash plate compressors (NISSAN only) Capacity: 40 mℓ (1.4 US fl oz., 1.4 Imp fl oz.)

PRESET SWITCH

< REMOVAL AND INSTALLATION >

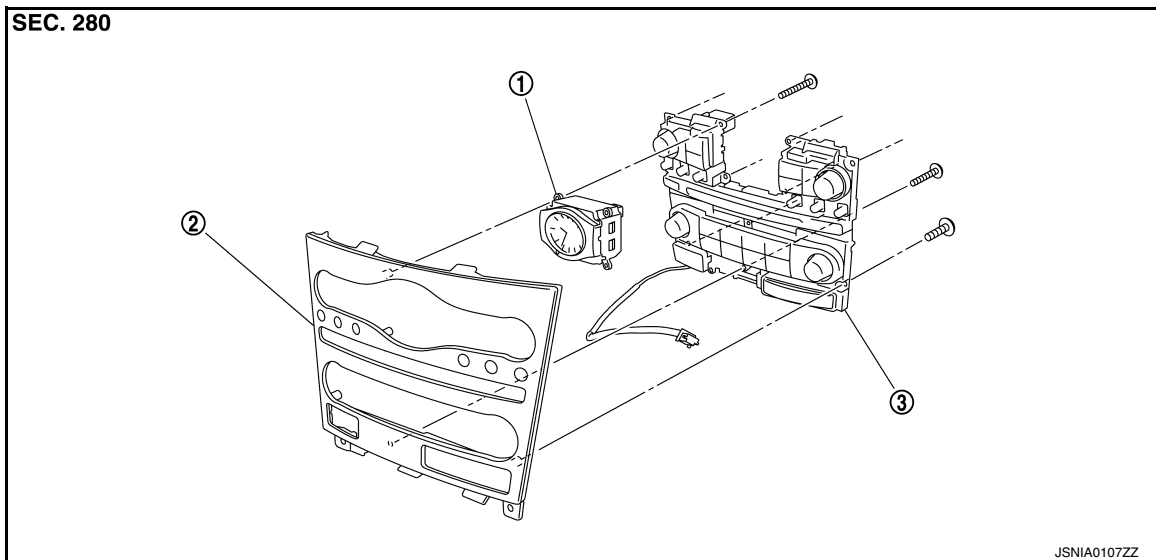
[AUTOMATIC AIR CONDITIONER]

REMOVAL AND INSTALLATION

PRESET SWITCH

Exploded View

INFOID:0000000010581454



1. Clock

2. Cluster lid C

3. Preset switch

Removal and Installation

INFOID:0000000010581455

HAC

REMOVAL

Remove preset switch. Refer to the following.

- Refer to [AV-143, "Removal and Installation"](#). (WITHOUT NAVIGATION)
- Refer to [AV-362, "Removal and Installation"](#). (WITH NAVIGATION)

INSTALLATION

Install in the reverse order of removal.

UNIFIED METER AND A/C AMP.

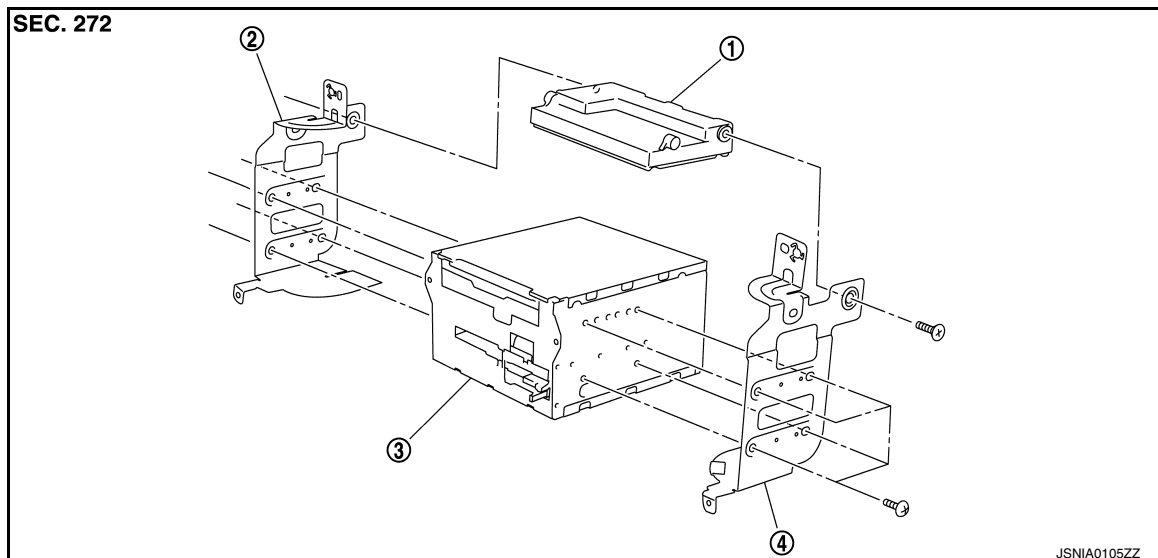
< REMOVAL AND INSTALLATION >

[AUTOMATIC AIR CONDITIONER]

UNIFIED METER AND A/C AMP.

Exploded View

INFOID:0000000010581456



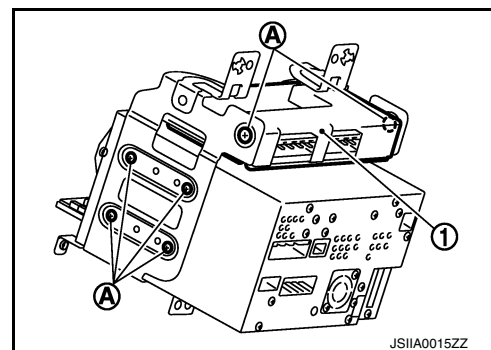
- | | | |
|-------------------------------|---------------|--------------------|
| 1. Unified meter and A/C amp. | 2. Bracket LH | 3. AV control unit |
| 4. Bracket RH | | |

Removal and Installation

INFOID:0000000010581457

REMOVAL

1. Remove AV control unit. Refer to the following.
 - Refer to [AV-130, "Exploded View"](#). (WITHOUT NAVIGATION)
 - Refer to [AV-350, "Exploded View"](#). (WITH NAVIGATION)
2. Remove fixing screws (A), and then remove unified meter and A/C amp. (1).



INSTALLATION

Note the following item, and then install in the reverse order of removal.

CAUTION:

Since unified meter and A/C amp. connector and AV control unit connector have the same form, be careful not to insert them wrongly.

AMBIENT SENSOR

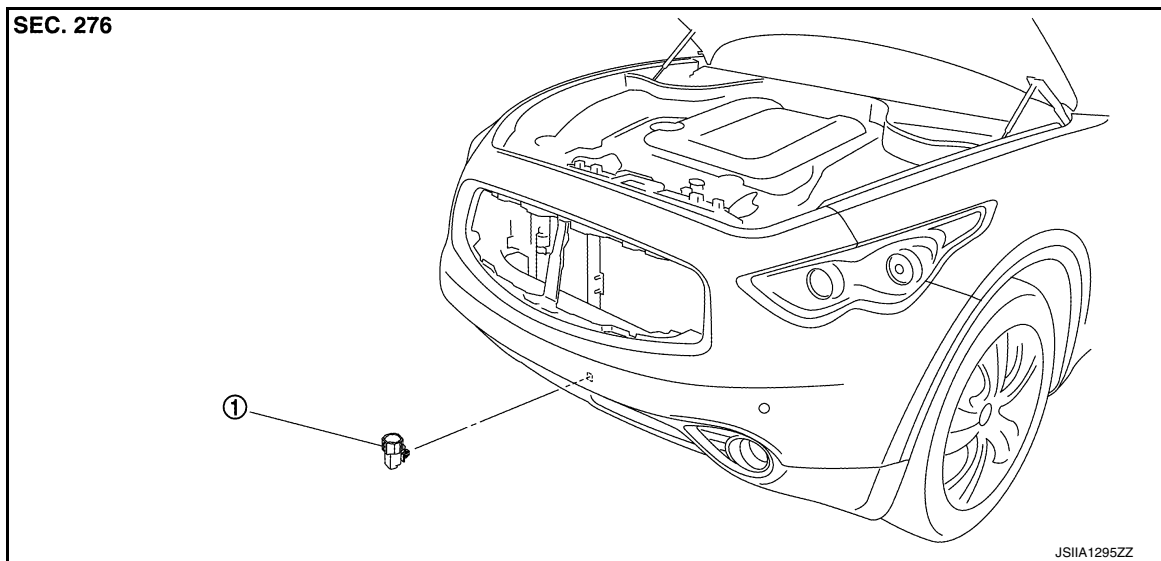
< REMOVAL AND INSTALLATION >

[AUTOMATIC AIR CONDITIONER]

AMBIENT SENSOR

Exploded View

INFOID:000000010581458



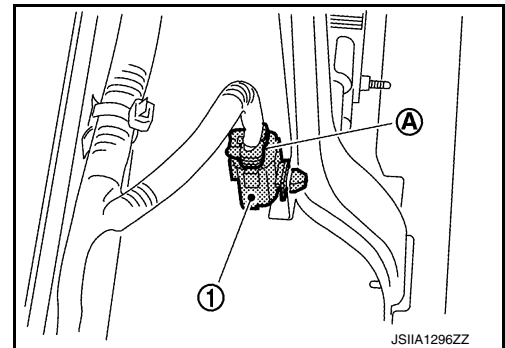
1. Ambient sensor

Removal and Installation

INFOID:000000010581459

REMOVAL

1. Remove air duct (inlet). Refer to the following.
 - Refer to [EM-29, "Exploded View"](#). (VQ35HR)
 - Refer to [EM-187, "Exploded View"](#). (VK50VE)
2. Disconnect ambient sensor connector (A), and then remove ambient sensor (1).



INSTALLATION

Install in the reverse order of removal.

IN-VEHICLE SENSOR

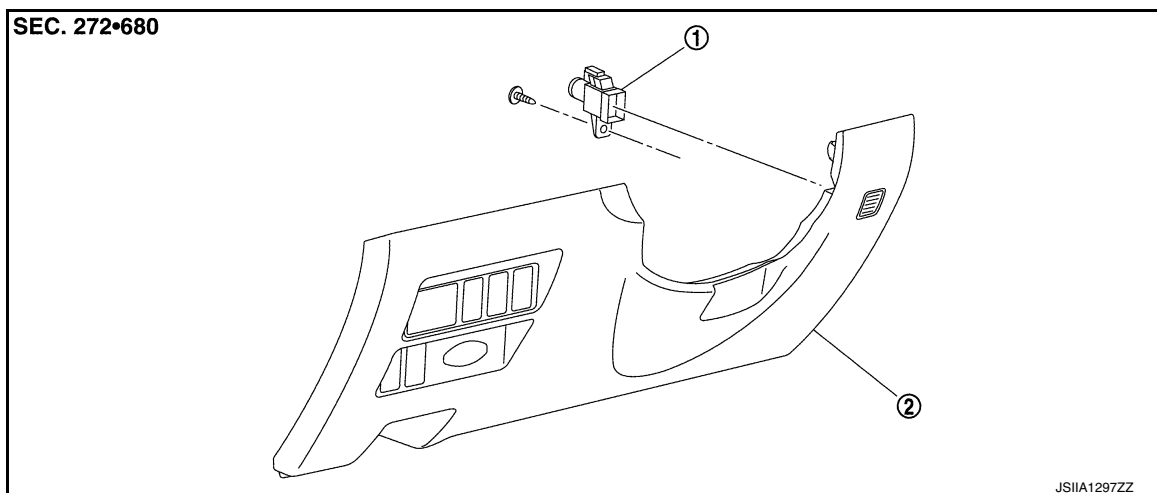
< REMOVAL AND INSTALLATION >

[AUTOMATIC AIR CONDITIONER]

IN-VEHICLE SENSOR

Exploded View

INFOID:0000000010581460



1. In-vehicle sensor

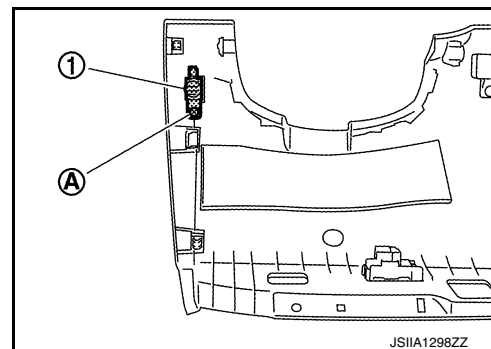
2. Instrument lower panel LH

Removal and Installation

INFOID:0000000010581461

REMOVAL

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



INSTALLATION

Install in the reverse order of removal.

SUNLOAD SENSOR

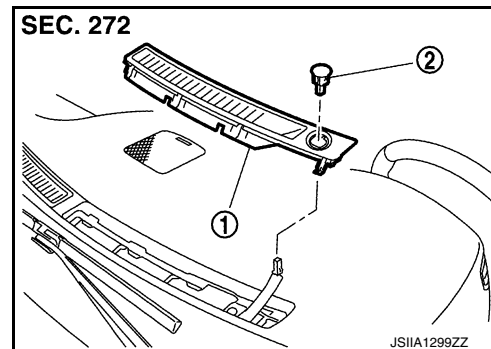
< REMOVAL AND INSTALLATION >

[AUTOMATIC AIR CONDITIONER]

SUNLOAD SENSOR

Exploded View

1. Front defroster grille LH
2. Sunload sensor



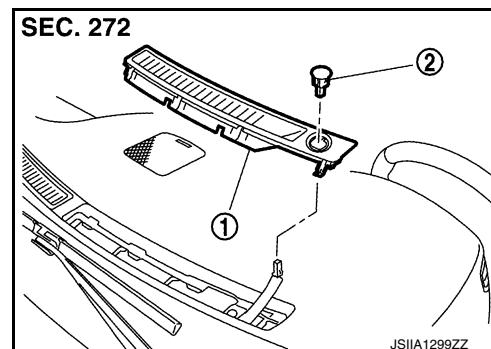
INFOID:0000000010581462

Removal and Installation

INFOID:0000000010581463

REMOVAL

1. Remove front defroster grille LH (1). Refer to [VTL-10, "Exploded View"](#).
2. Disconnect sunload sensor connector, and then remove sunload sensor (2).



INSTALLATION

Install in the reverse order of removal.

INTAKE SENSOR

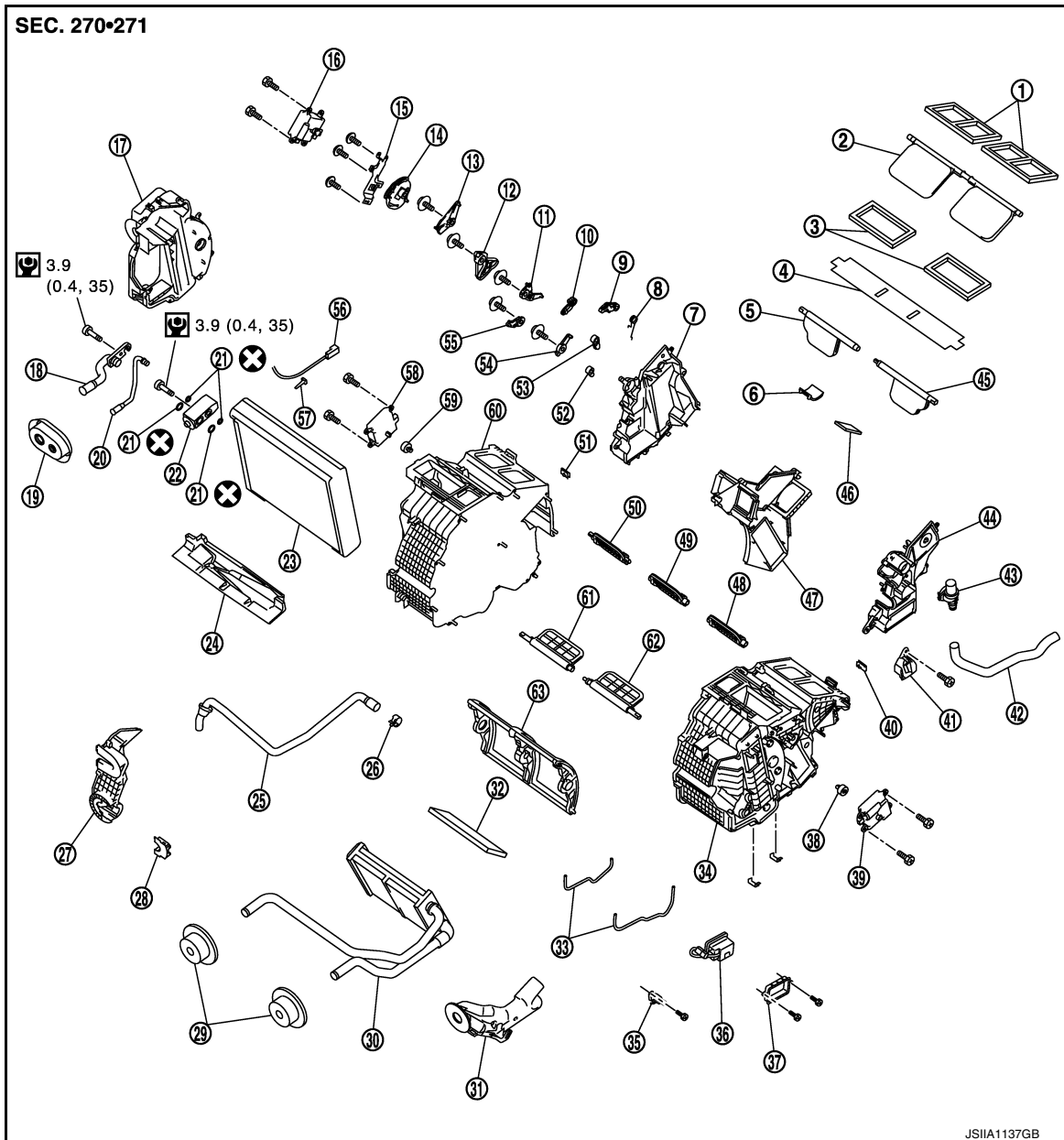
< REMOVAL AND INSTALLATION >

[AUTOMATIC AIR CONDITIONER]

INTAKE SENSOR

Exploded View

INFOID:000000010581464



- | | | |
|-----------------------------------|------------------------------|------------------------------|
| 1. Ventilator seal | 2. Ventilator door | 3. Defroster seal |
| 4. Packing | 5. Defroster door RH | 6. Packing |
| 7. Foot duct RH | 8. Ventilator door spring | 9. Ventilator door lever |
| 10. Foot door lever | 11. Foot door link | 12. Main link sub |
| 13. Ventilator door link | 14. Main link | 15. Mode door motor bracket |
| 16. Mode door motor | 17. Evaporator cover | 18. Low-pressure pipe 1 |
| 19. Cooler pipe grommet | 20. High-pressure pipe 2 | 21. O-ring |
| 22. Expansion valve | 23. Evaporator | 24. Insulator |
| 25. Drain hose | 26. Clamp | 27. Evaporator cover adapter |
| 28. Heater pipe bracket | 29. Heater pipe grommet | 30. Heater core |
| 31. Heater pipe cover | 32. Packing | 33. Case packing |
| 34. Heater & cooling unit case LH | 35. Ionizer harness bracket* | 36. Ionizer* |

INTAKE SENSOR

< REMOVAL AND INSTALLATION >

[AUTOMATIC AIR CONDITIONER]

- | | | |
|---|--------------------------|--------------------------------------|
| 37. Ionizer bracket* | 38. Air mix door adapter | 39. Air mix door motor (Driver side) |
| 40. J-nut | 41. Front heater duct | 42. Aspirator hose |
| 43. Aspirator | 44. Foot duct LH | 45. Defroster door LH |
| 46. Packing | 47. Center case | 48. Foot door LH |
| 49. Rear ventilator door | 50. Foot door RH | 51. J-nut |
| 52. Max. cool door lever | 53. Defroster door lever | 54. Defroster door link |
| 55. Max. cool door link | 56. Intake sensor | 57. Intake sensor bracket |
| 58. Air mix door motor (Passenger side) | 59. Air mix door adapter | 60. Heater & cooling unit case RH |
| 61. Max. cool door RH | 62. Max. cool door LH | 63. Air mix door (Slide door) |

Refer to [GI-4, "Components"](#) for symbols in the figure.

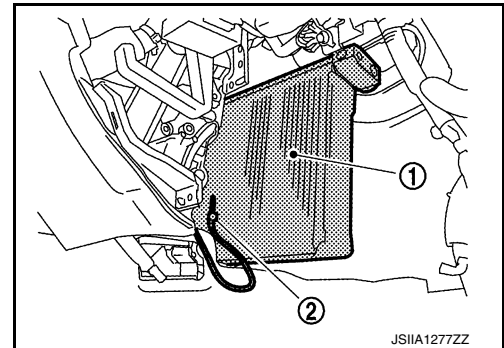
*With ACCS (ADVANCED CLIMATE CONTROL SYSTEM).

Removal and Installation

INFOID:0000000010581465

REMOVAL

1. Remove low-pressure pipe 1 and high-pressure pipe 2. Refer to the following.
 - Refer to [HA-42, "Exploded View"](#). (VQ35HR)
 - Refer to [HA-42, "Exploded View"](#). (VK50VE)
2. Slide evaporator (1) to passenger side, and then remove intake sensor (2).



3. Disconnect intake sensor connector.

INSTALLATION

Note the following items, and then install in the reverse order of removal.

CAUTION:

- Replace O-rings with new ones. Then apply compressor oil to them when installing.
- Mark the mounting position of intake sensor bracket prior to removal so that the reinstalled sensor can be located in the same position.
- Female-side piping connection 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.
- Check for leakages when recharging refrigerant.

EXHAUST GAS/OUTSIDE ODOR DETECTING SENSOR

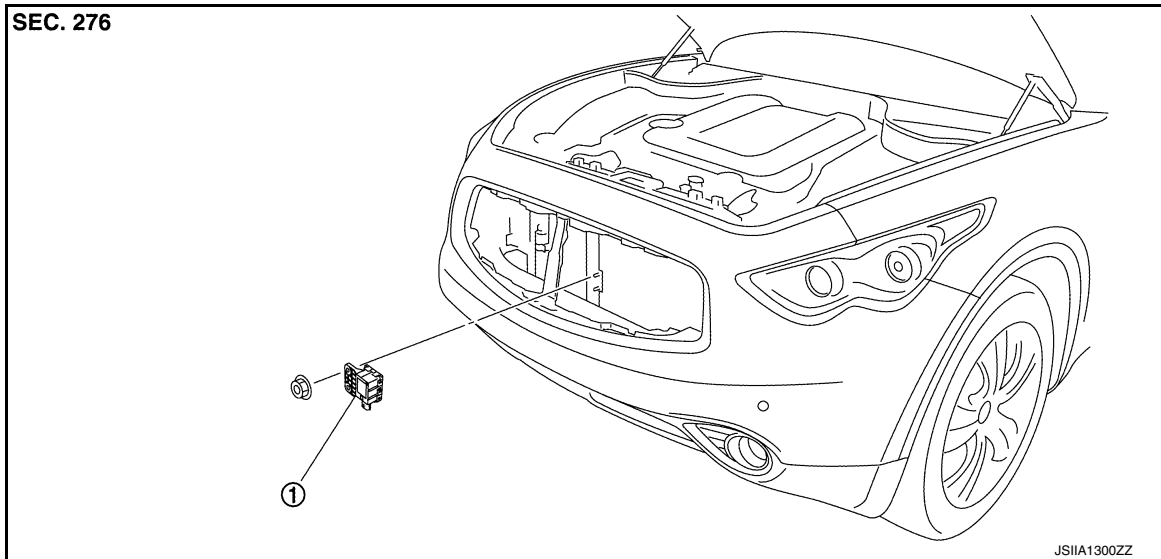
< REMOVAL AND INSTALLATION >

[AUTOMATIC AIR CONDITIONER]

EXHAUST GAS/OUTSIDE ODOR DETECTING SENSOR

Exploded View

INFOID:0000000010581466



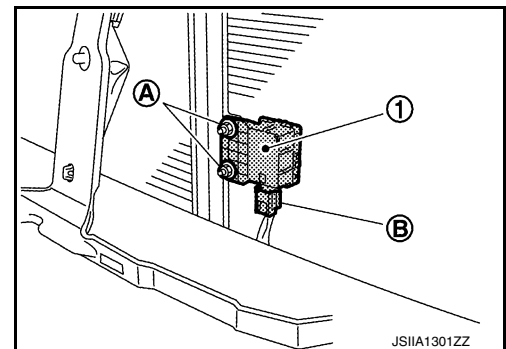
1. Exhaust gas/outside odor detecting sensor

Removal and Installation

INFOID:0000000010581467

REMOVAL

1. Remove air duct (inlet). Refer to the following.
 - Refer to [EM-29, "Exploded View"](#). (VQ35HR)
 - Refer to [EM-187, "Exploded View"](#). (VK50VE)
2. Remove mounting nuts (A), and then remove exhaust gas/outside odor detecting sensor (1).
3. Disconnect exhaust gas/outside odor detecting sensor connector (B).



INSTALLATION

Install in the reverse order of removal.

REFRIGERANT PRESSURE SENSOR

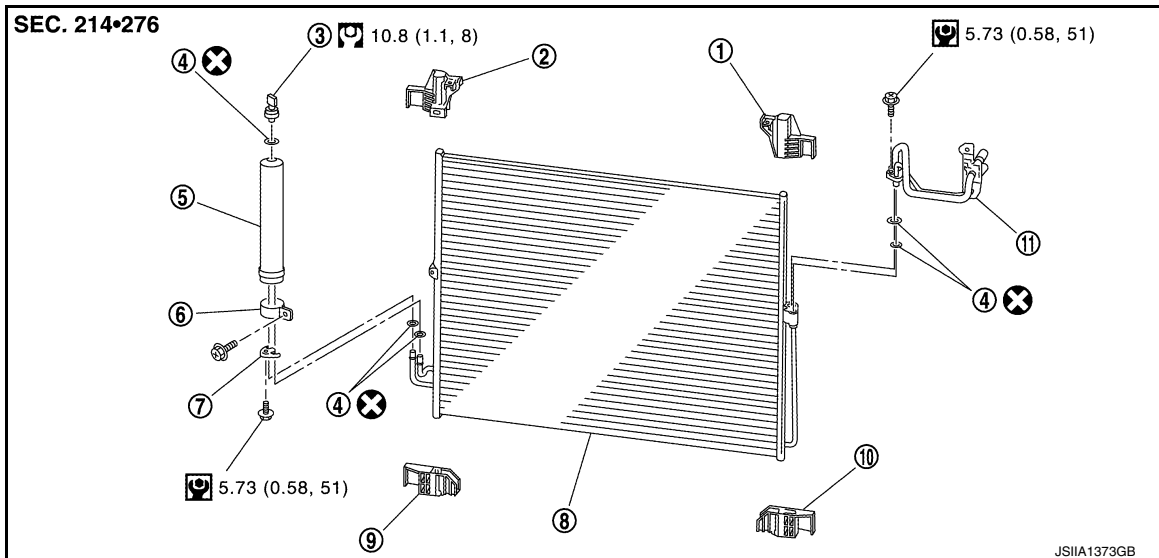
< REMOVAL AND INSTALLATION >

[AUTOMATIC AIR CONDITIONER]

REFRIGERANT PRESSURE SENSOR

Exploded View

INFOID:0000000010581468



- | | | |
|--------------------------------|-------------------------------|--------------------------------|
| 1. Condenser upper bracket LH | 2. Condenser upper bracket RH | 3. Refrigerant pressure sensor |
| 4. O-ring | 5. Liquid tank | 6. Liquid tank bracket |
| 7. Bracket | 8. Condenser | 9. Condenser lower bracket RH |
| 10. Condenser lower bracket LH | 11. Condenser pipe assembly | |

Refer to [GI-4, "Components"](#) for symbols in the figure.

Removal and Installation

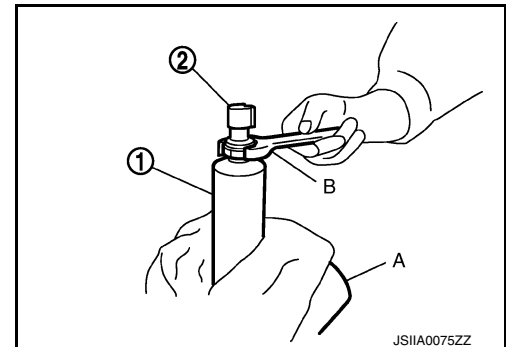
INFOID:0000000010581469

REMOVAL

1. Remove liquid tank. Refer to [HAC-201, "Exploded View"](#).
2. Fix the liquid tank (1) using a vise (A). Remove the refrigerant pressure sensor (2) using a wrench (B).

CAUTION:

Be careful not to damage liquid tank.



INSTALLATION

Note the following items, and then install in the reverse order of removal.

CAUTION:

- Replace O-ring with new one. Then apply compressor oil to them when installing.
- Check for leakages when recharging refrigerant.

DOOR MOTOR

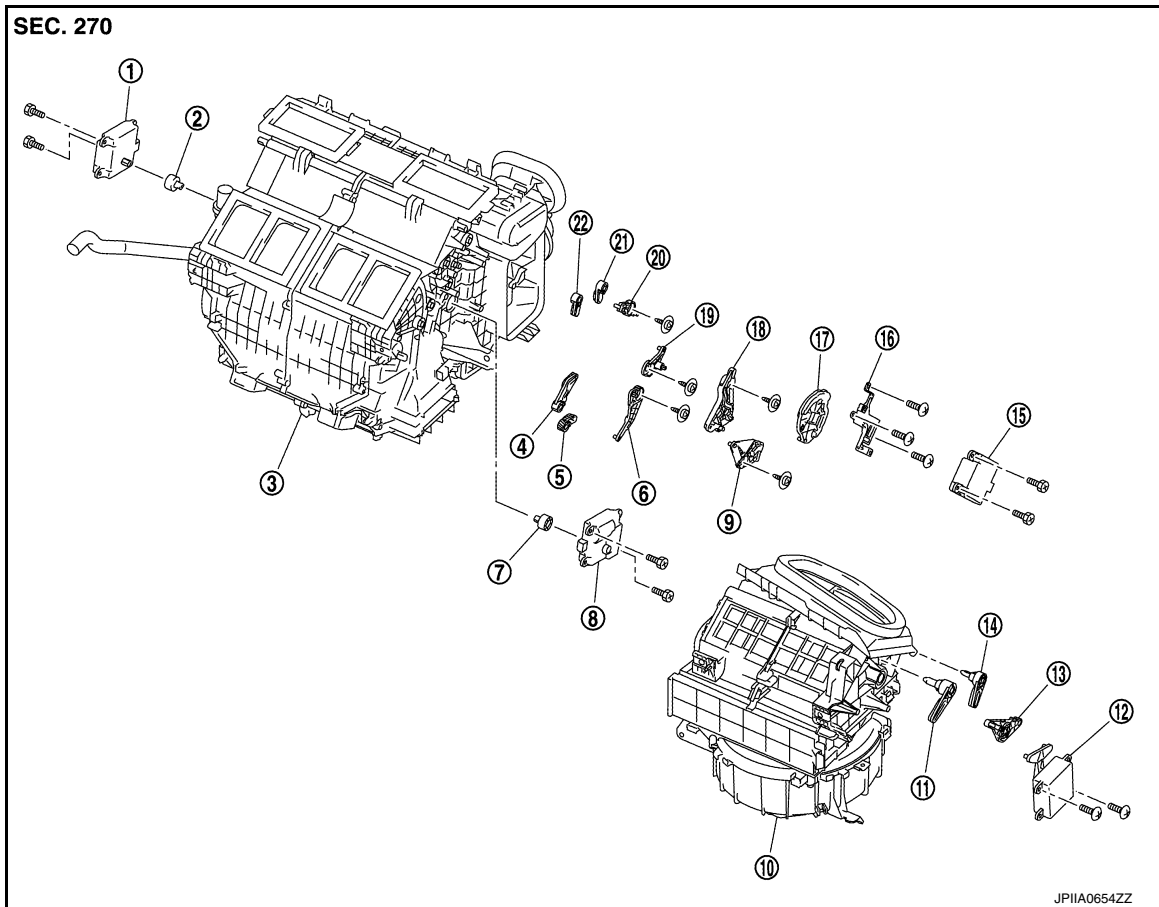
< REMOVAL AND INSTALLATION >

[AUTOMATIC AIR CONDITIONER]

DOOR MOTOR

Exploded View

INFOID:000000010581470



- | | | |
|-------------------------------------|--|-----------------------------------|
| 1. Air mix door motor (Driver side) | 2. Air mix door motor adapter | 3. Heater & cooling unit assembly |
| 4. Ventilator door lever | 5. Foot door lever | 6. Foot door link |
| 7. Air mix door motor adapter | 8. Air mix door motor (Passenger side) | 9. Ventilator door link |
| 10. Blower unit assembly | 11. Intake door lever 2 | 12. Intake door motor |
| 13. Intake door link | 14. Intake door lever 1 | 15. Mode door motor |
| 16. Mode door motor bracket | 17. Main link | 18. Main link sub |
| 19. Max.cool door link | 20. Defroster door link | 21. Max.cool door lever |
| 22. Defroster door lever | | |

MODE DOOR MOTOR

MODE DOOR MOTOR : Removal and Installation

INFOID:000000010581471

REMOVAL

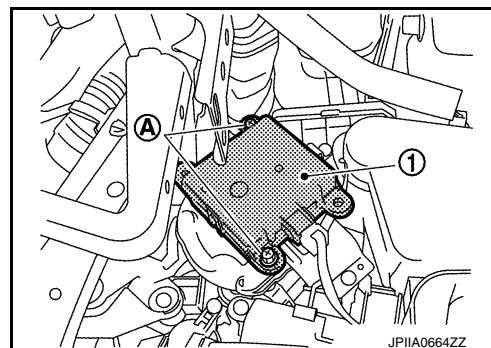
1. Remove blower unit assembly. Refer to the following.
 - Refer to [HA-59, "Exploded View"](#). (VQ35HR)
 - Refer to [HA-116, "Exploded View"](#). (VK50VE)
2. Disconnect mode door motor connector.

DOOR MOTOR

< REMOVAL AND INSTALLATION >

[AUTOMATIC AIR CONDITIONER]

3. Remove fixing screws (A), and then remove mode door motor (1).



INSTALLATION

Install in the reverse order of removal.

AIR MIX DOOR MOTOR

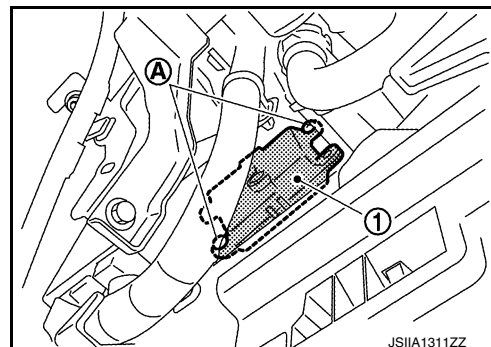
AIR MIX DOOR MOTOR : Removal and Installation

INFOID:0000000010581472

REMOVAL

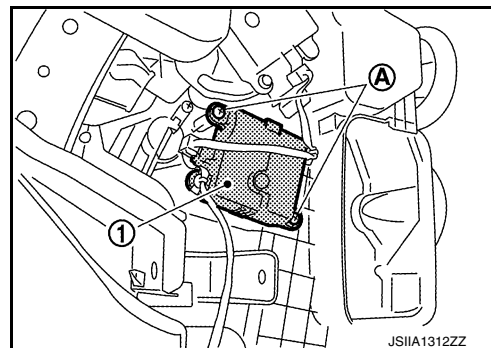
Driver Side

1. Set the temperature at full cold.
2. Disconnect the battery cable from the negative terminal.
3. Remove instrument lower panel LH. Refer to [IP-12, "Exploded View"](#).
4. Remove automatic drive positioner control unit. Refer to [ADP-217, "Exploded View"](#).
5. Disconnect air mix door motor connector.
6. Remove fixing screws (A), and then remove air mix door motor (1).



Passenger Side

1. Set the temperature at full cold.
2. Disconnect the battery cable from the negative terminal.
3. Remove blower unit assembly. Refer to the following.
 - Refer to [HA-59, "Exploded View"](#). (VQ35HR)
 - Refer to [HA-116, "Exploded View"](#). (VK50VE)
4. Disconnect air mix door motor connector.
5. Remove fixing screws (A), and then remove air mix door motor (passenger side) (1).



INSTALLATION

DOOR MOTOR

< REMOVAL AND INSTALLATION >

[AUTOMATIC AIR CONDITIONER]

Install in the reverse order of removal.

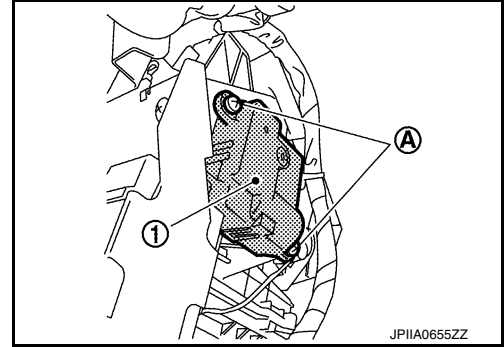
INTAKE DOOR MOTOR

INTAKE DOOR MOTOR : Removal and Installation

INFOID:0000000010581473

REMOVAL

1. Remove ECM and power steering control unit with bracket attached. Refer to the following. Refer to [STC-24, "Removal and Installation"](#).
2. Disconnect intake door motor connector.
3. Remove fixing screws (A), and then remove intake door motor (1) from blower unit assembly.



INSTALLATION

Install in the reverse order of removal.

IONIZER

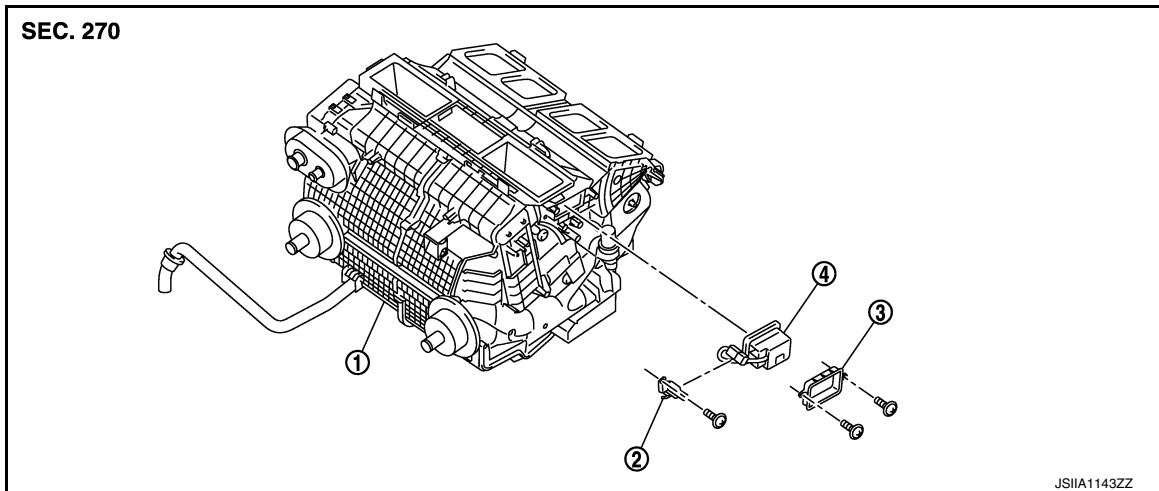
< REMOVAL AND INSTALLATION >

[AUTOMATIC AIR CONDITIONER]

IONIZER

Exploded View

INFOID:000000010581474



1. Heater & cooling unit assembly
2. Ionizer harness bracket
3. Ionizer bracket
4. Ionizer

Removal and Installation

INFOID:000000010581475

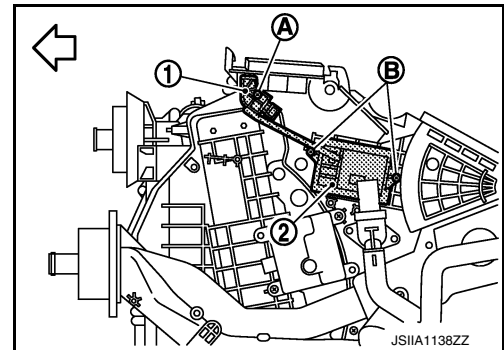
REMOVAL

1. Remove instrument lower panel LH. Refer to [IP-13, "Removal and Installation"](#).
2. Remove fixing screw (A), and then remove ionizer harness bracket (1) from heater & cooling unit assembly.
3. Remove fixing screws (B), and then remove ionizer (2).

CAUTION:

Never touch the surface (ceramic part) of ionizer. It is the discharge electrode.

← : Vehicle front



INSTALLATION

Note the following item, and then install in the reverse order of removal.

CAUTION:

If there is dirt, use a clean cloth and clean the discharge electrode (ceramic part) of ionizer.