

# SECTION HAC

## HEATER & AIR CONDITIONING CONTROL SYSTEM

### CONTENTS

<b>AUTOMATIC AIR CONDITIONER</b>		
<b>BASIC INSPECTION</b> .....	5	
<b>DIAGNOSIS AND REPAIR WORKFLOW</b> .....	5	
Work Flow .....	5	
<b>INSPECTION AND ADJUSTMENT</b> .....	6	
<b>WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM</b> .....	6	
WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Description & Inspection .....	6	
WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Temperature Setting Trimmer .....	7	
WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Foot Position Setting Trimmer .....	8	
WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Inlet Port Memory Function .....	9	
<b>WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM</b> .....	9	
WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Description & Inspection .....	9	
WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Temperature Setting Trimmer .....	11	
WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Foot Position Setting Trimmer .....	12	
WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Inlet Port Memory Function .....	13	
<b>SYSTEM DESCRIPTION</b> .....	14	
<b>COMPRESSOR CONTROL FUNCTION</b> .....	14	
<b>WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM</b> ....	14	
WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Description .....	14	
WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Fail-Safe .....	14	
WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Component Part Location .....	15	
WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Component's role .....	17	
<b>WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM</b> .....	18	
WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Description .....	18	
WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Fail-Safe .....	19	
WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Component Part Location .....	19	
WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Component's role .....	21	
<b>AUTOMATIC AIR CONDITIONER SYSTEM</b> ....	23	
<b>WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM</b> ....	23	
WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : System Diagram .....	23	
WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : System Description .....	23	

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



WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Component Part Location .....	28	<b>DIAGNOSIS SYSTEM (UNIFIED METER &amp; A/C AMP.) .....</b>	<b>53</b>
WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Component Description .....	30	<b>WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM ...</b>	<b>53</b>
<b>WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM .....</b>	<b>31</b>	WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description .....	53
WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : System Diagram .....	31	WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : CONSULT-III Function .....	58
WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : System Description .....	32	<b>WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM .....</b>	<b>59</b>
WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Component Part Location .....	37	WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description .....	59
WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Component Description .....	39	WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : CONSULT-III Function .....	64
<b>CAN COMMUNICATION SYSTEM .....</b>	<b>41</b>	<b>DTC/CIRCUIT DIAGNOSIS .....</b>	<b>66</b>
System Description .....	41	<b>MODE DOOR MOTOR .....</b>	<b>66</b>
<b>MODE DOOR CONTROL SYSTEM .....</b>	<b>42</b>	Description .....	66
System Diagram .....	42	Component Function Check .....	66
System Description .....	42	Diagnosis Procedure .....	66
<b>AIR MIX DOOR CONTROL SYSTEM .....</b>	<b>44</b>	<b>AIR MIX DOOR MOTOR .....</b>	<b>69</b>
<b>WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM ...</b>	<b>44</b>	<b>WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM ...</b>	<b>69</b>
WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : System Diagram .....	44	WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Description .....	69
WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : System Description .....	44	WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Component Function Check .....	69
<b>WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM .....</b>	<b>45</b>	WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Procedure .....	69
WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : System Diagram .....	45	<b>WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM .....</b>	<b>70</b>
WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : System Description .....	45	WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Description .....	70
<b>INTAKE DOOR CONTROL SYSTEM .....</b>	<b>47</b>	WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Component Function Check .....	71
System Diagram .....	47	WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Procedure .....	71
System Description .....	47	<b>INTAKE DOOR MOTOR .....</b>	<b>74</b>
<b>BLOWER MOTOR CONTROL SYSTEM .....</b>	<b>49</b>	Description .....	74
System Diagram .....	49	Component Function Check .....	74
System Description .....	49	Diagnosis Procedure .....	74
<b>MAGNET CLUTCH CONTROL SYSTEM .....</b>	<b>51</b>	<b>BLOWER MOTOR .....</b>	<b>76</b>
System Diagram .....	51		
System Description .....	51		

<b>WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM....</b>	76	Component Inspection .....	99	
WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Description .....	76	<b>POWER SUPPLY AND GROUND CIRCUIT FOR AUTO AMP. ....</b>	<b>101</b>	A
WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Component Function Check .....	76	Description .....	101	B
WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Procedure .....	77	Component Function Check .....	102	
WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Component Inspection .....	79	Diagnosis Procedure .....	102	C
<b>WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM .....</b>	<b>79</b>	<b>ECU DIAGNOSIS INFORMATION .....</b>	<b>103</b>	
WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Description .....	79	<b>ECM .....</b>	<b>103</b>	D
WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Component Function Check .....	80	Reference Value .....	103	
WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Procedure .....	80	<b>AUTO AMP. ....</b>	<b>121</b>	E
WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Component Inspection .....	82	Reference Value .....	121	
<b>MAGNET CLUTCH .....</b>	<b>84</b>	Wiring Diagram - AIR CONDITIONER CONTROL SYSTEM - .....	123	F
Description .....	84	Fail-Safe .....	129	
Component Function Check .....	84	<b>SYMPTOM DIAGNOSIS .....</b>	<b>131</b>	G
Diagnosis Procedure .....	84	<b>AIR CONDITIONER CONTROL .....</b>	<b>131</b>	
<b>ECV (ELECTRICAL CONTROL VALVE) .....</b>	<b>87</b>	Diagnosis Chart By Symptom .....	131	H
Description .....	87	<b>INSUFFICIENT COOLING .....</b>	<b>133</b>	
Diagnosis Procedure .....	87	Description .....	133	
<b>AMBIENT SENSOR .....</b>	<b>89</b>	Inspection procedure .....	133	HAC
Description .....	89	<b>INSUFFICIENT HEATING .....</b>	<b>135</b>	
Component Function Check .....	89	Description .....	135	
Diagnosis Procedure .....	89	Inspection procedure .....	135	J
Component Inspection .....	90	<b>NOISE .....</b>	<b>137</b>	
<b>IN-VEHICLE SENSOR .....</b>	<b>92</b>	Description .....	137	
Description .....	92	Inspection procedure .....	137	K
Component Function Check .....	92	<b>SELF-DIAGNOSIS CANNOT BE PERFORMED .....</b>	<b>139</b>	
Diagnosis Procedure .....	93	Description .....	139	
Component Inspection .....	94	Inspection procedure .....	139	L
<b>SUNLOAD SENSOR .....</b>	<b>95</b>	<b>MEMORY FUNCTION DOES NOT OPERATE. ....</b>	<b>140</b>	
Description .....	95	Description .....	140	
Component Function Check .....	95	Inspection procedure .....	140	M
Diagnosis Procedure .....	95	<b>PRECAUTION .....</b>	<b>141</b>	
Component Inspection .....	96	<b>PRECAUTIONS .....</b>	<b>141</b>	N
<b>INTAKE SENSOR .....</b>	<b>98</b>	Precaution for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER" .....	141	
Description .....	98	Precaution Necessary for Steering Wheel Rotation after Battery Disconnect .....	141	O
Component Function Check .....	98	<b>REMOVAL AND INSTALLATION .....</b>	<b>143</b>	P
Diagnosis Procedure .....	98	<b>PRESET SWITCH .....</b>	<b>143</b>	
		Exploded View .....	143	
		Removal and Installation .....	143	
		<b>UNIFIED METER AND A/C AMP. ....</b>	<b>144</b>	
		Exploded View .....	144	

Removal and Installation .....	144	<b>REFRIGERANT PRESSURE SENSOR .....</b>	<b>151</b>
<b>AMBIENT SENSOR .....</b>	<b>145</b>	Exploded View .....	151
Exploded View .....	145	Removal and Installation .....	151
Removal and Installation .....	145	<b>DOOR MOTOR .....</b>	<b>152</b>
<b>IN-VEHICLE SENSOR .....</b>	<b>146</b>	Exploded View .....	152
Exploded View .....	146	<b>INTAKE DOOR MOTOR .....</b>	<b>152</b>
Removal and Installation .....	146	INTAKE DOOR MOTOR : Removal and Installation .....	152
<b>SUNLOAD SENSOR .....</b>	<b>147</b>	<b>MODE DOOR MOTOR .....</b>	<b>153</b>
Exploded View .....	147	MODE DOOR MOTOR : Removal and Installation .....	153
Removal and Installation .....	147	<b>AIR MIX DOOR MOTOR .....</b>	<b>153</b>
<b>INTAKE SENSOR .....</b>	<b>148</b>	AIR MIX DOOR MOTOR : Removal and Installation .....	153
Exploded View .....	148		
Removal and Installation .....	150		

# DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

[AUTOMATIC AIR CONDITIONER]

## BASIC INSPECTION

### DIAGNOSIS AND REPAIR WORKFLOW

#### Work Flow

INFOID:000000004345685

#### DETAILED FLOW

#### 1. LISTEN TO CUSTOMER COMPLAINT

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

>> GO TO 2.

#### 2. VERIFY THE SYMPTOM WITH OPERATIONAL CHECK

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

>> GO TO 3.

#### 3. GO TO APPROPRIATE TROUBLE DIAGNOSIS

Go to appropriate trouble diagnosis. Refer to [HAC-131, "Diagnosis Chart By Symptom"](#).

>> GO TO 4.

#### 4. REPAIR OR REPLACE

Repair or replace the specific parts.

>> GO TO 5.

#### 5. FINAL CHECK

Final check.

Is the inspection result normal?

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

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

# INSPECTION AND ADJUSTMENT

< BASIC INSPECTION >

[AUTOMATIC AIR CONDITIONER]

## INSPECTION AND ADJUSTMENT

### WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM

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

INFOID:000000004345686

#### DESCRIPTION

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

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

#### INSPECTION PROCEDURE

##### Memory Function

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

If NG, go to trouble diagnosis procedure for [HAC-140, "Inspection procedure"](#).

If OK, continue the check.

##### Blower

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

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

If OK, continue the check.

##### Discharge Air

1. Press MODE switches and DEF switch.
2. Each position indicator turns ON.
3. Confirm that discharge air comes out according to the air distribution table. Refer to [VTL-5, "System Description"](#).

If NG, go to trouble diagnosis procedure for [HAC-66, "Diagnosis Procedure"](#).

If OK, continue the check.

#### **NOTE:**

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

##### Intake Air

1. Press intake switch. 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.)

If NG, go to trouble diagnosis procedure for [HAC-74, "Diagnosis Procedure"](#).

If OK, continue the check.

#### **NOTE:**

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

# INSPECTION AND ADJUSTMENT

[AUTOMATIC AIR CONDITIONER]

## < BASIC INSPECTION >

### A/C Switch

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

If NG, go to trouble diagnosis procedure for [HAC-84, "Diagnosis Procedure"](#).

If OK, continue the check.

### Temperature Decrease

1. Turn temperature control dial counterclockwise until 18°C (64°F) is displayed.
2. Check for cool air at discharge air outlets.

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

If OK, continue the check.

### Temperature Increase

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

If NG, go to trouble diagnosis procedure for [HAC-135, "Inspection procedure"](#).

If OK, continue the check.

### Auto Mode

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

If NG, go to trouble diagnosis procedure for [HAC-102, "Diagnosis Procedure"](#), then if necessary, trouble diagnosis procedure for [HAC-84, "Diagnosis Procedure"](#).

Go to Incident Simulation Tests in [GI-36, "Work Flow"](#) and perform tests as outlined to simulate driving conditions environment. If all operational checks are OK (symptom cannot be duplicated). Refer to [HAC-131, "Diagnosis Chart By Symptom"](#) and perform applicable trouble diagnosis procedures if symptom appears.

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

INFOID:000000004345687

### 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-53, "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#).
2. Turn fan control dial clockwise to set system in auxiliary mode.
3. Display shows "61" in auxiliary mechanism. It takes approximately 3 seconds to enable setting operation.
4. Turn temperature control dial as desired. Temperature will change at a rate of  $0.5^{\circ}\text{C}$  ( $1.0^{\circ}\text{F}$ ) each time a dial is turned.

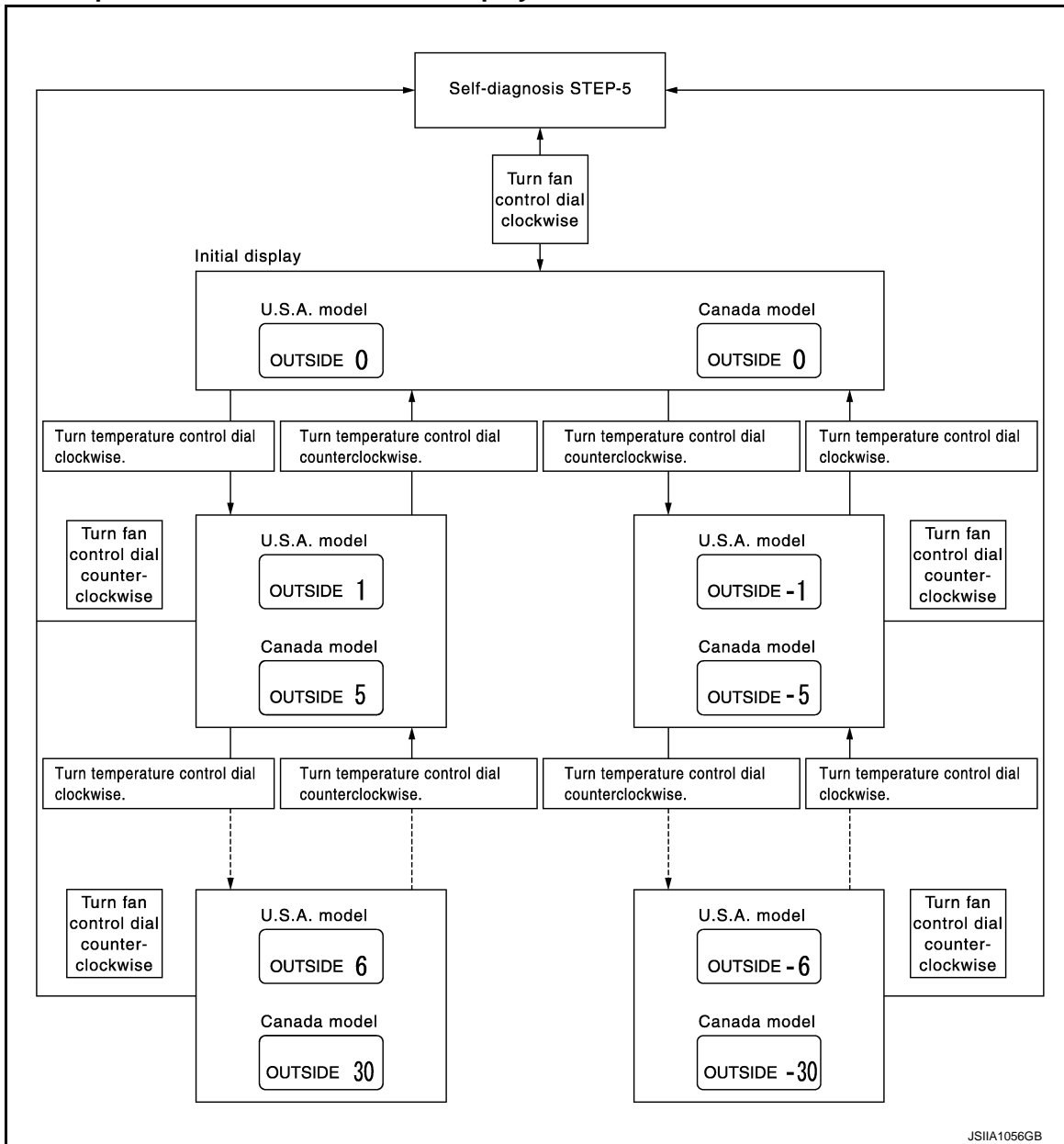
**CAUTION:**

# INSPECTION AND ADJUSTMENT

< BASIC INSPECTION >

[AUTOMATIC AIR CONDITIONER]

A decimal point is not indicated on the display.



JSIIA1056GB

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

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

INFOID:000000004345688

### 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-53, "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#).
2. Turn fan control dial clockwise to set system in auxiliary mode.



# INSPECTION AND ADJUSTMENT

< BASIC INSPECTION >

[AUTOMATIC AIR CONDITIONER]

3. Press each mode switch as desired.

Display	Discharge air flow									
	Automatically controls the mode door					Manually controls the mode door				
	VENT		FOOT		DEF	VENT		FOOT		DEF
	Front	Rear	Front	Rear		Front	Rear	Front	Rear	
	10%	12%	33%	22%	23%	10%	12%	33%	22%	23%
	10%	12%	33%	22%	23%	13%	16%	43%	28%	—
	13%	16%	43%	28%	—	10%	12%	33%	22%	23%
	13%	16%	43%	28%	—	13%	16%	43%	28%	—

JSIIA0894GB

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

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

INFOID:000000004345689

### 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-53, "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#).
2. Turn fan control dial clockwise to set system in auxiliary mode.
3. Press intake switch as desired.

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	

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

## WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM

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

INFOID:000000004345690

### DESCRIPTION

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

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

### INSPECTION PROCEDURE

Memory Function

# INSPECTION AND ADJUSTMENT

[AUTOMATIC AIR CONDITIONER]

## < BASIC INSPECTION >

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

If NG, go to trouble diagnosis procedure for [HAC-140, "Inspection procedure"](#).

If OK, continue the check.

### Blower

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

If NG, go to trouble diagnosis procedure for [HAC-80, "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Procedure"](#).

If OK, continue the check.

### Discharge Air

1. Press MODE switch and DEF switch.
2. Each position indicator should change shape.
3. Confirm that discharge air comes out according to the air distribution table. Refer to [VTL-5, "System Description"](#).

If NG, go to trouble diagnosis procedure for [HAC-66, "Diagnosis Procedure"](#).

If OK, continue the check.

### NOTE:

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

### Intake Air

1. Press intake switch. 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.)

If NG, go to trouble diagnosis procedure for [HAC-74, "Diagnosis Procedure"](#).

If OK, continue the check.

### NOTE:

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

### A/C Switch

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

If NG, go to trouble diagnosis procedure for [HAC-84, "Diagnosis Procedure"](#).

If OK, continue the check.

### Temperature Decrease

1. Turn temperature control dial (driver side) counterclockwise until 18°C (64°F) is displayed.
2. Check for cool air at discharge air outlets.

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

If OK, continue the check.

### Temperature Increase

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

If NG, go to trouble diagnosis procedure for [HAC-135, "Inspection procedure"](#).

# INSPECTION AND ADJUSTMENT

[AUTOMATIC AIR CONDITIONER]

< BASIC INSPECTION >

If OK, continue the check.

Auto Mode

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

If NG, go to trouble diagnosis procedure for [HAC-102, "Diagnosis Procedure"](#), then if necessary, trouble diagnosis procedure for [HAC-84, "Diagnosis Procedure"](#).

Go to Incident Simulation Tests in [GI-36, "Work Flow"](#) and perform tests as outlined to simulate driving conditions environment if all operational checks are OK (symptom cannot be duplicated). Refer to [HAC-131, "Diagnosis Chart By Symptom"](#) and perform applicable trouble diagnosis procedures if symptom appears.

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

INFOID:000000004345691

### 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-59, "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#).
2. Press fan (UP: +) switch to set system in auxiliary mode.
3. Display shows "61" in auxiliary mechanism. It takes approximately 3 seconds to enable setting operation.
4. Turn temperature control dial (driver side) as desired. Temperature will change at a rate of  $0.5^{\circ}\text{C}$  ( $1.0^{\circ}\text{F}$ ) each time a dial is turned.

**CAUTION:**

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

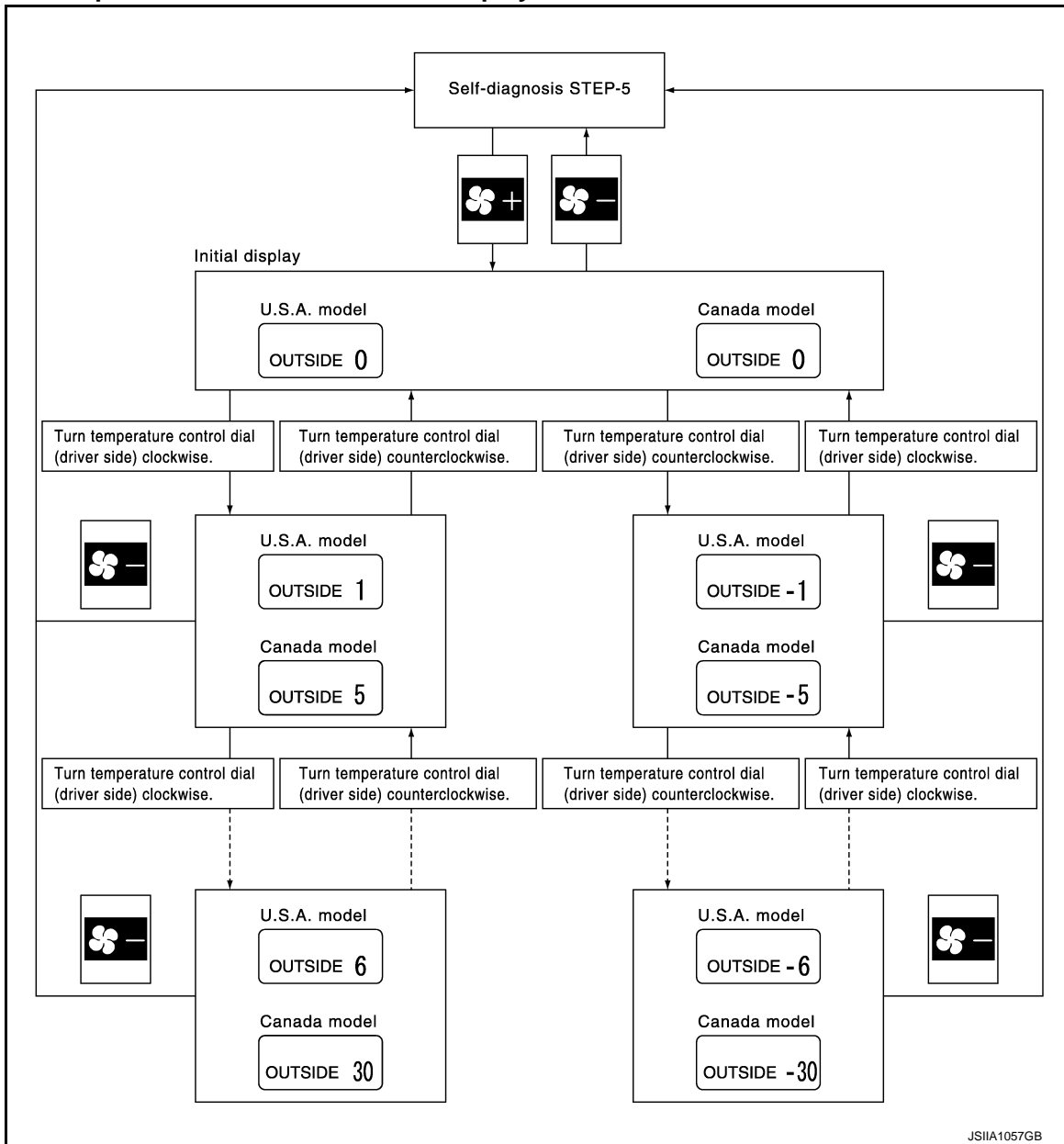
HAC

# INSPECTION AND ADJUSTMENT

< BASIC INSPECTION >

[AUTOMATIC AIR CONDITIONER]

A decimal point is not indicated on the display.



JSIIA1057GB

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

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

INFOID:000000004345692

### 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-59, "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#).
2. Press fan (UP:+) switch to set system in auxiliary mode.

# INSPECTION AND ADJUSTMENT

< BASIC INSPECTION >

[AUTOMATIC AIR CONDITIONER]

3. Press mode switch as desired.

Display	Discharge air flow									
	Automatically controls the mode door					Manually controls the mode door				
	VENT		FOOT		DEF	VENT		FOOT		DEF
	Front	Rear	Front	Rear		Front	Rear	Front	Rear	
	10%	12%	33%	22%	23%	10%	12%	33%	22%	23%
	10%	12%	33%	22%	23%	13%	16%	43%	28%	—
	13%	16%	43%	28%	—	10%	12%	33%	22%	23%
	13%	16%	43%	28%	—	13%	16%	43%	28%	—

JSIIA0894GB

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

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

INFOID:000000004345693

### 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, "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#).
2. Press fan (UP:+) switch to set system in auxiliary mode.
3. Press intake switch as desired.

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	

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

# COMPRESSOR CONTROL FUNCTION

[AUTOMATIC AIR CONDITIONER]

< SYSTEM DESCRIPTION >

## SYSTEM DESCRIPTION

### COMPRESSOR CONTROL FUNCTION

WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM

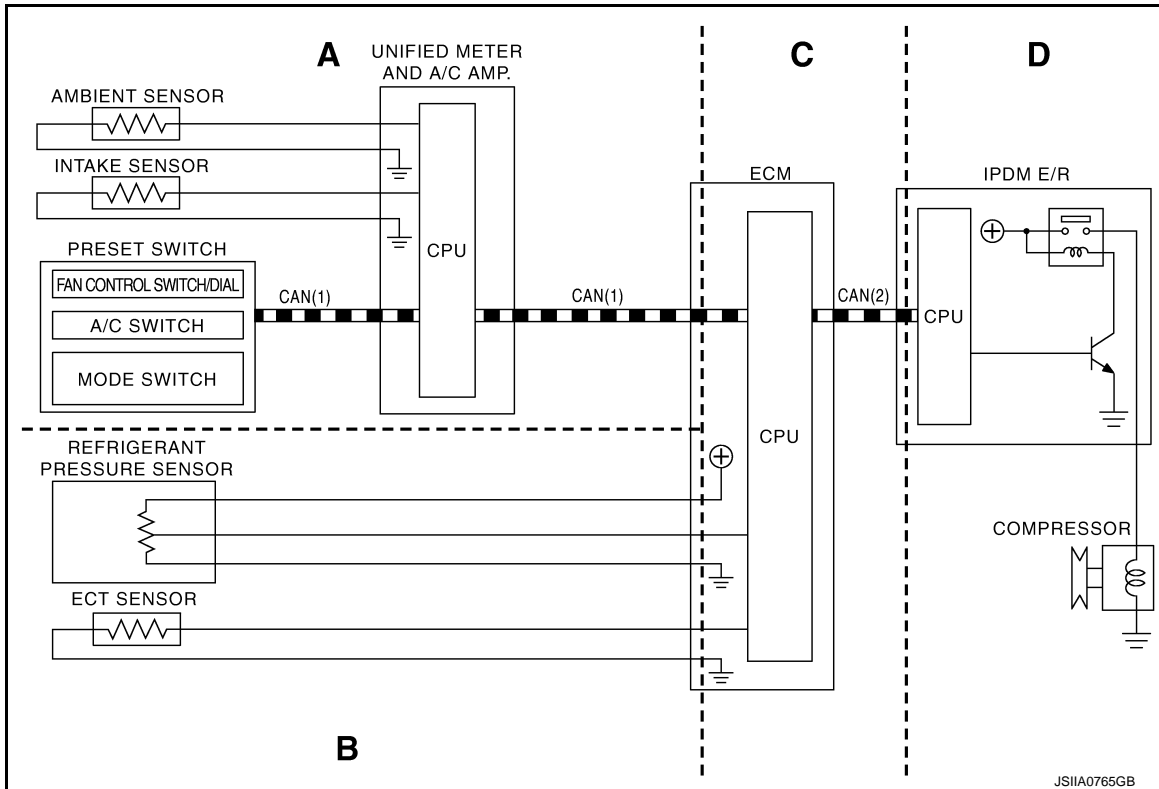
WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Description

INFOID:000000004345694

### 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

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

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

INFOID:000000004345695

### FAIL-SAFE FUNCTION

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

# COMPRESSOR CONTROL FUNCTION

< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]

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

A

B

C

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

INFOID:000000004345696

D

ENGINE COMPARTMENT

E

F

G

H

HAC

J

K

L

M

N

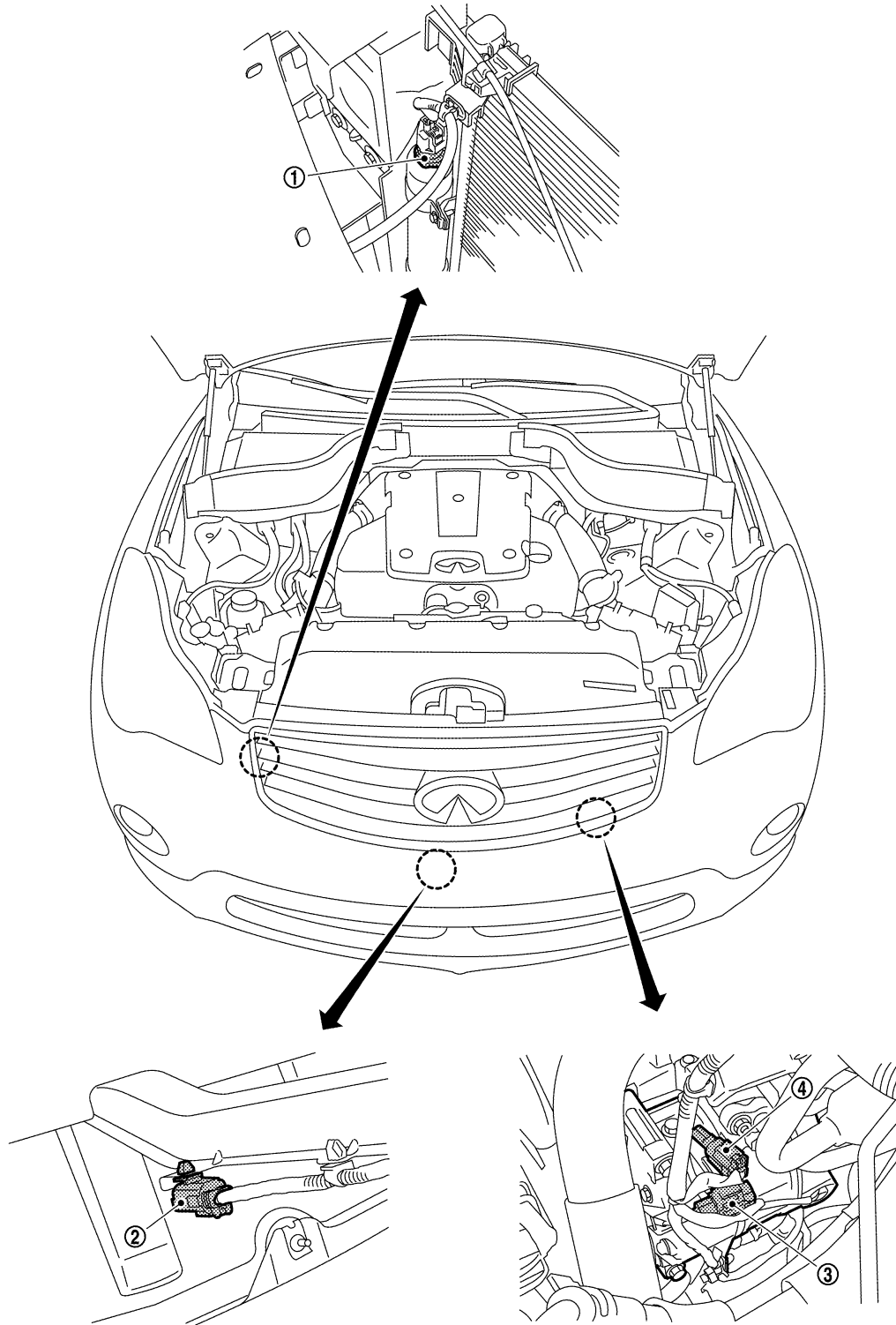
O

P

# COMPRESSOR CONTROL FUNCTION

< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]



JPIIA0715ZZ

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

- 2. Ambient sensor

- 3. Compressor (magnet clutch)

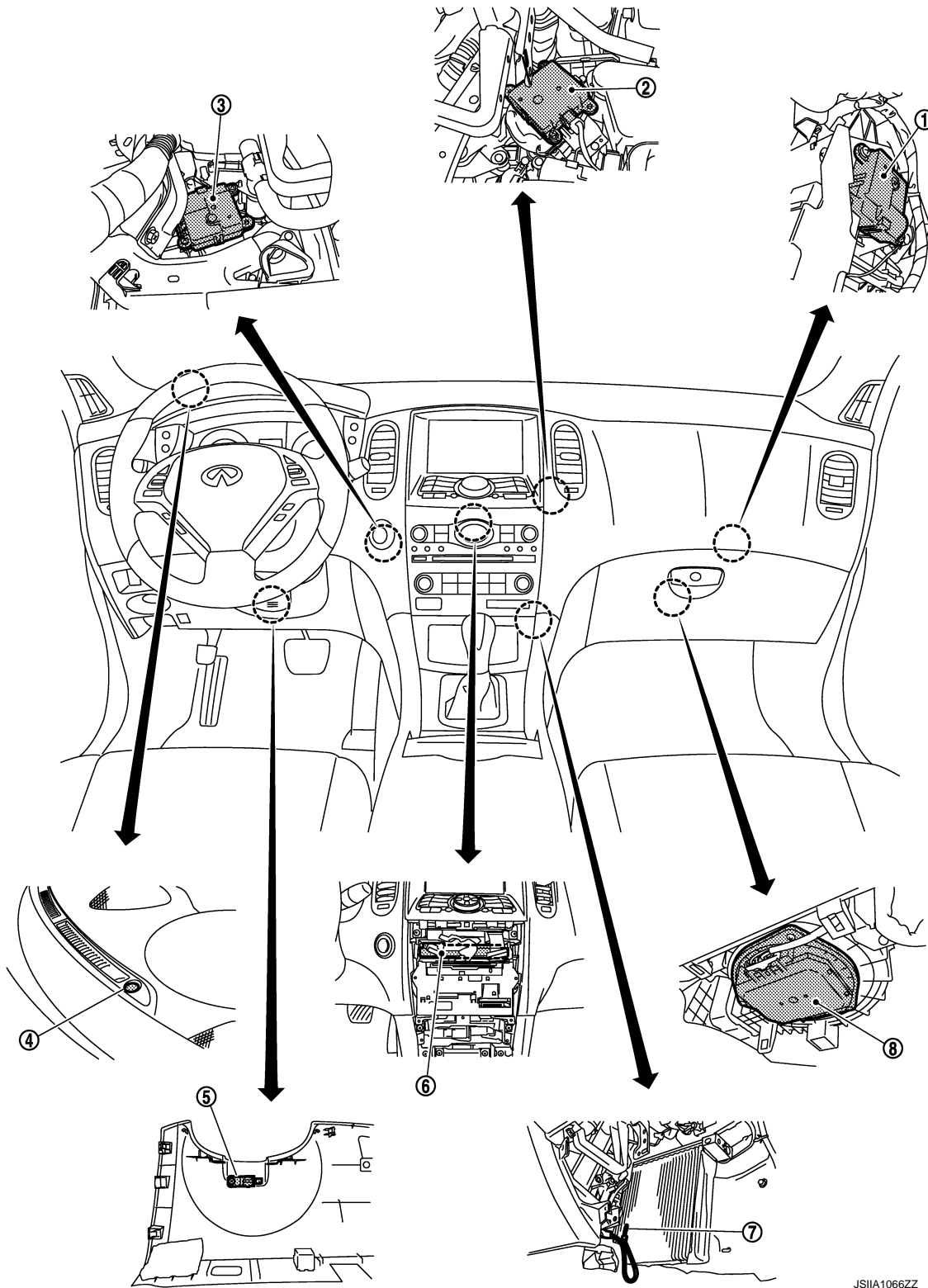
PASSENGER COMPARTMENT



# COMPRESSOR CONTROL FUNCTION

< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]



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

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

JSIA1066ZZ

WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CON-

# COMPRESSOR CONTROL FUNCTION

< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]

## TROL SYSTEM : Component's role

INFOID:000000004345697

Component	Reference
Air mix door motor	<a href="#">HAC-69. "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Description"</a>
Ambient sensor	<a href="#">HAC-89. "Description"</a>
Blower motor	<a href="#">HAC-76. "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Description"</a>
Compressor	<a href="#">HAC-84. "Description"</a>
intake door motor	<a href="#">HAC-74. "Description"</a>
intake sensor	<a href="#">HAC-98. "Description"</a>
In-vehicle sensor	<a href="#">HAC-92. "Description"</a>
Mode door motor	<a href="#">HAC-66. "Description"</a>
Refrigerant pressure sensor	<a href="#">EC-490. "Description"</a>
Sunload sensor	<a href="#">HAC-95. "Description"</a>
Unified meter and A/C amp.	<a href="#">HAC-101. "Description"</a>

## WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM

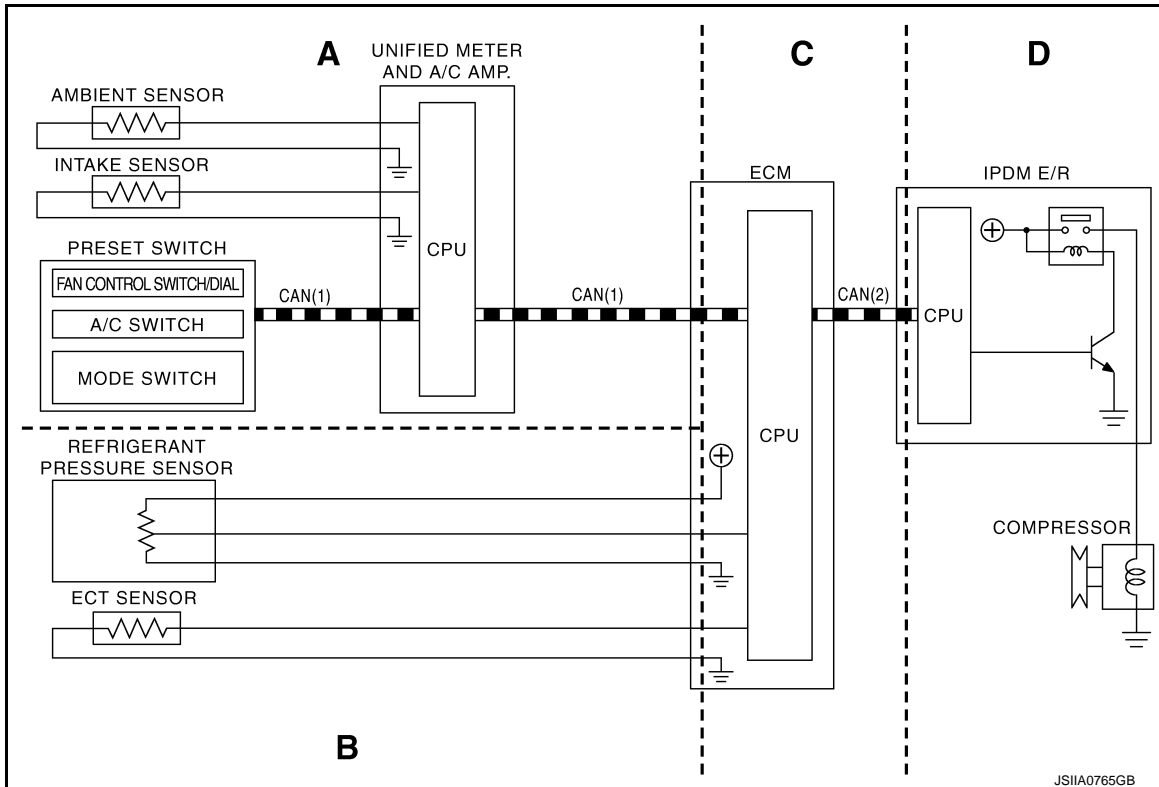
## WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Description

INFOID:000000004345698

### PRINCIPLE OF OPERATION

Compressor is not activated.

Functional circuit diagram



JS1IA0765GB

# 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

A

Functional initial inspection chart

B

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

C

D

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

INFOID:000000004345699

E

### FAIL-SAFE FUNCTION

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

F

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

G

H

HAC

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

INFOID:000000004345700

J

### ENGINE COMPARTMENT

K

L

M

N

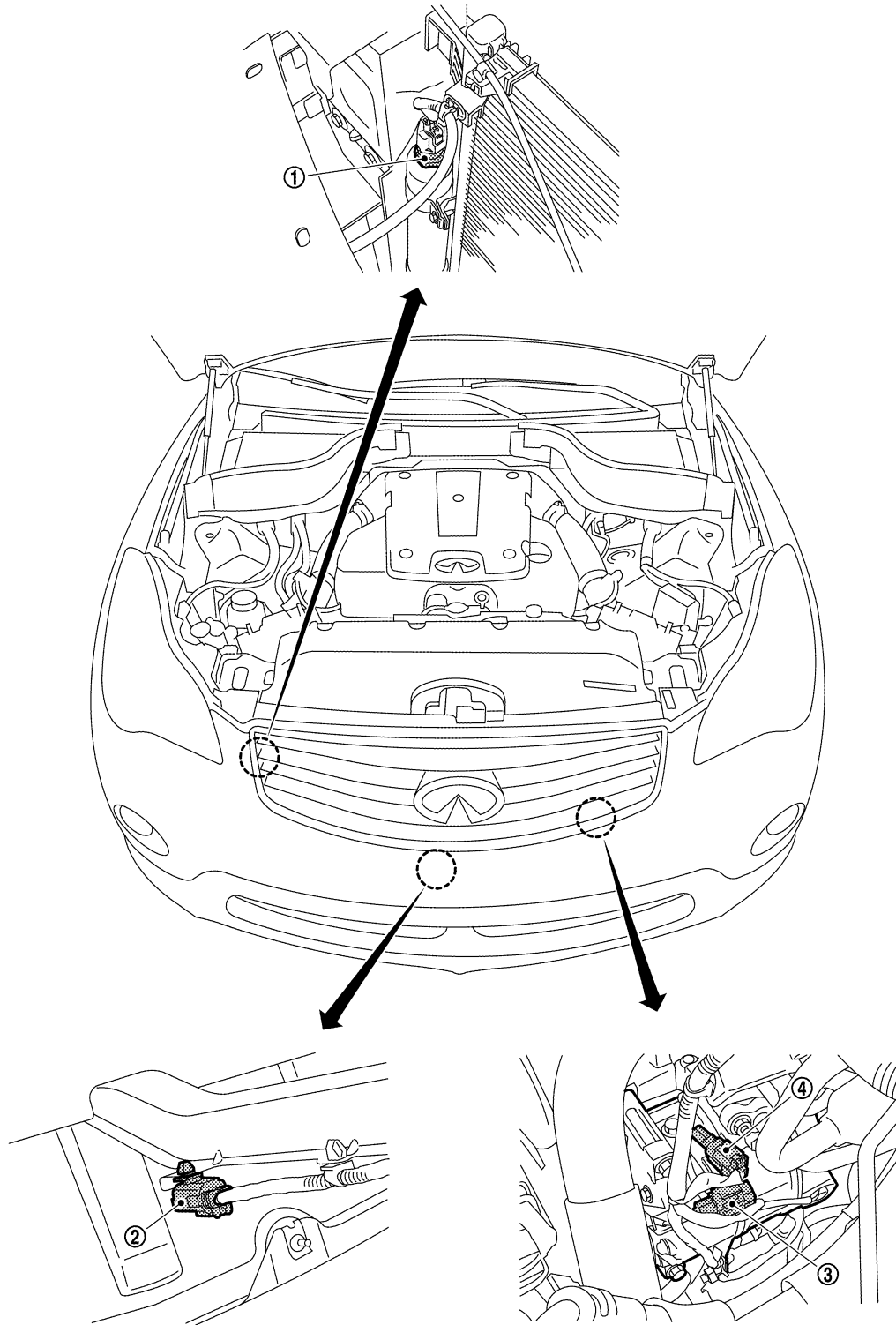
O

P

# COMPRESSOR CONTROL FUNCTION

< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]



JPIIA0715ZZ

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

- 2. Ambient sensor

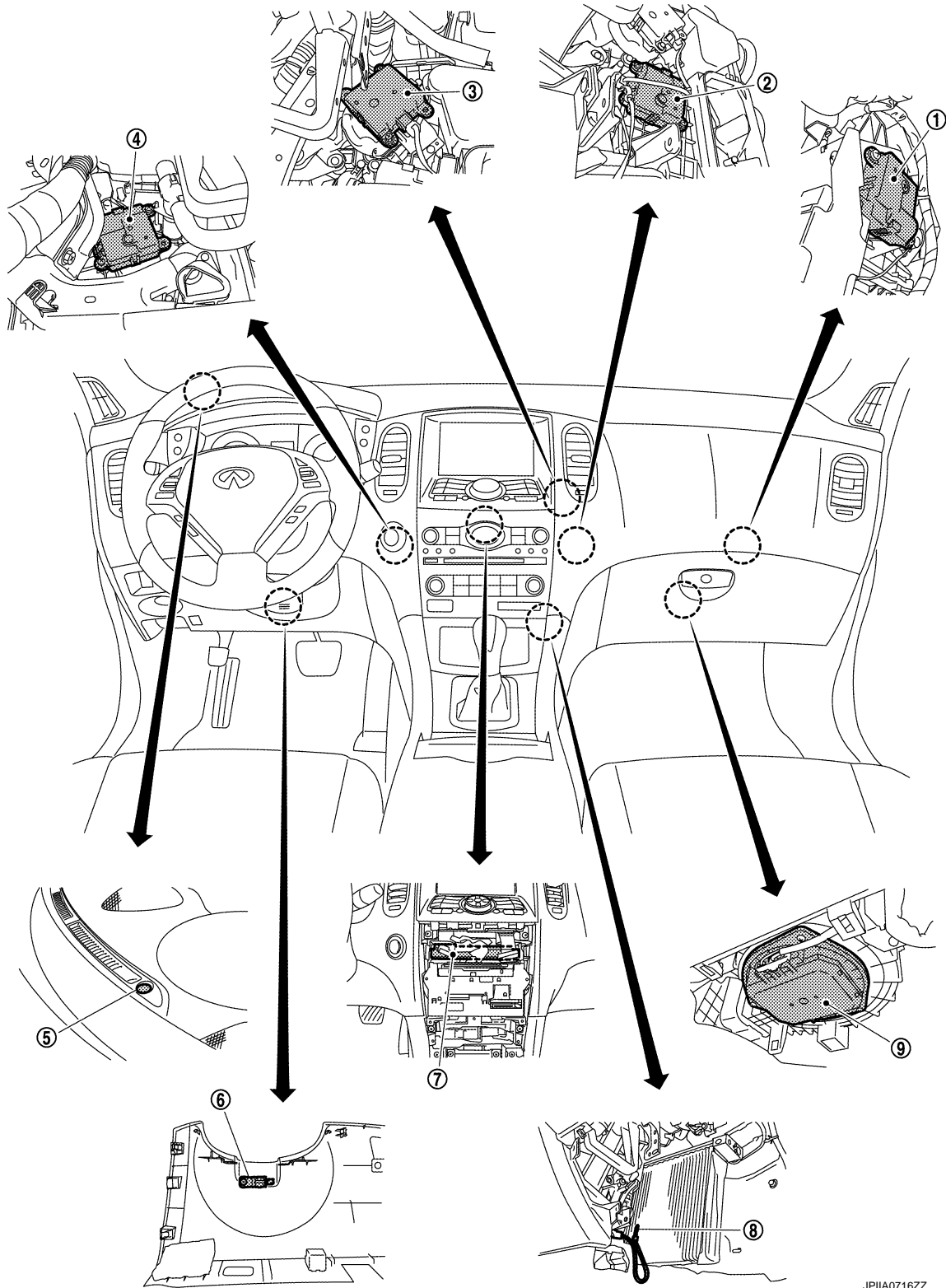
- 3. Compressor (magnet clutch)

PASSENGER COMPARTMENT

# COMPRESSOR CONTROL FUNCTION

< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]



- |                                     |  |                      |
|-------------------------------------|--|----------------------|
| 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 LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL

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

JPIIA0716ZZ

# COMPRESSOR CONTROL FUNCTION

< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]

SYSTEM : Component's role

INFOID:000000004345701

Component	Reference
Air mix door motor	<a href="#">HAC-70. "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Description"</a>
Ambient sensor	<a href="#">HAC-89. "Description"</a>
Blower motor	<a href="#">HAC-79. "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Description"</a>
Compressor	<a href="#">HAC-84. "Description"</a>
intake door motor	<a href="#">HAC-74. "Description"</a>
intake sensor	<a href="#">HAC-98. "Description"</a>
In-vehicle sensor	<a href="#">HAC-92. "Description"</a>
Mode door motor	<a href="#">HAC-66. "Description"</a>
Refrigerant pressure sensor	<a href="#">EC-490. "Description"</a>
Sunload sensor	<a href="#">HAC-95. "Description"</a>
Unified meter and A/C amp.	<a href="#">HAC-101. "Description"</a>

# AUTOMATIC AIR CONDITIONER SYSTEM

< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]

## AUTOMATIC AIR CONDITIONER SYSTEM

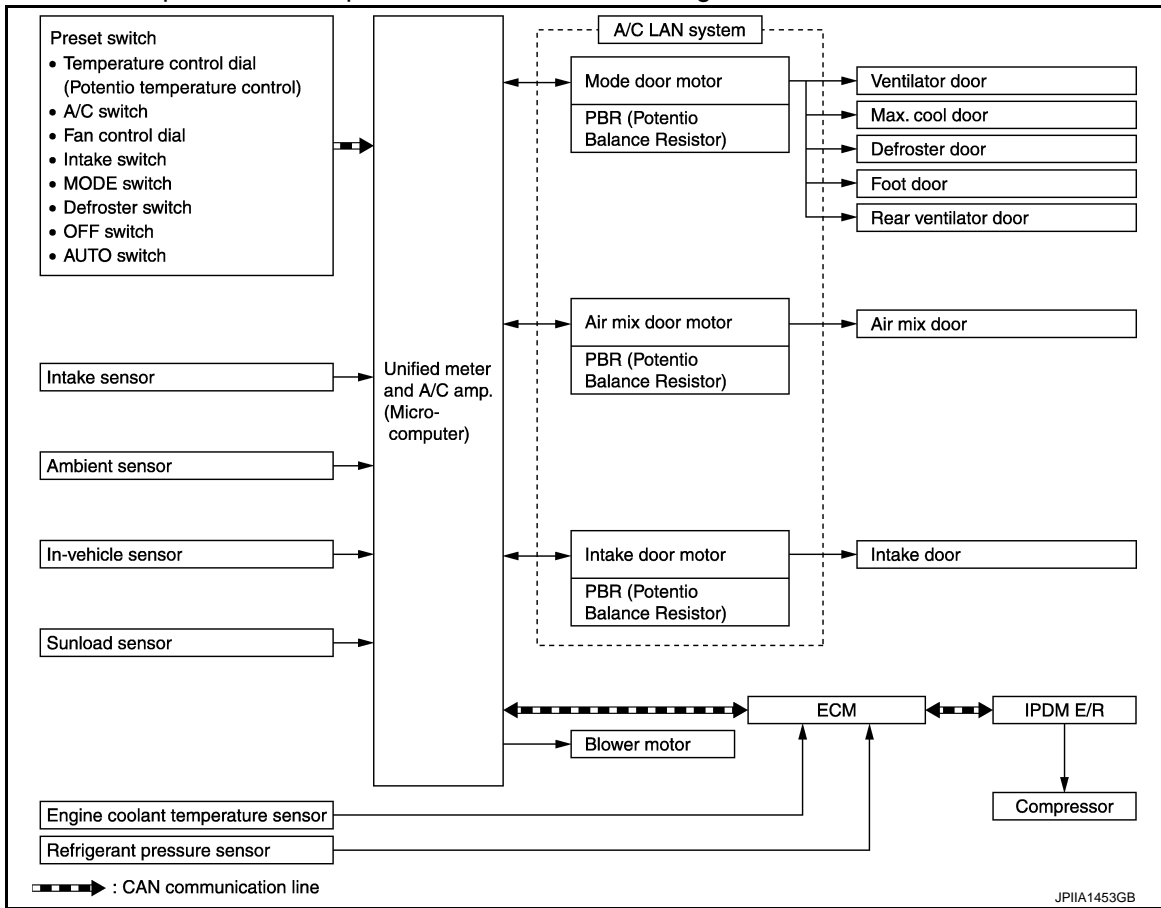
WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM

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

INFOID:000000004345702

### CONTROL SYSTEM

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



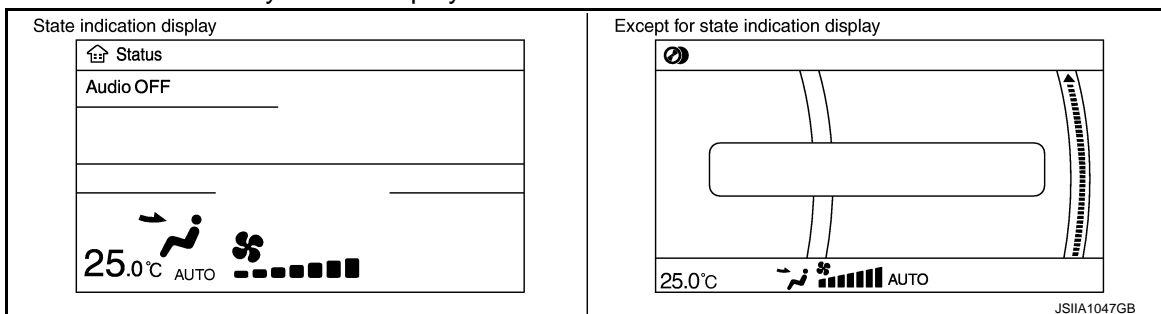
WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : System Description

INFOID:000000004345703

### CONTROL OPERATION

#### Display Screen

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

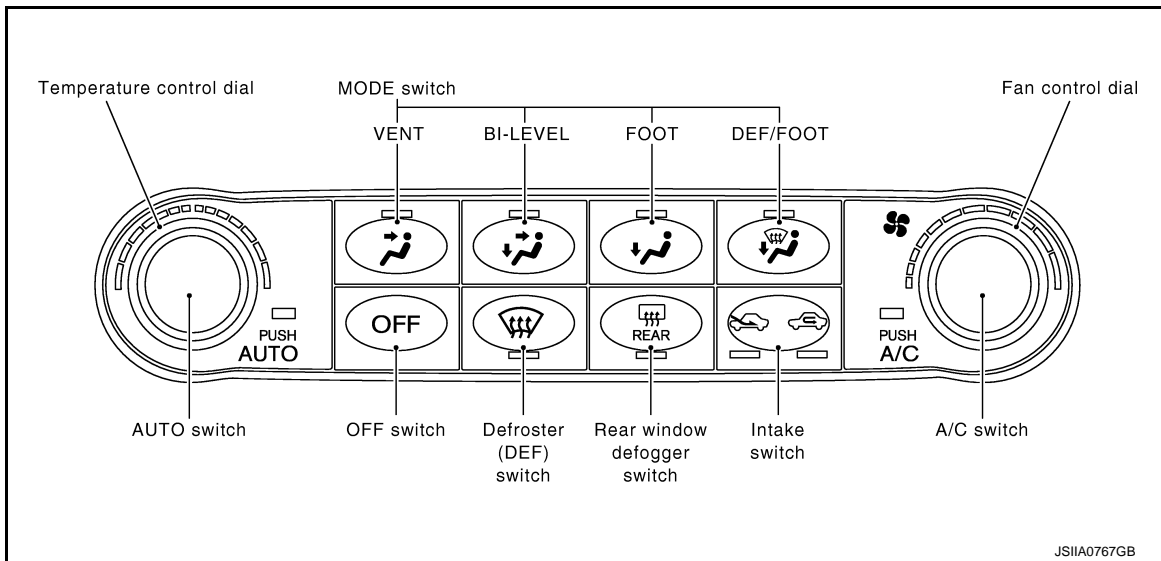


# AUTOMATIC AIR CONDITIONER SYSTEM

< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]

Preset Switch



## MODE Switch

The air discharge outlets is controlled with these switches.

## Temperature Control Dial (Potentio Temperature Control)

The set temperature is increased or decreased with this dial.

## AUTO Switch

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

## Defroster (DEF) Switch

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

## A/C Switch

Compressor is ON or OFF with this switch.

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

## Fan Control Dial

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

## OFF Switch

Compressor and blower are OFF, 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). REC mode can be re-entered by pressing intake switch again, and then compressor is turned ON. (Except D/F or DEF position)

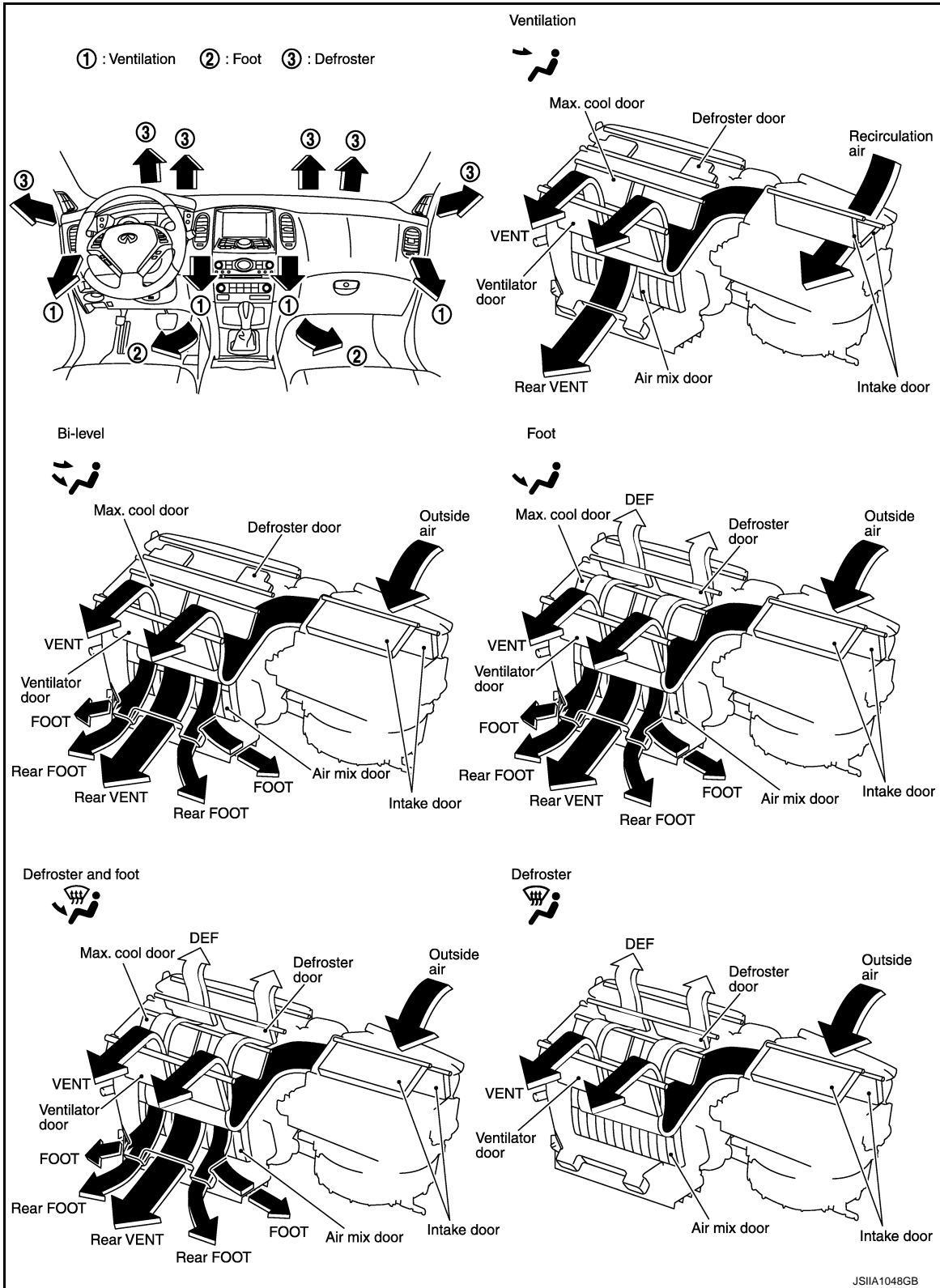


# AUTOMATIC AIR CONDITIONER SYSTEM

< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]

## DISCHARGE AIR FLOW



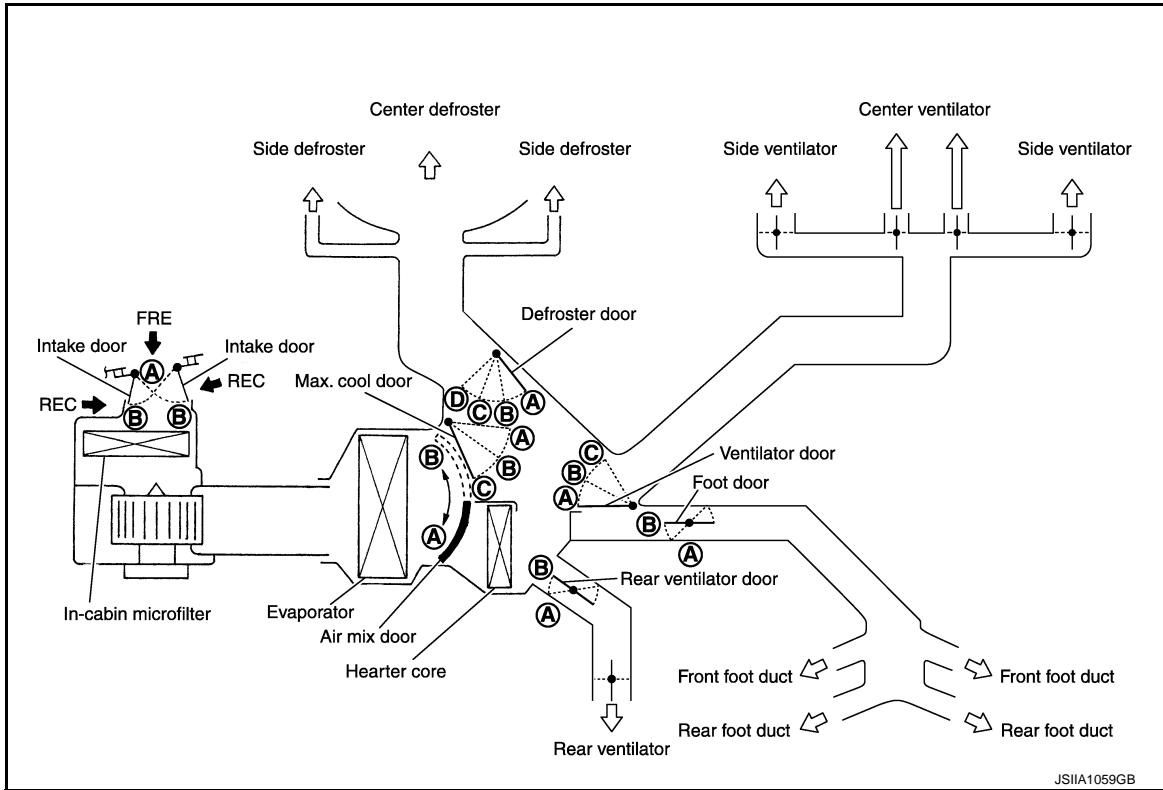
A  
B  
C  
D  
E  
F  
G  
H  
HAC  
J  
K  
L  
M  
N  
O  
P

# AUTOMATIC AIR CONDITIONER SYSTEM

< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]

## SWITCHES AND THEIR CONTROL FUNCTION



JSIIA1059GB

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

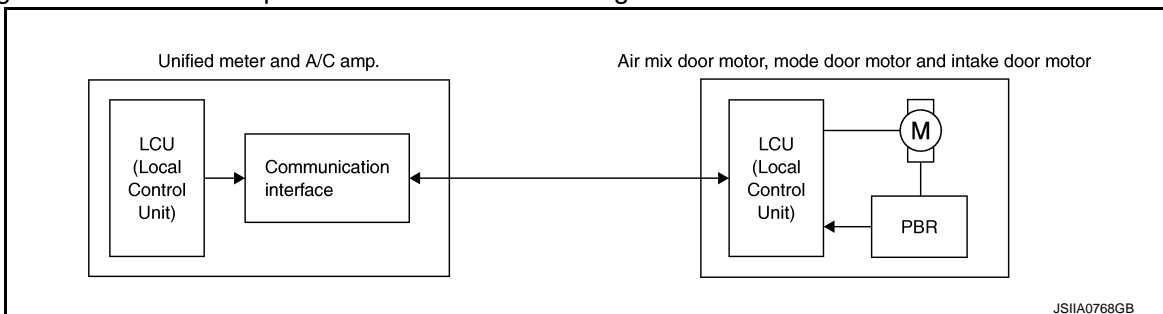
\*:Inlet status is displayed by LED when activating automatic control.

JSIIA1016GB

## AIR CONDITIONER LAN CONTROL SYSTEM

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

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



JSIIA0768GB

# AUTOMATIC AIR CONDITIONER SYSTEM

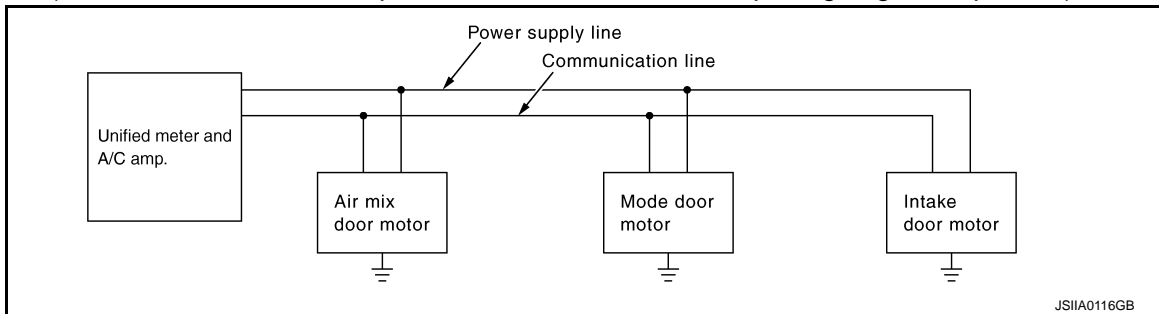
[AUTOMATIC AIR CONDITIONER]

< SYSTEM DESCRIPTION >

## SYSTEM CONSTRUCTION

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

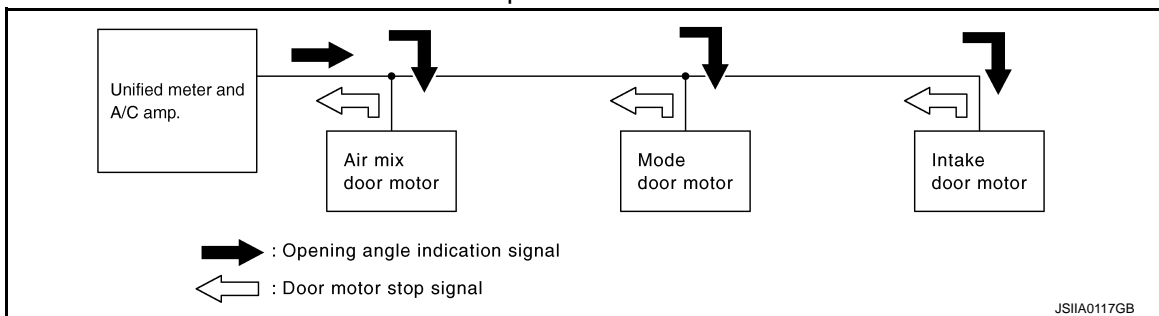
- Address
- Motor opening angle signals
- Data transmission
- Motor stop and drive decision
- Opening angle sensor (PBR function)
- Comparison
- Decision (Unified meter and A/C amp. indicated value and motor opening angle comparison)



## Operation

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

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



## Transmission Data and Transmission Order

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

### START:

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

### ADDRESS:

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

# AUTOMATIC AIR CONDITIONER SYSTEM

[AUTOMATIC AIR CONDITIONER]

## < SYSTEM DESCRIPTION >

### OPENING ANGLE:

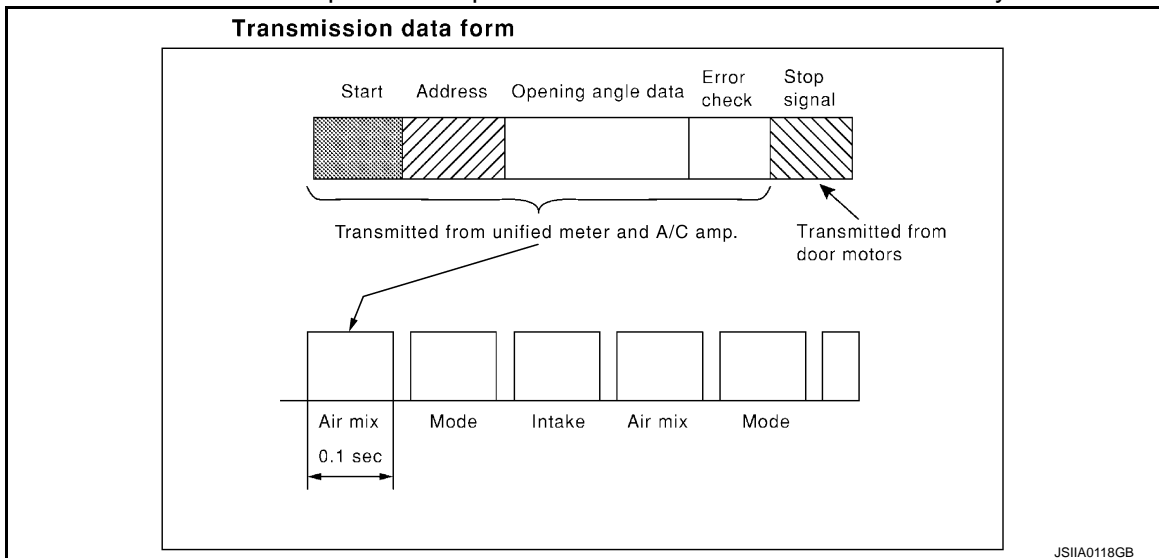
- Data that shows the indicated door opening angle of each door motor.

### ERROR CHECK:

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

### STOP SIGNAL:

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



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

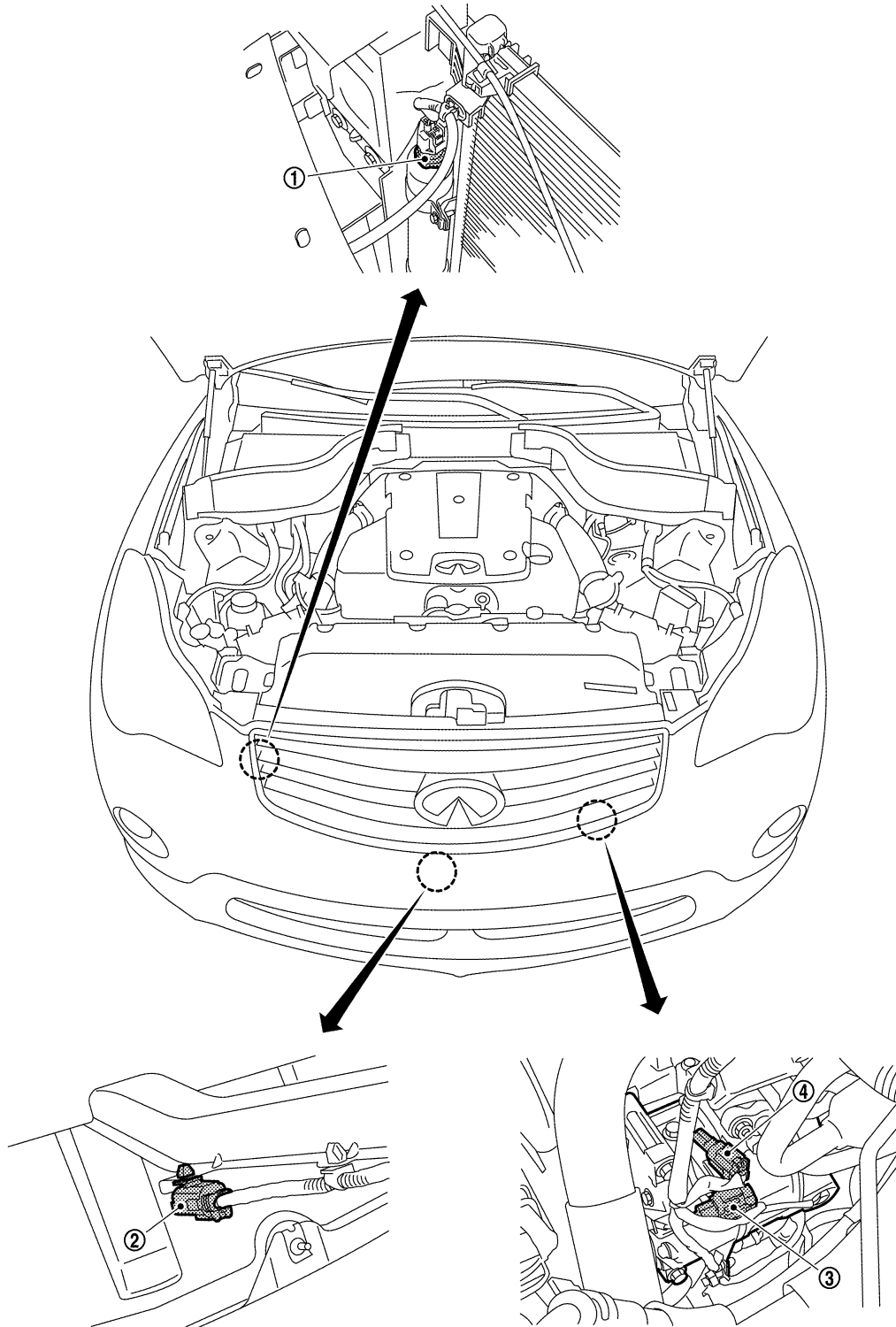
INFOID:000000004345704

ENGINE COMPARTMENT

# AUTOMATIC AIR CONDITIONER SYSTEM

< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]



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

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

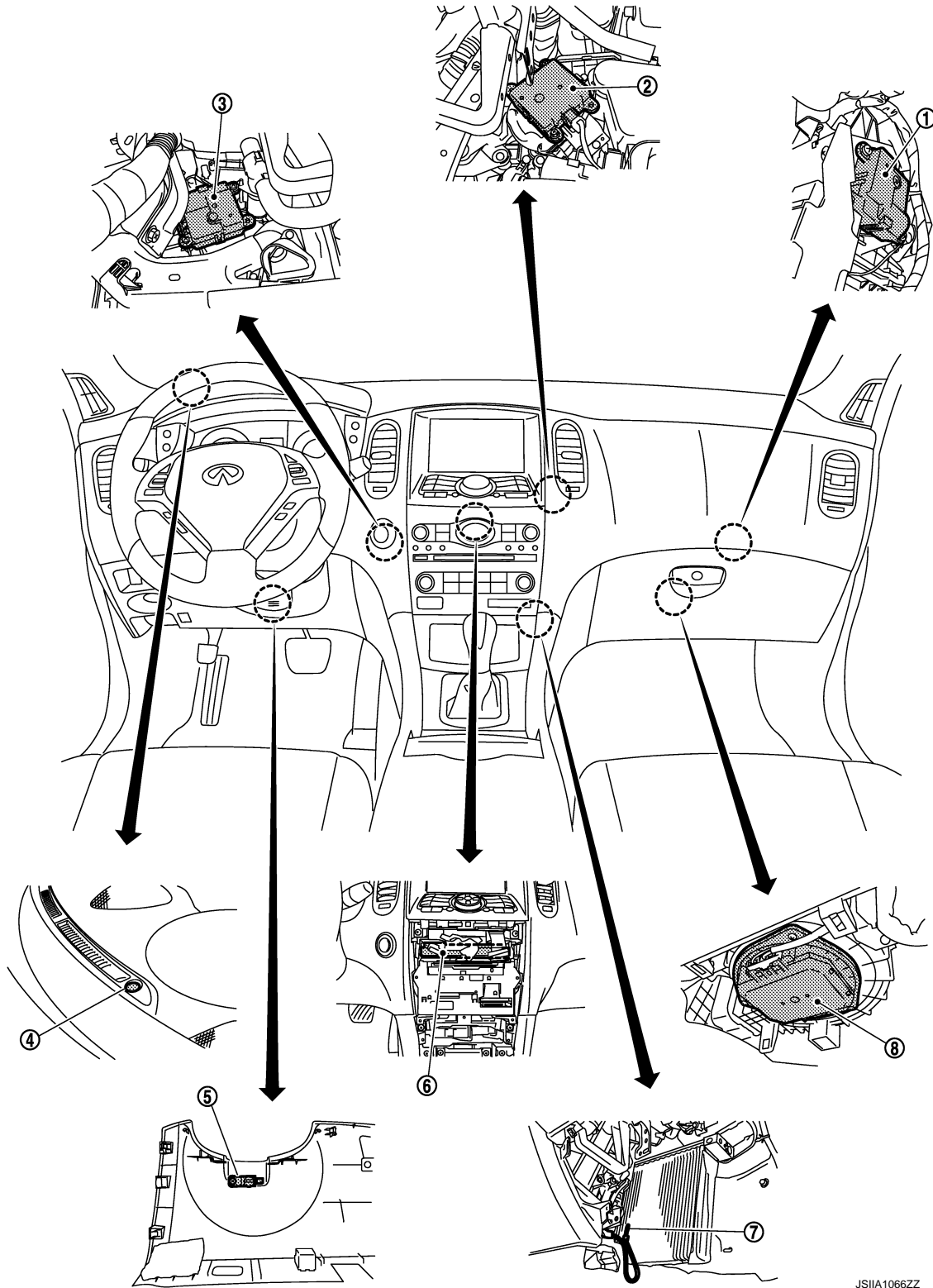
JPIIA0715ZZ

PASSENGER COMPARTMENT

# AUTOMATIC AIR CONDITIONER SYSTEM

< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]



JSIA1066ZZ

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

WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CON-

# AUTOMATIC AIR CONDITIONER SYSTEM

< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]

## TROL SYSTEM : Component Description

INFOID:000000004345705

Component	Reference
Air mix door motor	<a href="#">HAC-69. "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Description"</a>
Ambient sensor	<a href="#">HAC-89. "Description"</a>
Blower motor	<a href="#">HAC-76. "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Description"</a>
Compressor	<a href="#">HAC-84. "Description"</a>
intake door motor	<a href="#">HAC-74. "Description"</a>
intake sensor	<a href="#">HAC-98. "Description"</a>
In-vehicle sensor	<a href="#">HAC-92. "Description"</a>
Mode door motor	<a href="#">HAC-66. "Description"</a>
Refrigerant pressure sensor	<a href="#">EC-490. "Description"</a>
Sunload sensor	<a href="#">HAC-95. "Description"</a>
Unified meter and A/C amp.	<a href="#">HAC-101. "Description"</a>

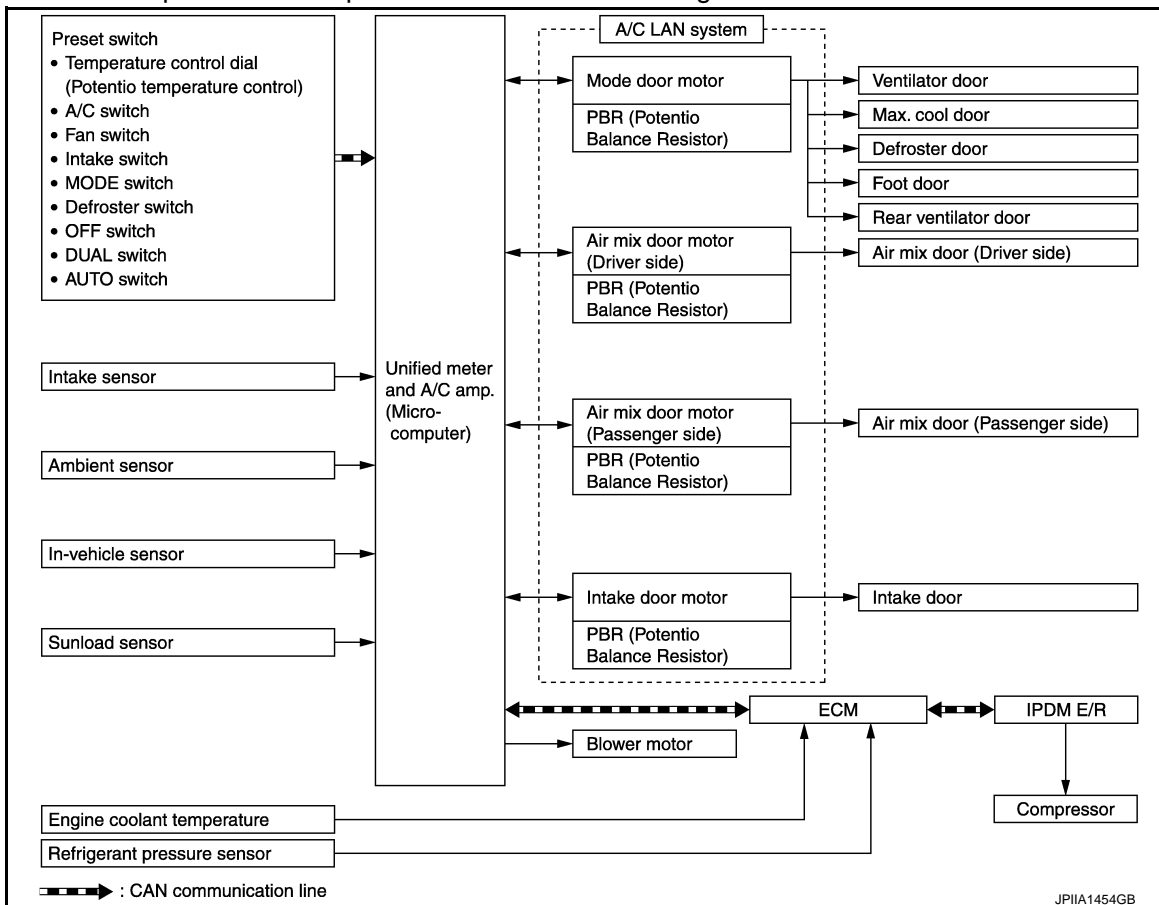
## WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM

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

INFOID:000000004345706

### CONTROL SYSTEM

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



# AUTOMATIC AIR CONDITIONER SYSTEM

< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]

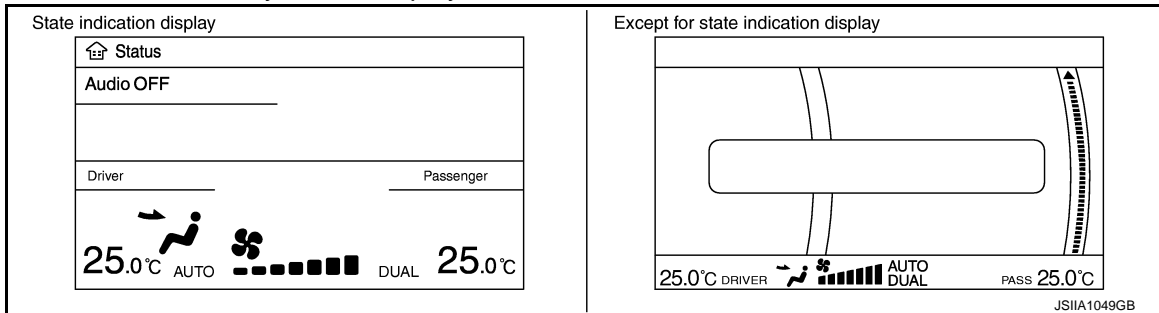
## WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : System Description

INFOID:000000004345707

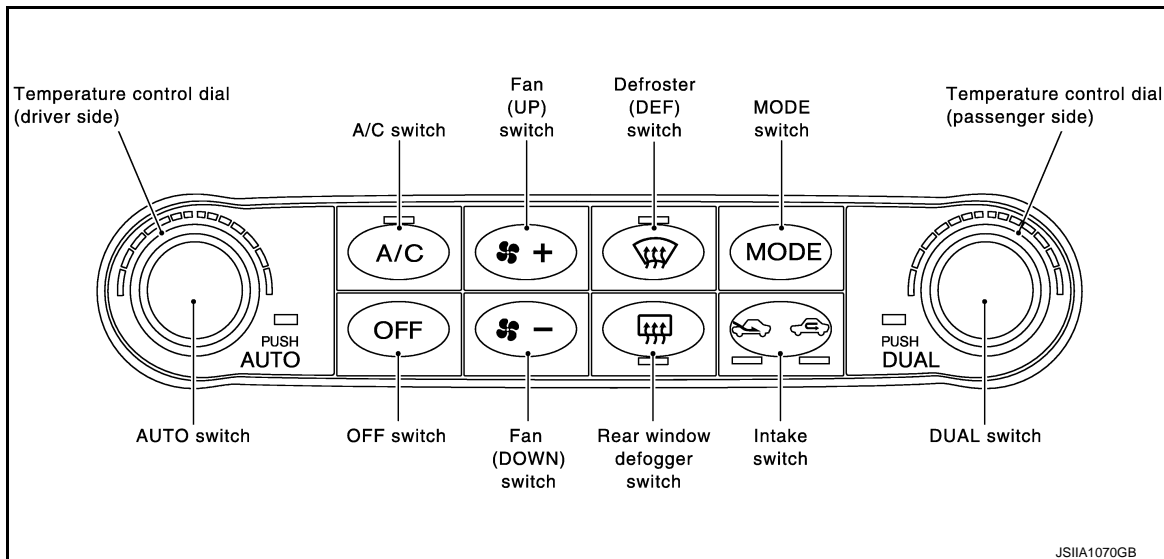
### CONTROL OPERATION

#### Display Screen

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



#### Preset Switch



#### MODE Switch

The air discharge outlets is controlled with this switch.

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

The set temperature is increased or decreased with this dial.

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

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



# AUTOMATIC AIR CONDITIONER SYSTEM

< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]

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

A

## OFF Switch

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

B

## 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). REC mode can be re-entered by pressing intake switch again, and then compressor is turned ON. (Except D/F or DEF position)

C

D

E

## DUAL Switch

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

F

G

H

HAC

J

K

L

M

N

O

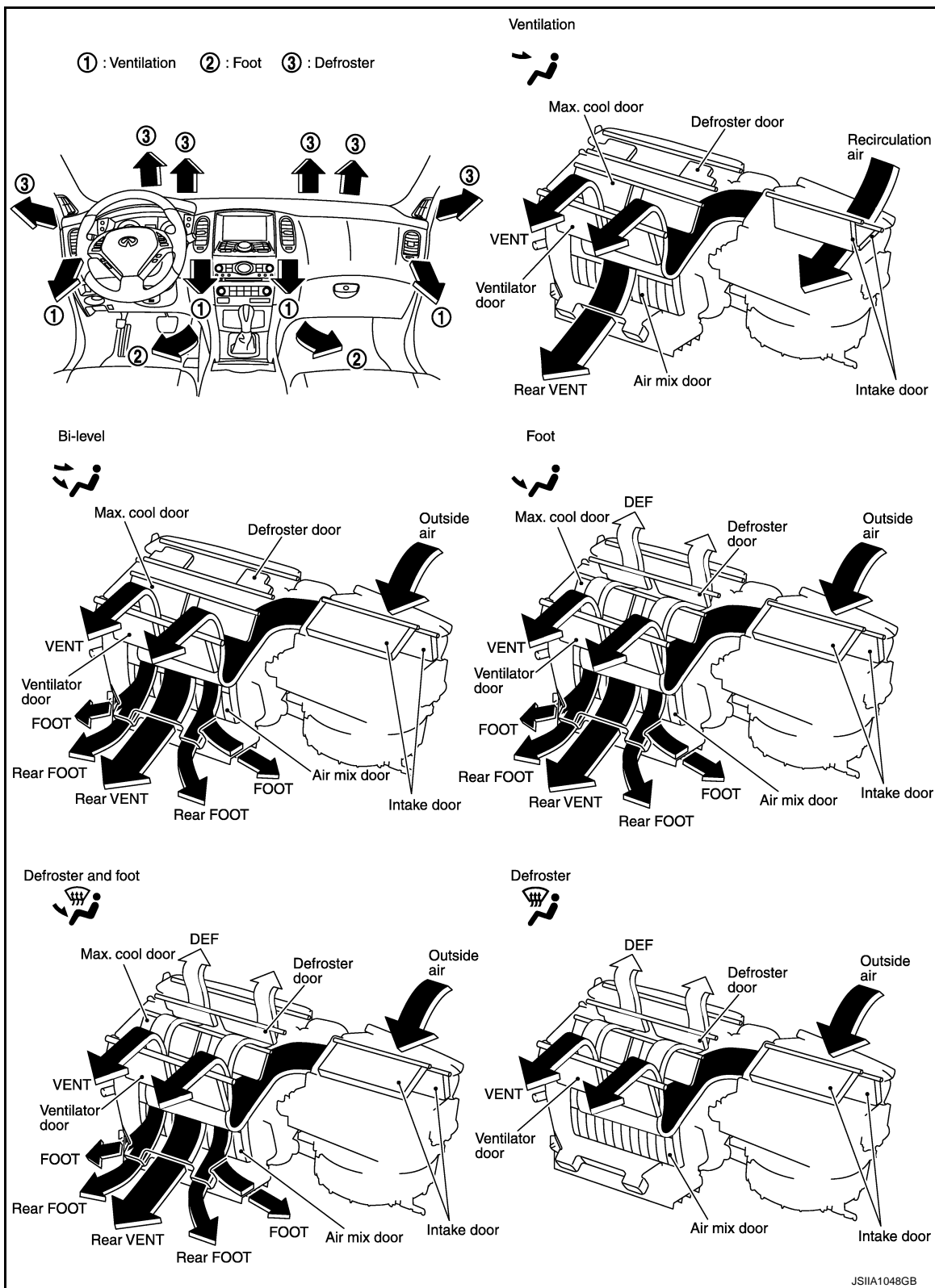
P

# AUTOMATIC AIR CONDITIONER SYSTEM

< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]

## DISCHARGE AIR FLOW

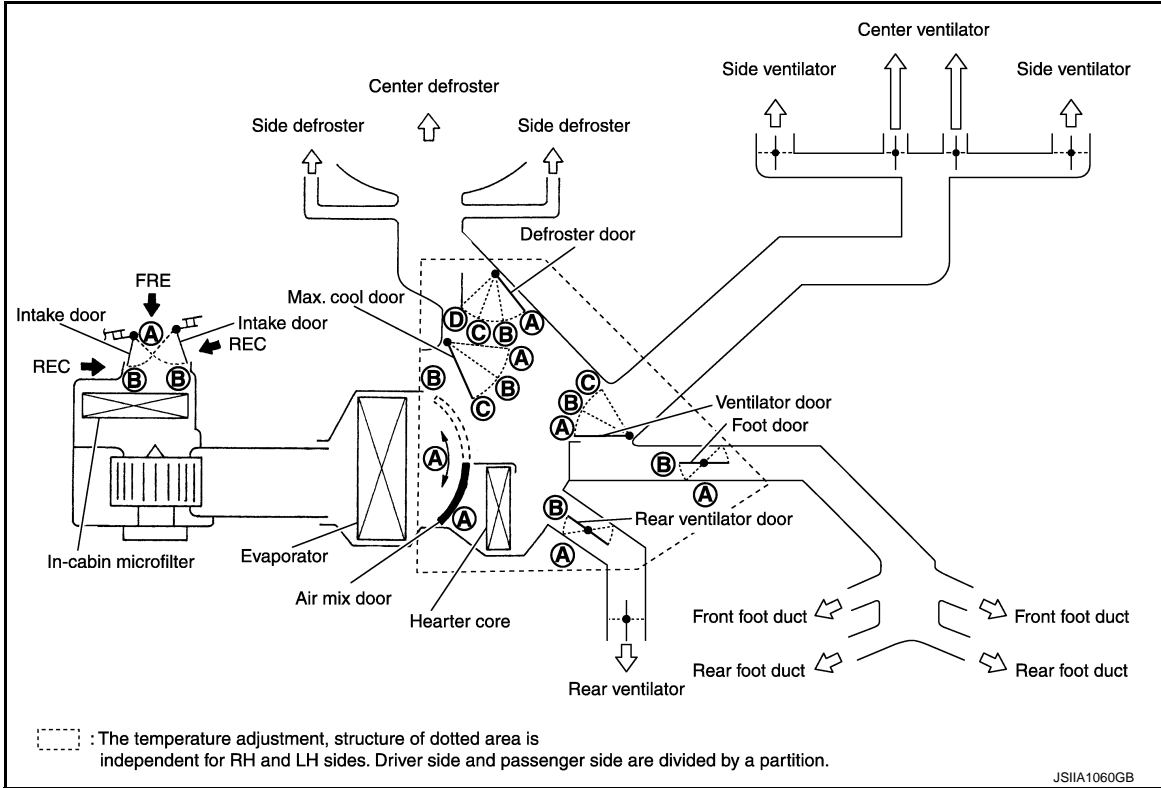


# AUTOMATIC AIR CONDITIONER SYSTEM

< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]

## SWITCHES AND THEIR CONTROL FUNCTION



A  
B  
C  
D  
E  
F  
G  
H

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															
Ventilator door	—	(A)	(B)	(C)	(C)	(C)	—	AUTO	—	—	—	—	—	(C)	
Max.cool door	—	(A)	(B)	(C)	(C)	(C)	—	AUTO	—	—	—	—	—	(C)	
Defroster door	—	(D)	(D)	(C)	(B)	(A)	—	AUTO	—	—	—	—	—	(C)	
Foot door	—	(B)	(B)	(B)	(B)	(A)	—	AUTO	—	—	—	—	—	(B)	
Rear ventilator door	—	(B)	(B)	(B)	(B)	(A)	—	AUTO	—	—	—	—	—	(B)	
Intake door	—	—	—	—	(B)	(B)	—	AUTO	(B)*	(A)*	—	—	—	(B)	
Air mix door (Driver side)	—	—	—	—	—	—	—	AUTO	—	—	(A) AUTO (B)	—	—	—	
Air mix door (Passenger side)	ON	—	—	—	—	—	—	AUTO	—	—	(A) AUTO (B)	—	—	—	
	OFF	—	—	—	—	—	—	AUTO	—	—	(A) AUTO (B)	—	—	—	

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

JSIIA1004GB

J  
K  
L  
M  
N  
O  
P

## AIR CONDITIONER LAN CONTROL SYSTEM

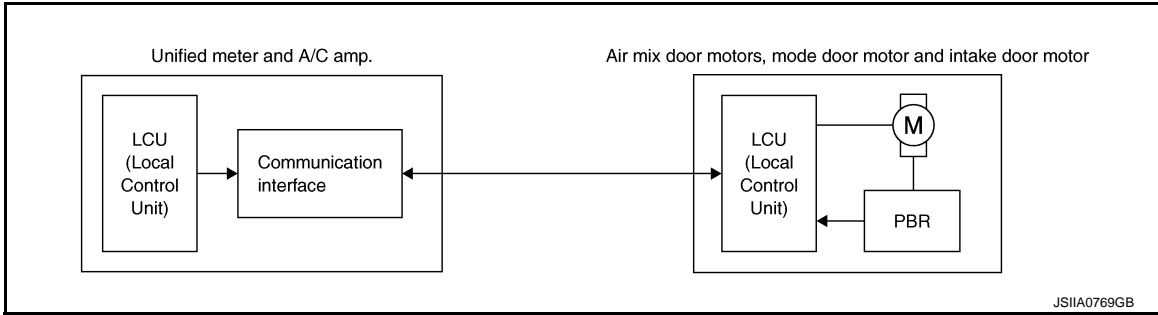
The LAN (Local Area Network) system consists of unified meter and A/C amp., mode door motor, air mix door motors and intake door motor.

# AUTOMATIC AIR CONDITIONER SYSTEM

< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]

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



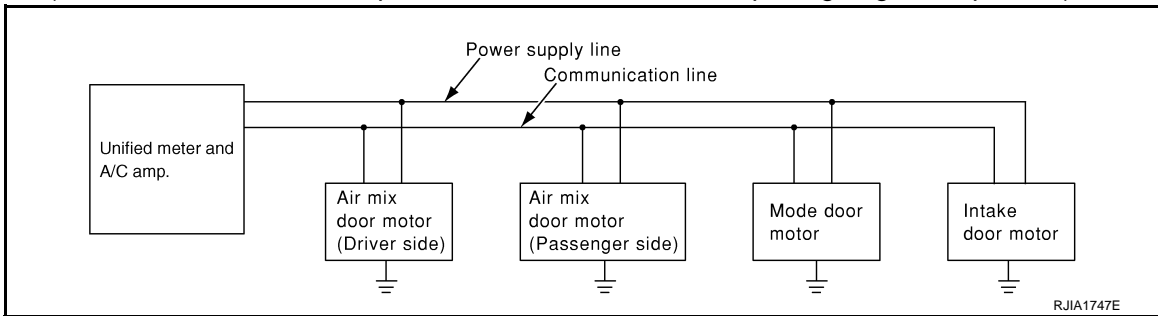
## SYSTEM CONSTRUCTION

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.

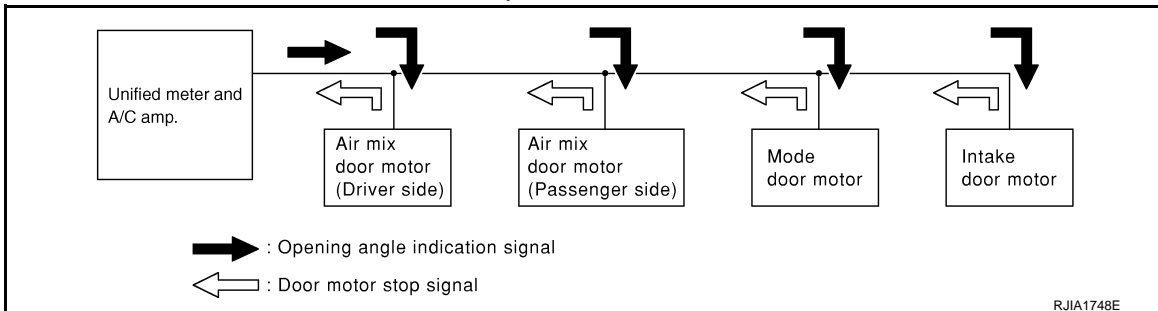
- Address
- Motor opening angle signals
- Data transmission
- Motor stop and drive decision
- Opening angle sensor (PBR function)
- Comparison
- Decision (Unified meter and A/C amp. indicated value and motor opening angle comparison)



## 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

## [AUTOMATIC AIR CONDITIONER]

### < SYSTEM DESCRIPTION >

#### START:

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

#### ADDRESS:

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

#### OPENING ANGLE:

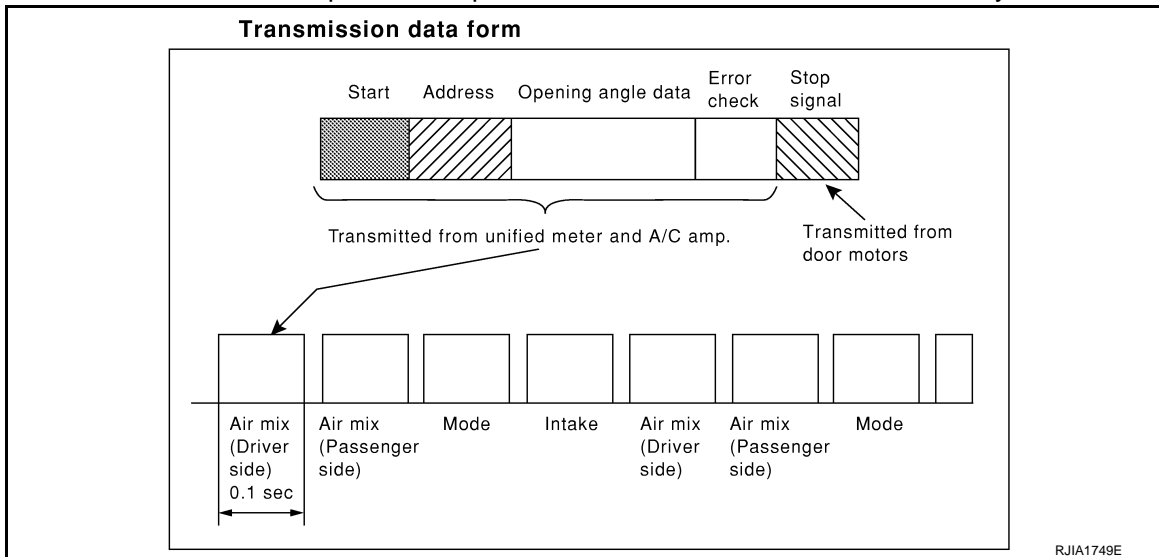
- Data that shows the indicated door opening angle of each door motor.

#### ERROR CHECK:

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

#### STOP SIGNAL:

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



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

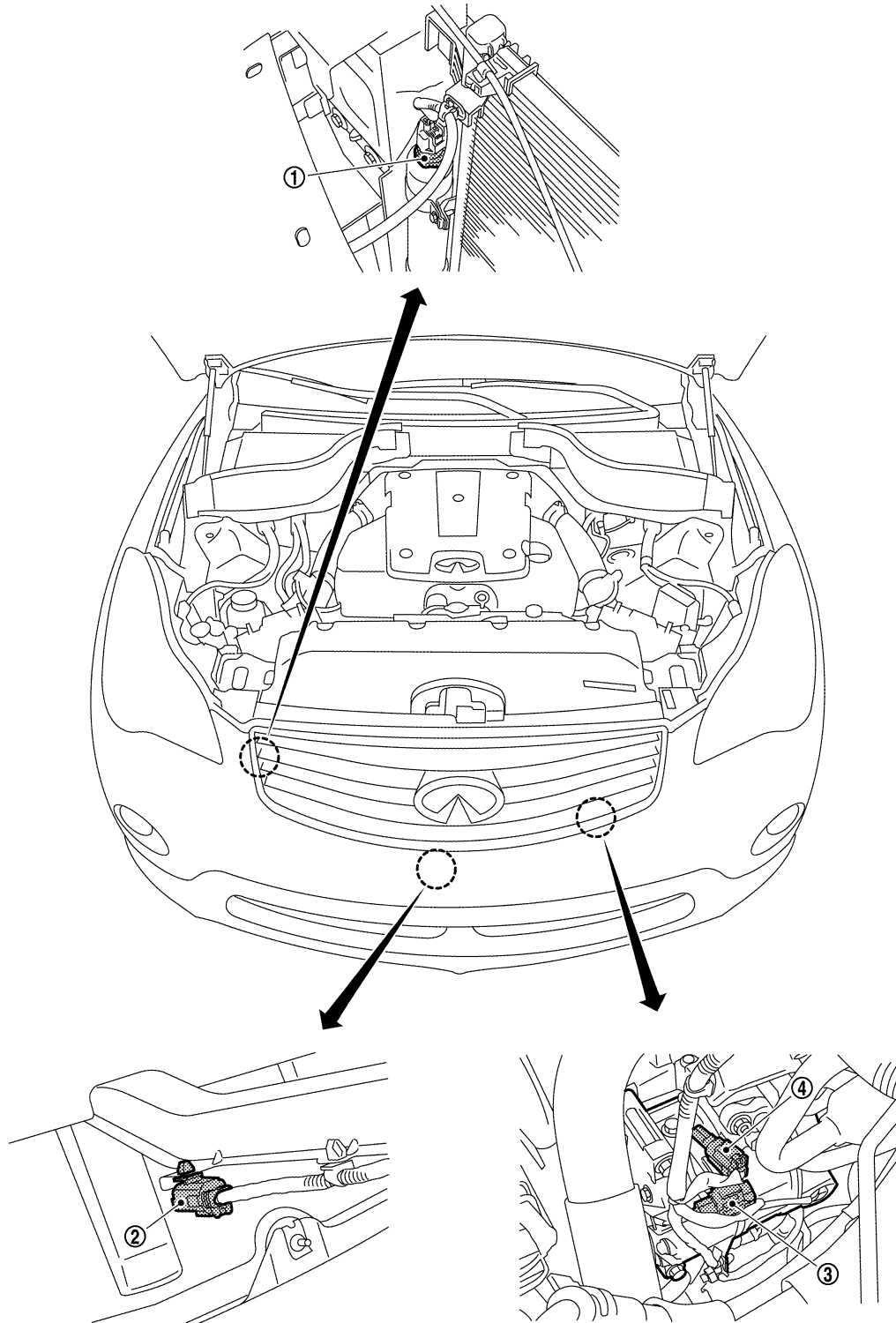
INFOID:000000004345708

#### ENGINE COMPARTMENT

# AUTOMATIC AIR CONDITIONER SYSTEM

< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]



JPIIA0715ZZ

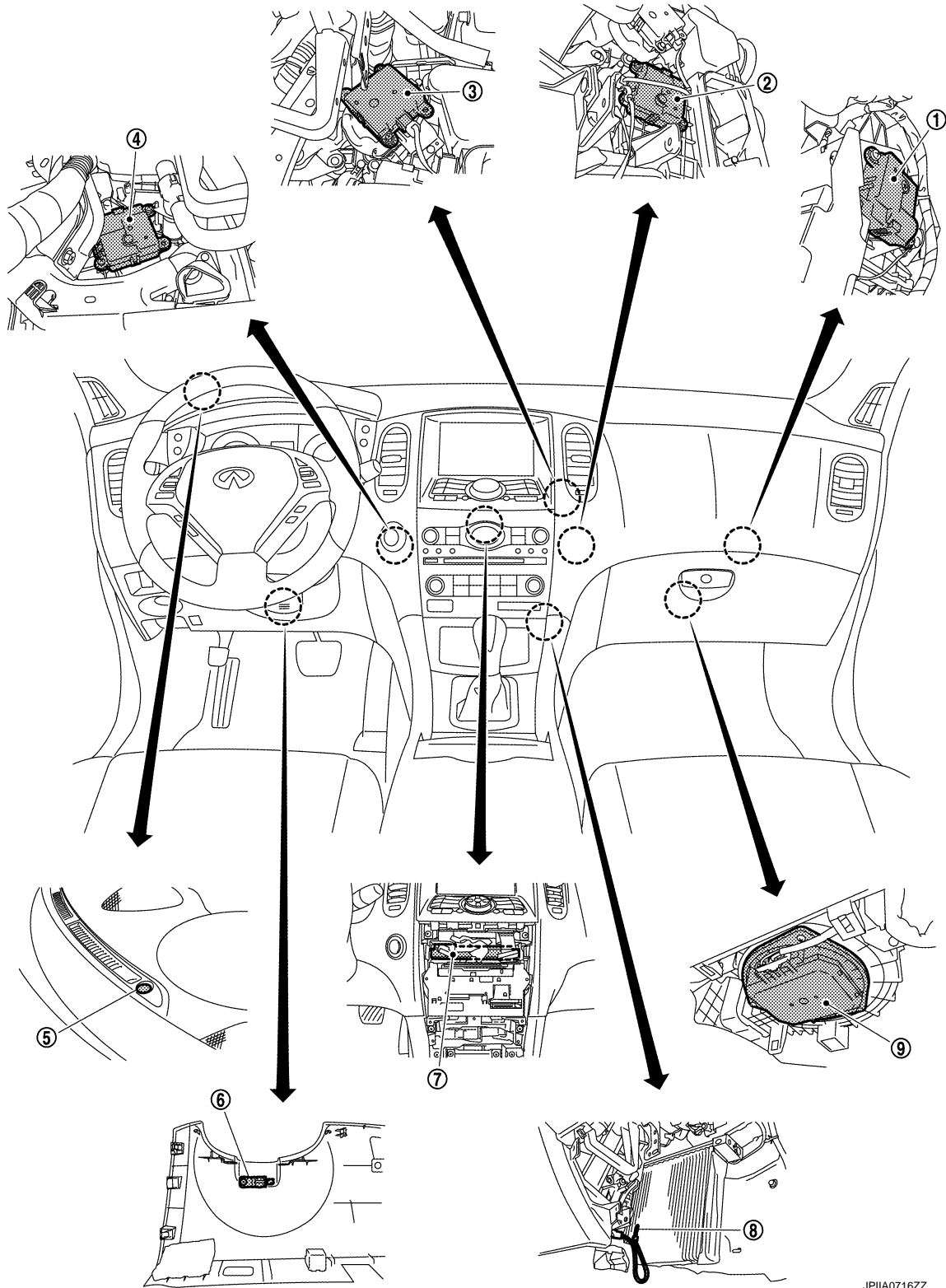
- 1. Refrigerant pressure sensor
- 2. Ambient sensor
- 3. Compressor (magnet clutch)
- 4. Compressor (ECV)

## PASSENGER COMPARTMENT

# AUTOMATIC AIR CONDITIONER SYSTEM

< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]



- |                                     |  |                      |
|-------------------------------------|--|----------------------|
| 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 LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL

# AUTOMATIC AIR CONDITIONER SYSTEM

< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]

## SYSTEM : Component Description

INFOID:000000004345709

Component	Reference
Air mix door motor	<a href="#">HAC-70. "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Description"</a>
Ambient sensor	<a href="#">HAC-89. "Description"</a>
Blower motor	<a href="#">HAC-79. "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Description"</a>
Compressor	<a href="#">HAC-84. "Description"</a>
intake door motor	<a href="#">HAC-74. "Description"</a>
intake sensor	<a href="#">HAC-98. "Description"</a>
In-vehicle sensor	<a href="#">HAC-92. "Description"</a>
Mode door motor	<a href="#">HAC-66. "Description"</a>
Refrigerant pressure sensor	<a href="#">EC-490. "Description"</a>
Sunload sensor	<a href="#">HAC-95. "Description"</a>
Unified meter and A/C amp.	<a href="#">HAC-101. "Description"</a>



# CAN COMMUNICATION SYSTEM

< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]

## CAN COMMUNICATION SYSTEM

### System Description

INFOID:000000004345710

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-26, "CAN System Specification Chart"](#).

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

HAC

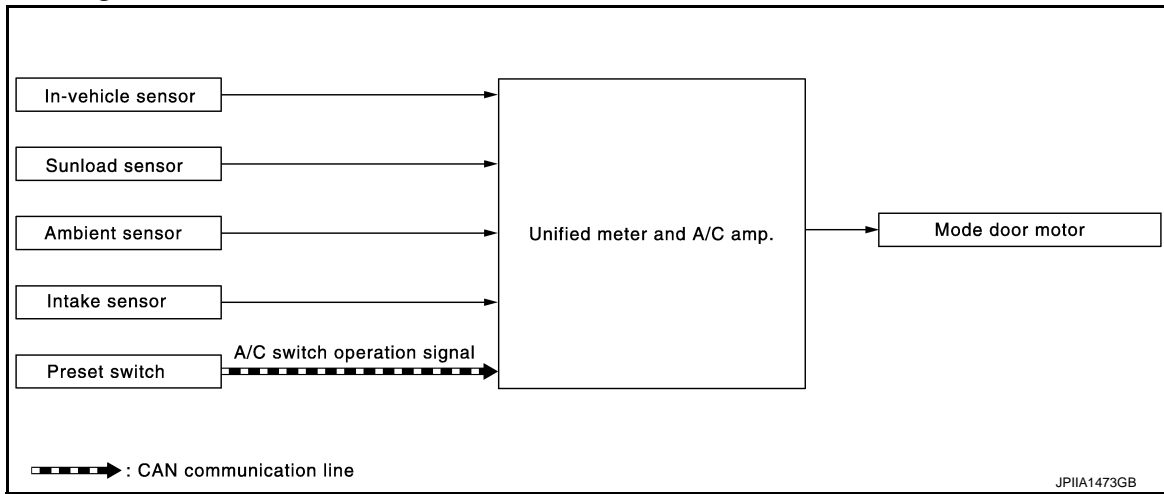
# MODE DOOR CONTROL SYSTEM

< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]

## MODE DOOR CONTROL SYSTEM

### System Diagram



### System Description

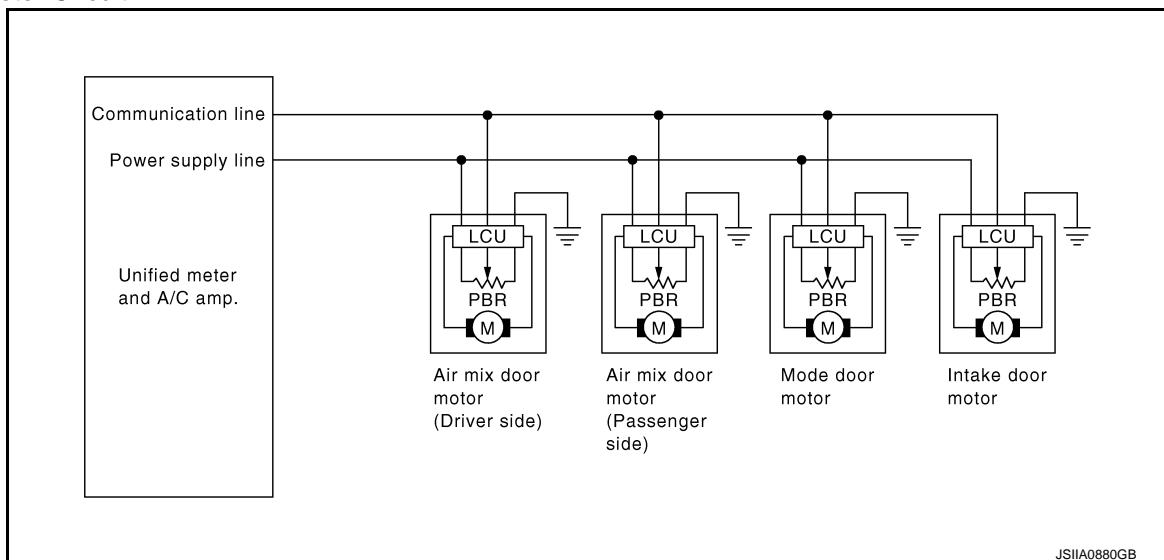
INFOID:000000004345712

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

### SYSTEM OPERATION

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

### Door Motor Circuit



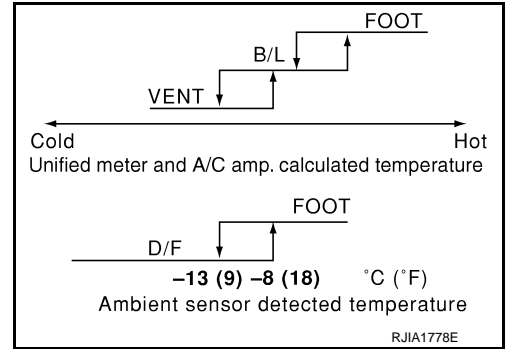
### Mode Door Control Specification

# MODE DOOR CONTROL SYSTEM

< 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.



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

HAC

# AIR MIX DOOR CONTROL SYSTEM

[AUTOMATIC AIR CONDITIONER]

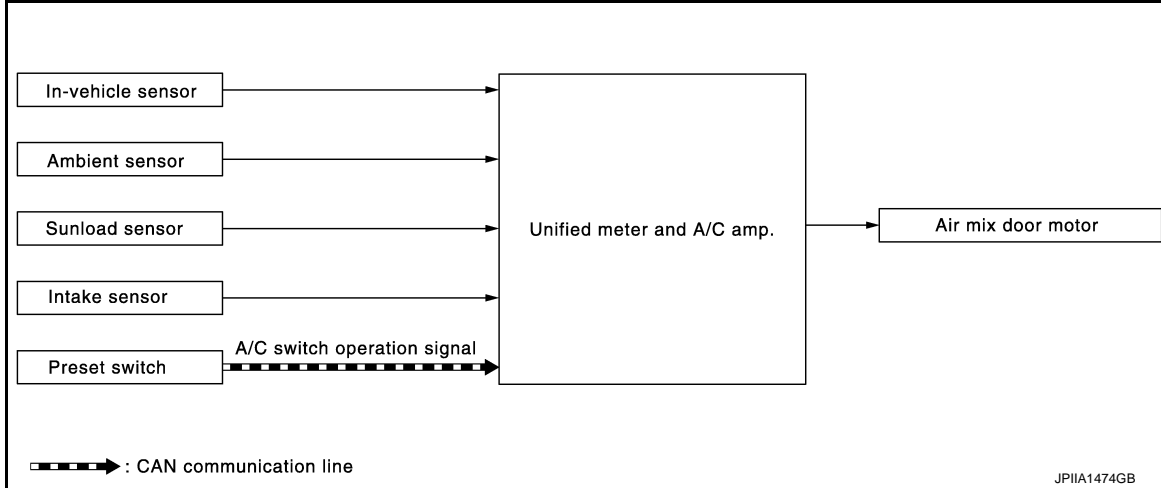
< SYSTEM DESCRIPTION >

## AIR MIX DOOR CONTROL SYSTEM

WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM

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

INFOID:000000004345713



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

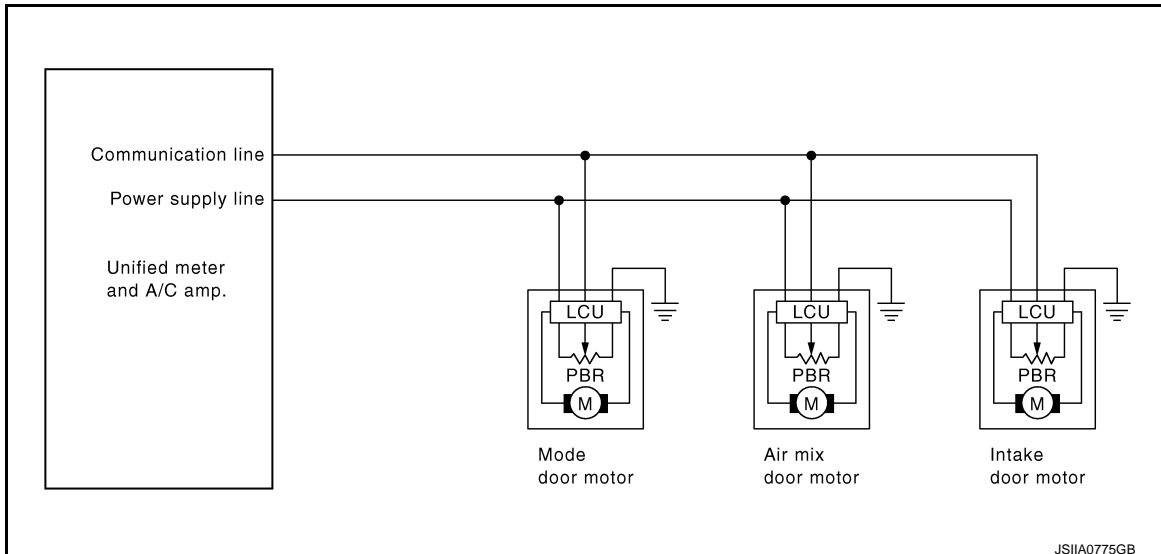
INFOID:000000004345714

The air mix door is 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

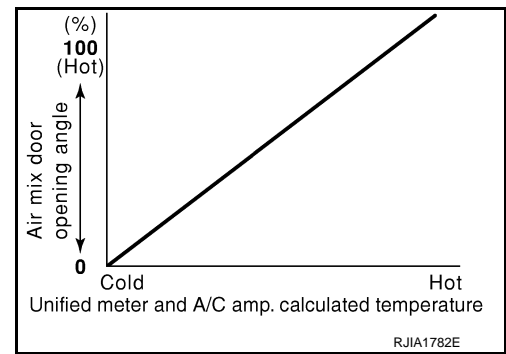


# AIR MIX DOOR CONTROL SYSTEM

[AUTOMATIC AIR CONDITIONER]

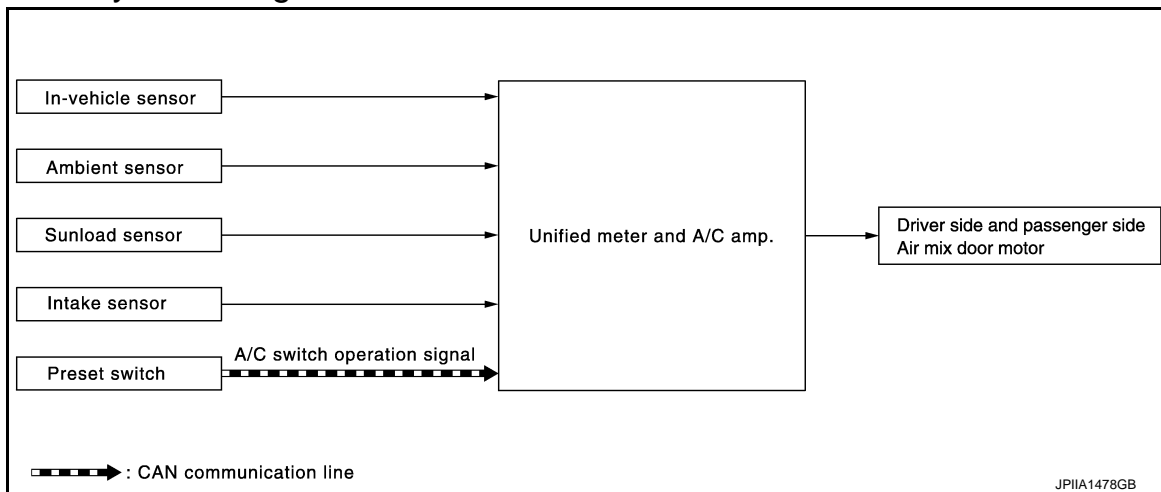
## < SYSTEM DESCRIPTION >

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



## WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM

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



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

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

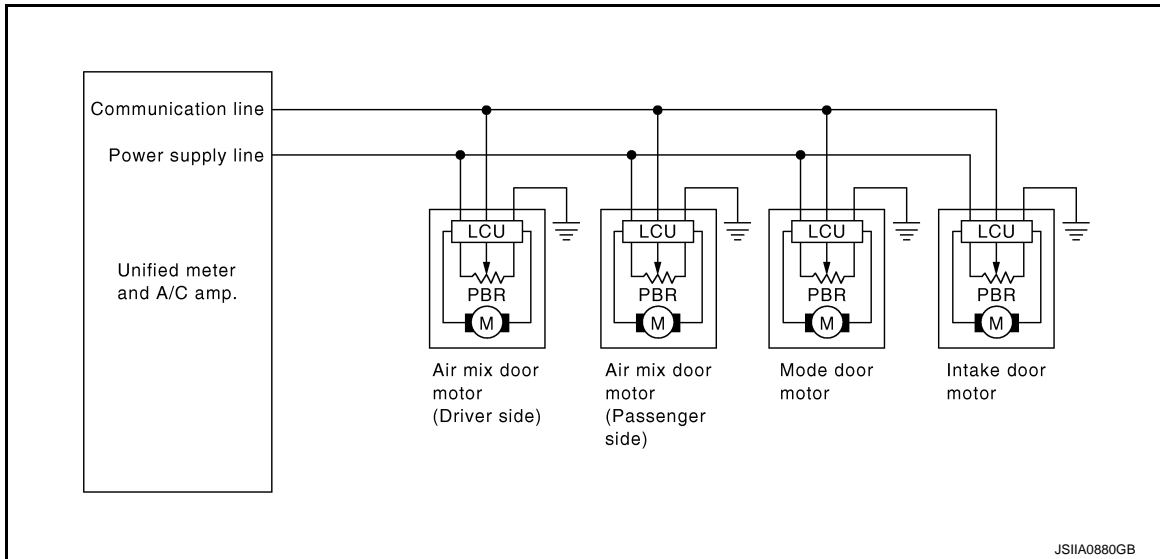
- The unified meter and A/C amp. receives data from each of the sensors. The unified meter and A/C amp. sends air mix doors, mode door and intake door opening angle data to the air mix door motor LCUs, mode door motor LCU and intake door motor LCU.
- The air mix door motors, mode door motor and intake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

# AIR MIX DOOR CONTROL SYSTEM

[AUTOMATIC AIR CONDITIONER]

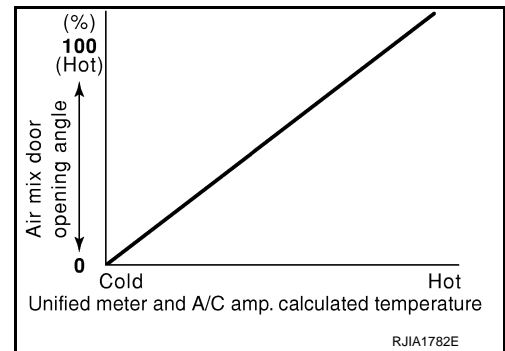
< SYSTEM DESCRIPTION >

## Door Motor Circuit



## Air Mix Door Control Specification

When ignition switch is ON, unified meter and A/C amp. continuously and automatically controls temperatures regardless of air conditioner operational condition. When setting a target temperature with temperature control dial, unified meter and A/C amp. corrects the set temperature and decides a target air mix door opening angle. Unified meter and A/C amp. controls air mix door according to the target air mix door opening angle and current air mix door opening angle for keeping an optimum air mix door opening angle. When a temperature is set at 18°C (64°F), air mix door is fixed at full cold, and when a temperature is set at 32°C (90°F), it is set at full hot.



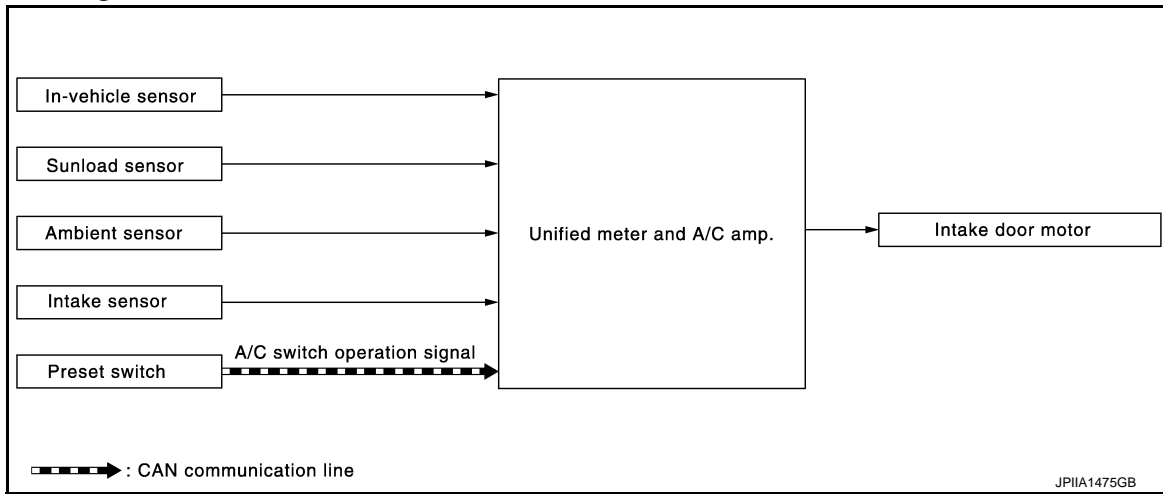
# INTAKE DOOR CONTROL SYSTEM

< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]

## INTAKE DOOR CONTROL SYSTEM

### System Diagram



### System Description

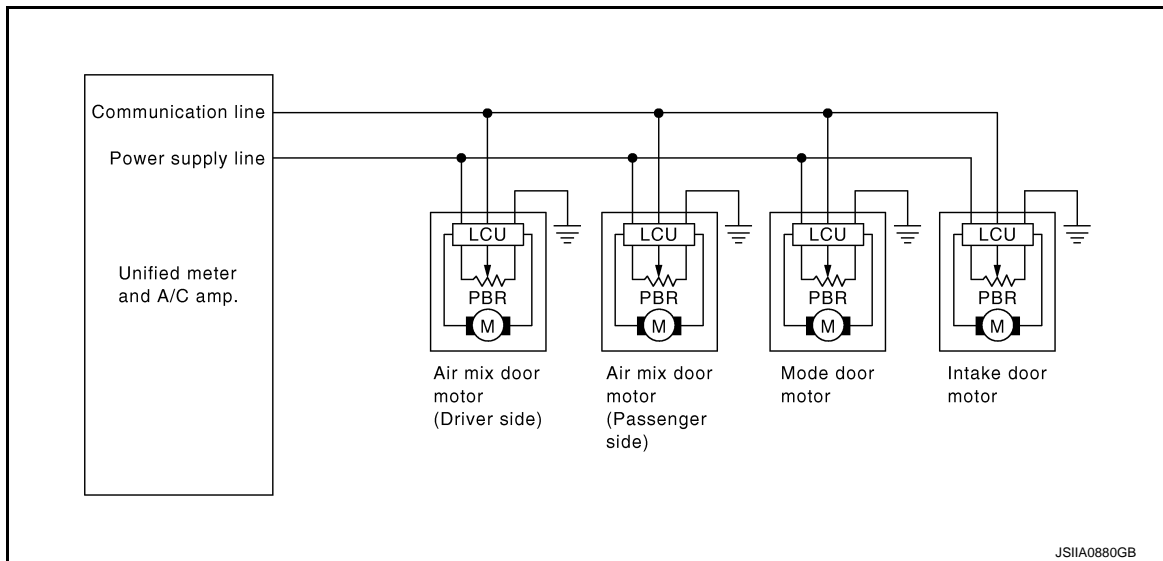
INFOID:000000004345718

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

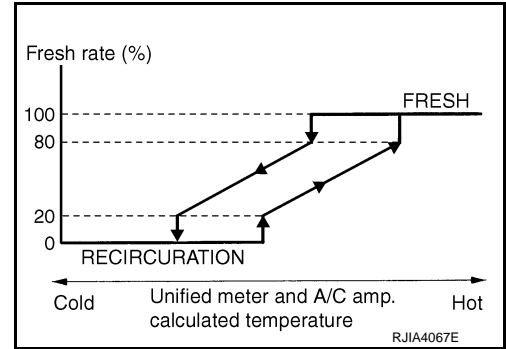
# INTAKE DOOR CONTROL SYSTEM

[AUTOMATIC AIR CONDITIONER]

## < SYSTEM DESCRIPTION >

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

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





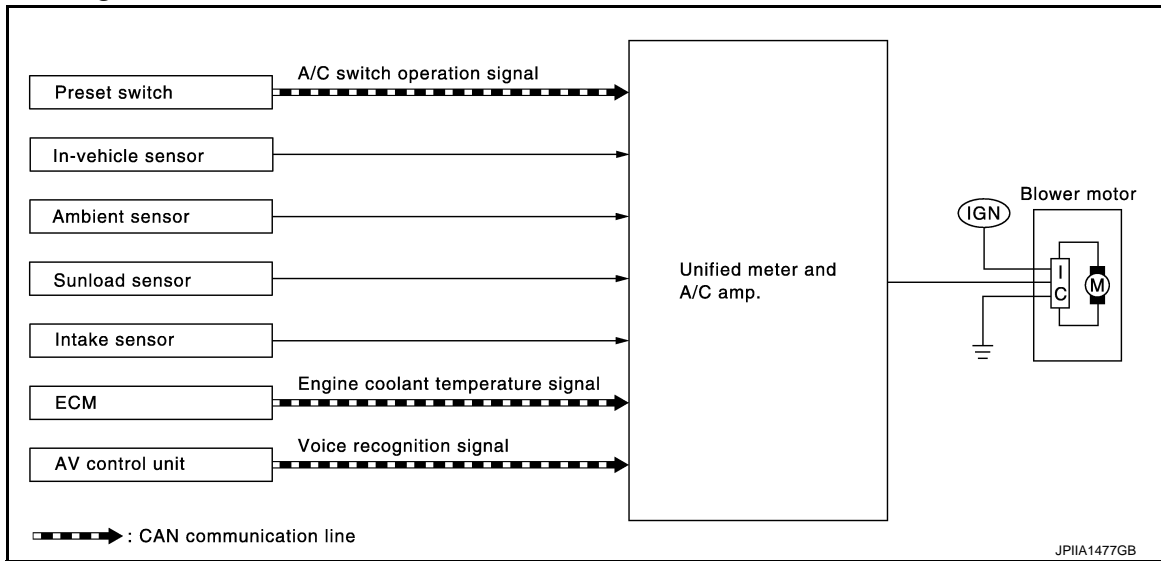
# BLOWER MOTOR CONTROL SYSTEM

< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]

## BLOWER MOTOR CONTROL SYSTEM

### System Diagram



### System Description

INFOID:000000004345720

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 fan motor's drive signal is changed at 8%/sec. to prevent a sudden increase in air flow.

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

#### Starting Fan Speed Control

##### Start up from COLD SOAK Condition (Automatic mode)

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

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

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

#### Blower Speed Compensation

##### Sunload

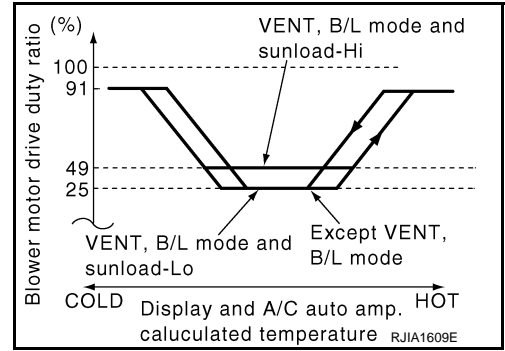
When the in-vehicle temperature and the set temperature are very close, the blower operates at low speed. The low speed varies depending on the sunload. During conditions of low or no sunload, the blower speed is at duty ratio 25%. During high sunload conditions, the unified meter and A/C amp. raise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

# BLOWER MOTOR CONTROL SYSTEM

[AUTOMATIC AIR CONDITIONER]

< SYSTEM DESCRIPTION >

Fan Speed Control Specification



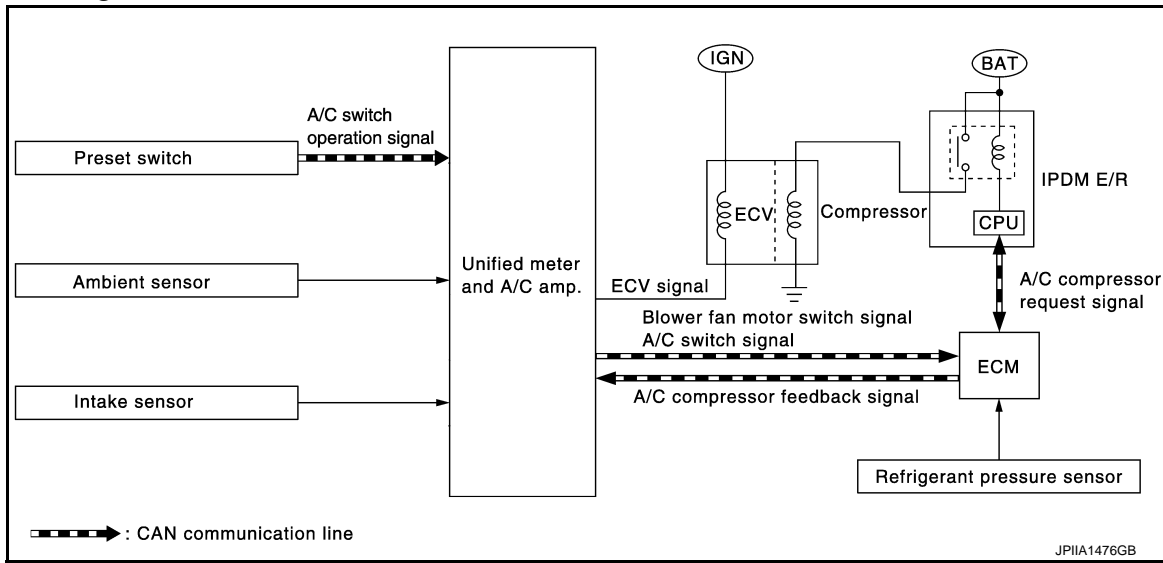
# MAGNET CLUTCH CONTROL SYSTEM

< 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 ECM 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.

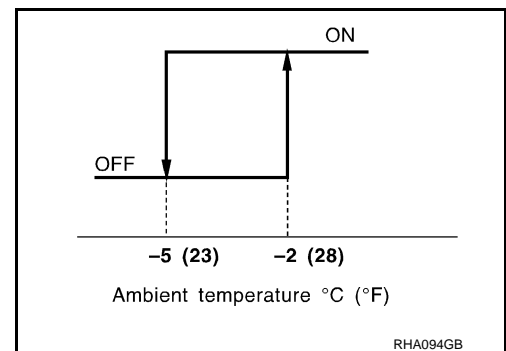
#### Compressor Protection Control

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/cm<sup>2</sup>, 452 psi), or below approximately 118 kPa (1.2 kg/cm<sup>2</sup>, 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.

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

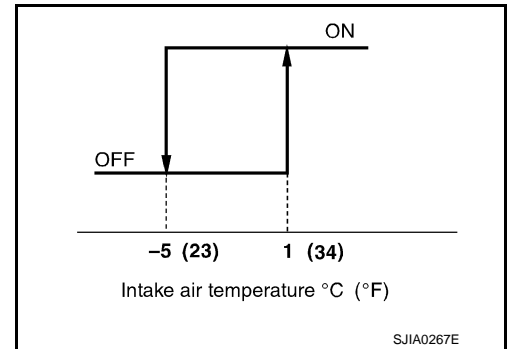


# MAGNET CLUTCH CONTROL SYSTEM

[AUTOMATIC AIR CONDITIONER]

## < SYSTEM DESCRIPTION >

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 LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM

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

INFOID:000000004345725

### SELF-DIAGNOSIS SYSTEM

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

### SELF-DIAGNOSIS FUNCTION

- The self-diagnosis system diagnoses sensors, door motors, blower motor, etc. by system line. Refer to applicable sections (items) for details. Shifting from normal control to the self-diagnosis system is accomplished by starting the engine (turning the ignition switch ON) and pressing OFF switch for at least 5 seconds. The OFF switch must be pressed within 10 seconds after starting the engine (ignition switch is turned ON). This system is canceled by either pressing AUTO switch or turning the ignition switch OFF. Shifting from one step is accomplished by means of turning temperature control dial, as required.
- Shifting from STEP-5 to AUXILIARY MECHANISM is accomplished by means of turning fan control dial clockwise.
- Temperature setting trimmer. Refer to [HAC-7, "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Temperature Setting Trimmer"](#).
- Foot position setting trimmer. Refer to [HAC-8, "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Foot Position Setting Trimmer"](#).

A

B

C

D

E

F

G

H

HAC

J

K

L

M

N

O

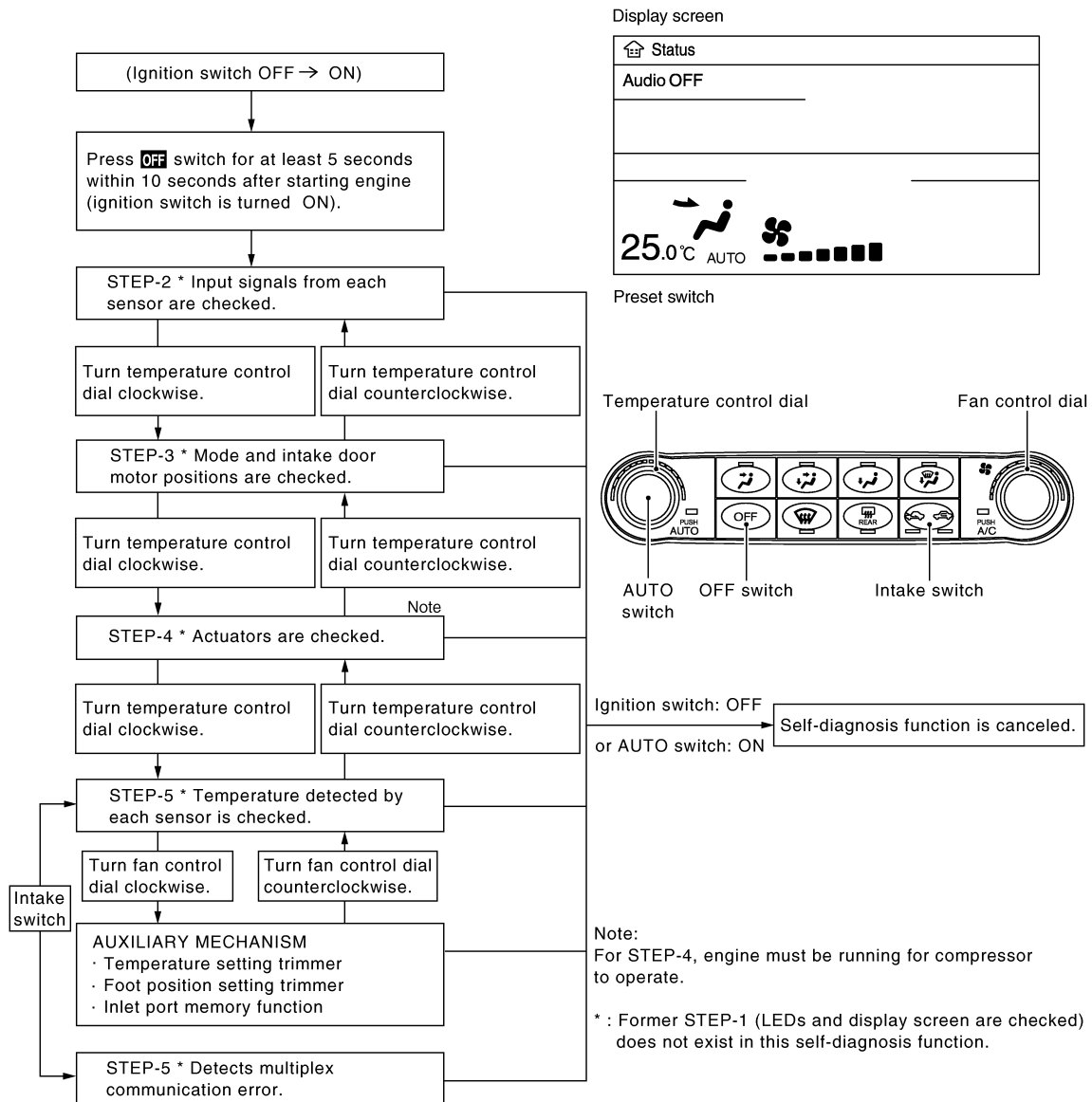
P

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

[AUTOMATIC AIR CONDITIONER]

## < SYSTEM DESCRIPTION >

- Inlet port memory function. Refer to [HAC-9, "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Inlet Port Memory Function"](#).



JSIIA0770GB

## CONFORMATION METHOD

### 1.SET IN SELF-DIAGNOSIS MODE

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

#### NOTE:

- If battery voltage drops below 12 V during diagnosis STEP-3, door motor speed becomes slower and as a result, the system may generate an error even when operation is normal. Start engine before performing this diagnosis to avoid this.
- Former STEP-1 (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 turning the intake switch indicators (REC/FRE) 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.)

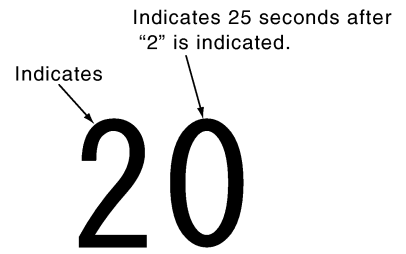
< SYSTEM DESCRIPTION >

[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)**



SJIA1778E

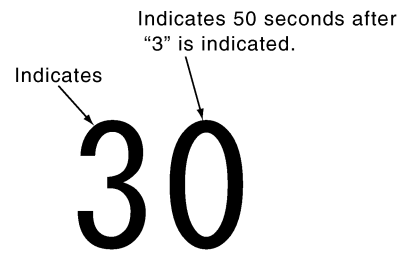
## 3.STEP-3: MODE DOOR AND INTAKE DOOR POSITIONS ARE CHECKED

Turn temperature control dial clockwise.

Does code No. 30 appear on the display?

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

**Display (when all doors are in good order)**



SJIA1779E

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

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

>> GO TO 5.



SJIA1780E

## 5.CHECK ACTUATORS

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

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.)

[AUTOMATIC AIR CONDITIONER]

## < SYSTEM DESCRIPTION >

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

Discharge air flow						
Mode position indication	Condition	Air outlet/distribution				
		VENT		FOOT		DEF
		Front	Rear	Front	Rear	
	Rear ventilator : OPEN	88%	12%	—	—	—
		49%	10%	25%	16%	—
		10%	12%	33%	22%	23%
		9%	11%	29%	18%	33%
		15%	—	—	—	85%

JSIAA0893GB

### Is the inspection result normal?

YES >> GO TO 6.

NO-1 >> Air outlet does not change. Go to Mode Door Motor Circuit. Refer to [HAC-66, "Diagnosis Procedure"](#).

NO-2 >> Intake door does not change. Go to Intake Door Motor Circuit. Refer to [HAC-74, "Diagnosis Procedure"](#).

NO-3 >> Discharge air temperature does not change. Go to Air Mix Door Motor Circuit. Refer to [HAC-69, "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Procedure"](#).

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

NO-5 >> Magnet clutch does not engage. Go to Magnet Clutch Circuit. Refer to [HAC-84, "Diagnosis Procedure"](#).

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

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

>> GO TO 7.

## 7.CHECK AMBIENT SENSOR

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

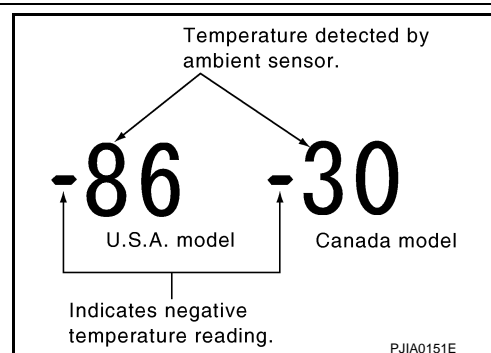
### NOTE:

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

### Is the inspection result normal?

YES >> GO TO 8.

NO >> Go to Ambient Sensor Circuit. Refer to [HAC-89, "Diagnosis Procedure"](#).



## 8.CHECK IN-VEHICLE SENSOR



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

[AUTOMATIC AIR CONDITIONER]

## < SYSTEM DESCRIPTION >

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

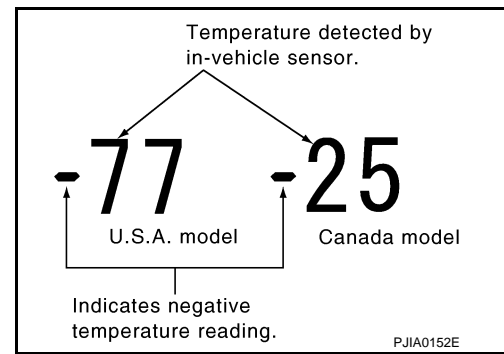
**NOTE:**

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

Is the inspection result normal?

YES >> GO TO 9.

NO >> Go to In-vehicle Sensor Circuit. Refer to [HAC-93, "Diagnosis Procedure"](#).



## 9. CHECK INTAKE SENSOR

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

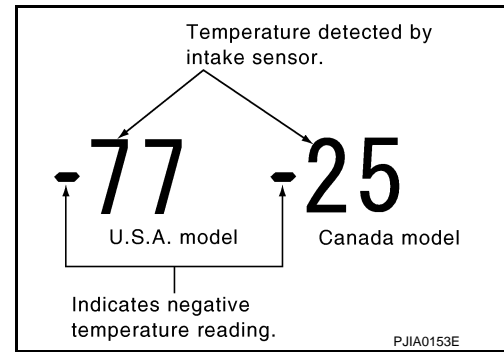
**NOTE:**

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

Is the inspection result normal?

YES >> GO TO 10.

NO >> Go to Intake Sensor Circuit. Refer to [HAC-98, "Diagnosis Procedure"](#).



## 10. CHECK CAN COMMUNICATION ERROR

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

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to CAN communication (Unified meter and A/C amp. - AV control unit). Refer to [MWI-44, "Diagnosis Procedure"](#).

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

JPIIA1360GB

## 11. CHECK MALFUNCTIONING SENSOR AND DOOR MOTOR

Refer to the following chart for malfunctioning code No.

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

Code No.	Malfunctioning sensor and door motor (Including circuits)	Reference
21 / -21	Ambient sensor	<a href="#">HAC-89, "Diagnosis Procedure"</a>
22 / -22	In-vehicle sensor	<a href="#">HAC-93, "Diagnosis Procedure"</a>
24 / -24	Intake sensor	<a href="#">HAC-98, "Diagnosis Procedure"</a>
25 / -25	Sunload sensor *	<a href="#">HAC-95, "Diagnosis Procedure"</a>
26 / -26	Air mix door motor PBR	<a href="#">HAC-69, "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Procedure"</a>

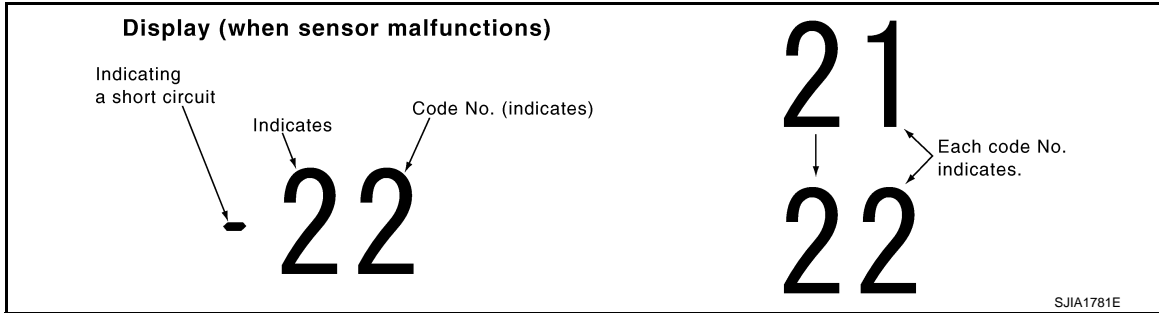
\*: Perform self-diagnosis STEP-2 under sunshine.

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

[AUTOMATIC AIR CONDITIONER]

## < SYSTEM DESCRIPTION >

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 <a href="#">HAC-66, "Diagnosis Procedure"</a>
32	DEF	
37	FRE	
38	20% FRE	Intake door motor <a href="#">HAC-74, "Diagnosis Procedure"</a>
39	REC	

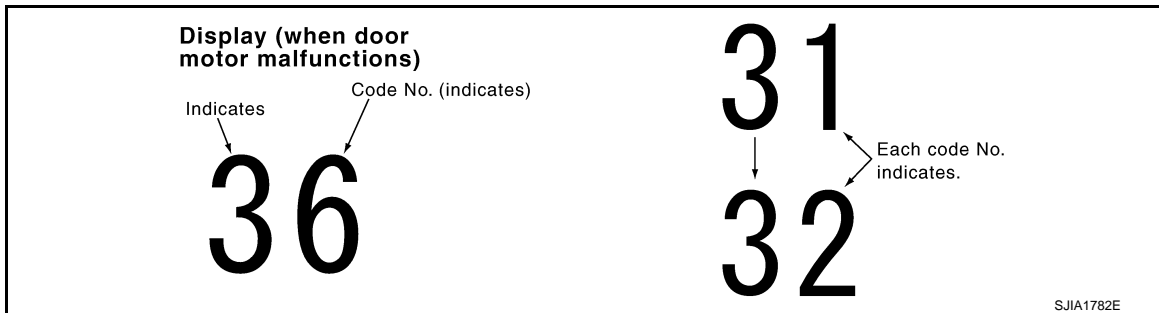
(Corresponding code Nos. indicates 1 second each if two or more mode or intake door motors malfunction.)

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

31→32→Return to 31

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

37→38→39→Return to 37



>> INSPECTION END

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

INFOID:000000004345726

### CONSULT-III APPLICATION ITEMS

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

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

### DATA MONITOR

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

< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]

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	<ul style="list-style-type: none"> <li>• Engine is running</li> <li>• Warm-up condition</li> <li>• Both A/C switch and blower fan motor switch: ON (Compressor operates)</li> </ul>	1.0 - 4.0 V

## WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM

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

INFOID:000000004345727

### 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

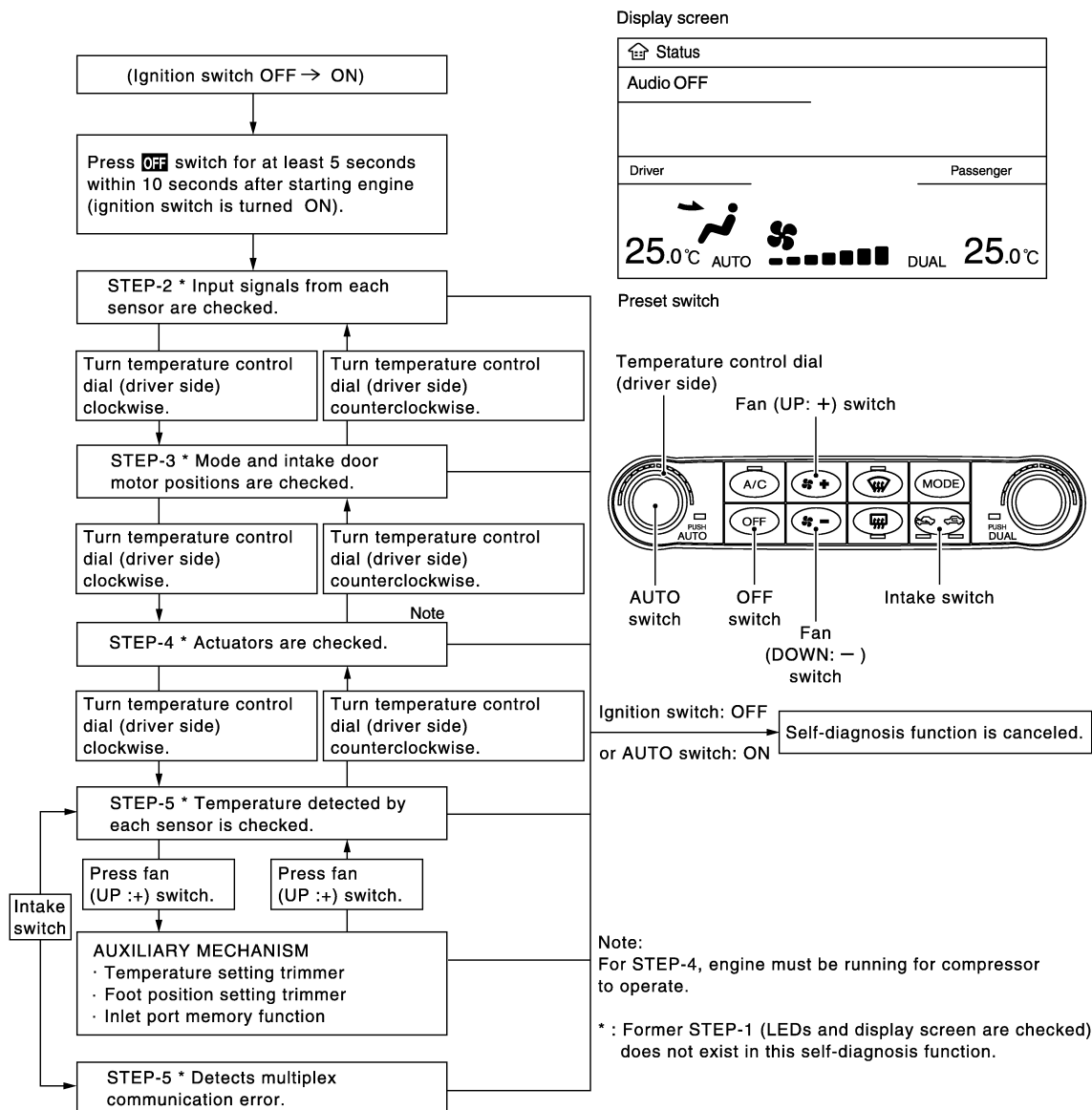
- The self-diagnosis system diagnoses sensors, door motors, blower motor, etc. by system line. Refer to applicable sections (items) for details. Shifting from normal control to the self-diagnosis system is accomplished by starting the engine (turning the ignition switch ON) and pressing OFF switch for 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-11. "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Temperature Setting Trimmer"](#).
- Foot position setting trimmer. Refer to [HAC-12. "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Foot Position Setting Trimmer"](#).

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

[AUTOMATIC AIR CONDITIONER]

## < SYSTEM DESCRIPTION >

- Inlet port memory function. Refer to [HAC-13. "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Inlet Port Memory Function"](#).



JSIIA1058GB

## 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 turning the intake switch indicators (REC/FRE) 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.)

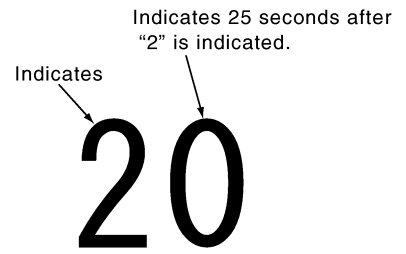
< SYSTEM DESCRIPTION >

[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)**



SJIA1778E

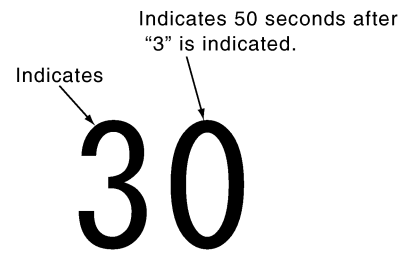
## 3.STEP-3: MODE DOOR AND INTAKE DOOR POSITIONS ARE CHECKED

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)**

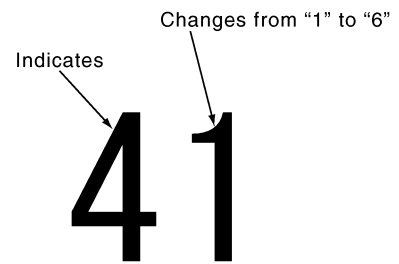


SJIA1779E

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

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

>> GO TO 5.



SJIA1780E

## 5.CHECK ACTUATORS

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

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.)

[AUTOMATIC AIR CONDITIONER]

## < SYSTEM DESCRIPTION >

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

Discharge air flow						
Mode position indication	Condition	Air outlet/distribution				
		VENT		FOOT		DEF
		Front	Rear	Front	Rear	
	DUAL switch: OFF Rear ventilator : OPEN	88%	12%	—	—	—
		49%	10%	25%	16%	—
		10%	12%	33%	22%	23%
		9%	11%	29%	18%	33%
		15%	—	—	—	85%

JSIA0888GB

### Is this inspection result normal?


- YES >> GO TO 6.
- NO-1 >> Air outlet does not change. Go to Mode Door Motor Circuit. Refer to [HAC-66, "Diagnosis Procedure"](#).
- NO-2 >> Intake door does not change. Go to Intake Door Motor Circuit. Refer to [HAC-74, "Diagnosis Procedure"](#).
- NO-3 >> Discharge air temperature does not change. Go to Air Mix Door Motor Circuit. Refer to [HAC-71, "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Procedure"](#).
- NO-4 >> Blower motor operation is malfunctioning. Go to Blower Motor Circuit. Refer to [HAC-80, "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Procedure"](#).
- NO-5 >> Magnet clutch does not engage. Go to Magnet Clutch Circuit. Refer to [HAC-84, "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

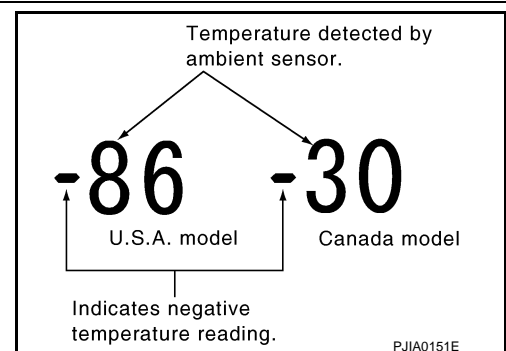
Press DEF () switch one time. Temperature detected by ambient sensor is indicated on the display.

### 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-89, "Diagnosis Procedure"](#).



## 8.CHECK IN-VEHICLE SENSOR

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

[AUTOMATIC AIR CONDITIONER]

## < SYSTEM DESCRIPTION >

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

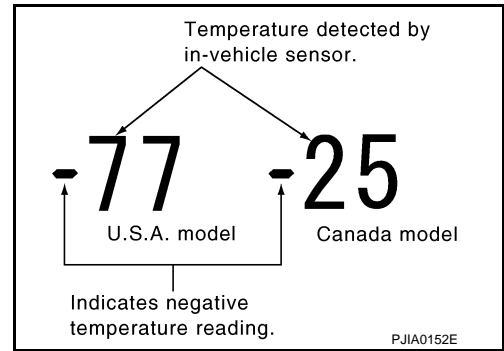
**NOTE:**

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.

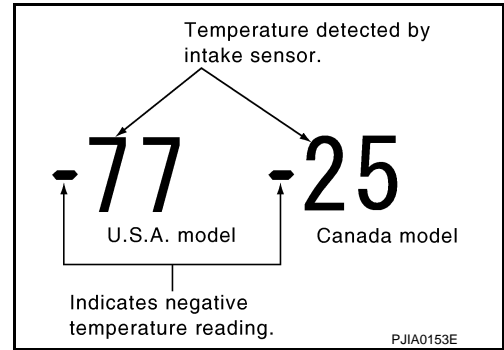
**NOTE:**

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-98, "Diagnosis Procedure"](#).



## 10. CHECK CAN COMMUNICATION ERROR

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

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to CAN communication (Unified meter and A/C amp. - AV control unit). Refer to [MWI-44, "Diagnosis Procedure"](#).

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

JPIIA1360GB

## 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	<a href="#">HAC-89, "Diagnosis Procedure"</a>
22 / -22	In-vehicle sensor	<a href="#">HAC-93, "Diagnosis Procedure"</a>
24 / -24	Intake sensor	<a href="#">HAC-98, "Diagnosis Procedure"</a>
25 / -25	Sunload sensor *	<a href="#">HAC-95, "Diagnosis Procedure"</a>
26 / -26	Air mix door motor PBR (Driver side)	<a href="#">HAC-71, "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Procedure"</a>
27 / -27	Air mix door motor PBR (Passenger side)	

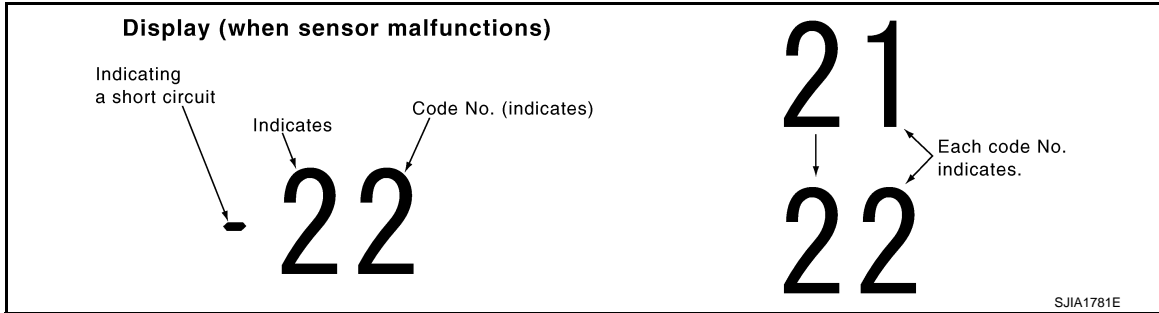
\*: Perform self-diagnosis STEP-2 under sunshine.

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

[AUTOMATIC AIR CONDITIONER]

## < SYSTEM DESCRIPTION >

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
32	DEF	
37	FRE	
38	20% FRE	Intake door motor
39	REC	

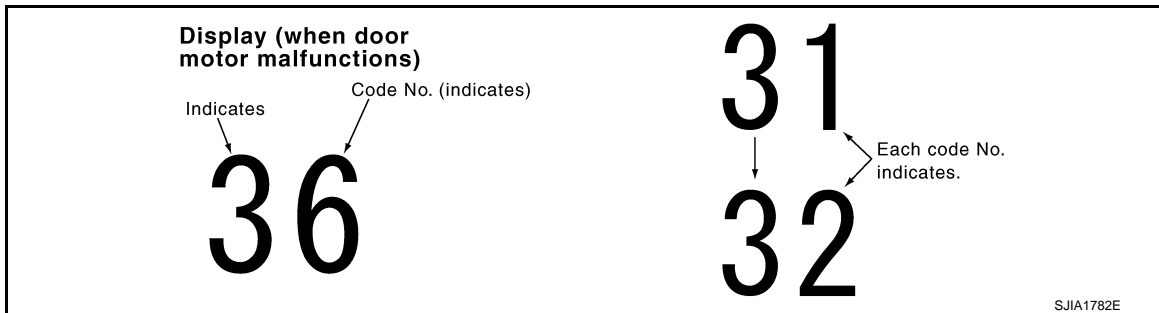
(Corresponding code Nos. indicates 1 second each if two or more mode or intake door motors malfunction.)

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

31→32→Return to 31

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

37→38→39→Return to 37



>> INSPECTION END

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

INFOID:000000004345728

### CONSULT-III APPLICATION ITEMS

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

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

### DATA MONITOR



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

< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]

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

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

HAC

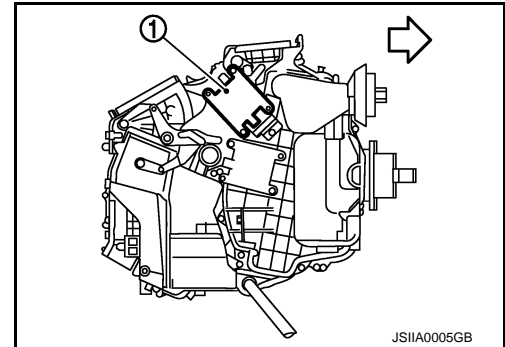
**DTC/CIRCUIT DIAGNOSIS****MODE DOOR MOTOR****Description**

INFOID:000000004345729

**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:000000004345730

**1. CONFIRM SYMPTOM BY PERFORMING THE FOLLOWING OPERATIONAL CHECK**

1. Press MODE switch(es) and DEF switch.
2. Each position indicator should change shape.
3. Confirm that discharge air comes out according to the air distribution table at below. Refer to [VTL-5, "System Description"](#).

**NOTE:**

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

Is the inspection result normal?

YES >> END.

NO >> Go to diagnosis procedure. Refer to [HAC-66, "Diagnosis Procedure"](#).

**Diagnosis Procedure**

INFOID:000000004345731

**1. PERFORM SELF-DIAGNOSIS STEP-2**

Perform self-diagnosis STEP-2. Refer to [HAC-53, "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (Without left and right ventilation temperature separately control system) or [HAC-59, "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (With left and right ventilation temperature separately control system), see Nos. 1 to 2.

Does code No. 20 appear on the display?

YES >> GO TO 2.

NO >> Go to appropriate malfunctioning sensor circuit. Refer to [HAC-53, "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (Without left and right ventilation temperature separately control system) or [HAC-59, "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (With left and right ventilation temperature separately control system), see No. 11.

**2. PERFORM SELF-DIAGNOSIS STEP-3**

Perform self-diagnosis STEP-3. Refer to [HAC-53, "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (Without left and right ventilation temperature separately control system) [HAC-59, "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (With left and right ventilation temperature separately control system), see Nos. 1 to 3.

Does code No. 30 appear on the display?

# MODE DOOR MOTOR

[AUTOMATIC AIR CONDITIONER]

## < DTC/CIRCUIT DIAGNOSIS >

- YES >> GO TO 6.
- NO-1 >> Code No. 31 or 32 appear on the display: GO TO 3.
- NO-2 >> Code No. 37, 38 or 39 appear on the display: Go to Intake Door Motor Circuit. Refer to [HAC-74](#), "[Diagnosis Procedure](#)".

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

Check voltage between mode door motor harness connector and ground.

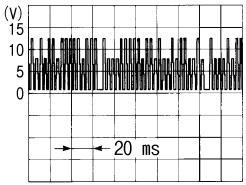
(+)		(-)	Voltage (Approx.)
Mode door motor		—	
Connector	Terminal		
M253	1	Ground	12 V

Is the inspection result normal?

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

### 4.CHECK SIGNAL FOR MODE DOOR MOTOR

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

(+)		(-)	Voltage
Mode door motor		—	
Connector	Terminal		
M253	3	Ground	 SJIA1453J

Is the inspection result normal?

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

### 5.CHECK MODE DOOR MOTOR GROUND CIRCUIT

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

Mode door motor		—	Continuity
Connector	Terminal		
M253	2	Ground	Existed

Is the inspection result normal?

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

### 6.PERFORM SELF-DIAGNOSIS STEP-4

Perform self-diagnosis STEP-4. Refer to [HAC-53](#), "[WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description](#)" (Without left and right ventilation temperature separately control system) [HAC-59](#), "[WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description](#)" (With left and right ventilation temperature separately control system), see Nos. 1 to 5.

Is it operated normally?

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

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

HAC

## MODE DOOR MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

---

### 7. CHECK MODE DOOR CONTROL LINKAGE

---

Check mode door control linkage.

Is it installed normally?

- YES >> Refer to [HAC-152. "Exploded View"](#).
- NO >> Repair or adjust control linkage.

# AIR MIX DOOR MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

## AIR MIX DOOR MOTOR

### WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM

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

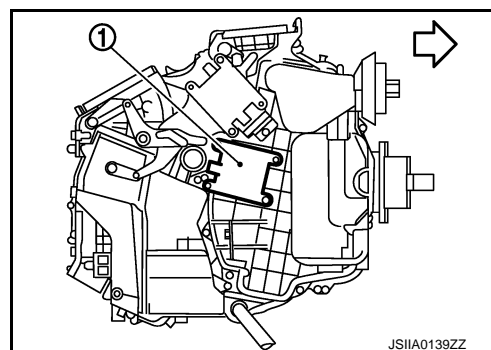
INFOID:000000004345732

#### COMPONENT DESCRIPTION

##### Air Mix Door Motor

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

←: Vehicle front



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

INFOID:000000004345733

#### 1.CONFIRM SYMPTOM BY PERFORMING THE FOLLOWING OPERATIONAL CHECK

1. Turn temperature control dial clockwise until 32°C (90°F) is displayed.
2. Check for warm air at discharge air outlets.
3. Turn temperature control dial counterclockwise until 18°C (64°F) is displayed.
4. Check for cool air at discharge air outlets.

Is the inspection result normal?

YES >> END.

NO >> Go to diagnosis procedure. Refer to [HAC-69. "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Procedure"](#).

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

INFOID:000000004345734

#### 1.PERFORM SELF-DIAGNOSIS STEP-2

Perform self-diagnosis STEP-2. Refer to [HAC-53. "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#), see Nos. 1 to 2.

Does code No. 20 appear on the display.

YES >> GO TO 2.

NO >> Go to appropriate malfunctioning sensor circuit. Refer to [HAC-53. "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#), see No. 11.

#### 2.PERFORM SELF-DIAGNOSIS STEP-4

Perform self-diagnosis STEP-4. Refer to [HAC-53. "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#), see Nos. 1 to 5.

Is it operated normally?

YES >> END.

NO >> GO TO 3.

#### 3.CHECK INSTALLATION OF AIR MIX DOOR MOTOR

Check installation of air mix door motor. Refer to [HAC-152. "Exploded View"](#).

# AIR MIX DOOR MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

Is it installed normally?

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

## 4. CHECK POWER SUPPLY FOR AIR MIX DOOR MOTOR

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

(+)		(-)	Voltage (Approx.)
Air mix door motor		—	
Connector	Terminal	—	
M255	1	Ground	

Is the inspection result normal?

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

## 5. CHECK SIGNAL FOR AIR MIX DOOR MOTOR

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

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

Is the inspection result normal?

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

## 6. CHECK AIR MIX DOOR MOTOR GROUND CIRCUIT

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

Air mix door motor		—	Continuity
Connector	Terminal	—	
M255	2	Ground	

Is the inspection result normal?

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

## WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM

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

INFOID:000000004345735

#### COMPONENT DESCRIPTION

Air Mix Door Motor

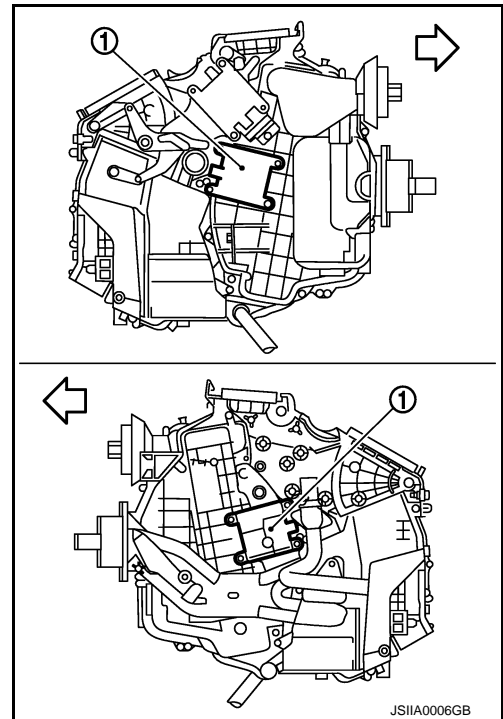
# AIR MIX DOOR MOTOR

## < DTC/CIRCUIT DIAGNOSIS >

## [AUTOMATIC AIR CONDITIONER]

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

←: Vehicle front



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

INFOID:000000004345736

### 1.CONFIRM SYMPTOM BY PERFORMING THE FOLLOWING OPERATIONAL CHECK

1. Turn temperature control dial (driver side) clockwise until 32°C (90°F) is displayed.
2. Check for warm air at discharge air outlets.
3. Turn temperature control dial (driver side) counterclockwise until 18°C (64°F) is displayed.
4. Check for cool air at discharge air outlets.

Is the inspection result normal?

YES >> END.

NO >> Go to diagnosis procedure. Refer to [HAC-71, "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Procedure"](#).

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

INFOID:000000004345737

### 1.PERFORM SELF-DIAGNOSIS STEP-2

Perform self-diagnosis STEP-2. Refer to [HAC-59, "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#), see Nos. 1 to 2.

Does code No. 20 appear on the display?

YES >> GO TO 2.

NO >> Go to appropriate malfunctioning sensor circuit. Refer to [HAC-59, "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#), see No. 11.

### 2.PERFORM SELF-DIAGNOSIS STEP-4

Perform self-diagnosis STEP-4. Refer to [HAC-59, "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#), see Nos. 1 to 5.

Is it operated normally?

YES >> END.

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

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

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

# AIR MIX DOOR MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

Check installation of air mix door motor (driver side). Refer to [HAC-152. "Exploded View"](#).

Is it installed normally?

YES >> GO TO 4.

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

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

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

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

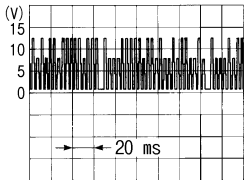
Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair harness or connector.

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

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

(+)		(-)	Voltage
Air mix door motor (driver side)		—	
Connector	Terminal		
M252	3	Ground	 SJIA1453J

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair harness or connector.

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

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

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

Is the inspection result normal?

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

NO >> Repair harness or connector.

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

Check installation of air mix door motor (passenger side). Refer to [HAC-152. "Exploded View"](#).

Is it installed normally?

YES >> GO TO 8.

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

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



# AIR MIX DOOR MOTOR

## < DTC/CIRCUIT DIAGNOSIS >

## [AUTOMATIC AIR CONDITIONER]

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

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

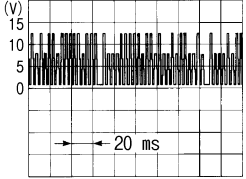
Is the inspection result normal?

YES >> GO TO 9.

NO >> Repair harness or connector.

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

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

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

Is the inspection result normal?

YES >> GO TO 10.

NO >> Repair harness or connector.

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

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

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

Is the inspection result normal?

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

NO >> Repair harness or connector.

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

# INTAKE DOOR MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

## INTAKE DOOR MOTOR

### Description

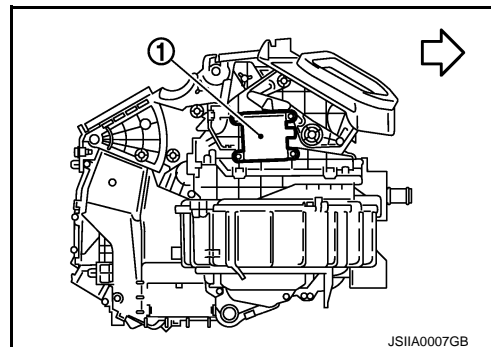
INFOID:000000004345738

### COMPONENT DESCRIPTION

#### Intake Door Motor

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

←: Vehicle front



### Component Function Check

INFOID:000000004345739

#### 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 >> END.

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

### Diagnosis Procedure

INFOID:000000004345740

#### 1. PERFORM SELF-DIAGNOSIS STEP-2

Perform self-diagnosis STEP-2. Refer to [HAC-53, "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (Without left and right ventilation temperature separately control system) or [HAC-59, "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (With left and right ventilation temperature separately control system), see Nos. 1 to 2.

Does code No. 20 appear on the display?

YES >> GO TO 2.

NO >> Go to appropriate malfunctioning sensor circuit. Refer to [HAC-53, "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (Without left and right ventilation temperature separately control system) or [HAC-59, "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (With left and right ventilation temperature separately control system), see No. 11.

#### 2. PERFORM SELF-DIAGNOSIS STEP-4

Perform self-diagnosis STEP-4. Refer to [HAC-53, "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (Without left and right ventilation temperature separately control system) or [HAC-59, "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (With left and right ventilation temperature separately control system), see Nos. 1 to 5.

Is it operated normally?

YES >> END.

NO >> GO TO 3.

#### 3. CHECK INTAKE DOOR CONTROL LINKAGE

# INTAKE DOOR MOTOR

[AUTOMATIC AIR CONDITIONER]

## < DTC/CIRCUIT DIAGNOSIS >

Check intake door control linkage.

Is it installed normally?

YES >> GO TO 4.

NO >> Repair or adjust control linkage.

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

Check voltage between intake door motor harness connector and ground.

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

Is the inspection result normal?

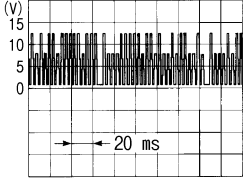
YES >> GO TO 5.

NO >> Repair harness or connector.

### 5.CHECK SIGNAL FOR INTAKE DOOR MOTOR

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

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



SJI1453J

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair harness or connector.

### 6.CHECK INTAKE DOOR MOTOR GROUND CIRCUIT

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

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

Is the inspection result normal?

YES >> Replace intake door motor.

NO >> Repair harness or connector.

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

HAC

# BLOWER MOTOR

[AUTOMATIC AIR CONDITIONER]

< DTC/CIRCUIT DIAGNOSIS >

## BLOWER MOTOR

WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM

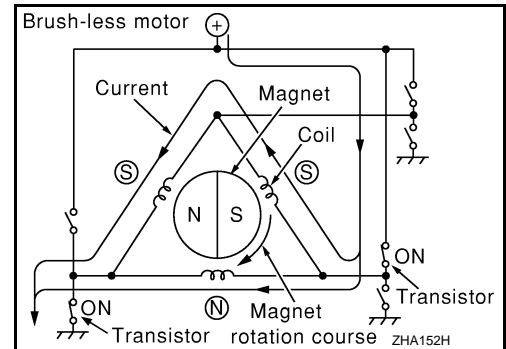
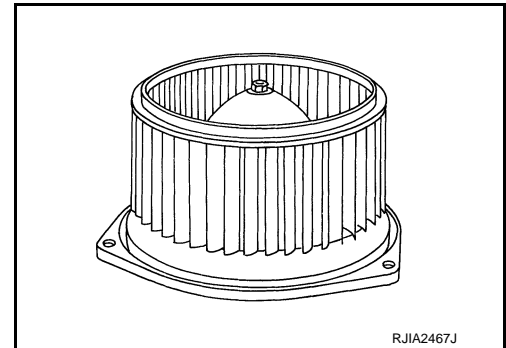
WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Description

INFOID:000000004345741

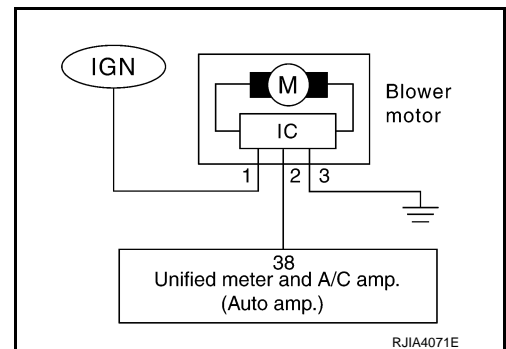
### COMPONENT DESCRIPTION

Brush-less Motor

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



Blower motor circuit



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

INFOID:000000004345742

### 1. CONFIRM SYMPTOM BY PERFORMING THE FOLLOWING OPERATIONAL CHECK

1. Turn fan control dial clockwise. Blower should operate on low speed.
2. Turn fan control dial clockwise, and continue checking blower speed and fan symbol until all speeds checked.

Is the inspection result normal?

YES >> END.

# BLOWER MOTOR

[AUTOMATIC AIR CONDITIONER]

< DTC/CIRCUIT DIAGNOSIS >

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

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

INFOID:000000004345743

### 1. PERFORM SELF-DIAGNOSIS STEP-4

Perform self-diagnosis STEP-4. Refer to [HAC-53, "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#), see Nos. 1 to 5.

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

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

YES >> END.

NO >> GO TO 2.

### 2. CHECK POWER SUPPLY FOR BLOWER MOTOR

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

(+)		(-)	Voltage
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

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

blower motor		—	Continuity
Connector	Terminal		
M109	2	ground	Not existed

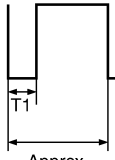
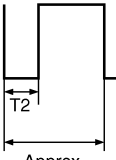
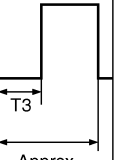
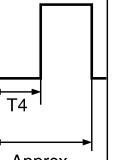
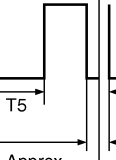
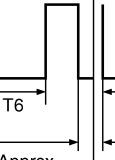
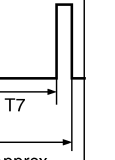
Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair harness or connector.

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

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

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

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

JSIIA0068GB

Is the inspection result normal?

YES >> 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

1. Turn ignition switch OFF.
2. Remove blower relay. Refer to [PG-99. "Fuse, Connector and Terminal Arrangement"](#).
3. Turn ignition switch ON.
4. Check the voltage between blower relay fuse block terminals and ground. Refer to [PG-97. "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-53. "Wiring Diagram - IGNITION POWER SUPPLY -"](#).

## 7. CHECK BLOWER RELAY

1. Turn ignition switch OFF.
2. Install blower relay. Refer to [PG-99. "Fuse, Connector and Terminal Arrangement"](#).
3. Check operation sound of the blower relay after switching ignition switch ON.

# BLOWER MOTOR

[AUTOMATIC AIR CONDITIONER]

## < DTC/CIRCUIT DIAGNOSIS >

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-99, "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.

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

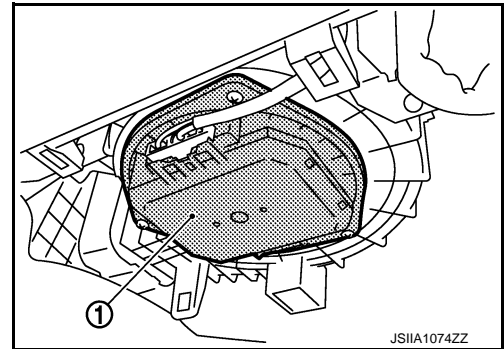
INFOID:000000004345744

### 1.CHECK BLOWER MOTOR

1. Remove blower motor (1). Refer to [VTL-19, "Exploded View"](#).
2. Confirm smooth rotation of the blower motor.

Is the inspection result normal?

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



## WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM

HAC

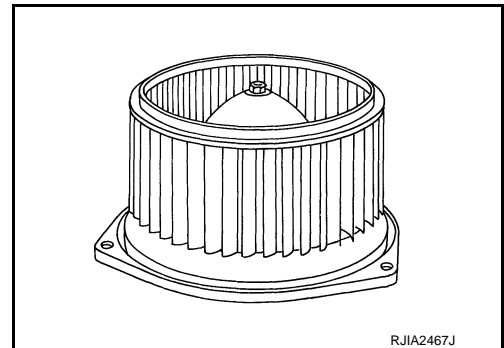
## WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Description

INFOID:000000004345745

### COMPONENT DESCRIPTION

#### Brush-less Motor

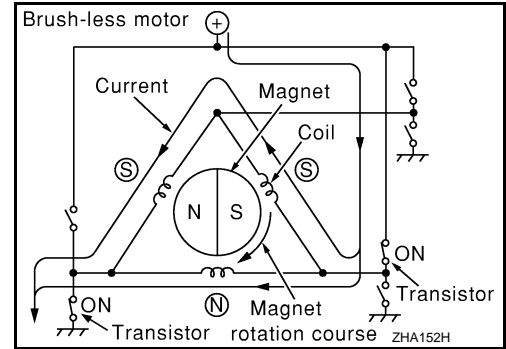
The blower motor utilizes a brush-less motor with a rotating magnet. Quietness is improved over previous motors where the brush was the point of contact and the coil rotated.



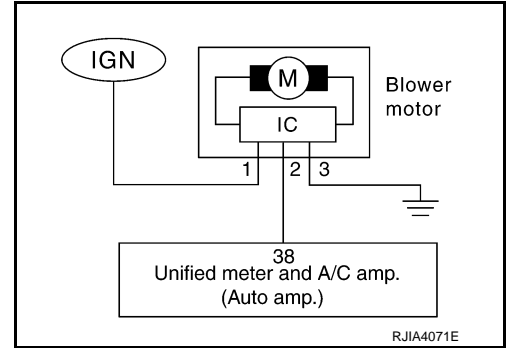
# BLOWER MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]



Blower motor circuit



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

INFOID:000000004345746

### 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 >> END.

NO >> Go to diagnosis procedure. Refer to [HAC-80, "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Procedure"](#).

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

INFOID:000000004345747

### 1. PERFORM SELF-DIAGNOSIS STEP-4

Perform self-diagnosis STEP-4. Refer to [HAC-59, "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#), see Nos. 1 to 5.

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

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

YES >> END.

NO >> GO TO 2.

### 2. CHECK POWER SUPPLY FOR BLOWER MOTOR

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



# BLOWER MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

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

Is the inspection result normal?

YES >> GO TO 3.

NO >> GO TO 6.

## 3. CHECK BLOWER MOTOR GROUND CIRCUIT

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

blower motor		—	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.

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

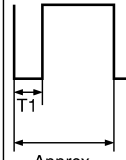
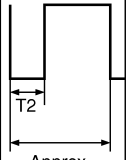
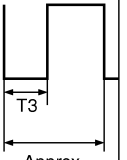
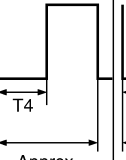
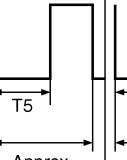
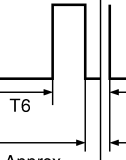
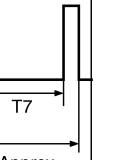
HAC

# BLOWER MOTOR

## < DTC/CIRCUIT DIAGNOSIS >

## [AUTOMATIC AIR CONDITIONER]

4. 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)							
Duty ratio	Approx. 25%	Approx. 33%	Approx. 41%	Approx. 51%	Approx. 61%	Approx. 71%	Approx. 83%

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

JSIIA0068GB

### Is the inspection result normal?

- YES >> 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-99, "Fuse, Connector and Terminal Arrangement"](#).
- Turn ignition switch ON.
- Check the voltage between blower relay fuse block terminals and ground. Refer to [PG-97, "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-53, "Wiring Diagram - IGNITION POWER SUPPLY -"](#).

## 7. CHECK BLOWER RELAY

- Turn ignition switch OFF.
- Install blower relay. Refer to [PG-99, "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-99, "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.

## WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL

# BLOWER MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

SYSTEM : Component Inspection

INFOID:000000004345748

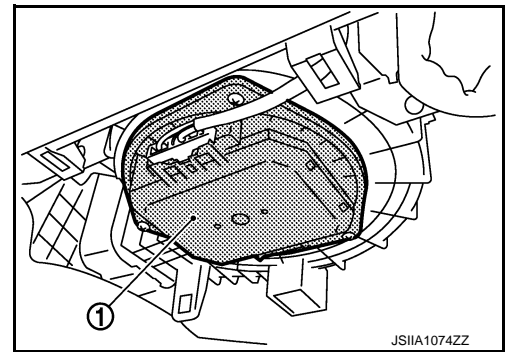
## 1. CHECK BLOWER MOTOR

1. Remove blower motor (1). Refer to [VTL-19, "Exploded View"](#).
2. Confirm smooth rotation of the blower motor.

Is the inspection result normal?

YES >> END.

NO >> Replace blower motor.



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

HAC

## MAGNET CLUTCH

### Description

INFOID:000000004345749

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

### Component Function Check

INFOID:000000004345750

#### 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 >> END.  
 NO >> Go to Diagnosis Procedure. Refer to [HAC-84. "Diagnosis Procedure"](#).

### Diagnosis Procedure

INFOID:000000004345751

#### 1. PERFORM SELF-DIAGNOSIS STEP-2

Perform self-diagnosis STEP-2. Refer to [HAC-53. "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (Without left and right ventilation temperature separately control system) or [HAC-59. "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (With left and right ventilation temperature separately control system), see Nos. 1 to 2.

#### Is there any malfunction displayed?

- YES >> Go to appropriate malfunctioning sensor circuit. Refer to [HAC-53. "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (Without left and right ventilation temperature separately control system) or [HAC-59. "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (With left and right ventilation temperature separately control system), see to No. 11.
- NO >> GO TO 2.

#### 2. PERFORM SELF-DIAGNOSIS STEP-4

Perform self-diagnosis STEP-4. Refer to [HAC-53. "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (Without left and right ventilation temperature separately control system) or [HAC-59. "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (With left and right ventilation temperature separately control system), see Nos. 1 to 5.

#### Is it operated normally?

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

#### 3. PERFORM IPDM E/R AUTO ACTIVE TEST

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

#### Does the magnet clutch operate?

- YES >> •  WITH CONSULT-III: GO TO 6.  
 •  WITHOUT CONSULT-III: GO TO 7.
- NO >> Check 10A fuse (No. 49, located in IPDM E/R), and GO TO 4.

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

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

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

# MAGNET CLUTCH

[AUTOMATIC AIR CONDITIONER]

## < DTC/CIRCUIT DIAGNOSIS >

Is the inspection result normal?

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

### 5.CHECK MAGNET CLUTCH CIRCUIT

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

Is the inspection result normal?

- YES >> 1. Replace IPDM E/R.
- 2. Refer to self-diagnosis procedure [HAC-53. "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (Without left and right ventilation temperature separately control system) or [HAC-59. "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (With left and right ventilation temperature separately control system) and perform self-diagnosis STEP-4. Confirm that magnet clutch operation normal.
- NO >> 1. Replace magnet clutch. Refer to [HA-40. "MAGNET CLUTCH : Removal and Installation of Compressor Clutch"](#).
- 2. Refer to self-diagnosis procedure [HAC-53. "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (Without left and right ventilation temperature separately control system) or [HAC-59. "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (With left and right ventilation temperature separately control system) and perform self-diagnosis STEP-4. Confirm that magnet clutch operation normal.

### 6.CHECK ECM INPUT SIGNAL-1

Check A/C switch signal in "Data monitor". Refer to [HAC-58. "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : CONSULT-III Function"](#)(Without left and right ventilation temperature separately control system) or [HAC-64. "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : CONSULT-III Function"](#) (With left and right ventilation temperature separately control system).

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

Is the inspection result normal?

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

### 7.CHECK REFRIGERANT PRESSURE SENSOR

WITH CONSULT-III

- 1. Start the engine.
- 2. Check voltage of refrigerant pressure sensor in "Data monitor". Refer to [EC-495. "Reference Value"](#).

WITHOUT CONSULT-III

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

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

Is the inspection result normal?

- YES >> •  WITH CONSULT-III: GO TO 8.
- WITHOUT CONSULT-III: Repair harness or connector.
- NO >> Refer to [EC-490. "Diagnosis Procedure"](#).

### 8.CHECK ECM INPUT SIGNAL-2

Check blower fan motor switch signal in "Data monitor". Refer to [HAC-58. "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : CONSULT-III Function"](#) (Without left

# MAGNET CLUTCH

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

and right ventilation temperature separately control system) or [HAC-64, "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : CONSULT-III Function"](#) (With left and right temperature separately control system).

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

Is the inspection result normal?

YES >> GO TO 9.

NO >> Repair harness or connector.

## 9.CHECK CAN COMMUNICATION

Check CAN communication. Refer to [LAN-17, "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)

[AUTOMATIC AIR CONDITIONER]

< DTC/CIRCUIT DIAGNOSIS >

## ECV (ELECTRICAL CONTROL VALVE)

### Description

INFOID:000000004507038

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

### Diagnosis Procedure

INFOID:000000004507039

#### 1. CHECK POWER SUPPLY FOR ECV (ELECTRIC CONTROL VALVE)

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

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

Is the inspection result normal?

- YES >> GO TO 3  
 NO >> GO TO 2

#### 2. CHECK FUSE

Check power supply circuit and 10A fuse [No. 3, located in the fuse block (J/B)]. Refer to [PG-99, "Fuse, Connector and Terminal Arrangement"](#).

Is the inspection result normal?

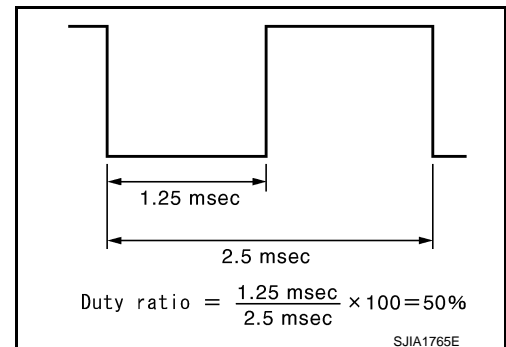
- YES >> Check harness for open circuit. Repair or replace if necessary.  
 NO >> Replace fuse and check harness for short circuit. Repair or replace if necessary.

#### 3. CHECK ECV CONTROL SIGNAL

1. Turn ignition switch OFF.
2. Reconnect compressor (ECV) connector.
3. Perform self-diagnosis. Refer to [HAC-53, "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (Without left and right ventilation temperature separately control system) or [HAC-59, "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (With left and right ventilation temperature separately control system).
4. Set in self-diagnosis STEP-4 (Code No. 45).
5. Confirm ECV control signal between unified meter and A/C amp harness connector M67 terminal 65 and ground using an oscilloscope.

Is the inspection result normal?

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



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

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

# ECV (ELECTRICAL CONTROL VALVE)

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

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

Is the inspection result normal?

YES >> GO TO 5

NO >> Repair the harnesses or connectors.

## 5.CHECK ECV

Check continuity between compressor (ECV) connector.

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

Is the inspection result normal?

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

NO >> Replace the compressor.



## AMBIENT SENSOR

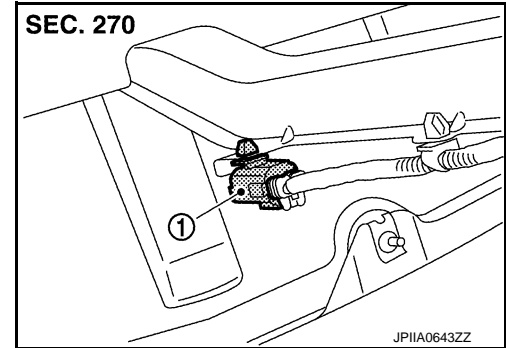
### Description

INFOID:000000004345752

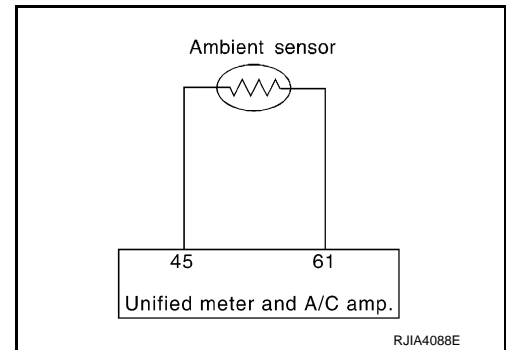
### COMPONENT DESCRIPTION

#### Ambient Sensor

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



#### Ambient Sensor Circuit



### AMBIENT TEMPERATURE INPUT PROCESS

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

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

### Component Function Check

INFOID:000000004345753

#### 1. PERFORM SELF-DIAGNOSIS STEP-2

Perform self-diagnosis STEP-2. Refer to [HAC-53. "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (Without left and right ventilation temperature separately control system) or [HAC-59. "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (With left and right ventilation temperature separately control system), see Nos. 1 to 2.

21 or -21 is displayed.

- YES >> Go to Diagnosis Procedure. Refer to [HAC-89. "Diagnosis Procedure"](#).
- NO >> END.

### Diagnosis Procedure

INFOID:000000004345754

#### 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.

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

# AMBIENT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

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

Is the inspection result normal?

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

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

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

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

Is the inspection result normal?

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

## 3. CHECK AMBIENT SENSOR

Check ambient sensor. Refer to [HAC-90. "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:000000004345755

## 1. CHECK AMBIENT SENSOR

1. Turn ignition switch OFF.
2. Disconnect ambient sensor connector. Refer to [HAC-145. "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 >> END.

NO >> Replace ambient sensor.

A

B

C

D

E

F

G

H

HAC

J

K

L

M

N

O

P

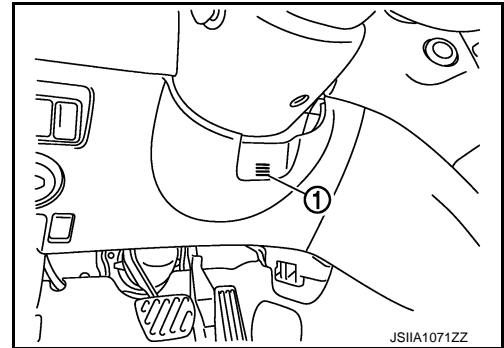
IN-VEHICLE SENSOR

Description

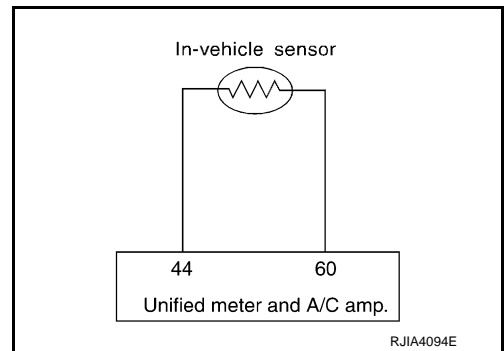
INFOID:000000004345756

In-vehicle Sensor

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

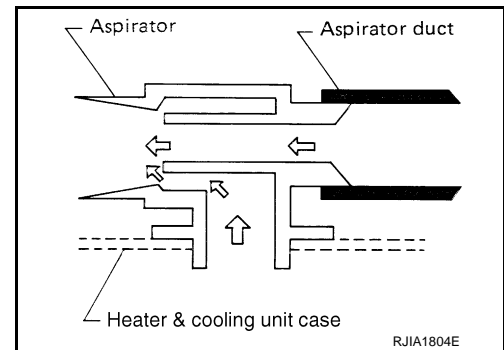
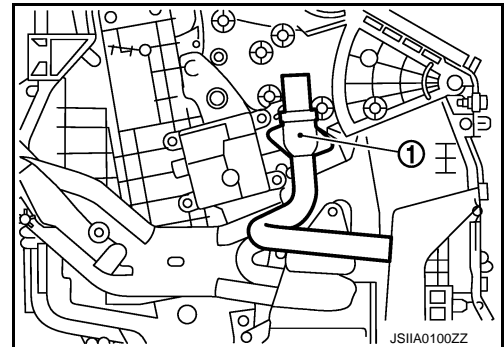


In-vehicle Sensor Circuit



Aspirator

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



Component Function Check

INFOID:000000004345757

1.PERFORM SELF-DIAGNOSIS STEP-2

# IN-VEHICLE SENSOR

[AUTOMATIC AIR CONDITIONER]

< DTC/CIRCUIT DIAGNOSIS >

Perform self-diagnosis STEP-2. Refer to [HAC-53. "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (Without left and right ventilation temperature separately control system) or [HAC-59. "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (With left and right ventilation temperature separately control system), see Nos. 1 to 2.

22 or -22 is displayed.

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

## Diagnosis Procedure

INFOID:000000004345758

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

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

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

Is the inspection result normal?

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

### 2. CHECK 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

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

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

Is the inspection result normal?

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

## Component Inspection

INFOID:000000004345759

### 1. CHECK IN-VEHICLE SENSOR

1. Turn ignition switch OFF.
2. Disconnect in-vehicle sensor connector. Refer to [HAC-146. "Exploded View"](#).
3. Check resistance between in-vehicle sensor terminals.

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

Is the inspection result normal?

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

# SUNLOAD SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

## SUNLOAD SENSOR

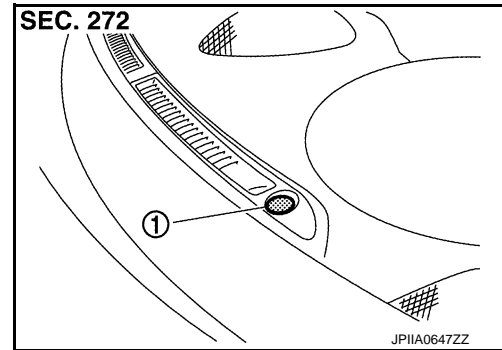
### Description

INFOID:000000004345760

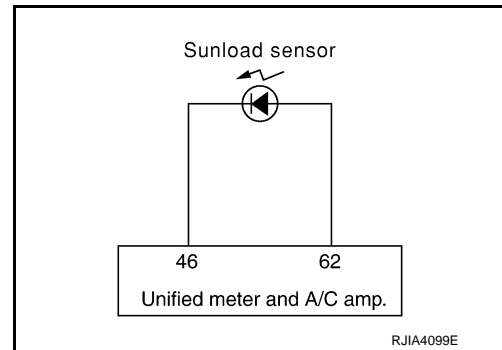
### COMPONENT DESCRIPTION

#### Sunload Sensor

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



#### Sunload Sensor Circuit



### SUNLOAD INPUT PROCESS

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

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

### Component Function Check

INFOID:000000004345761

#### 1. PERFORM SELF-DIAGNOSIS STEP-2

Perform self-diagnosis STEP-2. Refer to [HAC-53, "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (Without left and right ventilation temperature separately control system) or [HAC-59, "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (With left and right ventilation temperature separately control system), see Nos. 1 to 2.

25 or -25 is displayed.

- YES >> Go to Diagnosis Procedure. Refer to [HAC-95, "Diagnosis Procedure"](#).
- NO >> END.

### Diagnosis Procedure

INFOID:000000004345762

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

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

# SUNLOAD SENSOR

[AUTOMATIC AIR CONDITIONER]

## < DTC/CIRCUIT DIAGNOSIS >

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

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

Is the inspection result normal?

YES >> GO TO 2.

NO >> GO TO 4.

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

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

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

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair harness or connector.

## 3.CHECK SUNLOAD SENSOR

1. Reconnect sunload sensor connector and unified meter and A/C amp. connector.
2. Check sunload sensor. Refer to [HAC-96, "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:000000004345763

## 1.CHECK SUNLOAD SENSOR

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

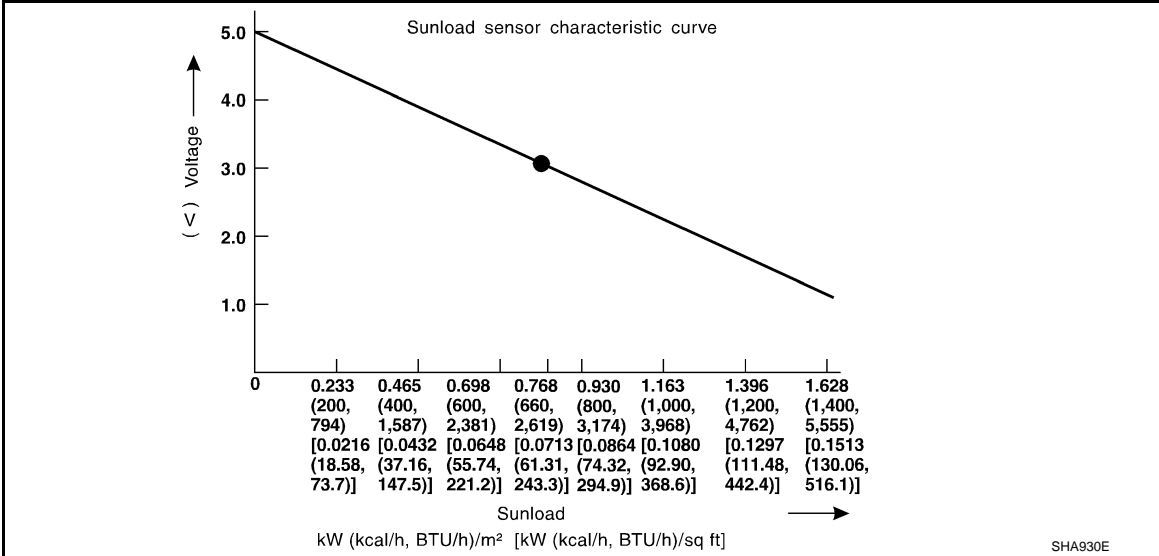


# SUNLOAD SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

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



**NOTE:**

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

Is the inspection result normal?

YES >> END.

NO >> Replace sunload sensor.

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

HAC

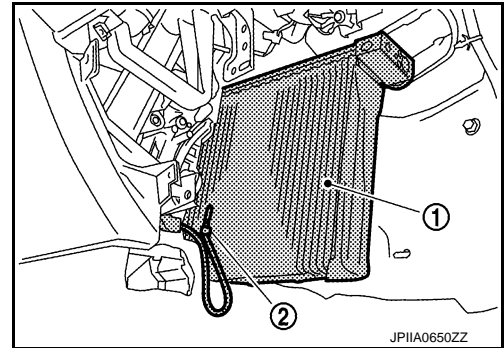
INTAKE SENSOR

Description

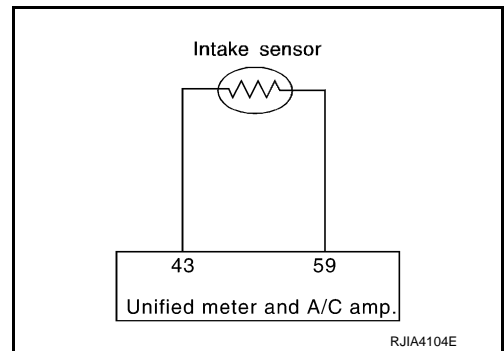
INFOID:000000004345764

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.



Intake Sensor Circuit



Component Function Check

INFOID:000000004345765

1.PERFORM SELF-DIAGNOSIS STEP-2

Perform self-diagnosis STEP-2. Refer to [HAC-53. "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (Without left and right ventilation temperature separately control system) or [HAC-59. "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (With left and right ventilation temperature separately control system), see Nos. 1 to 2.

24 or -24 is displayed.

- YES >> Go to Diagnosis Procedure. Refer to [HAC-98. "Diagnosis Procedure"](#).
- NO >> END.

Diagnosis Procedure

INFOID:000000004345766

1.CHECK VOLTAGE BETWEEN INTAKE SENSOR AND GROUND

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

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

Is the inspection result normal?

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

# INTAKE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

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

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

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

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair harness or connector.

## 3.CHECK INTAKE SENSOR

Check intake sensor. Refer to [HAC-99, "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:000000004345767

## 1.CHECK INTAKE SENSOR

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

# INTAKE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

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

Is the inspection result normal?

YES >> END.

NO >> Replace intake sensor.

# POWER SUPPLY AND GROUND CIRCUIT FOR AUTO AMP.

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

## POWER SUPPLY AND GROUND CIRCUIT FOR AUTO AMP.

### Description

INFOID:000000004345768

### COMPONENT DESCRIPTION

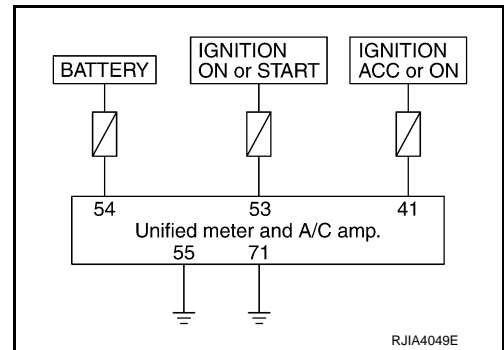
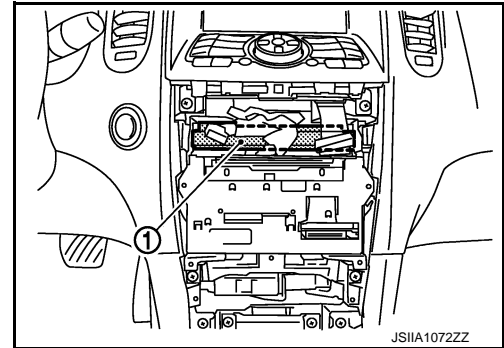
Unified Meter and A/C Amp. (Automatic Amplifier)

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

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

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

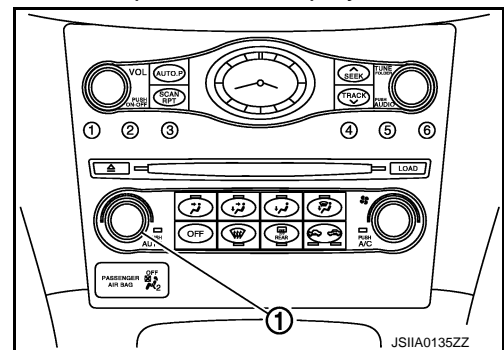
Power Supply and Ground Circuit for Unified Meter and A/C Amp.



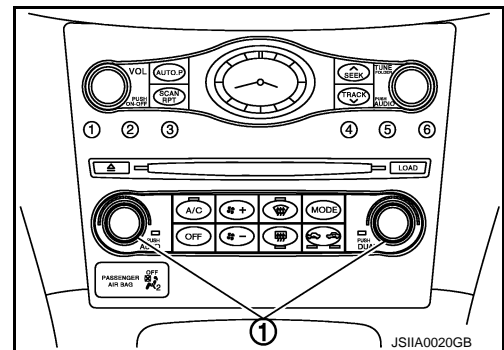
Potential Temperature Control (PTC)

The PTC (1) is built into the preset switch. It can be set at an interval of 0.5°C (1.0°F) in the 18°C (64°F) to 32°C (90°F) temperature range by turning temperature control dial. The set temperature is displayed.

Without left and right ventilation temperature separately system



With left and right ventilation temperature separately system



A

B

C

D

E

F

G

H

HAC

J

K

L

M

N

O

P

# POWER SUPPLY AND GROUND CIRCUIT FOR AUTO AMP.

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

## Component Function Check

INFOID:000000004345769

### 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 >> END.

NO >> Go to Diagnosis Procedure. Refer to [HAC-102. "Diagnosis Procedure"](#).

## Diagnosis Procedure

INFOID:000000004345770

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

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

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

Is the inspection result normal?

YES >> GO TO 3.

NO >> GO TO 2.

### 2. CHECK FUSE

Check 10A fuses [Nos. 3, 11 and 19, located in the fuse block (J/B)]. Refer to [PG-99. "Fuse, Connector and Terminal Arrangement"](#).

Is the inspection result normal?

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

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

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

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

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

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair harness or connector.

### 4. CHECK PRESET SWITCH

Check preset switch. Refer to [AV-144. "Symptom Table"](#) (BASE AUDIO WITHOUT NAVIGATION) or [AV-560. "Symptom Table"](#) (BOSE AUDIO WITH NAVIGATION).

Is the inspection result normal?

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

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

# ECU DIAGNOSIS INFORMATION

## ECM

### Reference Value

INFOID:000000004506882

### VALUES ON THE DIAGNOSIS TOOL

#### NOTE:

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

#### CONSULT-III MONITOR ITEM

Monitor Item	Condition		Values/Status
ENG SPEED	• Run engine and compare CONSULT-III value with the tachometer indication.		Almost the same speed as the tachometer indication
MAS A/F SE-B1	See <a href="#">EC-129, "Description"</a> .		
MAS A/F SE-B2	See <a href="#">EC-129, "Description"</a> .		
B/FUEL SCHDL	See <a href="#">EC-129, "Description"</a> .		
A/F ALPHA-B1	See <a href="#">EC-129, "Description"</a> .		
A/F ALPHA-B2	See <a href="#">EC-129, "Description"</a> .		
COOLAN TEMP/S	• Ignition switch: ON		Indicates engine coolant temperature
A/F SEN1 (B1)	• Engine: After warming up	Maintaining engine speed at 2,000 rpm	Fluctuates around 2.2 V
A/F SEN1 (B2)	• Engine: After warming up	Maintaining engine speed at 2,000 rpm	Fluctuates around 2.2 V
HO2S2 (B1)	<ul style="list-style-type: none"> <li>• Revving engine from idle to 3,000 rpm quickly after the following conditions are met.</li> <li>- Engine: After warming up</li> <li>- After keeping engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load</li> </ul>		0 - 0.3V ↔ Approx. 0.6 - 1.0V
HO2S2 (B2)	<ul style="list-style-type: none"> <li>• Revving engine from idle to 3,000 rpm quickly after the following conditions are met.</li> <li>- Engine: After warming up</li> <li>- After keeping engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load</li> </ul>		0 - 0.3V ↔ Approx. 0.6 - 1.0V
HO2S2 MNTR (B1)	<ul style="list-style-type: none"> <li>• Revving engine from idle to 3,000 rpm quickly after the following conditions are met.</li> <li>- Engine: After warming up</li> <li>- After keeping engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load</li> </ul>		LEAN ↔ RICH
HO2S2 MNTR (B2)	<ul style="list-style-type: none"> <li>• Revving engine from idle to 3,000 rpm quickly after the following conditions are met.</li> <li>- Engine: After warming up</li> <li>- After keeping engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load</li> </ul>		LEAN ↔ RICH
VHCL SPEED SE	• Turn drive wheels and compare CONSULT-III value with the speedometer indication.		Almost the same speed as speedometer indication
BATTERY VOLT	• Ignition switch: ON (Engine stopped)		11 - 14V
ACCEL SEN 1	• Ignition switch: ON (Engine stopped)	Accelerator pedal: Fully released	0.5 - 1.0V
		Accelerator pedal: Fully depressed	4.2 - 4.8V
ACCEL SEN 2*1	• Ignition switch: ON (Engine stopped)	Accelerator pedal: Fully released	0.5 - 1.0V
		Accelerator pedal: Fully depressed	4.2 - 4.8V

# ECM

## < ECU DIAGNOSIS INFORMATION >

## [AUTOMATIC AIR CONDITIONER]

Monitor Item	Condition		Values/Status
TP SEN 1-B1	<ul style="list-style-type: none"> <li>Ignition switch: ON (Engine stopped)</li> <li>Selector lever: D</li> </ul>	Accelerator pedal: Fully released	More than 0.36V
		Accelerator pedal: Fully depressed	Less than 4.75V
TP SEN 2-B1*1	<ul style="list-style-type: none"> <li>Ignition switch: ON (Engine stopped)</li> <li>Selector lever: D</li> </ul>	Accelerator pedal: Fully released	More than 0.36V
		Accelerator pedal: Fully depressed	Less than 4.75V
FUEL T/TMP SE	<ul style="list-style-type: none"> <li>Ignition switch: ON</li> </ul>		Indicates fuel tank temperature
INT/A TEMP SE	<ul style="list-style-type: none"> <li>Ignition switch: ON</li> </ul>		Indicates intake air temperature
EVAP SYS PRES	<ul style="list-style-type: none"> <li>Ignition switch: ON</li> </ul>		Approx. 1.8 - 4.8V
FUEL LEVEL SE	<ul style="list-style-type: none"> <li>Ignition switch: ON</li> </ul>		Depending on fuel level of fuel tank
START SIGNAL	<ul style="list-style-type: none"> <li>Ignition switch: ON → START → ON</li> </ul>		OFF → ON → OFF
CLSD THL POS	<ul style="list-style-type: none"> <li>Ignition switch: ON (Engine stopped)</li> </ul>	Accelerator pedal: Fully released	ON
		Accelerator pedal: Slightly depressed	OFF
AIR COND SIG	<ul style="list-style-type: none"> <li>Engine: After warming up, idle the engine</li> </ul>	Air conditioner switch: OFF	OFF
		Air conditioner switch: ON (Compressor operates.)	ON
P/N POSI SW	<ul style="list-style-type: none"> <li>Ignition switch: ON</li> </ul>	Selector lever: P or N	ON
		Selector lever: Except above	OFF
PW/ST SIGNAL	<ul style="list-style-type: none"> <li>Engine: After warming up, idle the engine</li> </ul>	Steering wheel: Not being turned	OFF
		Steering wheel: Being turned	ON
LOAD SIGNAL	<ul style="list-style-type: none"> <li>Ignition switch: ON</li> </ul>	Rear window defogger switch: ON and/or Lighting switch: 2nd position	ON
		Rear window defogger switch and lighting switch: OFF	OFF
IGNITION SW	<ul style="list-style-type: none"> <li>Ignition switch: ON → OFF → ON</li> </ul>		ON → OFF → ON
HEATER FAN SW	<ul style="list-style-type: none"> <li>Engine: After warming up, idle the engine</li> </ul>	Heater fan switch: ON	ON
		Heater fan switch: OFF	OFF
BRAKE SW	<ul style="list-style-type: none"> <li>Ignition switch: ON</li> </ul>	Brake pedal: Fully released	OFF
		Brake pedal: Slightly depressed	ON
INJ PULSE-B1	<ul style="list-style-type: none"> <li>Engine: After warming up</li> <li>Selector lever: P or N</li> <li>Air conditioner switch: OFF</li> <li>No load</li> </ul>	Idle	2.0 - 3.0 msec
		2,000 rpm	1.9 - 2.9 msec
INJ PULSE-B2	<ul style="list-style-type: none"> <li>Engine: After warming up</li> <li>Selector lever: P or N</li> <li>Air conditioner switch: OFF</li> <li>No load</li> </ul>	Idle	2.0 - 3.0 msec
		2,000 rpm	1.9 - 2.9 msec
IGN TIMING	<ul style="list-style-type: none"> <li>Engine: After warming up</li> <li>Selector lever: P or N</li> <li>Air conditioner switch: OFF</li> <li>No load</li> </ul>	Idle	6° - 16° BTDC (With 4WAS) 10° - 20° BTDC (Without 4WAS)
		2,000 rpm	25° - 45° BTDC
CAL/LD VALUE	<ul style="list-style-type: none"> <li>Engine: After warming up</li> <li>Selector lever: P or N</li> <li>Air conditioner switch: OFF</li> <li>No load</li> </ul>	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-m/s	A
		2,500 rpm	7.0 - 20.0 g-m/s	B
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%	C
		2,000 rpm	—	
INT/V TIM (B1)	• Engine: After warming up • Selector lever: P or N • Air conditioner switch: OFF • No load	Idle	-5° - 5°C	D
		2,000 rpm	Approx. 0° - 30°C	
INT/V TIM (B2)	• Engine: After warming up • Selector lever: P or N • Air conditioner switch: OFF • No load	Idle	-5° - 5°C	E
		2,000 rpm	Approx. 0° - 30°C	
EXH/V TIM B1	• Engine: After warming up • Selector lever: P or N • Air conditioner switch: OFF • No load	Idle	-5° - 5°C	F
		Around 2,500 rpm while the engine speed is rising	Approx. 0° - 30°C	G
EXH/V TIM B2	• Engine: After warming up • Selector lever: P or N • Air conditioner switch: OFF • No load	Idle	-5° - 5°C	H
		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 • Air conditioner switch: OFF • No load	Idle	0% - 2%	HAC
		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%	J
		2,000 rpm	Approx. 0% - 50%	
VTC DTY EX B1	• Engine: After warming up • Selector lever: P or N • Air conditioner switch: OFF • No load	Idle	0% - 2%	K
		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 • Air conditioner switch: OFF • No load	Idle	0% - 2%	L
		Around 2,500 rpm while the engine speed is rising	Approx. 0% - 70%	
TP SEN 1-B2	• Ignition switch: ON (Engine stopped) • Selector lever: D	Accelerator pedal: Fully released	More than 0.36V	M
		Accelerator pedal: Fully depressed	Less than 4.75V	
TP SEN 2-B2*1	• Ignition switch: ON (Engine stopped) • Selector lever: D	Accelerator pedal: Fully released	More than 0.36V	N
		Accelerator pedal: Fully depressed	Less than 4.75V	
AIR COND RLY	• Engine: After warming up, idle the engine	Air conditioner switch: OFF	OFF	O
		Air conditioner switch: ON (Compressor operates)	ON	
FUEL PUMP RLY	• For 1 seconds after turning ignition switch: ON • Engine running or cranking		ON	P
	• Except above		OFF	
VENT CONT/V	• Ignition switch: ON		OFF	
THRTL RELAY	• Ignition switch: ON		ON	

# ECM

## < ECU DIAGNOSIS INFORMATION >

## [AUTOMATIC AIR CONDITIONER]

Monitor Item	Condition		Values/Status
HO2S2 HTR (B1)	<ul style="list-style-type: none"> <li>Engine speed: Below 3,600 rpm after the following conditions are met.                             <ul style="list-style-type: none"> <li>Engine: After warming up</li> <li>Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load</li> </ul> </li> </ul>		ON
	<ul style="list-style-type: none"> <li>Engine speed: Above 3,600 rpm</li> </ul>		OFF
HO2S2 HTR (B2)	<ul style="list-style-type: none"> <li>Engine speed: Below 3,600 rpm after the following conditions are met.                             <ul style="list-style-type: none"> <li>Engine: After warming up</li> <li>Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load</li> </ul> </li> </ul>		ON
	<ul style="list-style-type: none"> <li>Engine speed: Above 3,600 rpm</li> </ul>		OFF
I/P PULLY SPD	<ul style="list-style-type: none"> <li>Vehicle speed: More than 20 km/h (12 MPH)</li> </ul>		Almost the same speed as the tachometer indication
VEHICLE SPEED	<ul style="list-style-type: none"> <li>Turn drive wheels and compare CONSULT-III value with the speedometer indication.</li> </ul>		Almost the same speed as the speedometer indication
IDL A/V LEARN	<ul style="list-style-type: none"> <li>Engine: Running</li> </ul>	Idle air volume learning has not been performed yet.	YET
		Idle air volume learning has already been performed successfully.	CMPLT
SNOW MODE SW	<ul style="list-style-type: none"> <li>Ignition switch: ON</li> </ul>	Snow mode switch: ON	ON
		Snow mode switch: OFF	OFF
ENG OIL TEMP	<ul style="list-style-type: none"> <li>Engine: After warming up</li> </ul>		More than 70°C (158°F)
TRVL AFTER MIL	<ul style="list-style-type: none"> <li>Ignition switch: ON</li> </ul>	Vehicle has traveled after MIL has turned ON.	0 - 65,535 km (0 - 40,723 miles)
A/F S1 HTR (B1)	<ul style="list-style-type: none"> <li>Engine: After warming up, idle the engine (More than 140 seconds after starting engine)</li> </ul>		4 - 100%
A/F S1 HTR (B2)	<ul style="list-style-type: none"> <li>Engine: After warming up, idle the engine (More than 140 seconds after starting engine)</li> </ul>		4 - 100%
AC PRESS SEN	<ul style="list-style-type: none"> <li>Engine: Idle</li> <li>Both A/C switch and blower fan switch: ON (Compressor operates)</li> </ul>		1.0 - 4.0V
VHCL SPEED SE	<ul style="list-style-type: none"> <li>Turn drive wheels and compare CONSULT-III value with the speedometer indication.</li> </ul>		Almost the same speed as the speedometer indication
SET VHCL SPD	<ul style="list-style-type: none"> <li>Engine: Running</li> </ul>	ASCD: Operating	The preset vehicle speed is displayed
MAIN SW	<ul style="list-style-type: none"> <li>Ignition switch: ON</li> </ul>	MAIN switch: Pressed	ON
		MAIN switch: Released	OFF
CANCEL SW	<ul style="list-style-type: none"> <li>Ignition switch: ON</li> </ul>	CANCEL switch: Pressed	ON
		CANCEL switch: Released	OFF
RESUME/ACC SW	<ul style="list-style-type: none"> <li>Ignition switch: ON</li> </ul>	RESUME/ACCELERATE switch: Pressed	ON
		RESUME/ACCELERATE switch: Released	OFF
SET SW	<ul style="list-style-type: none"> <li>Ignition switch: ON</li> </ul>	SET/COAST switch: Pressed	ON
		SET/COAST switch: Released	OFF
BRAKE SW1 (ICC/ASCD brake switch)	<ul style="list-style-type: none"> <li>Ignition switch: ON</li> </ul>	Brake pedal: Fully released	ON
		Brake pedal: Slightly depressed	OFF
BRAKE SW2 (Stop lamp switch)	<ul style="list-style-type: none"> <li>Ignition switch: ON</li> </ul>	Brake pedal: Fully released	OFF
		Brake pedal: Slightly depressed	ON
DIST SW	<ul style="list-style-type: none"> <li>Ignition switch: ON</li> </ul>	DISTANCE switch: Pressed	ON
		DISTANCE switch: Released	OFF

# ECM

## < ECU DIAGNOSIS INFORMATION >

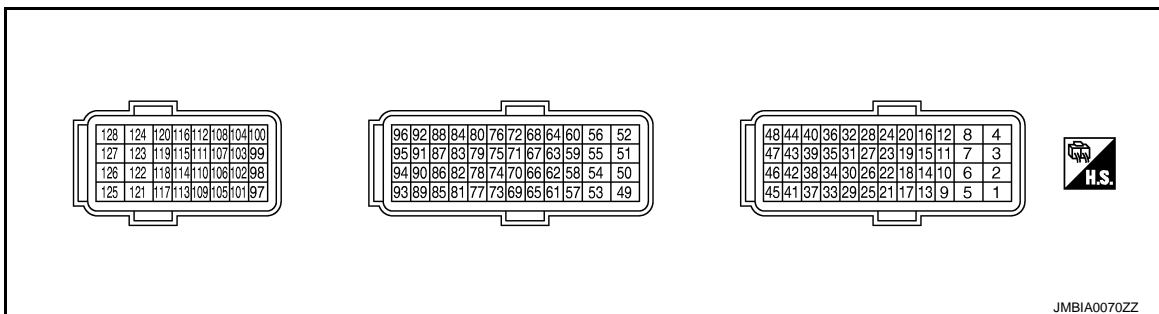
## [AUTOMATIC AIR CONDITIONER]

Monitor Item	Condition	Values/Status
LDP SW	• Ignition switch: ON	LDP switch: Pressed ON
		LDP 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
BAT CUR SEN	• Engine speed: Idle • Battery: Fully charged*2 • Selector lever: P or N • Air conditioner switch: OFF • No load	Approx. 2,600 - 3,500mV
ALT DUTY	• Engine: Idle	0 - 80%
A/F ADJ-B1	• Engine: Running	-0.330 - 0.330
A/F ADJ-B2	• Engine: Running	-0.330 - 0.330
FAN DUTY	• Engine: Running	0 - 100%
ALT DUTY SIG	• Power generation voltage variable control: Operating	ON
	• Power generation voltage variable control: Not operating	OFF

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

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

### TERMINAL LAYOUT



### PHYSICAL VALUES

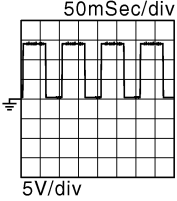
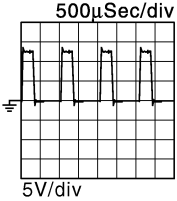
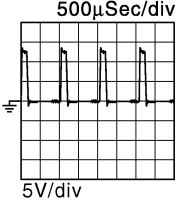
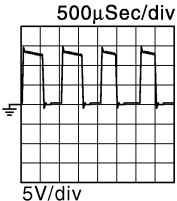
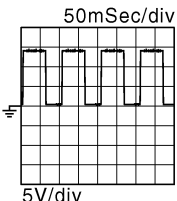
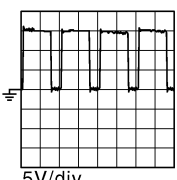
#### NOTE:

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

# ECM

< ECU DIAGNOSIS INFORMATION >

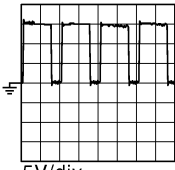
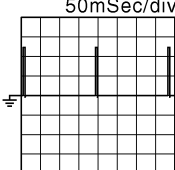
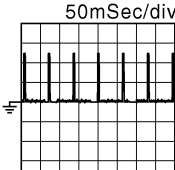
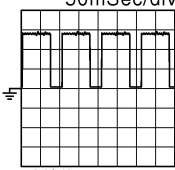
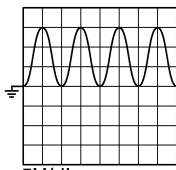
[AUTOMATIC AIR CONDITIONER]

Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	-	Signal name	Input/ Output		
1 (W)	128 (B)	A/F sensor 1 heater (bank 1)	Output	[Engine is running] • Warm-up condition • Idle speed (More than 140 seconds after start- ing engine)	2.9 - 8.8 V★ 
2 (G)	4 (BR)	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 relay 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 releasing operation	0 - 14 V★ 
5 (GR)	128 (B)	A/F sensor 1 heater (bank 2)	Output	[Engine is running] • Warm-up condition • Idle speed (More than 140 seconds after start- ing engine)	2.9 - 8.8 V★ 
6 (SB)	128 (B)	Exhaust valve timing con- trol magnet retarder (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★ 

# ECM

## < ECU DIAGNOSIS INFORMATION >

## [AUTOMATIC AIR CONDITIONER]

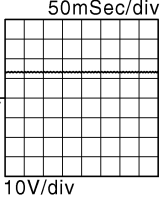
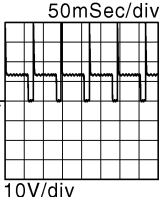
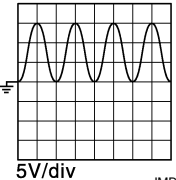
Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	-	Signal name	Input/ Output		
7 (Y)	128 (B)	Exhaust valve timing control magnet retarder (bank 2)	Output	[Engine is running] • Warm-up condition • Idle speed	BATTERY VOLTAGE (11 - 14 V)
				[Engine is running] • Warm-up condition • Around 2,500 rpm while the engine speed is rising	7 - 12 V★ 
8 (B)	—	ECM ground	—	—	—
11 (GR)	128 (B)	Ignition signal No. 4	Output	[Engine is running] • Warm-up condition • Idle speed <b>NOTE:</b> The pulse cycle changes depending on rpm at idle	0 - 0.2 V★ 
12 (L)		Ignition signal No. 3			0.1 - 0.4 V★ 
15 (V)		Ignition signal No. 5			
16 (G)		Ignition signal No. 2			
19 (SB)		Ignition signal No. 6			
20 (Y)	Ignition signal No. 1				
17 (P)	84 (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★ 

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

# ECM

## < ECU DIAGNOSIS INFORMATION >

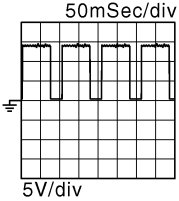
## [AUTOMATIC AIR CONDITIONER]

Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	-	Signal name	Input/ Output		
21 (GR)	128 (B)	EVAP canister purge volume control solenoid valve	Output	[Engine is running] <ul style="list-style-type: none"> <li>• Idle speed</li> <li>• Accelerator pedal: Not depressed even slightly, after engine starting</li> </ul>	BATTERY VOLTAGE (11 - 14 V)★ 
				[Engine is running] <ul style="list-style-type: none"> <li>• Engine speed: About 2,000 rpm (More than 100 seconds after starting engine)</li> </ul>	BATTERY VOLTAGE (11 - 14 V)★ 
22 (LG)	128 (B)	Fuel pump relay	Output	[Ignition switch: ON] <ul style="list-style-type: none"> <li>• For 1 second after turning ignition switch ON</li> </ul>	0 - 1.5 V
				[Engine is running] <ul style="list-style-type: none"> <li>• More than 1 second after turning ignition switch ON</li> </ul>	BATTERY VOLTAGE (11 - 14 V)
24 (BR)	128 (B)	ECM relay (Self shut-off)	Output	[Engine is running] <ul style="list-style-type: none"> <li>• [Ignition switch: OFF]</li> <li>• A few seconds after turning ignition switch OFF</li> </ul>	0 - 1.5 V
				[Ignition switch: OFF] <ul style="list-style-type: none"> <li>• More than a few seconds after turning ignition switch OFF</li> </ul>	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
29 (G)	128 (B)	Intake valve timing control solenoid valve (bank 2)	Output	[Engine is running] <ul style="list-style-type: none"> <li>• Warm-up condition</li> <li>• Idle speed</li> </ul>	BATTERY VOLTAGE (11 - 14V)
				[Engine is running] <ul style="list-style-type: none"> <li>• Warm-up condition</li> <li>• Engine speed: 2,000rpm</li> </ul>	7 - 12 V★ 

# ECM

## < ECU DIAGNOSIS INFORMATION >

## [AUTOMATIC AIR CONDITIONER]

Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	--	Signal name	Input/ Output		
30 (Y)	40 (R)	Throttle position sensor 1 (bank 1)	Input	[Ignition switch: ON] • Engine stopped • Selector lever: D • 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
33 (SB)	84 (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 (L)	40 (R)	Throttle position sensor 2 (bank 1)	Input	[Ignition switch: ON] • Engine stopped • Selector lever: D • Accelerator pedal: Fully released	Less than 4.75 V
				[Ignition switch: ON] • Engine stopped • Selector lever: D • 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 • Accelerator pedal: Fully released	Less than 4.75 V
				[Ignition switch: ON] • Engine stopped • Selector lever: D • Accelerator pedal: Fully depressed	More than 0.36 V

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

HAC

# ECM

## < ECU DIAGNOSIS INFORMATION >

## [AUTOMATIC AIR CONDITIONER]

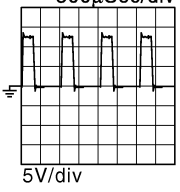
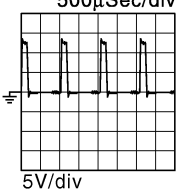
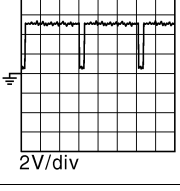
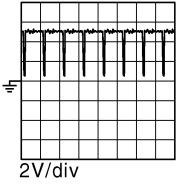
Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	-	Signal name	Input/ Output		
37 (LG)	47 (Y)	Crankshaft position sensor (POS)	Input	[Engine is running] <ul style="list-style-type: none"> <li>• Warm-up condition</li> <li>• Idle speed</li> </ul> <b>NOTE:</b> The pulse cycle changes depending on rpm at idle	4.0 - 5.0 V★ 
				[Engine is running] <ul style="list-style-type: none"> <li>• Engine speed: 2,000 rpm</li> </ul>	4.0 - 5.0 V★ 
40 (R)	—	Sensor ground [Throttle position sensor (bank 1)]	—	—	—
43 (G)	48 (B)	Sensor power supply [Throttle position sensor (bank 2)]	—	[Ignition switch: ON]	5 V
44 (B)	40 (R)	Sensor power supply [Throttle position sensor (bank 1)]	—	[Ignition switch: ON]	5 V
46 (R)	47 (Y)	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 (L)	128 (B)	Throttle control motor (Close) (bank 2)	Output	[Ignition switch: ON] <ul style="list-style-type: none"> <li>• Engine stopped</li> <li>• Selector lever: D</li> <li>• Accelerator pedal: In the middle of releasing operation</li> </ul>	0 - 14 V★ 



# ECM

## < ECU DIAGNOSIS INFORMATION >

## [AUTOMATIC AIR CONDITIONER]

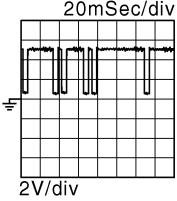
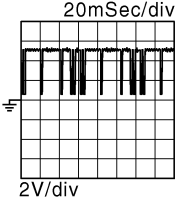
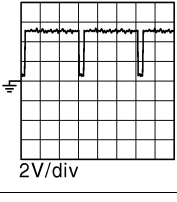
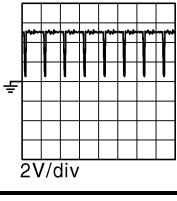
Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	--	Signal name	Input/ Output		
50 (V)	128 (B)	Throttle control motor (Open) (bank 2)	Output	[Ignition switch: ON] • Engine stopped • Selector lever: D • Accelerator pedal: Fully depressed	0 - 14 V★  500µSec/div 5V/div JMBIA0031GB
				[Ignition switch: ON] • Engine stopped • Selector lever: D • Accelerator pedal: Fully released	0 - 14 V★  500µSec/div 5V/div JMBIA0032GB
52 (R)	128 (B)	Throttle control motor relay power supply (bank 2)	Input	[Ignition switch: ON]	BATTERY VOLTAGE (11 - 14 V)
53 (P)	128 (B)	Ignition switch	Input	[Ignition switch: OFF]	0V
				[Ignition switch: ON]	BATTERY VOLTAGE (11 - 14 V)
57 (L)	128 (B)	A/F sensor 1 (bank 1)	Input	[Ignition switch: ON]	2.2 V
58 (GR)	88 (LG)	Exhaust valve timing control position sensor (bank 1)	Input	[Engine is running] • Warm-up condition • Idle speed <b>NOTE:</b> 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

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

# ECM

## < ECU DIAGNOSIS INFORMATION >

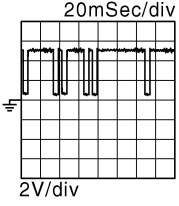
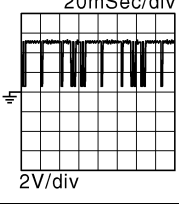
## [AUTOMATIC AIR CONDITIONER]

Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	-	Signal name	Input/ Output		
59 (O)	96 (B)	Camshaft position sensor (PHASE) (bank 1)	Input	[Engine is running] <ul style="list-style-type: none"> <li>• Warm-up condition</li> <li>• Idle speed</li> </ul> <b>NOTE:</b> The pulse cycle changes depending on rpm at idle	3.0 - 5.0 V★ 
				[Engine is running] <ul style="list-style-type: none"> <li>• Engine speed: 2,000 rpm</li> </ul>	3.0 - 5.0 V★ 
60 (R)	96 (B)	Sensor power supply [Camshaft position sensor (PHASE) (bank 1), Exhaust valve timing control position sensor (bank 1), Power steering pressure sensor]	—	[Ignition switch: ON]	5 V
61 (R)	128 (B)	A/F sensor 1 (bank 1)	Input	[Engine is running] <ul style="list-style-type: none"> <li>• Warm-up condition</li> <li>• Engine speed: 2,000 rpm</li> </ul>	1.8 V Output voltage varies with air fuel ratio.
62 (G)	88 (LG)	Exhaust valve timing control position sensor (bank 2)	Input	[Engine is running] <ul style="list-style-type: none"> <li>• Warm-up condition</li> <li>• Idle speed</li> </ul> <b>NOTE:</b> The pulse cycle changes depending on rpm at idle	4.0 - 5.0 V★ 
				[Engine is running] <ul style="list-style-type: none"> <li>• Warm-up condition</li> <li>• Engine speed: 2,000 rpm</li> </ul>	4.0 - 5.0 V★ 

# ECM

## < ECU DIAGNOSIS INFORMATION >

## [AUTOMATIC AIR CONDITIONER]

Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	—	Signal name	Input/ Output		
63 (SB)	92 (P)	Camshaft position sensor (PHASE) (bank 2)	Input	[Engine is running] • Warm-up condition • Idle speed <b>NOTE:</b> The pulse cycle changes depending on rpm at idle	3.0 - 5.0 V★  JMBIA0045GB
				[Engine is running] • Engine speed: 2,000 rpm	3.0 - 5.0 V★  JMBIA0046GB
64 (W)	92 (P)	Sensor power supply [Camshaft position sensor (PHASE) (bank 2), Exhaust valve timing control posi- tion sensor (bank 2), Bat- tery current sensor]	—	[Ignition switch: ON]	5 V
65 (V)	128 (B)	A/F sensor 1 (bank 2)	Input	[Ignition switch: ON]	2.2 V
66 (LG)	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)	68 (LG)	Intake air temperature sen- sor (bank 1)	Input	[Engine is running]	0 - 4.8 V Output voltage varies with intake air temperature.
68 (LG)	—	Sensor ground [Mass air flow sensor (bank 1), Intake air temperature sensor (bank 1)]	—	—	—
69 (W)	72 (—)	Knock sensor (bank 2)	Input	[Engine is running] • Idle speed	2.5 V*1
71 (Y)	84 (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)	72 (—)	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 condi- tions 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

A

B

C

D

E

F

G

H

HAC

J

K

L

M

N

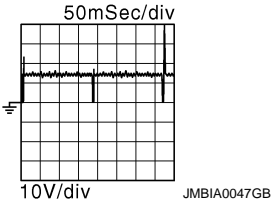
O

P

# ECM

## < ECU DIAGNOSIS INFORMATION >

## [AUTOMATIC AIR CONDITIONER]

Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	-	Signal name	Input/ Output		
77 (SB)	68 (LG)	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	1.4 - 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 (GR)	94 (LG)	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	1.4 - 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
81 (R)	128 (B)	Fuel injector No. 3	Output	[Engine is running] • Warm-up condition • Idle speed <b>NOTE:</b> 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			
83 (G)	94 (LG)	Intake air temperature sensor (bank 2)	Input	[Engine is running]	0 - 4.8 V Output voltage varies with intake air temperature.
84 (B)	—	Sensor ground (Heated oxygen sensor 2, Engine coolant temperature sensor, Engine oil temperature sensor)	—	—	—
87 (Y)	96 (B)	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

# ECM

< ECU DIAGNOSIS INFORMATION >

[AUTOMATIC AIR CONDITIONER]

Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	--	Signal name	Input/ Output		
88 (LG)	—	Sensor ground [Exhaust valve timing control position sensor (bank 1), Exhaust valve timing control position sensor (bank 2)]	—	—	—
91 (SB)	95 (G)	Battery current sensor	Input	[Engine is running] • Battery: Fully charged*2 • Idle speed	2.6 - 3.5 V
92 (P)	—	Sensor ground [Camshaft position sensor (PHASE) (bank 2)]	—	[Engine is running] • Warm-up condition • Idle speed	0 V
93 (P)	128 (B)	Power supply for ECM (Back-up)	Input	[Ignition switch: OFF]	BATTERY VOLTAGE (11 - 14 V)
94 (LG)	—	Sensor ground [Mass air flow sensor (bank 2)]	—	—	—
95 (G)	—	Sensor ground (Battery current sensor)	—	—	—
96 (B)	—	Sensor ground [Camshaft position sensor (PHASE) (bank 1), Power steering pressure sensor]	—	—	—
97 (R)	100 (W)	Accelerator pedal position sensor 1	Input	[Ignition switch: ON] • Engine stopped • Accelerator pedal: Fully released	0.5 - 1.0 V
				[Ignition switch: ON] • Engine stopped • Accelerator pedal: Fully depressed	4.2 - 4.8 V
98 (P)	104 (GR)	Accelerator pedal position sensor 2	Input	[Ignition switch: ON] • Engine stopped • Accelerator pedal: Fully released	0.25 - 0.50 V
				[Ignition switch: ON] • Engine stopped • Accelerator pedal: Fully depressed	2.0 - 2.5 V
99 (L)	100 (W)	Sensor power supply (Accelerator pedal position sensor 1)	—	[Ignition switch: ON]	5 V
100 (W)	—	Sensor ground (Accelerator pedal position sensor 1)	—	—	—

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

# ECM

## < ECU DIAGNOSIS INFORMATION >

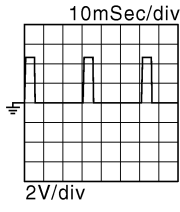
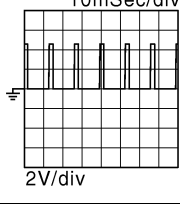
## [AUTOMATIC AIR CONDITIONER]

Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	—	Signal name	Input/ Output		
101 (SB)	108 (Y)	ICC steering switch (models with ICC system)	Input	[Ignition switch: ON] • ICC steering switch: OFF	4.3 V
				[Ignition switch: ON] • MAIN switch: Pressed	0 V
				[Ignition switch: ON] • CANCEL switch: Pressed	1.3 V
				[Ignition switch: ON] • RESUME/ACCELERATE switch: Pressed	3.7 V
				[Ignition switch: ON] • SET/COAST switch: Pressed	3 V
				[Ignition switch: ON] • DISTANCE switch: Pressed	2.2 V
101 (SB)	108 (Y)	ASCD steering switch (models with ASCD sys- tem)	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
102 (LG)	112 (V)	EVAP control system pres- sure sensor	Input	[Ignition switch: ON]	1.8 - 4.8 V
103 (G)	104 (GR)	Sensor power supply (Accelerator pedal position sensor 2)	—	[Ignition switch: ON]	5 V
104 (GR)	—	Sensor ground (Accelerator pedal position sensor 2)	—	—	—
105 (L)	116 (W)	Refrigerant pressure sen- sor	Input	[Engine is running] • Warm-up condition • Both A/C switch and blower fan mo- tor switch: ON (Compressor oper- ates)	1.0 - 4.0 V
106 (W)	128 (B)	Fuel tank temperature sen- sor	Input	[Engine is running]	0 - 4.8 V Output voltage varies with fuel tank temperature.
107 (BR)	112 (V)	Sensor power supply (EVAP control system pres- sure sensor)	—	[Ignition switch: ON]	5 V
108 (Y)	—	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

# 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 signal output	Output	[Engine is running] • Warm-up condition • Idle speed <b>NOTE:</b> The pulse cycle changes depending on rpm at idle	1 V★  JMBIA0076GB	A
				[Engine is running] • Engine speed is 2,000 rpm	1 V★  JMBIA0077GB	B
111 (O)	116 (W)	Sensor power supply (Refrigerant pressure sensor)	—	[Ignition switch: ON]	5 V	C
112 (V)	—	Sensor ground (EVAP control system pressure sensor)	—	—	—	D
113 (P)	128 (B)	CAN communication line	Input/ Output	—	—	E
114 (L)	128 (B)	CAN communication line	Input/ Output	—	—	F
116 (W)	—	Sensor ground (Refrigerant pressure sensor)	—	—	—	G
117 (V)	—	Data link connector	Input/ Output	—	—	H
121 (LG)	128 (B)	EVAP canister vent control valve	Output	[Ignition switch: ON]	BATTERY VOLTAGE (11 - 14 V)	HAC
122 (P)	128 (B)	Stop lamp switch	Input	[Ignition switch: OFF] • Brake pedal: Fully released	0 V	J
				[Ignition switch: OFF] • Brake pedal: Slightly depressed	BATTERY VOLTAGE (11 - 14 V)	K
123 (B) 124 (B)	—	ECM ground	—	[Engine is running] • Idle speed	Body ground	L
125 (R)	128 (B)	Power supply for ECM	Input	[Ignition switch: ON]	BATTERY VOLTAGE (11 - 14 V)	M
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	N
				[Ignition switch: ON] • Brake pedal: Fully released	BATTERY VOLTAGE (11 - 14 V)	O
127 (B) 128 (B)	—	ECM ground	—	[Engine is running] • Idle speed	Body ground	P

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

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

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



# AUTO AMP.

< ECU DIAGNOSIS INFORMATION >

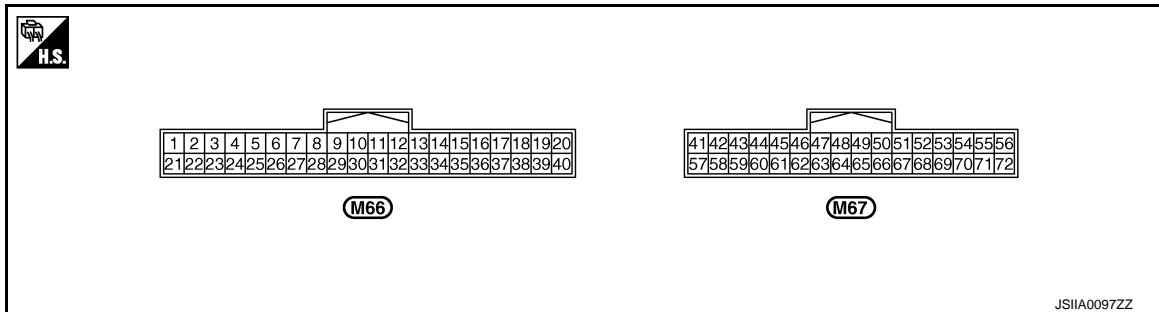
[AUTOMATIC AIR CONDITIONER]

## AUTO AMP.

Reference Value

INFOID:000000004345772

### TERMINAL LAYOUT



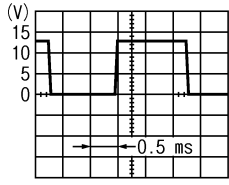
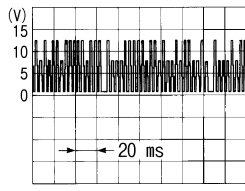
### PHYSICAL VALUES

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

# AUTO AMP.

< ECU DIAGNOSIS INFORMATION >

[AUTOMATIC AIR CONDITIONER]

Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	-	Signal name	Input/ Output		
62 (SB)	Ground	Sunload sensor ground	—	Ignition switch ON	0 V
65 (O)	Ground	ECV (Electrical Control Valve) signal	Output	<ul style="list-style-type: none"> <li>Ignition switch ON</li> <li>Self-diagnosis. STEP-4 (Code No. 45)</li> </ul>	 <p style="text-align: right; font-size: small;">SJI1607E</p>
69 (L)	Ground	A/C LAN signal	Input/ Output	Ignition switch ON	 <p style="text-align: right; font-size: small;">SJI1453J</p>
70 (R)	Ground	Each door motor power supply	Output	Ignition switch ON	Battery voltage
71 (B)	Ground	Ground	—	Ignition switch ON	0 V
72 (P)	Ground	CAN-L	—	—	—

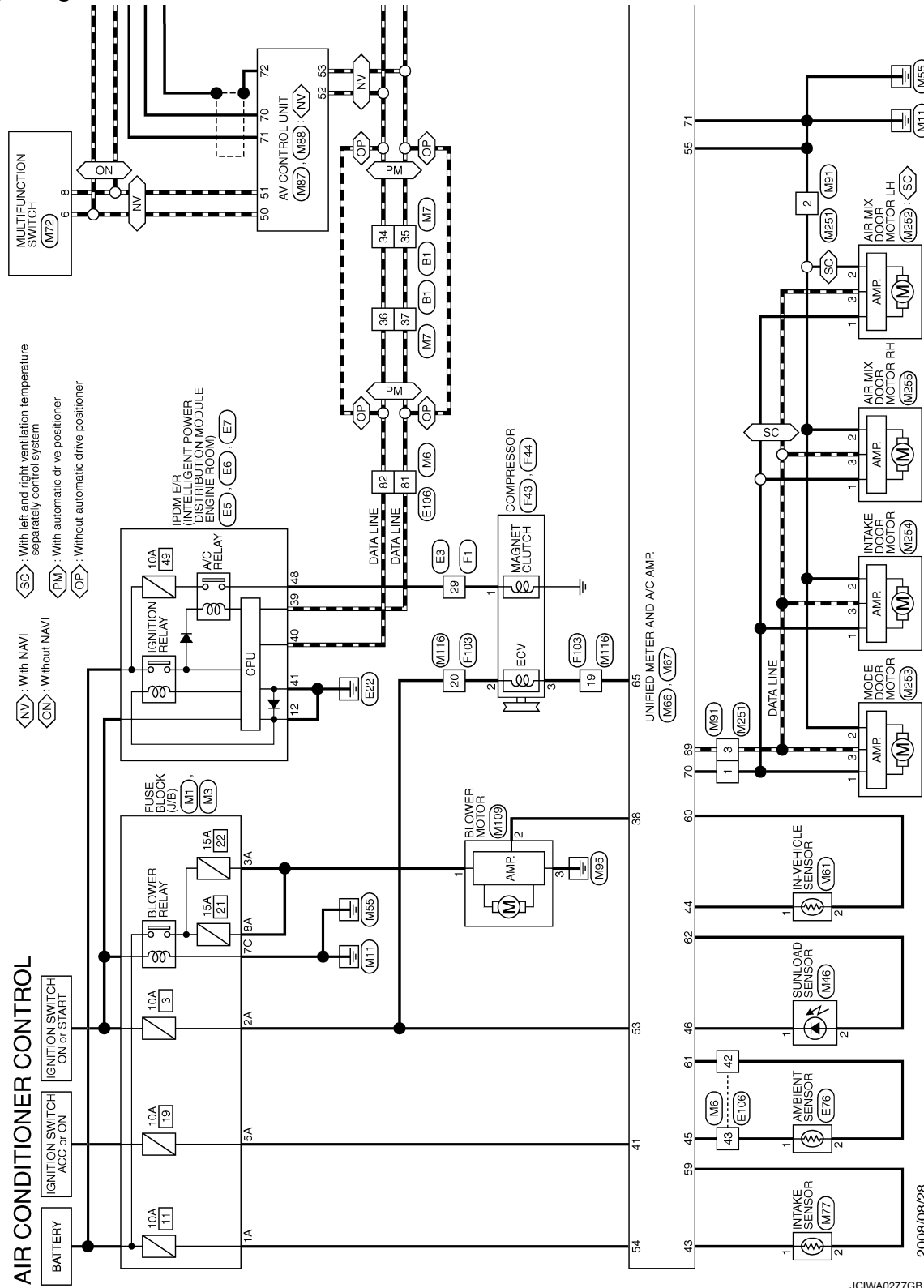
# AUTO AMP.

< ECU DIAGNOSIS INFORMATION >

[AUTOMATIC AIR CONDITIONER]

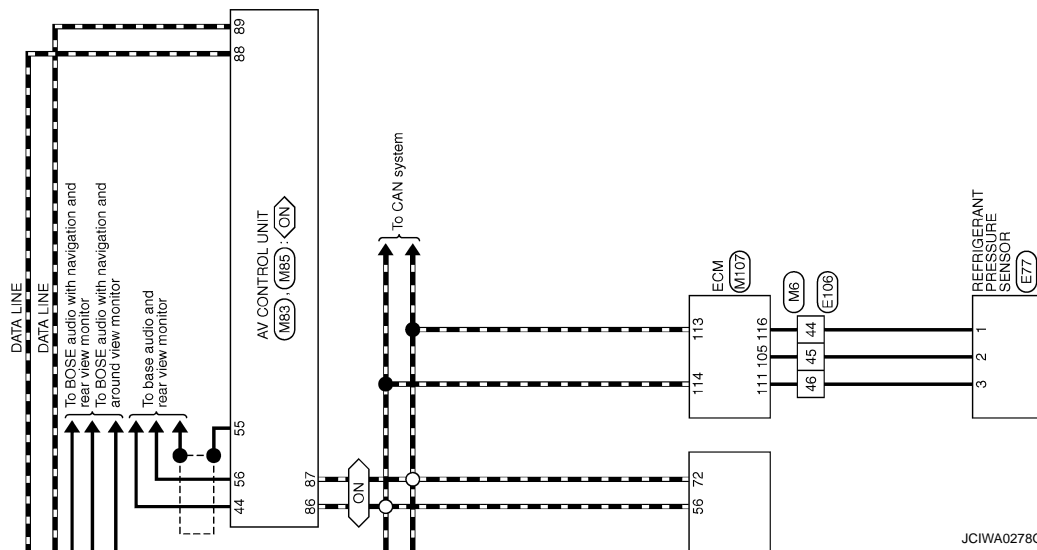
## Wiring Diagram - AIR CONDITIONER CONTROL SYSTEM -

INFOID:000000004345773



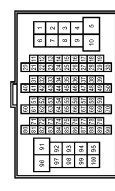
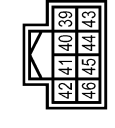
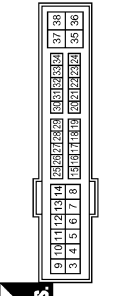
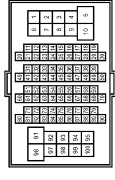




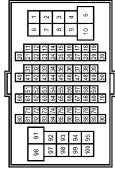
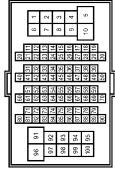
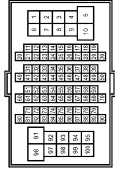
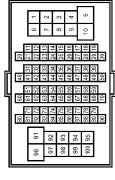
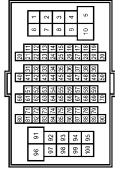
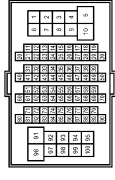
A  
B  
C  
D  
E  
F  
G  
H  
HAC  
J  
K  
L  
M  
N  
O  
P

ON : Without NAVI



JCIWA0278GB

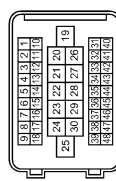
AIR CONDITIONER CONTROL

Connector No. E1	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)	TH80FW-CS16-TM4		Terminal No. 34	L	Signal Name [Specification]	
Connector No. E6	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)	TH80FW-NH		Terminal No. 39	P	Signal Name [Specification]	
Connector No. E7	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)	TH20FW-CS12-M4-1V		Terminal No. 12	B/W	Signal Name [Specification]	
Connector No. E106	WIRE TO WIRE	TH80FW-CS16-TM4		Terminal No. 42	P	Signal Name [Specification]	
Connector No. E16	WIRE TO WIRE	RS02FB		Terminal No. 1	G	Signal Name [Specification]	AMBIENT SENSOR SIGNAL
Connector No. E17	REFRIGERANT PRESSURE SENSOR	FR03FB		Terminal No. 1	W	Signal Name [Specification]	
Connector No. E18	AMBIENT SENSOR	RS02FB		Terminal No. 2	P	Signal Name [Specification]	SENSOR GROUND
Connector No. E7	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)	TH20FW-CS12-M4		Terminal No. 48	L	Signal Name [Specification]	
Connector No. E106	WIRE TO WIRE	TH80FW-CS16-TM4		Terminal No. 43	G	Signal Name [Specification]	
Connector No. E106	WIRE TO WIRE	TH80FW-CS16-TM4		Terminal No. 44	W	Signal Name [Specification]	
Connector No. E106	WIRE TO WIRE	TH80FW-CS16-TM4		Terminal No. 45	L	Signal Name [Specification]	
Connector No. E106	WIRE TO WIRE	TH80FW-CS16-TM4		Terminal No. 46	SB	Signal Name [Specification]	
Connector No. E106	WIRE TO WIRE	TH80FW-CS16-TM4		Terminal No. 81	P	Signal Name [Specification]	
Connector No. E106	WIRE TO WIRE	TH80FW-CS16-TM4		Terminal No. 82	L	Signal Name [Specification]	

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


### AIR CONDITIONER CONTROL

Connector No.	F1
Connector Name	WIRE TO WIRE
Connector Type	SAA3FBF-RS(U-SUZZ)




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

Connector No.	F43
Connector Name	COMPRESSOR
Connector Type	RS01FB



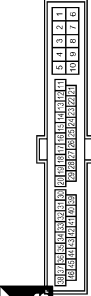
Terminal No.	Color of Wire	Signal Name [Specification]
1	L	MAGNET CLUTCH POWER SUPPLY

Connector No.	F44
Connector Name	COMPRESSOR
Connector Type	BR02FGY




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

Connector No.	F103
Connector Name	WIRE TO WIRE
Connector Type	TK3BFW-NS/D




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

Connector No.	M1
Connector Name	FUSE BLOCK (J/B)
Connector Type	MSBFW-MZ




Terminal No.	Color of Wire	Signal Name [Specification]
1A	GR	-
2A	G	-
3A	L	-
5A	V	-
8A	L	-

Connector No.	M3
Connector Name	FUSE BLOCK (J/B)
Connector Type	NS1ZFW-CS



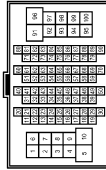
Terminal No.	Color of Wire	Signal Name [Specification]
7C	B	-

Connector No.	M6
Connector Name	WIRE TO WIRE
Connector Type	TH80MM-CS16-TM4



Terminal No.	Color of Wire	Signal Name [Specification]
42	BR	-
43	P	-
44	W	-
45	L	-
46	O	-
81	P	-
82	L	-

Connector No.	M7
Connector Name	WIRE TO WIRE
Connector Type	TH80MM-CS16-TM4



Terminal No.	Color of Wire	Signal Name [Specification]
34	L	-
35	P	-
36	L	-
37	P	-

JCIWA0280GB

AIR CONDITIONER CONTROL

Connector No.	M46
Connector Name	SUNLOAD SENSOR
Connector Type	K02FB



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

Connector No.	M61
Connector Name	IN-VEHICLE SENSOR
Connector Type	A02EV



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

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



Terminal No.	Color of Wire	Signal Name [Specification]
38	P	BLOWER MOTOR CONTROL SIGNAL

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



Terminal No.	Color of Wire	Signal Name [Specification]
41	V	ACC POWER SUPPLY
43	R	INTAKE SENSOR SIGNAL
44	LG	IN-VEHICLE SENSOR SIGNAL
45	P	AMBIENT SENSOR SIGNAL
46	O	SUNLOAD SENSOR SIGNAL
53	G	IGNITION POWER SUPPLY
54	Y	BATTERY POWER SUPPLY
55	B	GROUND
56	L	CAN-H
58	GR	INTAKE SENSOR GROUND
60	L	IN-VEHICLE SENSOR GROUND

61	BR	AMBIENT SENSOR GROUND
62	SB	SUNLOAD SENSOR GROUND
65	O	ECV SIGNAL
69	L	A/C LAN SIGNAL
70	R	EACH DOOR MOTOR POWER SUPPLY
71	B	GROUND
72	P	CAN-L

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



Terminal No.	Color of Wire	Signal Name [Specification]
6	LG	AV COMM (H)
8	V	AV COMM (L)

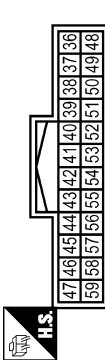
Connector No.	M77
Connector Name	INTAKE SENSOR
Connector Type	TH04FW



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

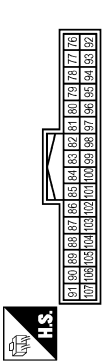
### AIR CONDITIONER CONTROL

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



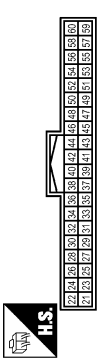
Terminal No.	Color of Wire	Signal Name [Specification]
44	BR	COMM (DISP->CONT)
55	SHIELD	SHIELD
56	Y	COMM (CONT->DISP)

Connector No.	M85
Connector Name	AV CONTROL UNIT (WITHOUT NAVI)
Connector Type	TH22FW-NH



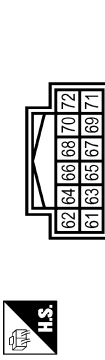
Terminal No.	Color of Wire	Signal Name [Specification]
86	L	CAN-H
87	P	CAN-L
88	LG	AV COMM (H)
89	V	AV COMM (L)

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



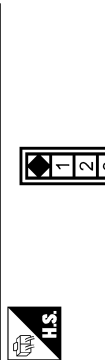
Terminal No.	Color of Wire	Signal Name [Specification]
50	LG	AV COMM (H)
51	V	AV COMM (L)
52	L	CAN-H
53	P	CAN-L

Connector No.	M88
Connector Name	AV CONTROL UNIT (WITH NAVI)
Connector Type	TH25FW-NH



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

Connector No.	M81
Connector Name	WIRE TO WIRE
Connector Type	A03MMV-P



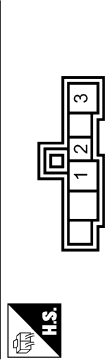
Terminal No.	Color of Wire	Signal Name [Specification]
1	R	-
2	B	-
3	L	-

Connector No.	M107
Connector Name	ECM
Connector Type	RN24FGY-R26-R-LH-Z



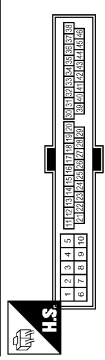
Terminal No.	Color of Wire	Signal Name [Specification]
105	L	PDPRESS
111	O	AVCC-PDPRESS
113	P	VEHCAN-LI
114	L	VEHCAN-HI
116	W	GNDA-PDPRES

Connector No.	M109
Connector Name	BLOWER MOTOR
Connector Type	NS30FW-M3



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

Connector No.	M116
Connector Name	WIRE TO WIRE
Connector Type	TK30MMV-NS10



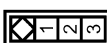
Terminal No.	Color of Wire	Signal Name [Specification]
19	O	-
20	Y	-



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

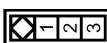
AIR CONDITIONER CONTROL

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



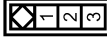
Terminal No.	Color of Wire	Signal Name [Specification]
1	L	-
2	B	-
3	L	-

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



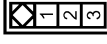
Terminal No.	Color of Wire	Signal Name [Specification]
1	L	DOOR MOTOR POWER SUPPLY
2	B	GROUND
3	L	A/C LAN SIGNAL

Connector No.	M253
Connector Name	MODE DOOR MOTOR
Connector Type	A03FW



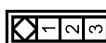
Terminal No.	Color of Wire	Signal Name [Specification]
1	L	DOOR MOTOR POWER SUPPLY
2	B	GROUND
3	L	A/C LAN SIGNAL

Connector No.	M254
Connector Name	INTAKE DOOR MOTOR
Connector Type	A03FW



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

Connector No.	M255
Connector Name	AIR MIX DOOR MOTOR RH
Connector Type	A03FW



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

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:

JCIWA0283GB

INFOID:000000004345774

## AUTO 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
Display	: OFF

# AIR CONDITIONER CONTROL

[AUTOMATIC AIR CONDITIONER]

< SYMPTOM DIAGNOSIS >

## SYMPTOM DIAGNOSIS

### AIR CONDITIONER CONTROL

#### Diagnosis Chart By Symptom

INFOID:000000004345775

Symptom	Reference	
A/C system does not activate.	Go to Trouble Diagnosis Procedure for A/C System.	<a href="#">HAC-102, "Diagnosis Procedure"</a>
A/C system cannot be controlled.	Go to Preset Switch System.	<a href="#">AV-144, "Symptom Table"</a> (BASE AUDIO WITHOUT NAVIGATION) or <a href="#">AV-560, "Symptom Table"</a> (BOSE AUDIO WITH NAVIGATION)
Air outlet does not change. Mode door motor does not operate normally.	Go to Trouble Diagnosis Procedure for Mode Door Motor. (LAN)	<a href="#">HAC-66, "Diagnosis Procedure"</a>
Discharge air temperature does not change.	Go to Trouble Diagnosis Procedure for Air Mix Door Motor. (LAN)	<a href="#">HAC-69, "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Procedure"</a> (Without left and right ventilation temperature separately control system) or <a href="#">HAC-71, "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Procedure"</a> (With left and right ventilation temperature separately control system)
Air mix door motor does not operate normally.		
Intake door does not change. Intake door motor does not operate normally.	Go to Trouble Diagnosis Procedure for Intake Door Motor. (LAN)	<a href="#">HAC-74, "Diagnosis Procedure"</a>
Blower motor operation is malfunctioning.	Go to Trouble Diagnosis Procedure for Blower Motor.	<a href="#">HAC-77, "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Procedure"</a> (Without left and right ventilation temperature separately control system) or <a href="#">HAC-80, "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Procedure"</a> (With left and right ventilation temperature separately control system)
Magnet clutch does not engage.	Go to Trouble Diagnosis Procedure for Magnet Clutch.	<a href="#">HAC-84, "Diagnosis Procedure"</a>
Insufficient cooling No cool air comes out. (Air flow volume is normal.)	Go to Trouble Diagnosis Procedure for Insufficient Cooling.	<a href="#">HAC-133, "Inspection procedure"</a>
Insufficient heating No warm air comes out. (Air flow volume is normal.)		
Noise	Go to Trouble Diagnosis Procedure for Noise.	<a href="#">HAC-137, "Inspection procedure"</a>

A

B

C

D

E

F

G

H

HAC

J

K

L

M

N

O

P

# AIR CONDITIONER CONTROL

[AUTOMATIC AIR CONDITIONER]

< SYMPTOM DIAGNOSIS >

Symptom	Reference	
Self-diagnosis cannot be performed.	Go to Trouble Diagnosis Procedure for Self-diagnosis.	<a href="#">HAC-139. "Inspection procedure"</a>
Memory function does not operate.	Go to Trouble Diagnosis Procedure for Memory Function.	<a href="#">HAC-140. "Inspection procedure"</a>

# INSUFFICIENT COOLING

< SYMPTOM DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

## INSUFFICIENT COOLING

### Description

INFOID:000000004345776

#### Symptom

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

### Inspection procedure

INFOID:000000004345777

#### 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"](#).

NO-2 >> GO TO 2 after repairing or replacing the parts according to the inspection results.

#### 2. CHECK CHARGED REFRIGERANT AMOUNT

1. Connect recovery/recycling recharging equipment to the vehicle and discharge the refrigerant.
2. Recharge with the proper amount of refrigerant and perform the inspection with the refrigerant leakage detecting fluorescent leak detector. Refer to [HA-34, "Inspection"](#).

##### Is the inspection result normal?

YES >> GO TO 3.

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

#### 3. CHECK REFRIGERANT CYCLE PRESSURE

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

##### Is the inspection result normal?

YES >> GO TO 4.

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

#### 4. CHECK SETTING OF TEMPERATURE SETTING TRIMMER

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

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

##### **NOTE:**

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

2. Set temperature control dial to "0".

##### Are the symptoms solved?

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

NO >> GO TO 5.

#### 5. PERFORM SELF-DIAGNOSIS STEP-2

Perform self-diagnosis STEP-2. Refer to [HAC-53, "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (Without left and right ventilation temperature separately control system) or [HAC-59, "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (With left and right ventilation temperature separately control system), see Nos. 1 to 2.

##### Does code No. 20 appear on the display?

YES >> GO TO 6.

A

B

C

D

E

F

G

H

HAC

J

K

L

M

N

O

P

# INSUFFICIENT COOLING

[AUTOMATIC AIR CONDITIONER]

## < SYMPTOM DIAGNOSIS >

- NO >> Go to appropriate malfunctioning sensor circuit. Refer to [HAC-53, "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (Without left and right ventilation temperature separately control system) or [HAC-59, "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (With left and right ventilation temperature separately control system), see No. 11.

## 6.PERFORM SELF-DIAGNOSIS STEP-4

Perform self-diagnosis STEP-4. Refer to [HAC-53, "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (Without left and right ventilation temperature separately control system) or [HAC-59, "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (With left and right ventilation temperature separately control system), see Nos.1 to 5.

Is it operated normally?

- YES >> GO TO 7.  
NO >> Perform the diagnosis applicable to each output device.

## 7.PERFORM SELF-DIAGNOSIS STEP-5

Perform self-diagnosis STEP-5. Refer to [HAC-53, "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (Without left and right ventilation temperature separately control system) or [HAC-59, "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (With left and right ventilation temperature separately control system), see Nos.1 to 10.

Is the inspection result normal?

- YES >> GO TO 8.  
NO >> Go to appropriate malfunctioning sensor circuit. Refer to [HAC-53, "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (Without left and right ventilation temperature separately control system) or [HAC-59, "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (With left and right ventilation temperature separately control system).

## 8.CHECK DRIVE BELT

Check tension of the drive belt. Refer to [EM-13, "Checking"](#).

Is the inspection result normal?

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

## 9.CHECK AIR LEAKAGE FROM DUCT

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

Is the inspection result normal?

- YES >> GO TO 10.  
NO >> Repair or replace parts according to the inspection results.

## 10.CHECK ECV

Perform the ECV diagnosis procedure. Refer to [HAC-87, "Diagnosis Procedure"](#).

Is the inspection result normal?

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

# INSUFFICIENT HEATING

[AUTOMATIC AIR CONDITIONER]

< SYMPTOM DIAGNOSIS >

## INSUFFICIENT HEATING

### Description

INFOID:000000004345778

#### Symptom

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

### Inspection procedure

INFOID:000000004345779

#### 1.CHECK COOLING SYSTEM

1. Check engine coolant level and check for leakage. Refer to [CO-7, "Inspection"](#).
2. Check radiator cap. Refer to [CO-10, "RADIATOR CAP : Inspection"](#).
3. Check water flow sounds of engine coolant. Refer to [CO-8, "Refilling"](#).

#### Is the inspection result normal?

YES >> GO TO 2.

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

#### 2.CHECK SETTING OF TEMPERATURE SETTING TRIMMER

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

#### NOTE:

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

3. Set temperature control dial to "0".

#### Are the symptoms solved?

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

NO >> GO TO 3.

#### 3.CHECK OPERATION

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

#### Is the inspection result normal?

YES >> END.

NO >> GO TO 4.

#### 4.PERFORM SELF-DIAGNOSIS STEP-2

Perform self-diagnosis STEP-2. Refer to [HAC-53, "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (Without left and right ventilation temperature separately control system) or [HAC-59, "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (With left and right ventilation temperature separately control system), see Nos. 1 to 2.

#### Does code No. 20 appear on the display?

YES >> GO TO 5.

NO >> Go to appropriate malfunctioning sensor circuit. Refer to [HAC-53, "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (Without left and right ventilation temperature separately control system) or [HAC-59, "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (With left and right ventilation temperature separately control system), see No. 11.

#### 5.PERFORM SELF-DIAGNOSIS STEP-4

Perform self-diagnosis STEP-4. Refer to [HAC-53, "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description"](#) (Without left and right ventilation temperature separately control system) or [HAC-59, "WITH LEFT AND RIGHT VENTILATION TEMPERATURE](#)

A  
B  
C  
D  
E  
F  
G  
H  
HAC

J  
K  
L  
M  
N  
O  
P

# INSUFFICIENT HEATING

[AUTOMATIC AIR CONDITIONER]

< SYMPTOM DIAGNOSIS >

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

Is it installed normally?

YES >> GO TO 6.

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

## 6.PERFORM SELF-DIAGNOSIS STEP-5

Perform self-diagnosis STEP-5. Refer to [HAC-53. "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description](#)" (Without left and right ventilation temperature separately control system) or [HAC-59. "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description](#)" (With left and right ventilation temperature separately control system).

Is the inspection result normal?

YES >> GO TO 7.

NO >> Go to appropriate malfunctioning sensor circuit. Refer to [HAC-53. "WITHOUT LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description](#)" (Without left and right ventilation temperature separately control system) or [HAC-59. "WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM : Diagnosis Description](#)" (With left and right ventilation temperature separately control system).

## 7.CHECK AIR LEAKAGE FROM DUCT

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

Is the inspection result normal?

YES >> GO TO 8.

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

## 8.CHECK HEATER HOSE INSTALLATION CONDITION

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

Is the inspection result normal?

YES >> GO TO 9.

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

## 9.CHECK TEMPERATURE OF HEATER HOSE

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

### **CAUTION:**

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

Is the inspection result normal?

YES >> GO TO 10.

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

## 10.REPLACE HEATER CORE

Replace the heater core. Refer to heater core. Refer to [HA-52. "Exploded View"](#).

Are the symptoms solved?

YES >> END

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



**NOISE****Description**

INFOID:000000004345780

## Symptom

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

**Inspection procedure**

INFOID:000000004345781

**1.CHECK OPERATION**

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

Can the parts where noise is occurring be checked?

- YES-1 >> Noise from blower 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 >> END.

**2.CHECK BLOWER MOTOR**

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

Is the inspection result normal?

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

**3.REPLACE COMPRESSOR**

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

Is the inspection result normal?

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

**4.CHECK WITH GAUGE PRESSURE**

Perform the diagnosis with the gauge pressure. Refer to [HA-7. "Trouble Diagnosis For Unusual Pressure"](#).

Is the inspection result normal?

- YES >> GO TO 5.  
 NO >> Repair or replace malfunctioning part(s).

**5.REPLACE EXPANSION VALVE**

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

Are the symptoms solved?

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

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

## NOISE

[AUTOMATIC AIR CONDITIONER]

### < SYMPTOM DIAGNOSIS >

---

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

#### Is the inspection result normal?

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

### 7.CHECK DRIVE BELT

---

Check tension of the drive belt. Refer to [EM-13. "Checking"](#).

#### Is the inspection result normal?

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

# SELF-DIAGNOSIS CANNOT BE PERFORMED

< SYMPTOM DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

## SELF-DIAGNOSIS CANNOT BE PERFORMED

### Description

INFOID:000000004345782

Symptom: Self-diagnosis function does not operate normally.

### Inspection procedure

INFOID:000000004345783

#### 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 turning the intake switch indicators (REC/FRE) ON.

#### Does self-diagnosis function operate?

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

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

Check power supply and ground circuit of unified meter and A/C amp. Refer to [HAC-102. "Diagnosis Procedure"](#).

#### Is the inspection result normal?

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

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

HAC

# MEMORY FUNCTION DOES NOT OPERATE

< SYMPTOM DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

---

## MEMORY FUNCTION DOES NOT OPERATE

### Description

INFOID:000000004345784

#### Symptom

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

### Inspection procedure

INFOID:000000004345785

#### 1. CHECK OPERATION

---

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

#### Is the inspection result normal?

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

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

---

Check power supply and ground circuit of unified meter and A/C amp. Refer to [HAC-102, "Diagnosis Procedure"](#).

#### Is the inspection result normal?

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

PRECAUTION

PRECAUTIONS

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

INFOID:000000004926068

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

**WARNING:**

- To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision 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 the "SRS AIR BAG".
- Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.

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

**WARNING:**

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

Precaution Necessary for Steering Wheel Rotation after Battery Disconnect

INFOID:000000004926071

**NOTE:**

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

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

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

OPERATION PROCEDURE

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

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

## PRECAUTIONS

< PRECAUTION >

[AUTOMATIC AIR CONDITIONER]

---

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

# PRESET SWITCH

< REMOVAL AND INSTALLATION >

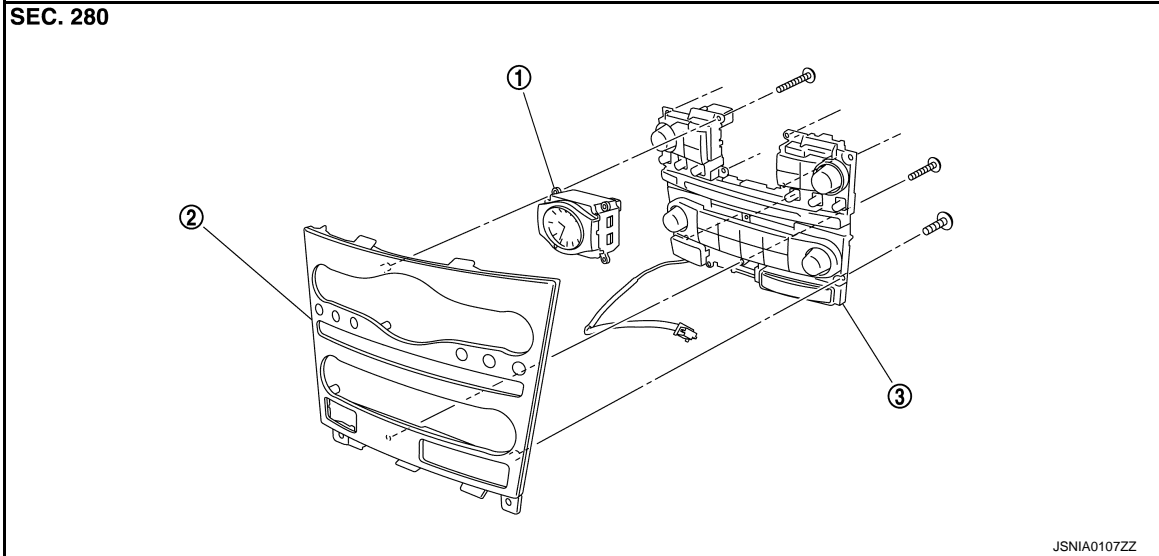
[AUTOMATIC AIR CONDITIONER]

## REMOVAL AND INSTALLATION

### PRESET SWITCH

Exploded View

INFOID:000000004498504



1. Clock

2. Cluster lid C

3. Preset switch

### Removal and Installation

INFOID:000000004498505

HAC

#### REMOVAL

Refer to [AV-161, "Removal and Installation"](#) (BASE AUDIO WITHOUT NAVIGATION) or [AV-586, "Removal and Installation"](#) (BOSE AUDIO WITH NAVIGATION).

#### INSTALLATION

Installation is basically the reverse order of removal.

# UNIFIED METER AND A/C AMP.

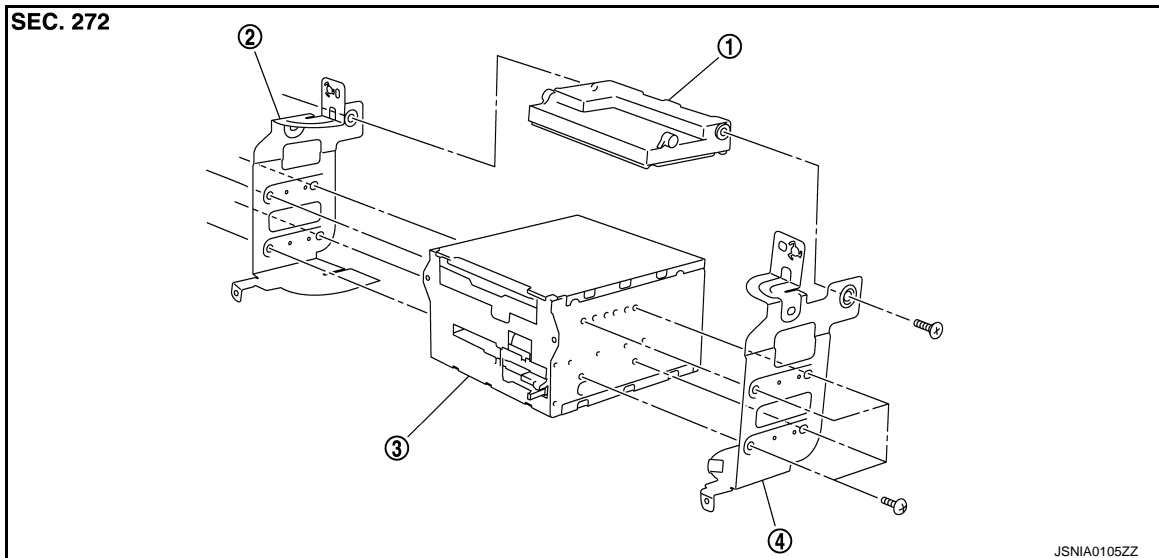
< REMOVAL AND INSTALLATION >

[AUTOMATIC AIR CONDITIONER]

## UNIFIED METER AND A/C AMP.

Exploded View

INFOID:000000004498506



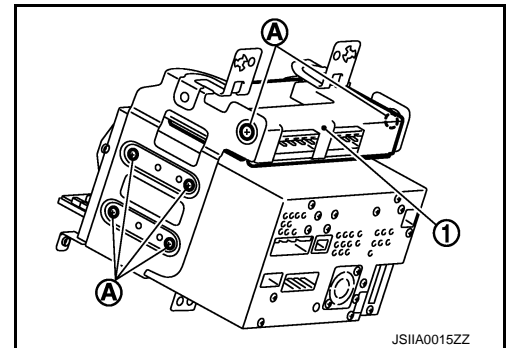
1. Unified meter and A/C amp.
2. Bracket (LH)
3. AV control unit
4. Bracket (RH)

## Removal and Installation

INFOID:000000004498507

### REMOVAL

1. Remove AV control unit. Refer to [AV-153, "Exploded View"](#) (BASE AUDIO WITHOUT NAVIGATION) or [AV-575, "Exploded View"](#) (BOSE AUDIO WITH NAVIGATION).
2. Remove mounting screws (A), and then remove unified meter and A/C amp. (1).



### INSTALLATION

Installation is basically 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 >

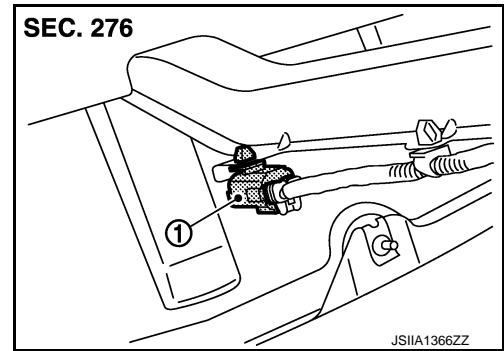
[AUTOMATIC AIR CONDITIONER]

## AMBIENT SENSOR

### Exploded View

1. Ambient sensor

INFOID:000000004498508

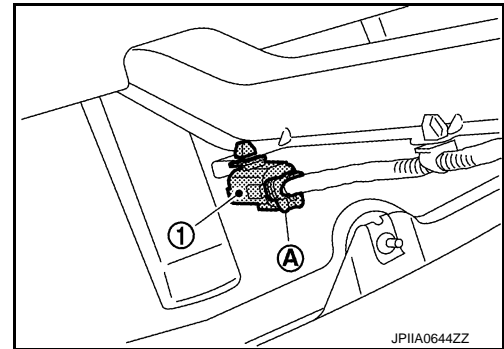


### Removal and Installation

INFOID:000000004498509

#### REMOVAL

1. Remove hood lock cover. Refer to [DLK-222, "Exploded View"](#).
2. Disconnect ambient sensor connector (A), and then remove ambient sensor (1).



#### INSTALLATION

Installation is basically the reverse order of removal.

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

# IN-VEHICLE SENSOR

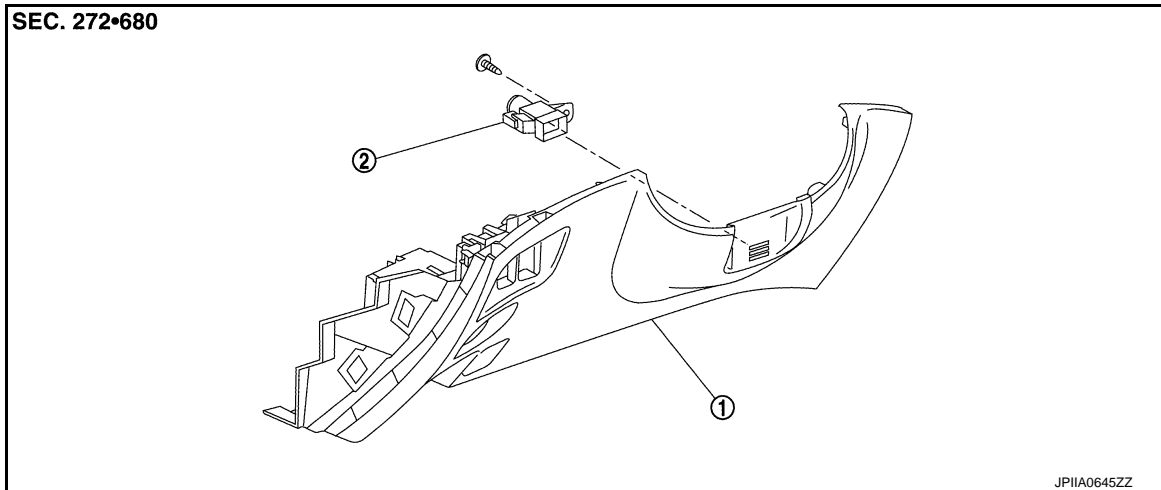
< REMOVAL AND INSTALLATION >

[AUTOMATIC AIR CONDITIONER]

## IN-VEHICLE SENSOR

Exploded View

INFOID:000000004498510



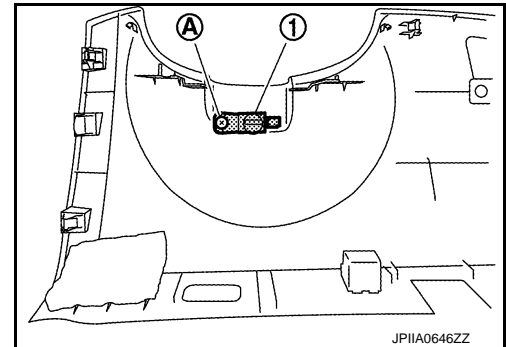
1. Instrument driver lower panel      2. In-vehicle sensor

## Removal and Installation

INFOID:000000004498511

### REMOVAL

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



### INSTALLATION

Installation is basically the reverse order of removal.

# SUNLOAD SENSOR

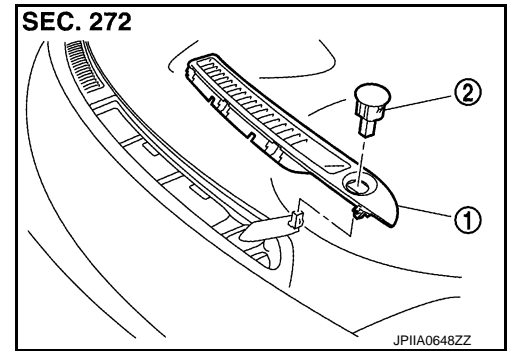
< REMOVAL AND INSTALLATION >

[AUTOMATIC AIR CONDITIONER]

## SUNLOAD SENSOR

### Exploded View

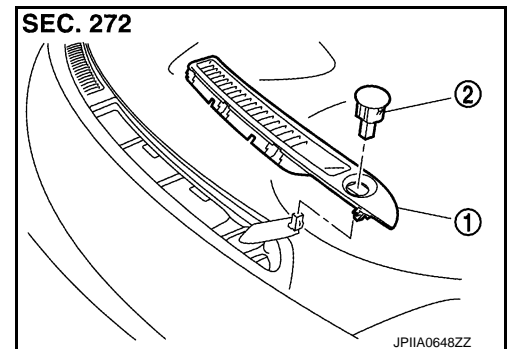
1. Front defroster grille (left)
2. Sunload sensor



### Removal and Installation

#### REMOVAL

1. Remove front defroster grille (left) (1). Refer to [VTL-11, "Exploded View"](#).
2. Disconnect sunload sensor connector, and then remove sunload sensor (2).



#### INSTALLATION

Installation is basically the reverse order of removal.

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

# INTAKE SENSOR

< REMOVAL AND INSTALLATION >

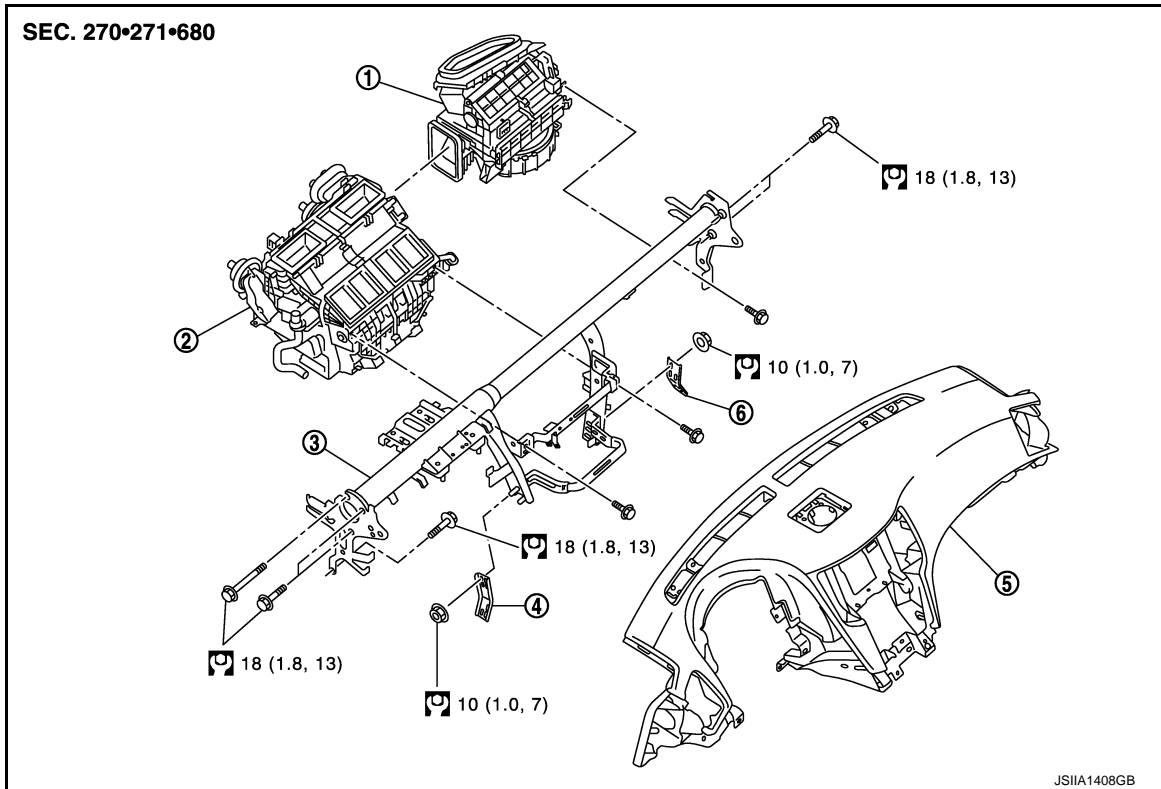
[AUTOMATIC AIR CONDITIONER]

## INTAKE SENSOR

Exploded View

INFOID:000000004908425

REMOVAL



- |                           |                                   |                            |
|---------------------------|-----------------------------------|----------------------------|
| 1. Blower unit            | 2. Heater & cooling unit assembly | 3. Steering member         |
| 4. Instrument stay (left) | 5. Instrument panel assembly      | 6. Instrument stay (right) |

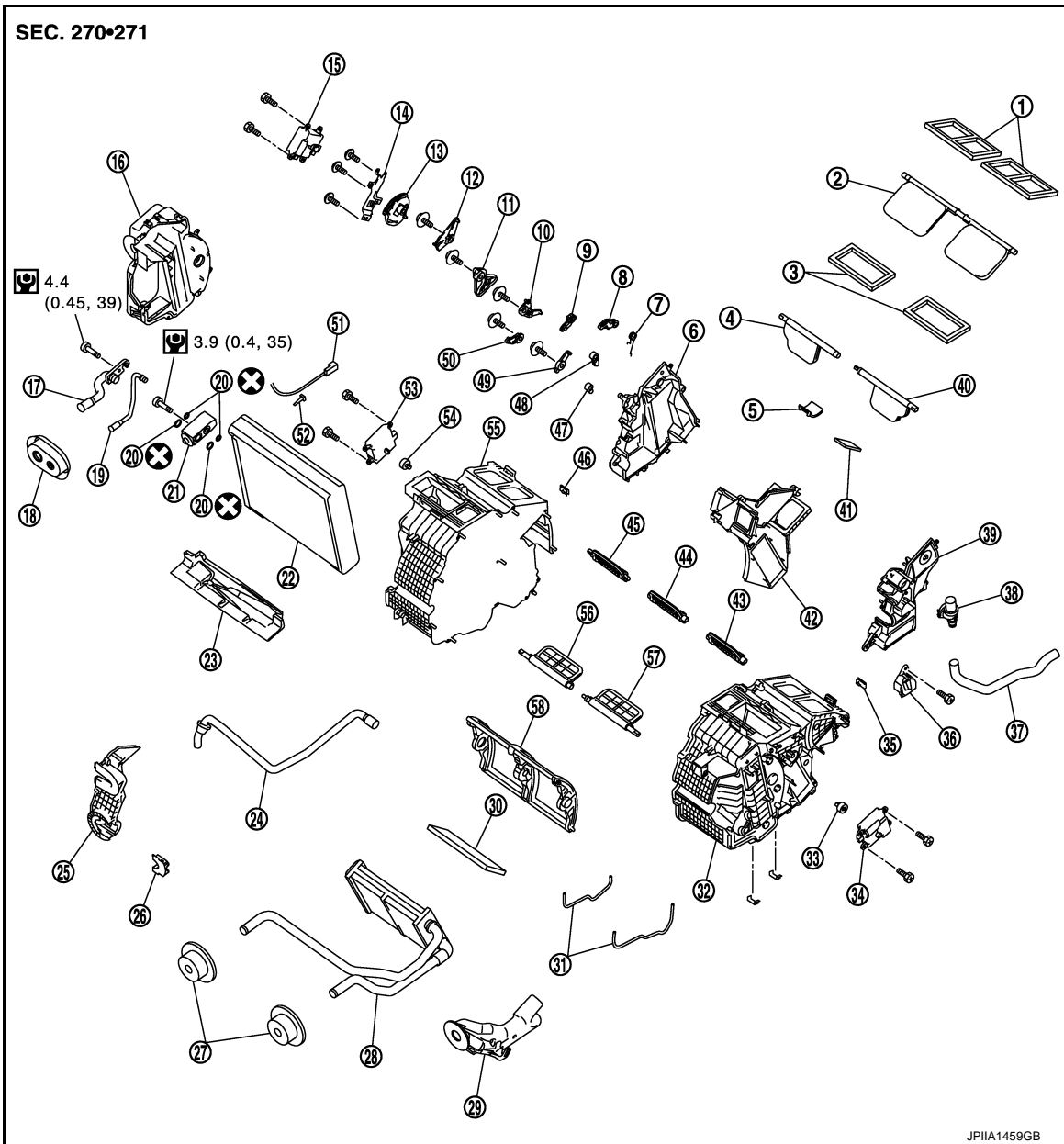
Refer to [GI-4, "Components"](#) for symbols in the figure.

DISASSEMBLY

# INTAKE SENSOR

< REMOVAL AND INSTALLATION >

[AUTOMATIC AIR CONDITIONER]



- |                                       |                                       |                          |
|---------------------------------------|---------------------------------------|--------------------------|
| 1. Ventilator seal                    | 2. Ventilator door                    | 3. Defroster seal        |
| 4. Defroster door (right)             | 5. Packing                            | 6. Foot duct (right)     |
| 7. Ventilator door spring             | 8. Ventilator door lever              | 9. Foot door lever       |
| 10. Foot door link                    | 11. Main link sub                     | 12. Ventilator door link |
| 13. Main link                         | 14. Mode door motor bracket           | 15. Mode door motor      |
| 16. Evaporator cover                  | 17. Low-pressure pipe 1               | 18. Cooler pipe grommet  |
| 19. High-pressure pipe 2              | 20. O-ring                            | 21. Expansion valve      |
| 22. Evaporator                        | 23. Insulator                         | 24. Drain hose           |
| 25. Evaporator cover adapter          | 26. Heater pipe bracket               | 27. Heater pipe grommet  |
| 28. Heater core                       | 29. Heater pipe cover                 | 30. Packing              |
| 31. Case packing                      | 32. Heater & cooling unit case (left) | 33. Air mix door adapter |
| 34. Air mix door motor (driver side)* | 35. J-nut                             | 36. Heater duct          |
| 37. Aspirator hose                    | 38. Aspirator                         | 39. Foot duct (left)     |
| 40. Defroster door (left)             | 41. Packing                           | 42. Center case          |
| 43. Foot door (left)                  | 44. Rear ventilator door              | 45. Foot door (right)    |
| 46. J-nut                             | 47. Max. cool door lever              | 48. Defroster door lever |

A  
B  
C  
D  
E  
F  
G  
H  
I  
J  
K  
L

HAC

M  
N  
O  
P

# INTAKE SENSOR

## < REMOVAL AND INSTALLATION >

[AUTOMATIC AIR CONDITIONER]

- |  |   |                           |
|--|---|---------------------------|
| 49. Defroster door link                | 50. Max. cool door link                 | 51. Intake sensor         |
| 52. Intake sensor bracket              | 53. Air mix door motor (passenger side) | 54. Air mix door adapter  |
| 55. Heater & cooling unit case (right) | 56. Max. cool door (right)              | 57. Max. cool door (left) |
| 58. Air mix door (Slide door)          |   |                           |

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

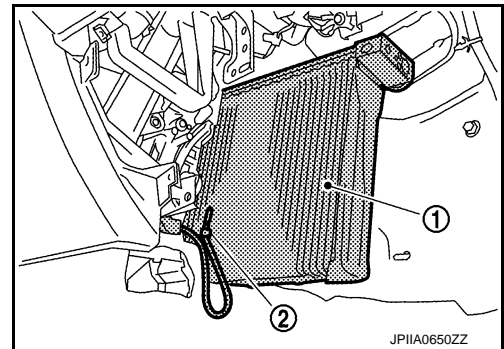
\*: With left and right ventilation temperature separately control system.

## Removal and Installation

INFOID:000000004498515

### REMOVAL

1. Remove low-pressure pipe 1 and high-pressure pipe 2. Refer to [HA-42, "Exploded View"](#).  
**CAUTION:**  
Cap or wrap the joint of the A/C piping with suitable material such as vinyl tape to avoid the entry of air.
2. Slide evaporator (1) to passenger side, and then remove intake sensor (2).



### INSTALLATION

Installation is basically 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.

# REFRIGERANT PRESSURE SENSOR

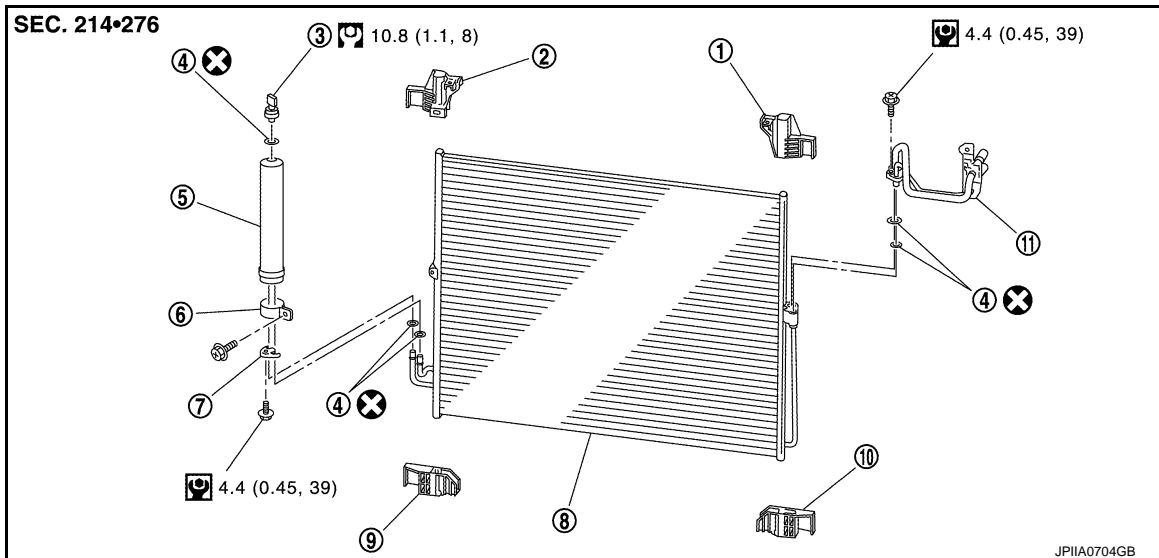
< REMOVAL AND INSTALLATION >

[AUTOMATIC AIR CONDITIONER]

## REFRIGERANT PRESSURE SENSOR

Exploded View

INFOID:000000004506876



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

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

## Removal and Installation

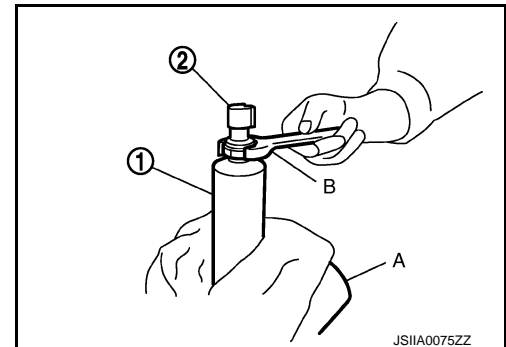
INFOID:000000004506880

### REMOVAL

1. Remove liquid tank. Refer to [HA-49, "Exploded View"](#).
2. Fix the liquid tank (1) with a vise (A). Remove the refrigerant pressure sensor (2) with a wrench (B).

**CAUTION:**

**Be careful not to damage liquid tank.**



### INSTALLATION

Installation is basically the reverse order of removal.

**CAUTION:**

- Apply compressor oil to O-ring of refrigerant pressure sensor when installing.
- Check for leakages when recharging refrigerant.

# DOOR MOTOR

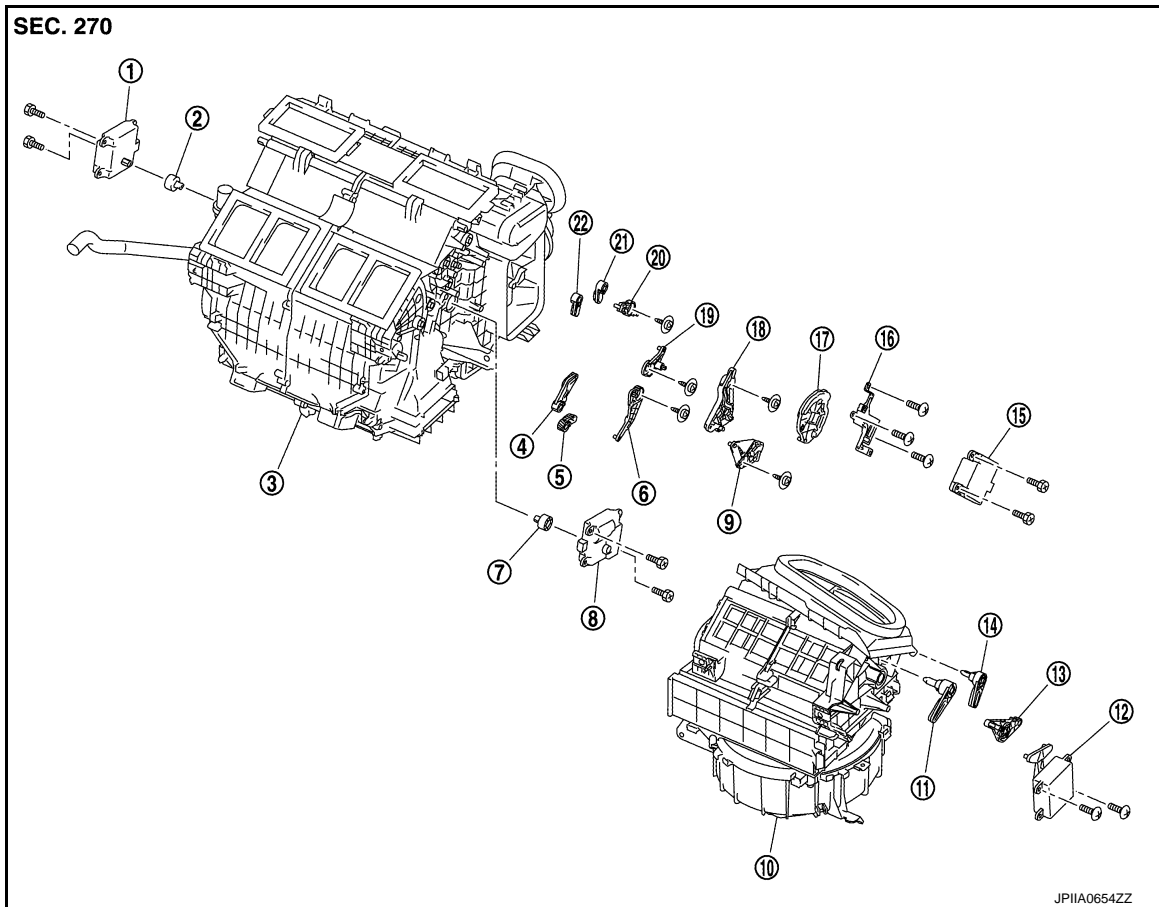
< REMOVAL AND INSTALLATION >

[AUTOMATIC AIR CONDITIONER]

## DOOR MOTOR

Exploded View

INFOID:000000004498520



- |                                      |  |                                   |
|--------------------------------------|--|-----------------------------------|
| 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                      | 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             |  |                                   |

\*: With left and right ventilation temperature separately control system.

## INTAKE DOOR MOTOR

### INTAKE DOOR MOTOR : Removal and Installation

INFOID:000000004498521

#### REMOVAL

1. Remove ECM and power steering control unit with bracket attached. Refer to [VTL-20, "BLOWER UNIT : Removal and Installation"](#).



# DOOR MOTOR

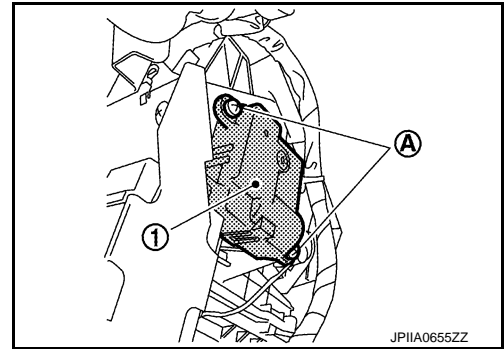
## < REMOVAL AND INSTALLATION >

[AUTOMATIC AIR CONDITIONER]

2. Remove mounting screws (A), and then remove intake door motor (1) from blower unit.

← Vehicle front

3. Disconnect intake door motor connector.



## INSTALLATION

Installation is basically the reverse order of removal.

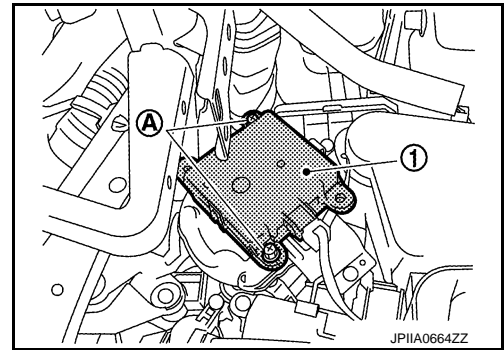
## MODE DOOR MOTOR

### MODE DOOR MOTOR : Removal and Installation

INFOID:000000004498525

## REMOVAL

1. Remove blower unit. Refer to [VTL-19. "Exploded View"](#).
2. Remove mounting screws (A), and then remove mode door motor (1).
3. Disconnect mode door motor connector.



## INSTALLATION

Installation is basically the reverse order of removal.

## AIR MIX DOOR MOTOR

### AIR MIX DOOR MOTOR : Removal and Installation

INFOID:000000004498527

## REMOVAL

Driver Side (With left and right ventilation temperature separately system)

1. Set the temperature (driver side) at 18°C (64°F).

### **CAUTION:**

**The angle may be out, when installing the air mix door motor to the air mix door, unless above procedure is performed.**

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-208. "Exploded View"](#).

# DOOR MOTOR

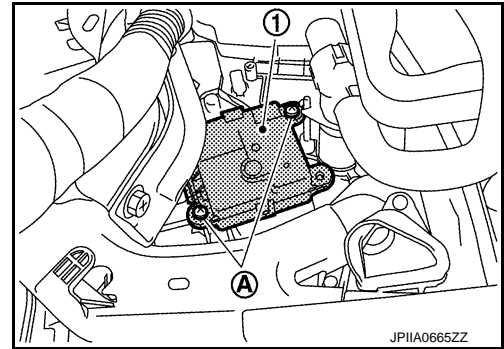
## < REMOVAL AND INSTALLATION >

[AUTOMATIC AIR CONDITIONER]

5. Remove mounting screws (A), and then remove air mix door motor (driver side) (1).

← Vehicle front

6. Disconnect air mix door motor connector.



### Passenger Side

1. Set the temperature (passenger side) at 18°C (64°F).

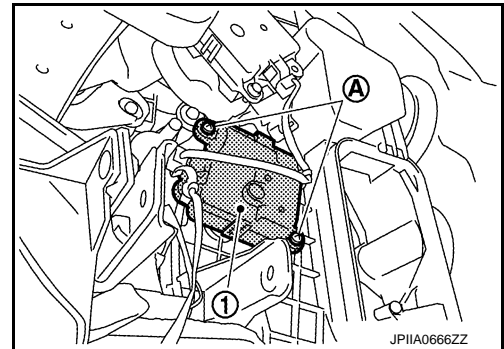
**CAUTION:**

**The angle may be out, when installing the air mix door motor to the air mix door, unless above procedure is performed.**

2. Disconnect the battery cable from the negative terminal.
3. Remove blower unit. Refer to [VTL-19, "Exploded View"](#).
4. Remove mounting screws (A), and then remove air mix door motor (passenger side) (1).

← Vehicle front

5. Disconnect air mix door motor connector.



## INSTALLATION

Installation is basically the reverse order of removal.