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# **HEATER & AIR CONDITIONING CONTROL SYSTEM**

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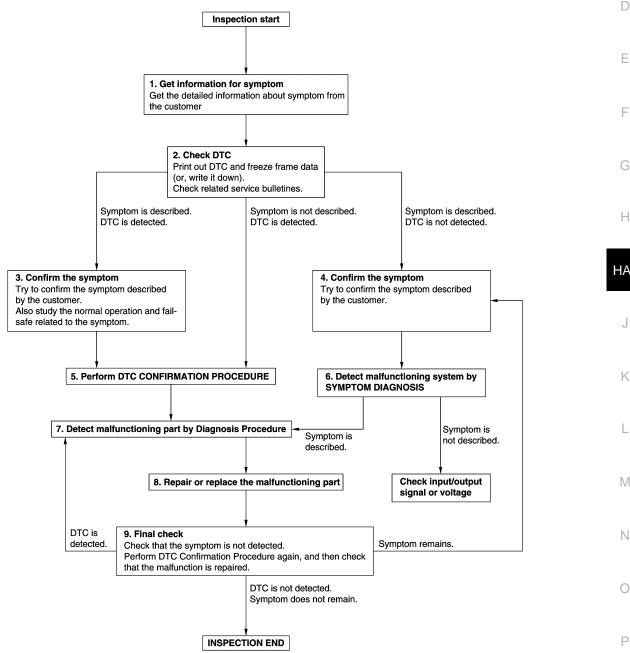
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# **BASIC INSPECTION**

# DIAGNOSIS AND REPAIR WORKFLOW

Work Flow INFOID:0000000009722024 В

**OVERALL SEQUENCE** 



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## DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

[WITHOUT 7 INCH DISPLAY]

# 1.GET INFORMATION FOR SYMPTOM

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

>> GO TO 2.

# 2. CHECK DTC

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

### Are any symptoms described and any DTC detected?

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

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

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

## 3.CONFIRM THE SYMPTOM

Try to confirm the symptom described by the customer.

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

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

>> GO TO 5.

## 4. CONFIRM THE SYMPTOM

Try to confirm the symptom described by the customer.

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

>> GO TO 6.

# 5. PERFORM DTC CONFIRMATION PROCEDURE

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

#### NOTE:

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

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

### Is DTC detected?

YES >> GO TO 7.

NO >> Check according to GI-44, "Intermittent Incident".

# 6.DETECT MALFUNCTIONING SYSTEM BY SYMPTOM DIAGNOSIS

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

#### Is the symptom described?

YES >> GO TO 7.

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

# 7. DETECT MALFUNCTIONING PART BY DIAGNOSIS PROCEDURE

### DIAGNOSIS AND REPAIR WORKFLOW

### < BASIC INSPECTION >

[WITHOUT 7 INCH DISPLAY]

Inspect according to Diagnosis Procedure of the system.

Is malfunctioning part detected?

YES >> GO TO 8.

NO >> Check according to GI-44, "Intermittent Incident".

# 8.repair or replace the malfunctioning part

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

>> GO TO 9.

# 9. FINAL CHECK

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

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

## Is DTC detected and does symptom remain?

YES-1 >> DTC is detected: GO TO 7.

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

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

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## **INSPECTION AND ADJUSTMENT**

< BASIC INSPECTION >

[WITHOUT 7 INCH DISPLAY]

# **INSPECTION AND ADJUSTMENT**

## **Description & Inspection**

INFOID:0000000009722025

#### DESCRIPTION

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

### Conditions : Engine running at normal operating temperature

## INSPECTION PROCEDURE

# 1. CHECK MEMORY FUNCTION

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

### Is the inspection result normal?

YES >> GO TO 2.

NO >> Memory function malfunction: HAC-117, "Inspection procedure".

# 2.CHECK BLOWER MOTOR SPEED

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

#### Is the inspection result normal?

YES >> GO TO 3.

NO >> Blower motor system malfunction: <u>HAC-70</u>, "<u>Diagnosis Procedure</u>".

# 3.check discharge air (mode switch and def switch)

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

#### NOTE:

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

#### Is the inspection result normal?

YES >> GO TO 4.

NO >> Mode door system malfunction: HAC-63, "Diagnosis Procedure".

# 4. CHECK DISCHARGE AIR (UPPER VENT SWITCH)

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

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

Discharge air flo	ow .						
Mode position		Air outlet/distribution					
indication	Condition		VENT		FOOT		DEE
		Front	Upper	Rear	Front	Rear	DEF
<b>~</b> ;		81%	8%	11%	_	_	_
**	DUAL switch: OFF	41%	10%	17%	24%	8%	_
<b>'~i</b>	UPPER VENT	12%	12%	16%	27%	10%	23%
<b>*</b>	SWIICH : ON	11%	11%	14%	25%	10%	29%
<b>*</b>		11%	11%	12%	_	_	66%

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

#### Does it operate normally?

YES >> GO TO 5.

>> Upper ventilator door system malfunction: <u>HAC-68</u>, "<u>Diagnosis Procedure</u>". NO

## **5.**CHECK INTAKE AIR

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

#### NOTE:

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

#### Is the inspection result normal?

YES >> GO TO 6.

NO >> Intake door system malfunction: <u>HAC-66</u>, "<u>Diagnosis Procedure</u>".

## 6.CHECK A/C SWITCH

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

#### Is the inspection result normal?

YES >> GO TO 7.

NO >> Magnet clutch system malfunction: <u>HAC-74</u>, "<u>Diagnosis Procedure</u>".

# 7.CHECK WITH TEMPERATURE SETTING LOWERED

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

#### Is the inspection result normal?

YES >> GO TO 8.

NO >> Insufficient cooling: <u>HAC-109</u>, "Inspection procedure".

## f 8.CHECK WITH TEMPERATURE SETTING RAISED

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

## Is the inspection result normal?

YES >> GO TO 9.

NO >> Insufficient heating: HAC-112, "Inspection procedure".

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[WITHOUT 7 INCH DISPLAY]

# $9.\mathsf{CHECK}\ \mathsf{LH/RH}\ \mathsf{INDEPENDENT}\ \mathsf{TEMPERATURE}\ \mathsf{ADJUSTMENT}\ \mathsf{FUNCTION}$

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

#### Is the inspection result normal?

YES >> GO TO 10.

NO >> Refer to <u>HAC-108</u>, "<u>Diagnosis Chart By Symptom</u>" and perform the appropriate diagnosis.

# 10. CHECK AUTO MODE

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

### Is the inspection result normal?

YES >> INSPECTION END

NO >> Refer to <u>HAC-108</u>, "<u>Diagnosis Chart By Symptom</u>" and perform the appropriate diagnosis.

# Temperature Setting Trimmer

INFOID:0000000009722026

#### Description

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

#### How to set

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

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

#### NOTE:

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

# Foot Position Setting Trimmer

INFOID:0000000009722027

#### Description

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

#### [WITHOUT 7 INCH DISPLAY]

How to set

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

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

#### NOTE:

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

## Inlet Port Memory Function (FRE)

#### Description

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

#### How to set

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

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

#### NOTE:

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

# Inlet Port Memory Function (REC)

#### Description

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

#### How to set

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

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

### NOTE:

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

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# SYSTEM DESCRIPTION

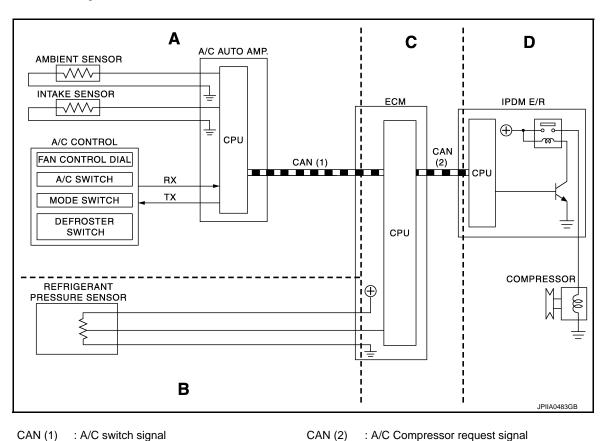
# **COMPRESSOR CONTROL FUNCTION**

Description INFOID:0000000009722030

### PRINCIPLE OF OPERATION

Compressor is not activated.

Functional circuit diagram



CAN (1) : A/C switch signal

: Blower fan motor switch signal

RX, TX : A/C switch signal

: Fan ON signal : Defroster signal

## Functional initial inspection chart

×: Applicable

				Loc	ation	• • • • • • • • • • • • • • • • • • • •
Control unit	D	iagnosis item	A	В	С	D
		Self-diagnosis	×	_	_	_
A/C auto amp.	(E) "HVAC"	Data monitor	×	_	_	_
		Active test	×	_	_	×
ECM ( "ENGINE"	Self-diagnosis function (CAN system diagnosis)	_	_	×	_	
		Data monitor	_	×	×	_
	(P) "IPDM E/R"	Self-diagnosis function (CAN system diagnosis)	_	_	_	×
IPDM E/R		Data monitor	_	_	×	_
	Auto active test		_	_	_	×

[WITHOUT 7 INCH DISPLAY]

**Component Part Location** 

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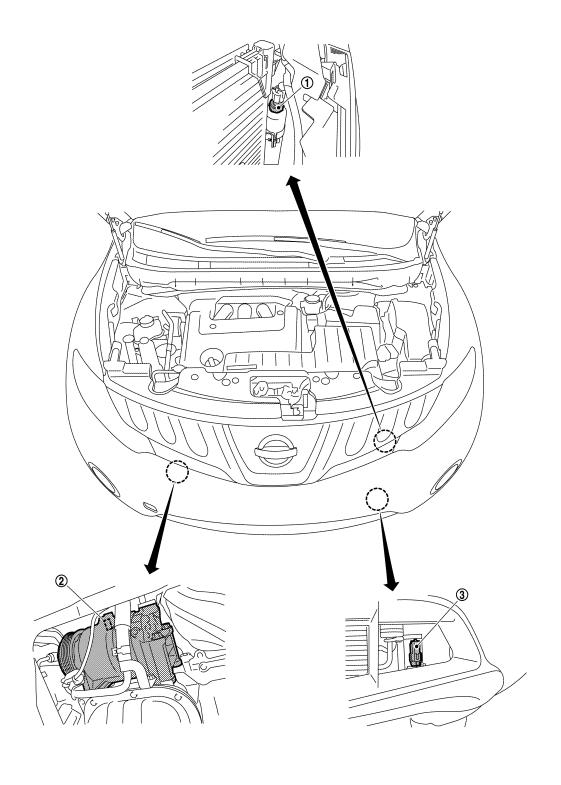
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# **ENGINE COMPARTMENT**



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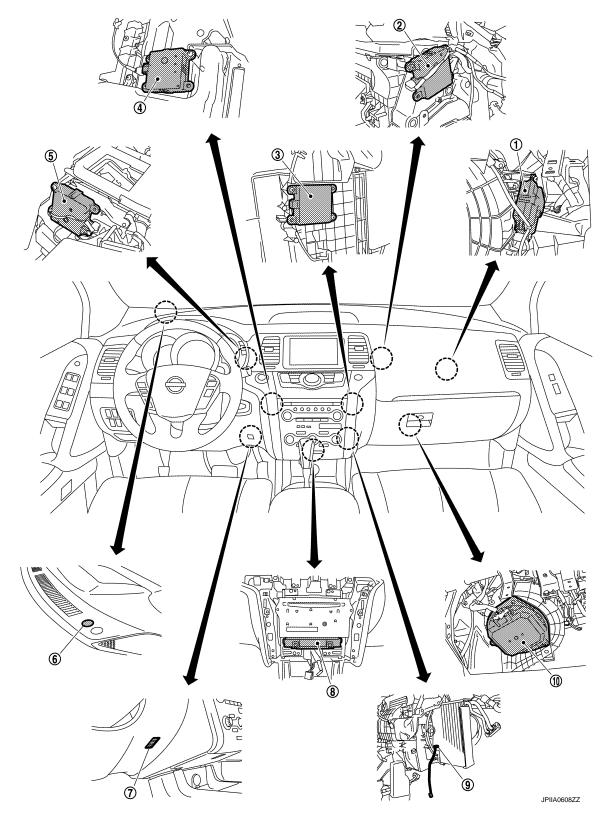
1. Refrigerant pressure sensor

2. Compressor (magnet clutch)

3. Ambient sensor

PASSENGER COMPARTMENT

Revision: 2013 August HAC-13 2014 MURANO



- 1. Intake door motor
- 4. Air mix door motor (driver side)
- 7. In-vehicle sensor
- 10. Blower motor

- 2. Upper ventilator door motor
- 5. Mode door motor
- 8. A/C auto amp.

- 3. Air mix door motor (passenger side)
- 6. Sunload sensor
- 9. Intake sensor

# **COMPRESSOR CONTROL FUNCTION**

# < SYSTEM DESCRIPTION >

Component's Role

Intake sensor Blower motor

# [WITHOUT 7 INCH DISPLAY]

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

HAC-52, "Description"

HAC-70, "Description"

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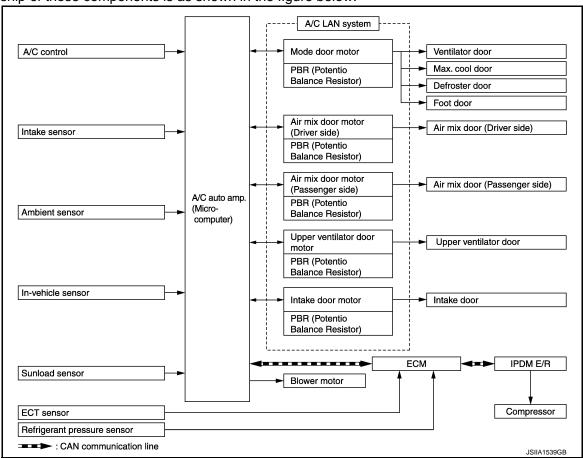
INFOID:0000000009722034

# **AUTOMATIC AIR CONDITIONER SYSTEM**

System Diagram INFOID:000000009722033

## **CONTROL SYSTEM**

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

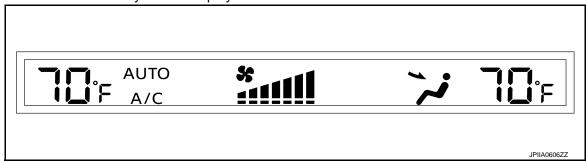


# System Description

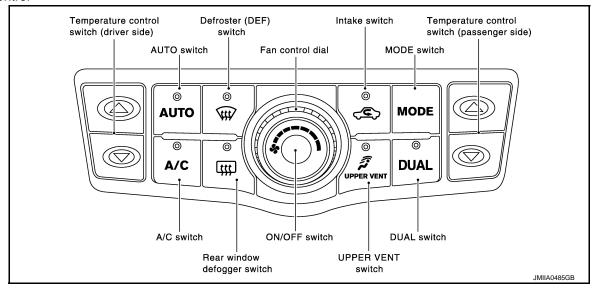
CONTROL OPERATION

Display

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



#### A/C Control



#### MODE Switch

The air discharge outlets are controlled with this switch.

Temperature Control Switch (Driver Side)

The set temperature is increased or decreased with this switch.

Temperature Control Switch (Passenger Side)

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

#### **AUTO Switch**

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

#### Defroster (DEF) Switch

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

#### **UPPER VENT Switch**

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

#### A/C Switch

Compressor turns ON or OFF with this switch.

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

#### Fan Control Dial

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

#### ON/OFF Switch

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

#### Rear Window Defogger Switch

When indicator is ON, rear window is defogged.

#### Intake Switch

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

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## **AUTOMATIC AIR CONDITIONER SYSTEM**

#### < SYSTEM DESCRIPTION >

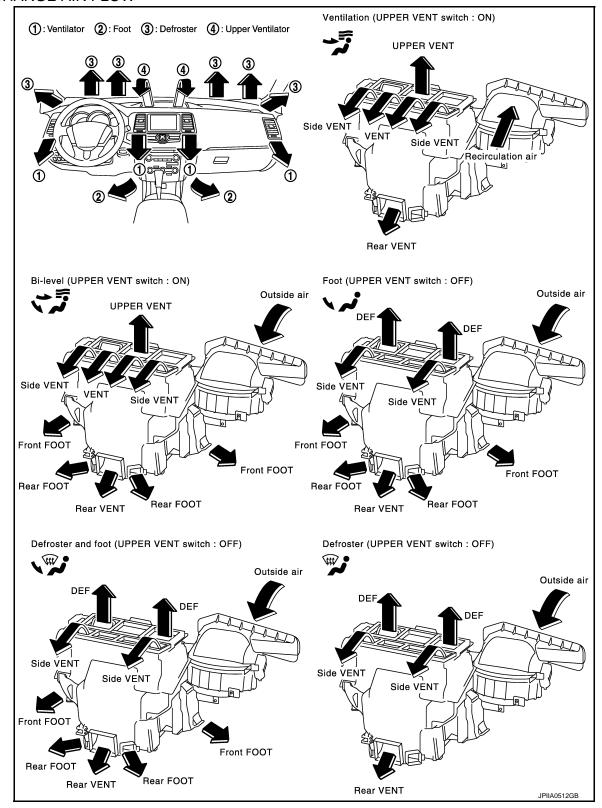
[WITHOUT 7 INCH DISPLAY]

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

#### **DUAL Switch**

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

## DISCHARGE AIR FLOW



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# AIR DISTRIBUTION

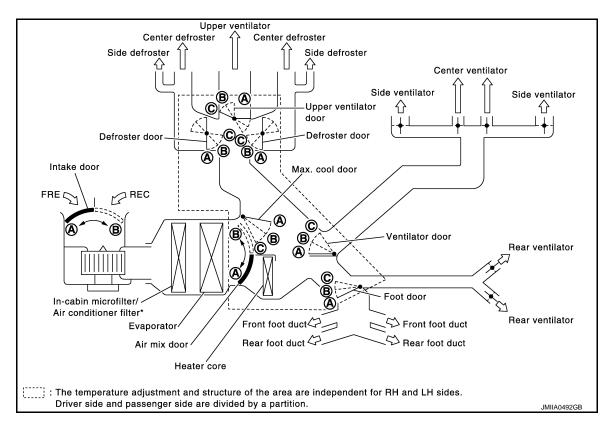
Discharge air flow									
Mode position indication	Condition	Air outlet/distribution							
			VENT		FOOT		DEE		
		Front	Upper	Rear	Front	Rear	DEF		
نبر		81%	8%	11%	_	_	_		
**	DUAL switch: OFF UPPER VENT switch : ON	41%	10%	17%	24%	8%	_		
<b>'~</b> i		12%	12%	16%	27%	10%	23%		
)		11%	11%	14%	25%	10%	29%		
<b>*</b>		11%	11%	12%	_	_	66%		

JPIIA0509GB

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

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# SWITCHES AND THEIR CONTROL FUNCTION



\* : Models for Mexico.

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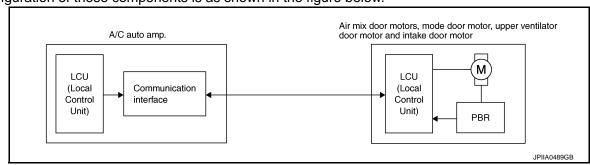
				Door position								
Switch position			Ventilator door	Max. cool door	Defroster door	Foot door	Upper ventila- tor door	Intake door	Air mix door (Driver side)	Air mix door (Pas- senger side)		
AUTO switch		*			го		_	AUTO				
	VENT B/L		7 7		Α	Α		Α				
MODE					В	А		В				
switch		ų,		С	В	В	С	_				
	D/F	4		С	В	В	В		В			
DEF switch	<b>(</b>	=	*		С	С	Α		В	_	_	
UPPER VENT	ON	<i>f</i>	*					A-B				
switch	OFF	٠,	0		_				С			
Intake	ON		*					A	Α*			
switch	OFF	<b>©</b>	0						B <sup>*</sup>			
Townsersture	DUAL		.0°C 0°F)							A		
Temperature control switch (Driver side)	switch:	$18.5^{\circ}C \Leftrightarrow 31.5^{\circ}C$ $(61^{\circ}F \Leftrightarrow 89^{\circ}F)$								AUTO		
,			.0°C 0°F)					ı			В	
			.0°C 0°F)	_	_	_	_	_		А		
Temperature control switch (Passenger	DUAL switch: ON		⇒ 31.5°C ⇒ 89°F)						_	AUTO	_	
			.0°C D°F)							В		
			.0°C 0°F)								А	
			⇒ 31.5°C ⇒ 89°F)							_	AUTO	
side)	side)		.0°C D°F)								В	
ON/OFF switch			С	С	В	С	_	В	_	_		

<sup>\*:</sup> Inlet status is displayed by indicator when activating automatic control.

## AIR CONDITIONER LAN CONTROL SYSTEM

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

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



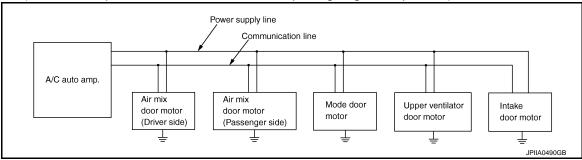
#### SYSTEM CONSTRUCTION

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

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

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

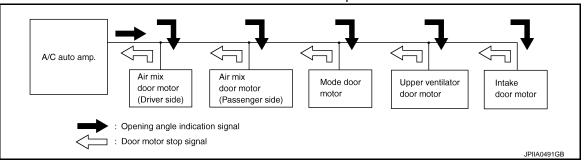
- Address
- Motor opening angle signals
- Data transmission
- Motor stop and drive decision
- Opening angle sensor (PBR function)
- Comparison
- Decision (A/C auto amp. indicated value and motor opening angle comparison)



#### Operation

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

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



Transmission Data and Transmission Order

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

#### START:

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

#### ADDRESS:

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

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apon the corrected opening angle data.

#### **OPENING ANGLE:**

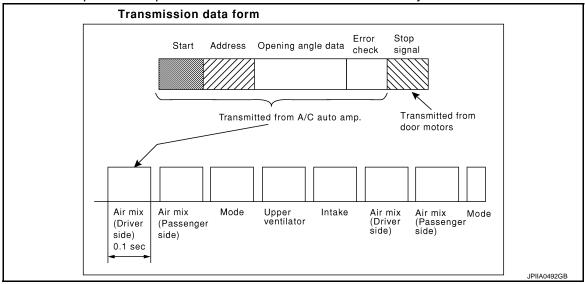
Data that shows the indicated door opening angle of each door motor.

#### ERROR CHECK:

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

#### STOP SIGNAL:

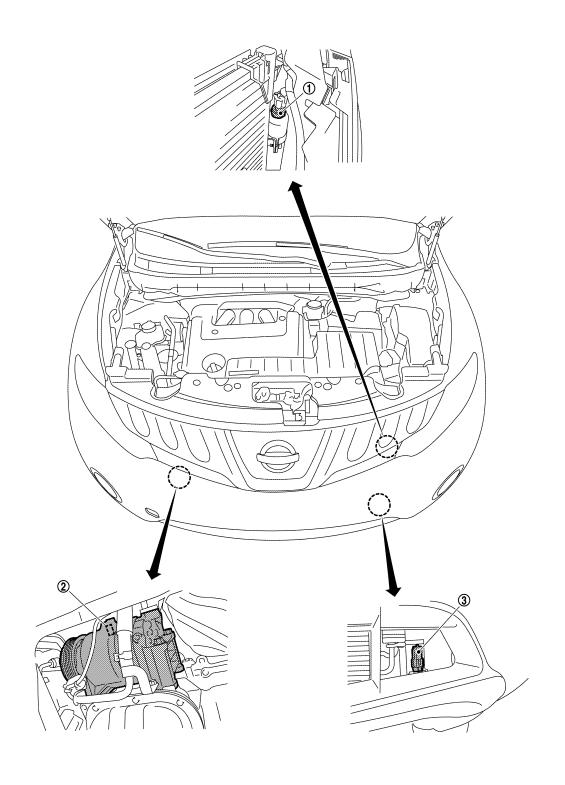
• At the end of each transmission, a stop operation, in-operation, or internal malfunction message is delivered to the A/C auto amp. This completes one data transmission and control cycle.



Component Part Location

**ENGINE COMPARTMENT** 

INFOID:0000000009722035



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1. Refrigerant pressure sensor

2. Compressor (magnet clutch)

3. Ambient sensor

PASSENGER COMPARTMENT

Revision: 2013 August HAC-25 2014 MURANO

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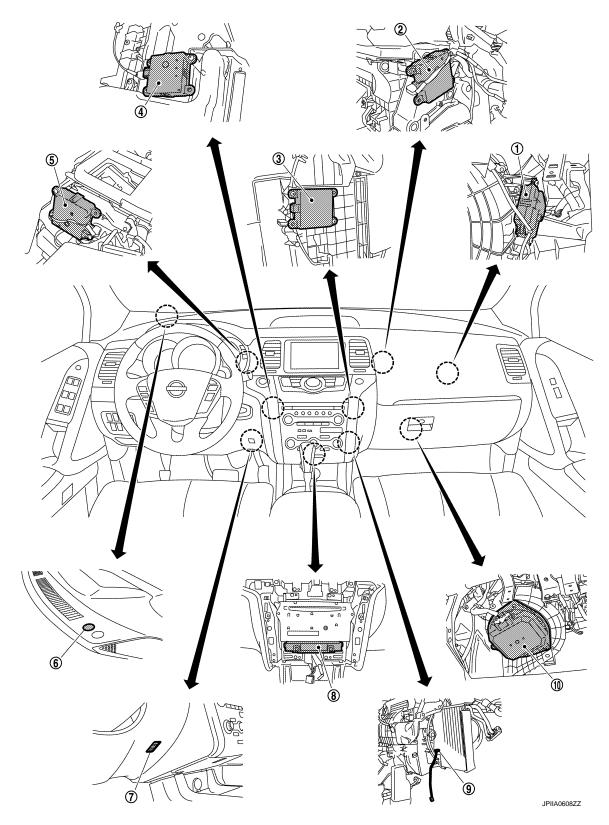
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- 1. Intake door motor
- 4. Air mix door motor (driver side)
- 7. In-vehicle sensor
- 10. Blower motor

- 2. Upper ventilator door motor
- 5. Mode door motor
- 8. A/C auto amp.

- 3. Air mix door motor (passenger side)
- 6. Sunload sensor
- 9. Intake sensor

# **AUTOMATIC AIR CONDITIONER SYSTEM**

< SYSTEM DESCRIPTION >

# [WITHOUT 7 INCH DISPLAY]

# **Component Description**

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

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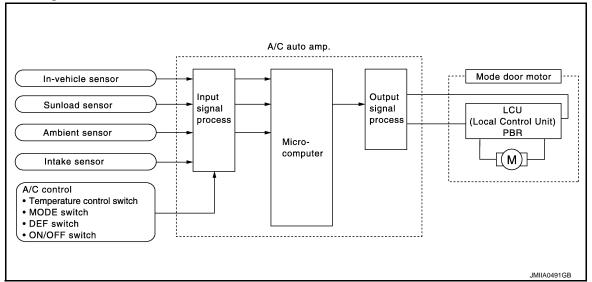
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## MODE DOOR CONTROL SYSTEM

## System Diagram

INFOID:0000000009722037



# System Description

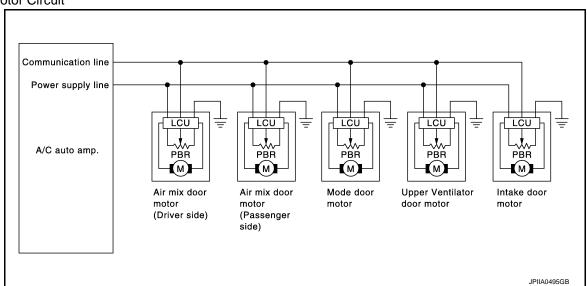
INFOID:0000000009722038

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

#### SYSTEM OPERATION

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

#### **Door Motor Circuit**



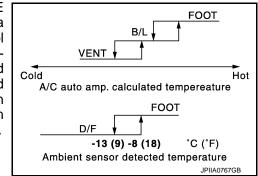
Mode Door Control Specification

## MODE DOOR CONTROL SYSTEM

## < SYSTEM DESCRIPTION >

## [WITHOUT 7 INCH DISPLAY]

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



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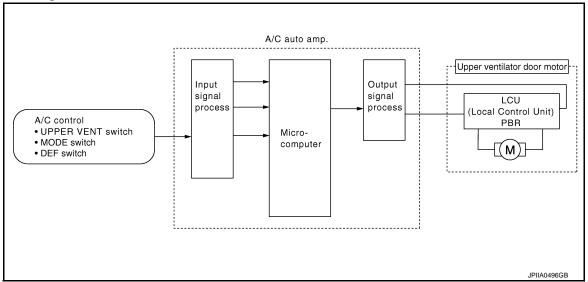
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## UPPER VENTILATOR DOOR CONTROL SYSTEM

## System Diagram

INFOID:0000000009722039



# System Description

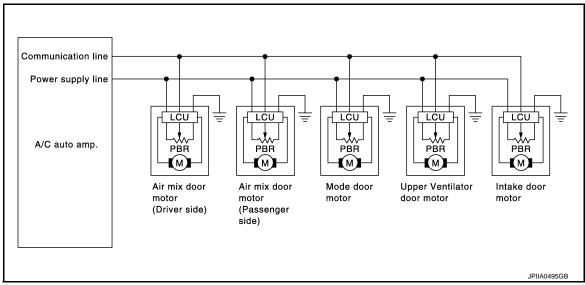
INFOID:0000000009722040

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

#### SYSTEM OPERATION

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

#### **Door Motor Circuit**



Revision: 2013 August

# **UPPER VENTILATOR DOOR CONTROL SYSTEM**

< SYSTEM DESCRIPTION >

# [WITHOUT 7 INCH DISPLAY]

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

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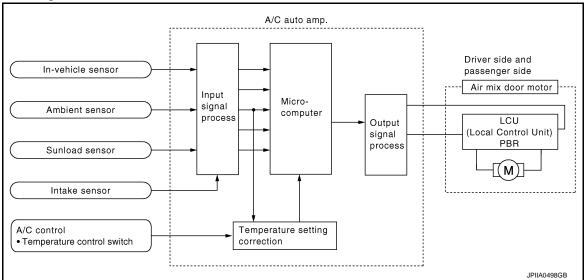
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# AIR MIX DOOR CONTROL SYSTEM

## System Diagram

INFOID:0000000009722041



# System Description

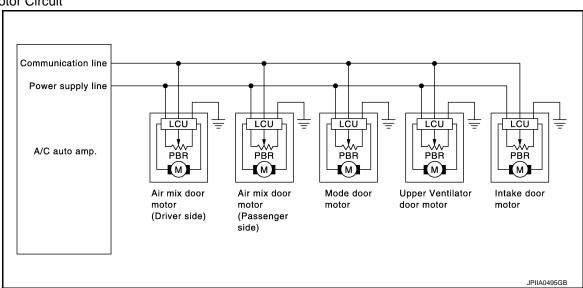
INFOID:0000000009722042

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

#### SYSTEM OPERATION

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

#### **Door Motor Circuit**



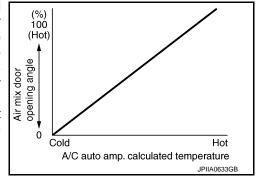
Air Mix Door Control Specification

## AIR MIX DOOR CONTROL SYSTEM

< SYSTEM DESCRIPTION >

## [WITHOUT 7 INCH DISPLAY]

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



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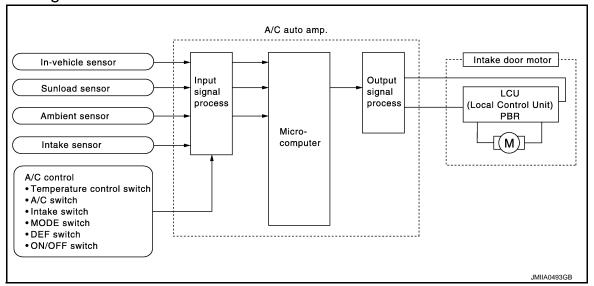
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## INTAKE DOOR CONTROL SYSTEM

# System Diagram

INFOID:0000000009722043



# System Description

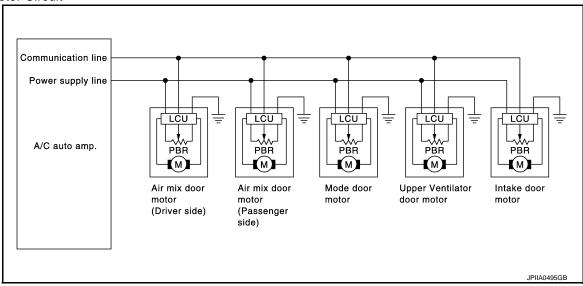
INFOID:0000000009722044

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

### SYSTEM OPERATION

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

#### **Door Motor Circuit**



Intake Door Control Specification

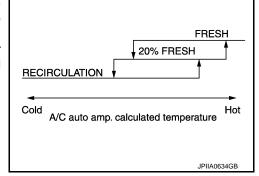
## INTAKE DOOR CONTROL SYSTEM

## < SYSTEM DESCRIPTION >

## [WITHOUT 7 INCH DISPLAY]

Intake door position is basically set to the FRE when the FRE indicator of the DEF switch and the intake switch turn ON, and set on the REC when the REC indicator of intake switch turns ON.

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



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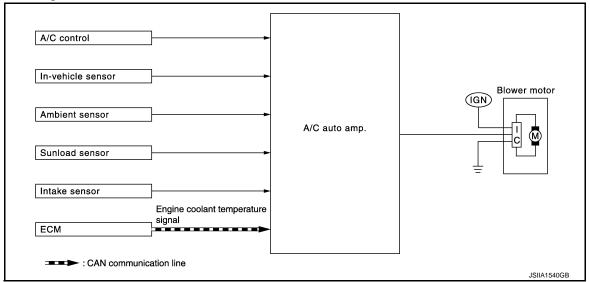
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# **BLOWER MOTOR CONTROL SYSTEM**

## System Diagram

INFOID:0000000009722045



# System Description

INFOID:0000000009722046

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

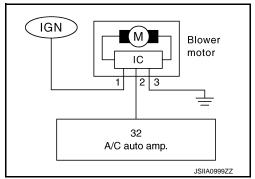
By pressing the AUTO switch, the blower motor starts to gradually increase air flow volume.

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

#### SYSTEM OPERATION

## System operation

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



#### Normal automatic air flow control

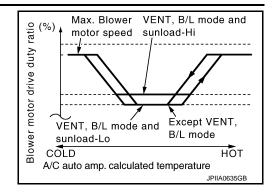
- When the target temperature is set by the temperature control switch of A/C control, the A/C auto amp. performs the calculation and decides the target according to the signal from each sensor.
- The A/C auto amp. changes the duty ratio of blower motor drive signal and controls the air flow continuously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

### **BLOWER MOTOR CONTROL SYSTEM**

### < SYSTEM DESCRIPTION >

### [WITHOUT 7 INCH DISPLAY]

Fan Speed Control Specification



Starting air flow control

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

Starting Fan Speed Control

Start up from COLD SOAK Condition (Automatic mode)

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

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

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

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

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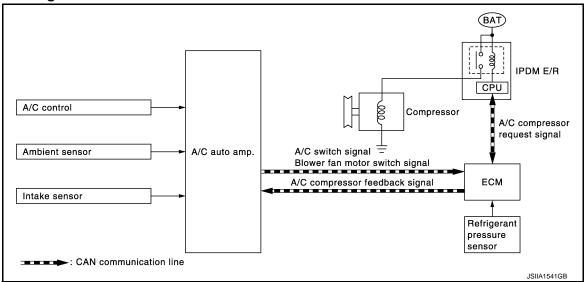
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### MAGNET CLUTCH CONTROL SYSTEM

### System Diagram

INFOID:0000000009722047



## System Description

INFOID:0000000009722048

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

#### SYSTEM OPERATION

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

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

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

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

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

### Compressor Protection Control

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

### Low Temperature Protection Control

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

### **CAN COMMUNICATION SYSTEM**

< SYSTEM DESCRIPTION >

[WITHOUT 7 INCH DISPLAY]

## CAN COMMUNICATION SYSTEM

## System Description

INFOID:0000000009722049

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

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[WITHOUT 7 INCH DISPLAY]

# **DIAGNOSIS SYSTEM (HVAC)**

## **CONSULT Function**

INFOID:0000000009722050

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

**CONSULT** application items

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

### SELF DIAGNOSTIC RESULT

Refer to HAC-106, "DTC Index".

Display Item List

DTC	Items (CONSULT screen terms)	Diagnostic item is detected when	Possible cause
U1000	CAN COMM CIRCUIT	When A/C auto amp. is not transmitting or receiving CAN communication signal for 2 or more seconds.	CAN communication system
U1010	CONTROL UNIT (CAN)	When detecting error during the initial diagnosis of CAN controller of A/C auto amp.	A/C auto amp.
B257B	AMB TEMP SEN SHORT	Detected temperature at ambient sensor –44°C (–47°F) or less	Ambient sensor     A/C auto amp.
B257C	AMB TEMP SEN OPEN	Detected temperature at ambient sensor 100°C (212°F) or more	Harness and connector     (Ambient sensor circuit is open,     or there is a short in the circuit)
B2578	IN CAR SEN SHORT	Detected temperature at in-vehicle sensor –44°C (–47°F) or less	In-vehicle sensor     A/C auto amp.
B2579	IN CAR SEN OPEN	Detected temperature at in-vehicle sensor 100°C (212°F) or more	Harness and connector     (In-vehicle sensor circuit is open, or there is a short in the circuit)
B2581	EVAP TEMP SEN SHORT	Detected temperature at intake sensor –33°C (–27°F) or less	Intake sensor     A/C auto amp.
B2582	EVAP TEMP SEN OPEN	Detected temperature at intake sensor 69°C (156°F) or more	Harness and connector     (Intake sensor circuit is open, or there is a short in the circuit)
B2630*	SUNLOAD SEN SHORT	Detected calorie at sunload sensor 64.7 w/m² (56 kcal/m²·h) or less	Sunload sensor     A/C auto amp.
B2631*	SUNLOAD SEN OPEN	Detected calorie at sunload sensor 2832 w/m² (2436 kcal/m²-h) or more	Harness and connector     (Sunload sensor circuit is open, or there is a short in the circuit)
B2632	DR AIRMIX ACTR SHORT	Air mix door PBR (driver side) position 5% or less	Air mix door motor (driver side)     A/C auto amp.
B2633	DR AIRMIX ACTR OPEN	Air mix door PBR (driver side) position 95% or more	Harness and connector     (CAN communication line is open     or shorted)     (Air mix door motor is open or     shorted)

## **DIAGNOSIS SYSTEM (HVAC)**

### < SYSTEM DESCRIPTION >

### [WITHOUT 7 INCH DISPLAY]

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

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

### **DATA MONITOR**

### NOTE:

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

Display item list

Monitor item [Unit]		Description
COMP REQ SIG	MP REQ SIG [On/Off] Displays A/C switch ON/OFF status transmitted to other units via 0	
FAN REQ SIG	[On/Off]	Displays blower switch ON/OFF status transmitted to other units via CAN communication
AMB TEMP SEN [°C] Ambient sensor value sensor		Ambient sensor value converted from ambient sensor signal received from ambient sensor
IN-VEH TEMP	[°C]	In-vehicle sensor value converted from in-vehicle sensor signal received from in-vehicle sensor

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# **DIAGNOSIS SYSTEM (HVAC)**

### < SYSTEM DESCRIPTION >

## [WITHOUT 7 INCH DISPLAY]

Monitor item [Unit]		Description
INT TEMP SEN [°C]		Intake sensor value converted from intake sensor signal received from intake sensor
SUNLOAD SEN [w/m²]		Sunload sensor value converted from sunload sensor signal received from sunload sensor
AMB SEN CAL	[°C]	Ambient sensor value calculated by A/C auto amp.
IN-VEH CAL	[°C]	In-vehicle sensor value calculated by A/C auto amp.
INT TEMP CAL	[°C]	Intake sensor value calculated by A/C auto amp.
SUNL SEN CAL [w/m²]		Sunload sensor value calculated by A/C auto amp.
FAN DUTY		Duty ratio of blower motor judged by A/C auto amp.
XM		Target discharge air temperature judged by A/C auto amp. according to the temperature setting and the value from each sensor
ENG COOL TEMP	[°C]	Water temperature signal value received from ECM via CAN communication
VEHICLE SPEED	[Mph (km/h)]	Vehicle speed signal value received from meter via CAN communication

### **ACTIVE TEST**

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

### **HVAC TEST**

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

### NOTE:

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

### **WORK SUPPORT**

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

# **DIAGNOSIS SYSTEM (HVAC)**

# < SYSTEM DESCRIPTION >

## [WITHOUT 7 INCH DISPLAY]

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

### NOTE:

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

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### **U1000 CAN COMM CIRCUIT**

< DTC/CIRCUIT DIAGNOSIS >

[WITHOUT 7 INCH DISPLAY]

# DTC/CIRCUIT DIAGNOSIS

### U1000 CAN COMM CIRCUIT

Description INFOID:000000009722051

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

CAN Communication Signal Chart. Refer to LAN-17, "How to Use CAN Communication Signal Chart".

DTC Logic

### DTC DETECTION LOGIC

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

# Diagnosis Procedure

INFOID:0000000009722053

# 1. CHECK WITH SELF-DIAGNOSIS FUNCTION OF CONSULT

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

### Is "CAN COMM CIRCUIT" displayed?

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

# **U1010 CONTROL UNIT (CAN)**

### < DTC/CIRCUIT DIAGNOSIS >

### [WITHOUT 7 INCH DISPLAY]

# U1010 CONTROL UNIT (CAN)

Description INFOID:0000000009722054

Initial diagnosis of A/C auto amp.

DTC Logic

### DTC DETECTION LOGIC

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

## Diagnosis Procedure

1. CHECK WITH SELF-DIAGNOSIS FUNCTION OF CONSULT

Using CONSULT, perform "SELF-DIAGNOSIS RESULTS" of HVAC.

Is DTC No. "U1010" displayed?

YES >> Replace A/C auto amp.

NO >> INSPECTION END

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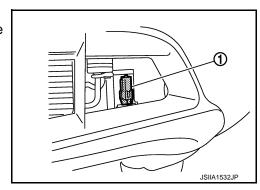
# B257B, B257C AMBIENT SENSOR

Description INFOID:000000009722057

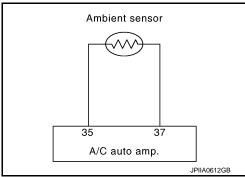
#### COMPONENT DESCRIPTION

#### **Ambient Sensor**

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



**Ambient Sensor Circuit** 



### AMBIENT TEMPERATURE INPUT PROCESS

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

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

DTC Logic

#### DTC DETECTION LOGIC

### NOTE:

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

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

### DTC CONFIRMATION PROCEDURE

1. CHECK WITH SELF-DIAGNOSIS FUNCTION OF CONSULT

### **B257B, B257C AMBIENT SENSOR**

### < DTC/CIRCUIT DIAGNOSIS >

[WITHOUT 7 INCH DISPLAY]

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

#### NOTE:

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

### Is DTC No. "B257B" or "B257C" displayed?

YES >> Perform trouble diagnosis for the ambient sensor. Refer to HAC-47, "Diagnosis Procedure".

NO >> INSPECTION END

## **Diagnosis Procedure**

# 1. CHECK VOLTAGE BETWEEN AMBIENT SENSOR AND GROUND

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

(	+)	(-)	
Ambier	nt sensor		Voltage
Connector	Terminal		
E337	1	Ground	Approx. 5 V

#### Is the inspection result normal?

YES >> GO TO 2.

NO >> GO TO 4.

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

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

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

#### Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair harness or connector.

### 3.CHECK AMBIENT SENSOR

Check ambient sensor. Refer to <u>HAC-48</u>, "Component Inspection".

### Is the inspection result normal?

YES >> Replace A/C auto amp.

NO >> Replace ambient sensor.

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

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

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

<sup>4.</sup> Check continuity between ambient sensor harness connector and ground.

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INFOID:0000000009722059

## **B257B, B257C AMBIENT SENSOR**

### < DTC/CIRCUIT DIAGNOSIS >

### [WITHOUT 7 INCH DISPLAY]

Ambien	t sensor	_	Continuity	
Connector	Terminal	<del></del>	Continuity	
E337	1	Ground	Not existed	

### Is the inspection result normal?

YES >> Replace A/C auto amp.

NO >> Repair harness or connector.

## Component Inspection

INFOID:0000000009722060

# 1. CHECK AMBIENT SENSOR

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

Torr	minal	Condition	Resistance kΩ
1611	IIIIIai	Temperature °C (°F)	Resistance K12
		-15 (5)	12.73
		-10 (14)	9.92
		-5 (23)	7.80
		0 (32)	6.19
		5 (41)	4.95
		10 (50)	3.99
1	2	15 (59)	3.24
		20 (68)	2.65
		25 (77)	2.19
		30 (86)	1.81
		35 (95)	1.51
		40 (104)	1.27
		45 (113)	1.07

### Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace ambient sensor.

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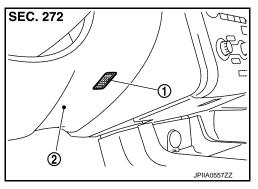
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# B2578, B2579 IN-VEHICLE SENSOR

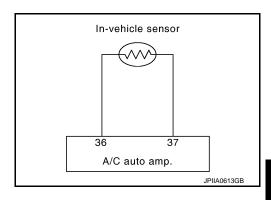
Description INFOID:0000000009722061

#### In-vehicle Sensor

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

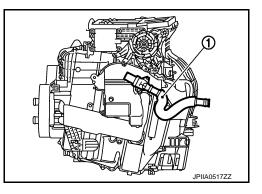


In-vehicle Sensor Circuit



#### Aspirator

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



Aspirator Aspirator duct

Aspirator duct

Heater & cooling unit case

RJIA1804E

DTC Logic

DTC DETECTION LOGIC

### B2578, B2579 IN-VEHICLE SENSOR

### < DTC/CIRCUIT DIAGNOSIS >

### [WITHOUT 7 INCH DISPLAY]

#### NOTE:

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

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

### DTC CONFIRMATION PROCEDURE

## ${f 1}$ .CHECK WITH SELF-DIAGNOSIS FUNCTION OF CONSULT

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

#### NOTE:

If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to <a href="HAC-44">HAC-45</a>, "DTC Logic" or <a href="HAC-45">HAC-45</a>, "DTC Logic".

### Is DTC No. "B2578" or "B2579" displayed?

YES >> Perform trouble diagnosis for the in-vehicle sensor. Refer to <u>HAC-50</u>, "<u>Diagnosis Procedure</u>".

NO >> INSPECTION END

### Diagnosis Procedure

INFOID:0000000009722063

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

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

(+)		(–)	
In-vehic	le sensor		Voltage
Connector	Terminal	<del></del>	
M41	1	Ground	Approx. 5 V

#### Is the inspection result normal?

YES >> GO TO 2.

NO >> GO TO 4.

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

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

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

#### Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair harness or connector.

# 3.check in-vehicle sensor

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

#### Is the inspection result normal?

YES >> Replace A/C auto amp.

### B2578, B2579 IN-VEHICLE SENSOR

### < DTC/CIRCUIT DIAGNOSIS >

[WITHOUT 7 INCH DISPLAY]

NO >> Replace in-vehicle sensor.

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

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

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

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

In-vehic	le sensor		Continuity	
Connector	Terminal		Continuity	
M41	1	Ground	Not existed	

### Is the inspection result normal?

YES >> Replace A/C auto amp.

NO >> Repair harness or connector.

# Component Inspection

# 1. CHECK IN-VEHICLE SENSOR

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

Tori	minal	Condition	Resistance kΩ
1611	IIIIIai	Temperature °C (°F)	Nesistance K22
		-15 (5)	12.73
		-10 (14)	9.92
		-5 (23)	7.80
		0 (32)	6.19
		5 (41)	4.95
		10 (50)	3.99
1	2	15 (59)	3.24
		20 (68)	2.65
		25 (77)	2.19
		30 (86)	1.81
		35 (95)	1.51
		40 (104)	1.27
		45 (113)	1.07

### Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace in-vehicle sensor.

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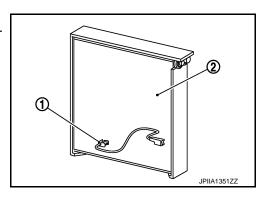
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## B2581, B2582 INTAKE SENSOR

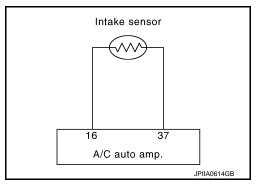
**Description** 

#### Intake Sensor

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



Intake Sensor Circuit



DTC Logic

### DTC DETECTION LOGIC

#### NOTE:

If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to <a href="HAC-44">HAC-44</a>, "DTC Logic" or <a href="HAC-45">HAC-45</a>, "DTC Logic".

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

### DTC CONFIRMATION PROCEDURE

# 1. CHECK WITH SELF-DIAGNOSIS FUNCTION OF CONSULT

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

#### NOTE

If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to <a href="HAC-44">HAC-45</a>, "DTC Logic".

### Is DTC No. "B2581" or "B2582" displayed?

YES >> Perform trouble diagnosis for the intake sensor. Refer to HAC-52, "Diagnosis Procedure".

NO >> INSPECTION END

### **Diagnosis Procedure**

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 ${f 1}$  .CHECK VOLTAGE BETWEEN INTAKE SENSOR AND GROUND

## B2581, B2582 INTAKE SENSOR

### < DTC/CIRCUIT DIAGNOSIS >

### [WITHOUT 7 INCH DISPLAY]

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

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

#### Is the inspection result normal?

>> GO TO 2. YES

NO >> GO TO 4.

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

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

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

#### Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair harness or connector.

# 3. CHECK INTAKE SENSOR

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

#### Is the inspection result normal?

YES >> Replace A/C auto amp.

NO >> Replace intake sensor.

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

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

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

Check continuity between intake sensor harness connector and ground.

Intake sensor			Continuity
Connector	Terminal		Continuity
M42	1	Ground	Not existed

#### Is the inspection result normal?

YES >> Replace A/C auto amp.

NO >> Repair harness or connector.

## Component Inspection

# 1. CHECK INTAKE SENSOR

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

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Torn	minal	Condition	Resistance kΩ
Terminal		Temperature °C (°F)	Resistance K12
		-15 (5)	18.63
		-10 (14)	14.15
		-5 (23)	10.86
		0 (32)	8.41
		5 (41)	6.58
		10 (50)	5.19
1	2	15 (59)	4.12
		20 (68)	3.30
		25 (77)	2.67
		30 (86)	2.17
		35 (95)	1.78
		40 (104)	1.46
		45 (113)	1.21

### Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace intake sensor.

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# B2630, B2631 SUNLOAD SENSOR

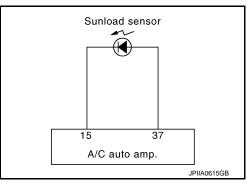
Description A

#### COMPONENT DESCRIPTION

#### Sunload Sensor

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

Sunload Sensor Circuit



### SUNLOAD INPUT PROCESS

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

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

DTC Logic

### DTC DETECTION LOGIC

#### NOTE:

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

• Sunload sensor may register a malfunction when indoors, at dusk, or at other times when light is insufficient. When performing the diagnosis indoors, light the sunload sensor with a lamp (60W or more).

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

Revision: 2013 August HAC-55 2014 MURANO

### B2630, B2631 SUNLOAD SENSOR

### < DTC/CIRCUIT DIAGNOSIS >

[WITHOUT 7 INCH DISPLAY]

### DTC CONFIRMATION PROCEDURE

# ${f 1}.$ check with self-diagnosis function of consult

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

#### NOTE:

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

### Is DTC No. "B2630" or "B2631" displayed?

YES >> Perform trouble diagnosis for the sunload sensor. Refer to <u>HAC-56</u>, "Diagnosis Procedure".

NO >> INSPECTION END

## Diagnosis Procedure

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# 1.CHECK VOLTAGE BETWEEN SUNLOAD SENSOR AND GROUND

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

(	+)	(–)	Voltage	
Sunload	d sensor			
Connector	Terminal	<del></del>		
M74	1	Ground	Approx. 5 V	

### Is the inspection result normal?

YES >> GO TO 2.

NO >> GO TO 4.

# $2.\mathsf{CHECK}$ CIRCUIT CONTINUITY BETWEEN SUNLOAD SENSOR AND A/C AUTO AMP.

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

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

#### Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair harness or connector.

### 3.CHECK SUNLOAD SENSOR

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

#### Is the inspection result normal?

YES >> Replace A/C auto amp.

NO >> Replace sunload sensor.

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

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

Sunloa	d sensor	A/C auto amp.		Continuity
Connector	Terminal	Connector	Terminal	Continuity
M74	1	M50	15	Existed

Check continuity between sunload sensor harness connector and ground.

Sunload sensor			Continuity
Connector	Terminal		Continuity
M74	1	Ground	Not existed

### Is the inspection result normal?

YES >> Replace A/C auto amp.

NO >> Repair harness or connector.

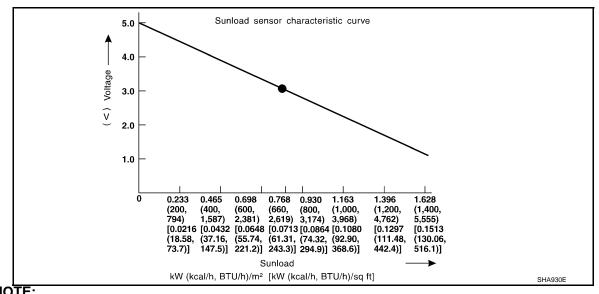
## Component Inspection

# 1. CHECK SUNLOAD SENSOR

Turn ignition switch ON.

Check voltage between A/C auto amp. harness connector and ground.

(	+)	(–)
A/C au	to amp.	
Connector	Terminal	
M50	15	Ground



NOTE:

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

### Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace sunload sensor. HAC

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

< DTC/CIRCUIT DIAGNOSIS >

[WITHOUT 7 INCH DISPLAY]

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

Description INFOID:000000009722073

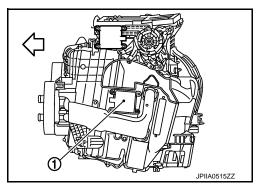
#### COMPONENT DESCRIPTION

Air Mix Door Motor (Driver Side)

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

∀
 ∀ehicle front

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



DTC Logic

### DTC DETECTION LOGIC

#### NOTE:

If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to <a href="HAC-44">HAC-44</a>, "DTC Logic" or <a href="HAC-45">HAC-45</a>, "DTC Logic".

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

#### DTC CONFIRMATION PROCEDURE

## ${f 1}$ .CHECK WITH SELF-DIAGNOSIS FUNCTION OF CONSULT

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

#### NOTE:

If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to <a href="HAC-44">HAC-45</a>, "DTC Logic" or <a href="HAC-45">HAC-45</a>, "DTC Logic".

#### Is DTC No. "B2632" or "B2633" displayed?

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

NO >> GO TO 2.

## 2. FUNCTION INSPECTION

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

### Does it operate normally?

YES >> INSPECTION END

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

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

< DTC/CIRCUIT DIAGNOSIS >

[WITHOUT 7 INCH DISPLAY]

# Diagnosis Procedure

INFOID:0000000009722075

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

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

(+)		(+) (-)		
Air mix door mo	otor (driver side)		Voltage	
Connector	Terminal	_		
M306	1	Ground	Battery voltage	

### Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair the harnesses or connectors.

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

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

(	+)	(-)			
Air mix door mo	otor (driver side)		Voltage		
Connector	Terminal	<del>_</del>			
M306	3	Ground	(Y) 15 10 5 0 		

#### Is the inspection result normal?

>> GO TO 3. YES

NO >> Repair the harnesses or connectors.

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

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

Air mix door motor (driver side)		_	Continuity	
Connector	Terminal	_	Continuity	
M306	2	Ground	Existed	

### Is the inspection result normal?

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

>> Repair harness or connector. NO

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

< DTC/CIRCUIT DIAGNOSIS >

[WITHOUT 7 INCH DISPLAY]

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

Description INFOID:000000009722076

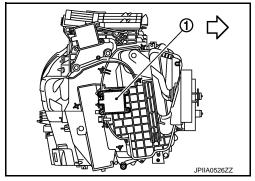
#### COMPONENT DESCRIPTION

Air Mix Door Motor (Passenger Side)

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

∀
 ∀ehicle front

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



DTC Logic

### DTC DETECTION LOGIC

#### NOTE:

If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to <a href="HAC-44">HAC-45</a>, "DTC Logic" or <a href="HAC-45">HAC-45</a>, "DTC Logic".

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

#### DTC CONFIRMATION PROCEDURE

## ${f 1}$ .CHECK WITH SELF-DIAGNOSIS FUNCTION OF CONSULT

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

#### NOTE:

If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to <a href="HAC-44">HAC-45</a>, "DTC Logic".

### Is DTC No. "B2634" or "B2635" displayed?

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

NO >> GO TO 2.

## 2.function inspection

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

#### Does it operate normally?

YES >> INSPECTION END

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

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

### < DTC/CIRCUIT DIAGNOSIS >

[WITHOUT 7 INCH DISPLAY]

# **Diagnosis Procedure**

INFOID:0000000009722078

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

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

(+)		(-)		
Air mix door moto	r (passenger side)		Voltage	
Connector	Terminal			
M307	1	Ground	Battery voltage	

### Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair the harnesses or connectors.

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

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

(+)		(–)	
Air mix door motor (passenger side)			Voltage
Connector	Terminal		
M307	3	Ground	(V) 15 10 5 0 

#### Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair the harnesses or connectors.

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

- 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		Continuity	
M307	2	Ground	Existed	

#### Is the inspection result normal?

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

NO >> Repair harness or connector.

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

< DTC/CIRCUIT DIAGNOSIS >

[WITHOUT 7 INCH DISPLAY]

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

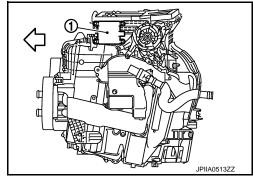
Description INFOID:000000009722079

#### COMPONENT DESCRIPTION

Mode Door Motor

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





DTC Logic

#### DTC DETECTION LOGIC

#### NOTE:

If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to <a href="HAC-44">HAC-44</a>, "DTC Logic" or <a href="HAC-45">HAC-45</a>, "DTC Logic".

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

#### DTC CONFIRMATION PROCEDURE

# 1. CHECK WITH SELF-DIAGNOSIS FUNCTION OF CONSULT

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

#### NOTE:

If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to <a href="HAC-44">HAC-45</a>, "DTC Logic".

### Is DTC No. "B2636", "B2637", "B2638", "B2639", "B2654" or "B2655" displayed?

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

# 2. FUNCTION INSPECTION

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

### B2636, B2637, B2638, B2639, B2654, B2655 MODE DOOR MOTOR [WITHOUT 7 INCH DISPLAY]

### < DTC/CIRCUIT DIAGNOSIS >

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

Discharge air flow								
Mode position			Air outlet/distribution					
indication	Condition		VENT		FO	ОТ	DEE	
		Front	Upper	Rear	Front	Rear	DEF	
<b>ن</b> ړ-		81%	8%	11%	_	_	_	
**	DUAL switch: OFF	41%	10%	17%	24%	8%	_	
<b>`~i</b>	UPPER VENT	12%	12%	16%	27%	10%	23%	
Ţ,	SWILCHT: OIV	11%	11%	14%	25%	10%	29%	
<b>F</b>		11%	11%	12%	_	_	66%	

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Discharge air flo	ow .						
Mode position				Air outlet/d	distribution		
indication	Condition		VENT		FO	ОТ	5
		Front	Upper	Rear	Front	Rear	DEF
نه-		88%	_	12%	_	_	_
ジャ	DUAL switch: OFF	47%	_	18%	26%	9%	_
<b>'~</b> i	UPPER VENT	13%	_	17%	33%	12%	25%
<b>*</b>	SWIIGH . OFF	12%	_	16%	28%	12%	32%
<b>*</b>	]	11%	_	15%	_	_	74%

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### NOTE:

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

#### Does it operate normally?

YES >> INSPECTION END

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

# Diagnosis Procedure

# 1. CHECK POWER SUPPLY FOR MODE DOOR MOTOR

Check voltage between mode door motor harness connector and ground.

(	+)	(–)		
Mode do	oor motor		Voltage	
Connector	Terminal	_		
M310	1	Ground	Battery voltage	

### Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair harness or connector.

# 2.CHECK SIGNAL FOR MODE DOOR MOTOR

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

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

< DTC/CIRCUIT DIAGNOSIS >

[WITHOUT 7 INCH DISPLAY]

(-	(+) (-)				
Mode do	oor motor		Voltage		
Connector	Terminal	_			
M310	3	Ground	(V) 15 10 5 0 		

### Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair harness or connector.

# 3.check mode door motor ground circuit

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

Mode door motor			Continuity	
Connector	Terminal		Continuity	
M310	2	Ground	Existed	

### Is the inspection result normal?

YES >> Replace mode door motor.

NO >> Repair harness or connector.

### B263D, B263E, B263F INTAKE DOOR MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[WITHOUT 7 INCH DISPLAY]

# B263D, B263E, B263F INTAKE DOOR MOTOR

Α Description INFOID:0000000009722082

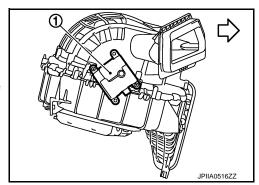
#### COMPONENT DESCRIPTION

Intake Door Motor

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

Vehicle front

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



**DTC Logic** INFOID:00000000009722083

#### DTC DETECTION LOGIC

#### NOTE:

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

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

#### DTC CONFIRMATION PROCEDURE

# 1. CHECK WITH SELF-DIAGNOSIS FUNCTION OF CONSULT

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

#### NOTE:

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

### Is DTC No. "B263D", "B263E" or "B263F" displayed?

YES >> Perform trouble diagnosis for the intake door motor. Refer to HAC-66, "Diagnosis Procedure".

NO >> GO TO 2.

# 2. FUNCTION INSPECTION

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

#### Does it operate normally?

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

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## B263D, B263E, B263F INTAKE DOOR MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[WITHOUT 7 INCH DISPLAY]

# Diagnosis Procedure

INFOID:0000000009722084

# 1. CHECK POWER SUPPLY FOR INTAKE DOOR MOTOR

Check voltage between intake door motor harness connector and ground.

(+)		(–)	
Intake door motor			Voltage
Connector	Terminal	<del>_</del>	
M304	1	Ground	Battery voltage

### Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair harness or connector.

# 2. CHECK SIGNAL FOR INTAKE DOOR MOTOR

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

(	(+) (–)			
Intake de	oor motor		Voltage	
Connector	Terminal	<del></del>		
M304	3	Ground	(V) 15 10 5 4 20 ms SJIA1453J	

#### Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair harness or connector.

# 3.CHECK INTAKE DOOR MOTOR GROUND CIRCUIT

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

Intake door motor			Continuity	
Connector	Terminal		Continuity	
M304	2	Ground	Existed	

### Is the inspection result normal?

YES >> Replace intake door motor.

NO >> Repair harness or connector.

### B2661, B2662, B2663 UPPER VENTILATOR DOOR MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[WITHOUT 7 INCH DISPLAY]

# B2661, B2662, B2663 UPPER VENTILATOR DOOR MOTOR

**Description** 

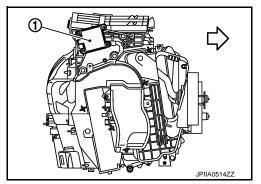
#### COMPONENT DESCRIPTION

Upper Ventilator Door Motor

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

Vehicle front

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



DTC Logic

#### DTC DETECTION LOGIC

NOTE:

If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to <a href="HAC-44">HAC-45</a>, "DTC Logic" or <a href="HAC-45">HAC-45</a>, "DTC Logic".

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

### DTC CONFIRMATION PROCEDURE

# 1. CHECK WITH SELF-DIAGNOSIS FUNCTION OF CONSULT

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

### NOTE:

If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to <a href="HAC-44">HAC-45</a>, "DTC Logic" or <a href="HAC-45">HAC-45</a>, "DTC Logic".

#### Is DTC No. "B2661", "B2662" or "B2663" displayed?

YES >> Perform trouble diagnosis for the upper ventilator door motor. Refer to <u>HAC-68</u>, "<u>Diagnosis Procedure</u>".

NO >> GO TO 2.

## 2.function inspection

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

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# B2661, B2662, B2663 UPPER VENTILATOR DOOR MOTOR

### < DTC/CIRCUIT DIAGNOSIS >

[WITHOUT 7 INCH DISPLAY]

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

Discharge air flo	ow						
Mode position				Air outlet/d	distribution		
indication	Condition		VENT		FO	ОТ	DEE
		Front	Upper	Rear	Front	Rear	DEF
نه-ّ		81%	8%	11%	_	_	_
**	DUAL switch: OFF	41%	10%	17%	24%	8%	_
نه.	UPPER VENT	12%	12%	16%	27%	10%	23%
**	SWILCH . OIV	11%	11%	14%	25%	10%	29%
<b>*</b>		11%	11%	12%	_	_	66%

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

### Does it operate normally?

YES >> INSPECTION END

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

## Diagnosis Procedure

INFOID:0000000009722087

# 1. CHECK POWER SUPPLY FOR UPPER VENTILATOR DOOR MOTOR

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

(+)		(+) (-)		
Upper ventila	tor door motor		Voltage	
Connector	Terminal			
M308	1	Ground	Battery voltage	

#### Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair harness or connector.

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

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

(+)		(–)	
Upper ventila	tor door motor		Voltage
Connector	Terminal	_	
M308	3	Ground	(V) 15 10 5 0 

### Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair harness or connector.

# B2661, B2662, B2663 UPPER VENTILATOR DOOR MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[WITHOUT 7 INCH DISPLAY]

# $\overline{3}$ .check upper ventilator door motor ground circuit

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

Upper ventilator door motor			Continuity	
Connector	Terminal		Continuity	
M308	2	Ground	Existed	

### Is the inspection result normal?

YES >> Replace upper ventilator door motor.

NO >> Repair harness or connector.

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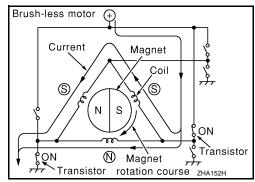
## **BLOWER MOTOR**

**Description** 

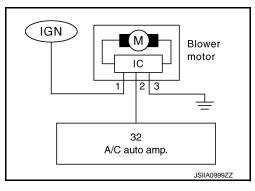
#### COMPONENT DESCRIPTION

#### **Brush-less Motor**

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



Blower Motor Circuit



# Component Function Check

INFOID:0000000009722089

# 1. CHECK OPERATION

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

#### Does it operate normally?

YES >> INSPECTION END

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

# Diagnosis Procedure

INFOID:0000000009722090

# 1. CHECK WITH SELF-DIAGNOSIS FUNCTION OF CONSULT

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

#### NOTE

If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to <a href="HAC-44">HAC-45</a>, "DTC Logic" or <a href="HAC-45">HAC-45</a>, "DTC Logic".

#### Is any DTC No. displayed?

YES >> Perform the diagnosis that is applicable to the sensor and actuator. Refer to <u>HAC-106</u>, "DTC Index".

NO >> GO TO 2.

## 2. CHECK WITH ACTIVE TEST OF CONSULT

1. Using CONSULT, perform "HVAC TEST" "ACTIVE TEST" of HVAC to check each output device. Refer to HAC-40, "CONSULT Function".

### NOTE:

Perform the ACTIVE TEST after starting the engine because the compressor is operated.

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

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

#### NOTE:

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

### Does it operate normally?

YES >> INSPECTION END

NO >> GO TO 3.

# 3.CHECK POWER SUPPLY FOR BLOWER MOTOR

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

(+)		(+)	
Blower motor			Voltage
Connector	Terminal		
M98	1	Ground	Battery voltage

### Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 7.

### 4. CHECK BLOWER MOTOR GROUND CIRCUIT

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

Blower motor			Continuity
Connector	Terminal	_	Continuity
M98	3	Ground	Existed

#### Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair harness or connector.

## ${f 5.}$ CHECK BLOWER MOTOR CIRCUIT CONTINUITY

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

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

#### Is the inspection result normal?

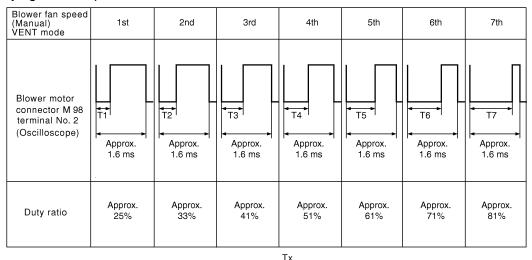
YES >> GO TO 6.

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NO >> Repair harness or connector.

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

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



Approx. 1.6 ms

x 100 (%)

#### Is the inspection result normal?

YES >> Replace the blower motor.

NO >> Replace the A/C auto amp.

# 7.CHECK POWER VOLTAGE OF BLOWER RELAY

- 1. Turn the ignition switch OFF.
- 2. Remove the blower relay. Refer to PG-91, "Fuse, Connector and Terminal Arrangement".

NOTE: Duty ratio =

- 3. Turn the ignition switch ON.
- Check the voltage between blower relay fuse block side terminal and ground. Refer to <u>PG-91</u>, "Fuse, Connector and Terminal Arrangement" for relay terminal assignment.

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

### Is the inspection result normal?

YES >> GO TO 8.

NO >> Inspection the power supply circuit. Refer to <u>PG-47, "Wiring Diagram - IGNITION POWER SUP-PLY -".</u>

## 8. CHECK BLOWER RELAY

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

### Is the inspection result normal?

YES >> GO TO 9.

NO >> Replace the blower relay.

## 9.CHECK FUSE

Check 15A fuses (Nos. 21 and 22).

NOTE:

### **BLOWER MOTOR**

[WITHOUT 7 INCH DISPLAY] < DTC/CIRCUIT DIAGNOSIS > Refer to PG-91, "Fuse, Connector and Terminal Arrangement" for fuse location. Α Is the inspection result normal? YES >> Repair the harnesses or connectors. NO >> Replace the fuse after repairing the applicable circuit. В Component Inspection INFOID:0000000009722091 1. CHECK BLOWER MOTOR Remove the blower motor. Refer to VTL-33, "Exploded View". Check that the blower motor rotates smoothly. 2. Is the inspection result normal? D YES >> INSPECTION END NO >> Replace blower motor. Е F Н HAC K L M Ν

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### MAGNET CLUTCH

Description INFOID:000000009722092

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

### Component Function Check

INFOID:0000000009722093

# 1. FUNCTION INSPECTION

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

#### Does it operate normally?

YES >> INSPECTION END

NO >> Perform trouble diagnosis for the compressor. Refer to <u>HAC-74</u>, "<u>Diagnosis Procedure</u>".

### **Diagnosis Procedure**

INFOID:0000000009722094

# 1. INSPECTION IN AUTO ACTIVE TEST MODE

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

#### Does it operate normally?

YES >> GO TO 6.

NO >> GO TO 2.

## 2. CHECK MAGNET CLUTCH POWER SUPPLY

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

+			
Comp	Compressor Connector Terminal		Voltage
Connector			
F18	1	Ground	0 V ⇔ Battery voltage

#### Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 3.

### 3.CHECK FUSE

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

#### NOTE:

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

#### Is the inspection result normal?

YES >> GO TO 4.

NO >> Replace the blown fuse after repairing the affected circuit if a fuse is blown.

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

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

### **MAGNET CLUTCH**

### < DTC/CIRCUIT DIAGNOSIS >

Commonter	IPDM E/R Compressor				
Connector	Terminal	Connector	Terminal	Continuity	
F12	48	F18	1	Existed	
s the inspection re	esult normal?				
			noval and Installat	on".	
_	harness or conne				
).CHECK MAGN	ET CLUTCH GRO	UND CIRCUIT FC	R OPEN		
Check continuity b	etween compresso	or harness connec	tor and ground.		
				<u>-</u>	
Comp	ressor	_	Continuity		
Connector	Terminal			_	
F18	2	Ground	Existed	_	
s the inspection re					
			MAGNET CLUTCH	: Removal and Installation".	
` '	harness or conne				
O.CHECK WITH S	SELF-DIAGNOSIS	FUNCTION OF C	CONSULT		
		-DIAGNOSIS RES			
	OTC No. is displaye	ed in the self-diagr	osis results.		
<b>NOTE:</b> f DTC is displayed	d along with DTC I	J1000 or U1010 f	irst diagnose the Γ	TC U1000 or U1010. Refer to	HAC-
	HAC-45, "DTC Lo		not diagnoss the E	TO Group of Grove. Refer to	11/10
B=0 · ·					
<u>s any DTC No. dis</u>	<u>splayed?</u>				Ī
YES >> Perfor	m the diagnosis t	hat is applicable t	to the sensor and	actuator. Refer to <u>HAC-106.</u>	"DTC
YES >> Perfor Index"	m the diagnosis t	hat is applicable t	to the sensor and	actuator. Refer to <u>HAC-106</u> .	"DTC
YES >> Performula	m the diagnosis t D 7.		to the sensor and	actuator. Refer to <u>HAC-106.</u>	"DTC
YES >> Perform Index" NO >> GO TO CHECK A/C AL	m the diagnosis t	SIGNAL			
YES >> Perform Index"  NO >> GO TO  CHECK A/C AL  Jsing CONSULT,	m the diagnosis t	SIGNAL "COMP REQ SIG		actuator. Refer to <u>HAC-106.</u> SIG" in "DATA MONITOR" of F	
YES >> Perform Index"  NO >> GO TO  CHECK A/C AL  Jsing CONSULT,	m the diagnosis t	SIGNAL "COMP REQ SIG			
YES >> Perform Index" NO >> GO TO  CHECK A/C AL  Jsing CONSULT,	m the diagnosis to the check "On/Off" of CONSULT Function	SIGNAL "COMP REQ SIG	" and "FAN REQ S		
YES >> Perform Index"  NO >> GO TO  CHECK A/C AL  Jsing CONSULT, Refer to HAC-40, "  A/C SWITC	m the diagnosis to 7.  JTO AMP. INPUT Scheck "On/Off" of CONSULT Function	SIGNAL  "COMP REQ SIG on".  : COMP REQ SI	" and "FAN REQ S G On		
YES >> Perform Index" NO >> GO TO CHECK A/C AL Jsing CONSULT, GRefer to HAC-40, "  A/C SWITC A/C SWITC	m the diagnosis to the check "On/Off" of CONSULT Function CH OFF	SIGNAL  "COMP REQ SIGON".  : COMP REQ SIGON RE	" and "FAN REQ S G On G Off		
NO >> GO TO  CHECK A/C AL  Jsing CONSULT, Refer to HAC-40, "  A/C SWITC  A/C SWITC  FAN CONT	m the diagnosis to 7.  ITO AMP. INPUT Scheck "On/Off" of CONSULT Function CH ON CH OFF  TROL DIAL ON	SIGNAL  "COMP REQ SIG on".  : COMP REQ SI : COMP REQ SI : FAN REQ SIG	" and "FAN REQ S G On G Off On		
YES >> Perform Index" NO >> GO TO CHECK A/C AL Using CONSULT, or Refer to HAC-40, "  A/C SWITC A/C SWITC FAN CONT	m the diagnosis to the consult function to the consult	SIGNAL  "COMP REQ SIGON".  : COMP REQ SIGON RE	" and "FAN REQ S G On G Off On		
YES >> Perform Index"  NO >> GO TO  7. CHECK A/C AL  Using CONSULT, GREFER TO HAC-40, "  A/C SWITCH  A/C SWITCH  FAN CONTHER  S the inspection reserved.	m the diagnosis to the	SIGNAL  "COMP REQ SIG on".  : COMP REQ SI : COMP REQ SI : FAN REQ SIG	" and "FAN REQ S G On G Off On		
YES >> Perform Index"  NO >> GO TO  7. CHECK A/C AL  Jsing CONSULT, GREFER TO HAC-40, "  A/C SWITCH  A/C SWITCH  FAN CONTHER  Sthe inspection recovery and the conther  YES >> GO TO	m the diagnosis to the	SIGNAL  "COMP REQ SIG on".  : COMP REQ SI : COMP REQ SI : FAN REQ SIG	" and "FAN REQ S G On G Off On		
YES >> Perform Index"  NO >> GO TO  CHECK A/C AL  Using CONSULT, or CONSULT, o	m the diagnosis to the consult function of the consult	COMP REQ SIGON".  COMP REQ SIGON".  COMP REQ SIGON	" and "FAN REQ S G On G Off On		
YES >> Perform Index"  NO >> GO TO  CHECK A/C AL  Jsing CONSULT, GREFER TO HAC-40, "  A/C SWITCH  FAN CONTINUES THE INSPECTION TO  YES >> GO TO  NO >> Replace  CHECK REFRICATION  Index "  A C SWITCH  A/C SWITCH	m the diagnosis to the consult function of the consult	SIGNAL  "COMP REQ SIGON".  : COMP REQ SIGONP	" and "FAN REQ S G On G Off On Off	SIG" in "DATA MONITOR" of F	
YES >> Perform Index"  NO >> GO TO  CHECK A/C AL  Using CONSULT, Refer to HAC-40, "  A/C SWITCH  A/C SWITCH  FAN CONTHER STAN CONTHER STAN CONTHER SAN CONTHE	m the diagnosis to the control of th	SIGNAL  "COMP REQ SIGON".  : COMP REQ SIGONP	" and "FAN REQ S G On G Off On	SIG" in "DATA MONITOR" of F	
YES >> Perform Index"  NO >> GO TO  7. CHECK A/C AL  Jsing CONSULT, GREFER TO HAC-40, "  A/C SWITCH  A/C SWITCH  FAN CONTHER FAN CONTHER CONTHE CONTHER CONTHE	m the diagnosis to the control of th	SIGNAL  "COMP REQ SIGON".  : COMP REQ SIGONP	" and "FAN REQ S G On G Off On Off	SIG" in "DATA MONITOR" of F	
YES >> Perform Index" NO >> GO TO  7. CHECK A/C AL  Jsing CONSULT, GREFER TO HAC-40, "  A/C SWITCH A/C SWITCH FAN CONTHER FAN CONTHER SHE INSPECTION FOR TO THE SHE INSPECTION FOR THE	m the diagnosis to the control of th	"COMP REQ SIGON".  : COMP REQ SIGON".  : COMP REQ SIGON REGER TO EC-465, "E	" and "FAN REQ S G On G Off On Off	SIG" in "DATA MONITOR" of F	
YES >> Perform Index"  NO >> GO TO  CHECK A/C AL  Jsing CONSULT, GREET TO HAC-40, "  A/C SWITCH A/C SWITCH FAN CONTHER TO THE STAN CONTHE	m the diagnosis to the control of th	"COMP REQ SIGON".  : COMP REQ SIGON".  : COMP REQ SIGON REGER TO EC-465, "E	" and "FAN REQ S G On G Off On Off	SIG" in "DATA MONITOR" of F	

#### A/C CONTROL SIGNAL CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[WITHOUT 7 INCH DISPLAY]

### A/C CONTROL SIGNAL CIRCUIT

### Diagnosis Procedure

INFOID:0000000009722095

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

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

#### NOTE:

If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to <a href="HAC-44">HAC-45</a>, "DTC Logic" or <a href="HAC-45">HAC-45</a>, "DTC Logic".

#### Is any DTC No. displayed?

YES >> Perform the diagnosis that is applicable to the sensor and actuator. Refer to <a href="HAC-106">HAC-106</a>, "DTC Index".

NO >> GO TO 2.

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

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

A/C o	A/C control		ito amp.	Continuity
Connector	Terminal	Connector	Terminal	Continuity
M95	4	M50	7	Existed

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

A/C o	control	_	Continuity
Connector	Terminal		Continuity
M95	4	Ground	Not existed

#### Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair harness or connector.

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

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

A/C d	control	A/C au	to amp.	Continuity
Connector	Terminal	Connector	Terminal	Continuity
M95	3	M50	6	Existed

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

A/C o	control		Continuity
Connector	Terminal	<del></del>	Continuity
M95	3	Ground	Not existed

#### Is the inspection result normal?

YES >> Perform trouble diagnosis for the A/C control. Refer to <u>HAC-78, "A/C CONTROL : Diagnosis Procedure"</u>.

NO >> Repair harness or connector.

### POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[WITHOUT 7 INCH DISPLAY]

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

A/C AUTO AMP.: Description

#### INFOID:0000000009722096

Α

В

D

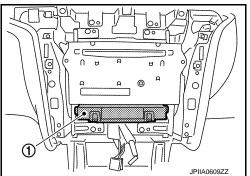
Е

#### COMPONENT DESCRIPTION

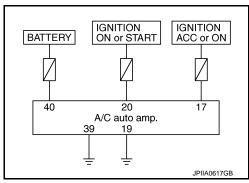
A/C Auto Amp. (Air Conditioner Automatic Amplifier)

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

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



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



# A/C AUTO AMP.: Component Function Check

# 1. CHECK OPERATION

Press the AUTO switch, and then check that "AUTO" is shown on the display.

2. Operate the temperature control switch (driver side). Check that the fan speed or outlet changes. (The discharge air temperature or fan speed varies depending on the ambient temperature, in-vehicle temperature, and temperature setting.)

### Does it operate normally?

YES >> INSPECTION END

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

# A/C AUTO AMP. : Diagnosis Procedure

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

Disconnect the A/C auto amp. connector.

Check voltage between A/C auto amp. harness connector and ground.

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INFOID:0000000009722097

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### POWER SUPPLY AND GROUND CIRCUIT

#### < DTC/CIRCUIT DIAGNOSIS >

#### [WITHOUT 7 INCH DISPLAY]

INFOID:0000000009722099

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

#### Is the inspection result normal?

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

### 2.CHECK FUSE

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

#### NOTE:

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

#### Is the inspection result normal?

YES >> Repair the harnesses or connectors.

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

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

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

A/C au	to amp.		Continuity
Connector	Terminal	<del></del>	Continuity
M50	19	Ground	Existed
UCIVI	39	Giouria	Existed

#### Is the inspection result normal?

YES >> Replace the A/C auto amp.

NO >> Repair the harnesses or connectors.

#### A/C CONTROL

# A/C CONTROL: Diagnosis Procedure

1. CHECK A/C CONTROL POWER SUPPLY CIRCUIT

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

(	+)	(–)	
A/C o	control		Voltage
Connector	Terminal	_	
M95	1	Ground	Battery voltage

#### Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair the harnesses or connectors.

# 2.CHECK A/C CONTROL CIRCUIT CONTINUITY

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

### **POWER SUPPLY AND GROUND CIRCUIT**

< DTC/CIRCUIT DIAGNOSIS >

A/C o	ontrol		O	
Connector	Terminal	_	Continuity	
M95	2	Ground	Existed	_
the inspection	n result normal?			_
	place the A/C controllers the harnesses AY			
	Y : Diagnosis l			INFOID:000000009722100
.CHECK A/C	DISPLAY POWER	R SUPPLY CIRCUIT		
	the A/C display co	onnector.		
	n switch ON. age between A/C d	lisplay harness connector	and ground.	
			· ·	
(-	+)	(–)		•
A/C d	isplay	_	Voltage	
Connector	Terminal			
NAAC	•	Ground	Battery voltage	
'ES >> GC IO >> Re	pair the harnesses	or connectors.	Battery Voltage	
the inspection YES >> GC NO >> Re CHECK A/C Turn ignitio	n result normal?  TO 2. Dair the harnesses DISPLAY CIRCUI  n switch OFF.	or connectors. T CONTINUITY		
the inspection YES >> GC NO >> Re CHECK A/C Turn ignitio	n result normal?  TO 2. Dair the harnesses DISPLAY CIRCUI  n switch OFF.	or connectors.		· 
the inspection YES >> GC NO >> Re CHECK A/C Turn ignitio Check cont	n result normal?  TO 2. Dair the harnesses DISPLAY CIRCUI  n switch OFF.	or connectors. T CONTINUITY	tor and ground.	<u> </u>
the inspection (ES >> GC NO >> Re CHECK A/C Turn ignitio Check cont	n result normal?  TO 2. Dair the harnesses DISPLAY CIRCUI  n switch OFF. inuity between A/C	or connectors. T CONTINUITY		
the inspection  (ES >> GC  NO >> Re  CHECK A/C  Turn ignition  Check cont	n result normal?  TO 2. Dair the harnesses DISPLAY CIRCUI  Switch OFF. Cinuity between A/C	or connectors. T CONTINUITY	tor and ground.	
the inspection (FS >> GC) (FS -S -S -SC) (FS -S -SC	n result normal?  TO 2. Dair the harnesses DISPLAY CIRCUI  In switch OFF. Inuity between A/C  Isplay Terminal 1  In result normal?	or connectors. T CONTINUITY C display harness connect  —  Ground	tor and ground.  Continuity	- - -
the inspection  (ES >> GC  NO >> Report    CHECK A/C  Turn ignition Check control  A/C of  Connector  M16  the inspection  (ES >> Report    The inspection of the inspection o	n result normal?  TO 2. Dair the harnesses DISPLAY CIRCUI  n switch OFF. inuity between A/C  isplay Terminal 1 n result normal? Date the A/C display	or connectors. T CONTINUITY C display harness connect  —  Ground  ay.	tor and ground.  Continuity	-
the inspection  (ES >> GC  NO >> Report    CHECK A/C  Turn ignition Check control  A/C of  Connector  M16  the inspection  (ES >> Report    The inspection of the inspection o	n result normal?  TO 2. Dair the harnesses DISPLAY CIRCUI  In switch OFF. Inuity between A/C  Isplay Terminal 1  In result normal?	or connectors. T CONTINUITY C display harness connect  —  Ground  ay.	tor and ground.  Continuity	- -
the inspection  (ES >> GC  NO >> Report    CHECK A/C  Turn ignition Check control  A/C of  Connector  M16  the inspection  (ES >> Report    The inspection of the inspection o	n result normal?  TO 2. Dair the harnesses DISPLAY CIRCUIT  In switch OFF. Inuity between A/C  Isplay Terminal  1  In result normal? Daice the A/C display	or connectors. T CONTINUITY C display harness connect  —  Ground  ay.	tor and ground.  Continuity	_
the inspection  (ES >> GC  NO >> Report    CHECK A/C  Turn ignition Check control  A/C of  Connector  M16  the inspection  (ES >> Report    The inspection of the inspection o	n result normal?  TO 2. Dair the harnesses DISPLAY CIRCUIT  In switch OFF. Inuity between A/C  Isplay Terminal  1  In result normal? Daice the A/C display	or connectors. T CONTINUITY C display harness connect  —  Ground  ay.	tor and ground.  Continuity	
the inspection  (ES >> GC  NO >> Report    CHECK A/C  Turn ignition Check control  A/C of  Connector  M16  the inspection  (ES >> Report    The inspection of the inspection o	n result normal?  TO 2. Dair the harnesses DISPLAY CIRCUIT  In switch OFF. Inuity between A/C  Isplay Terminal  1  In result normal? Daice the A/C display	or connectors. T CONTINUITY C display harness connect  —  Ground  ay.	tor and ground.  Continuity	- -
the inspection (FS >> GC) NO >> Report of the inspection (FS >> Report of the inspection) (FS >> Report of the inspection) (FS >> Report of the inspection)	n result normal?  TO 2. Dair the harnesses DISPLAY CIRCUIT  In switch OFF. Inuity between A/C  Isplay Terminal  1  In result normal? Daice the A/C display	or connectors. T CONTINUITY C display harness connect  —  Ground  ay.	tor and ground.  Continuity	
the inspection (ES >> GC) NO >> Report of the inspection (ES >> Report of the inspection) (ES >> Report of the inspection) (ES >> Report of the inspection)	n result normal?  TO 2. Dair the harnesses DISPLAY CIRCUIT  In switch OFF. Inuity between A/C  Isplay Terminal  1  In result normal? Daice the A/C display	or connectors. T CONTINUITY C display harness connect  —  Ground  ay.	tor and ground.  Continuity	-
the inspection (ES >> GC) NO >> Report of the inspection (ES >> Report of the inspection) (ES >> Report of the inspection) (ES >> Report of the inspection)	n result normal?  TO 2. Dair the harnesses DISPLAY CIRCUIT  In switch OFF. Inuity between A/C  Isplay Terminal  1  In result normal? Daice the A/C display	or connectors. T CONTINUITY C display harness connect  —  Ground  ay.	tor and ground.  Continuity	
the inspection  YES >> GC  NO >> Report of the inspection  Turn ignition Check contour of the inspection  YES >> Report of the inspection  The inspection of the inspection  The inspection of t	n result normal?  TO 2. Dair the harnesses DISPLAY CIRCUIT  In switch OFF. Inuity between A/C  Isplay Terminal  1  In result normal? Daice the A/C display	or connectors. T CONTINUITY C display harness connect  —  Ground  ay.	tor and ground.  Continuity	
the inspection  YES >> GC  NO >> Report of the inspection  Turn ignition Check contour of the inspection  YES >> Report of the inspection  The inspection of the inspection  The inspection of t	n result normal?  TO 2. Dair the harnesses DISPLAY CIRCUIT  In switch OFF. Inuity between A/C  Isplay Terminal  1  In result normal? Daice the A/C display	or connectors. T CONTINUITY C display harness connect  —  Ground  ay.	tor and ground.  Continuity	

# **ECU DIAGNOSIS INFORMATION**

### **ECM**

Reference Value

#### VALUES ON THE DIAGNOSIS TOOL

#### NOTE:

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

The ignition timing shown by the timing light may differ from the ignition timing displayed on the data monitor. This occurs because the timing light shows a value calculated by ECM according to signals received from the cam shaft position sensor and other sensors related to ignition timing.

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

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

Monitor Item	C	ondition	Values/Status	_
TD CEN 4 D4	Ignition switch: ON     (Facing standed)	Accelerator pedal: Fully released	More than 0.36 V	-
TP SEN 1-B1	<ul><li>(Engine stopped)</li><li>Selector lever: D position</li></ul>	Accelerator pedal: Fully depressed	Less than 4.75 V	
	Ignition switch: ON	Accelerator pedal: Fully released	More than 0.36 V	-
TP SEN 2-B1* <sup>1</sup>	<ul><li>(Engine stopped)</li><li>Selector lever: D position</li></ul>	Accelerator pedal: Fully depressed	Less than 4.75 V	•
FUEL T/TMP SE	Ignition switch: ON		Indicates fuel tank temperature	-
INT/A TEMP SE	Ignition switch: ON		Indicates intake air temperature	_
EVAP SYS PRES	Ignition switch: ON		Approx. 1.8 - 4.8 V	•
FUEL LEVEL SE	Ignition switch: ON		Depending on fuel level of fuel tank	•
START SIGNAL	• Ignition switch: $ON \rightarrow START \rightarrow O$	ON	$OFF \to ON \to OFF$	-
CLOD THE DOC	Ignition switch: ON	Accelerator pedal: Fully released	ON	•
CLSD THL POS	(Engine stopped)	Accelerator pedal: Slightly depressed	OFF	•
	- Engine Afternamin - I all all a	Air conditioner switch: OFF	OFF	•
AIR COND SIG	Engine: After warming up, idle the engine	Air conditioner switch: ON (Compressor operates.)	ON	=
D/N DOCLOW	. Inviting solitate ONI	Selector lever: P or N position	ON	-
P/N POSI SW	Ignition switch: ON	Selector lever: Except above position	OFF	=
DW/CT CICNAL	Engine: After warming up, idle the	Steering wheel: Not being turned	OFF	
PW/ST SIGNAL	engine	Steering wheel: Being turned	ON	
		Rear window defogger switch: ON and/or Lighting switch: 2nd position	ON	
LOAD SIGNAL	Ignition switch: ON	Rear window defogger switch and lighting switch: OFF	OFF	=
IGNITION SW	<ul> <li>Ignition switch: ON → OFF → ON</li> </ul>		$ON \rightarrow OFF \rightarrow ON$	-
	Engine: After warming up, idle the	Heater fan switch: ON	ON	-
HEATER FAN SW	engine	Heater fan switch: OFF	OFF	-
		Brake pedal: Fully released	OFF	-
BRAKE SW	Ignition switch: ON	Brake pedal: Slightly depressed	ON	-
	Engine: After warming up	Idle	2.0 - 3.0 msec	-
INJ PULSE-B1	Selector lever: P or N position     Air conditioner switch: OFF     No load	2,000 rpm	1.9 - 2.9 msec	_
	Engine: After warming up	Idle	2.0 - 3.0 msec	=-
INJ PULSE-B2	Selector lever: P or N position     Air conditioner switch: OFF     No load	2,000 rpm	1.9 - 2.9 msec	=
	Engine: After warming up	Idle	7 - 17°BTDC	=
IGN TIMING	<ul><li>Selector lever: P or N position</li><li>Air conditioner switch: OFF</li><li>No load</li></ul>	2,000 rpm	25 - 45°BTDC	÷
	Engine: After warming up	Idle	5 - 35%	=
CAL/LD VALUE	<ul><li>Selector lever: P or N position</li><li>Air conditioner switch: OFF</li><li>No load</li></ul>	2,500 rpm	5 - 35%	€
	Engine: After warming up	Idle	2.0 - 6.0 g/s	-
MASS AIRFLOW	Selector lever: P or N position     Air conditioner switch: OFF     No load	2,500 rpm	7.0 - 20.0 g/s	-

Monitor Item	C	ondition	Values/Status
PURG VOL C/V	Engine: After warming up     Selector lever: P or N position     Air conditioner switch: OFF	Idle (Accelerator pedal: Not depressed even slightly, after engine starting.)	0%
	No load	2,000 rpm	_
INT/V TIM (B1)	Engine: After warming up     Selector lever: P or N position     Air conditioner switch: OFF	Idle 2,000 rpm	−5 - 5°CA Approx. 0 - 30°CA
	No load     Engine: After warming up	Idle	−5 - 5°CA
INT/V TIM (B2)	<ul><li>Selector lever: P or N position</li><li>Air conditioner switch: OFF</li><li>No load</li></ul>	2,000 rpm	Approx. 0 - 30°CA
INT/V SOL (B1)	Engine: After warming up     Selector lever: P or N position	Idle	0 - 2%
,	<ul><li>Air conditioner switch: OFF</li><li>No load</li></ul>	2,000 rpm	Approx. 0 - 50%
INITAL COLUMN	Engine: After warming up     Selector lever: P or N position	Idle	0 - 2%
INT/V SOL (B2)	<ul><li> Air conditioner switch: OFF</li><li> No load</li></ul>	2,000 rpm	Approx. 0 - 50%
VIAS S/V-1	<ul> <li>Engine: After warming up</li> <li>Selector lever: P or N position</li> <li>Air conditioner switch: OFF</li> <li>No load</li> </ul>	When revving engine up to 5,000 rpm quickly	$OFF \to ON \to OFF$
VIAS S/V-2	<ul> <li>Engine: After warming up</li> <li>Selector lever: P or N position</li> <li>Air conditioner switch: OFF</li> <li>No load</li> </ul>	When revving engine up to 5,000 rpm quickly	$OFF \to ON \to OFF$
	Engine: After warming up, idle the	Air conditioner switch: OFF	OFF
AIR COND RLY	engine engine	Air conditioner switch: ON (Compressor operates)	ON
ENGINE MOUNT	Faring Affanonania and	Idle (With vehicle stopped)	IDLE
ENGINE MOUNT	Engine: After warming up	Except above conditions	TRVL
FUEL PUMP RLY	For 1 second after turning ignition     Engine running or cranking	switch: ON	ON
	Except above		OFF
VENT CONT/V	Ignition switch: ON		OFF
THRTL RELAY	Ignition switch: ON		ON
	· ·	Engine coolant temperature: 97°C (206°F) or less	OFF
0001110 500	Engine: After warming up, idle the	Engine coolant temperature: Between 98°C (208°F) and 99°C (210°F)	LOW
COOLING FAN	engine • Air conditioner switch: OFF	Engine coolant temperature: Between 100°C (212°F) and 104°C (219°F)	MID
		Engine coolant temperature: 105°C (221°F) or more	н
HO2S2 HTR (B1)	Engine speed: Below 3,600 rpm a     Engine: After warming up     Keeping the engine speed betwee idle for 1 minute under no load	,	ON
	• Engine speed: Above 3,600 rpm		OFF

Monitor Item	C	condition	Values/Status
HO2S2 HTR (B2)	- Engine: After warming up	en 3,500 and 4,000 rpm for 1 minute and at	ON
	Engine speed: Above 3,600 rpm		OFF
I/P PULLY SPD	Vehicle speed: More than 20 km/h		Almost the same speed as the tachometer indication
VEHICLE SPEED	Turn drive wheels and compare C cation.	ONSULT value with the speedometer indi-	Almost the same speed as the speedometer indication
IDL A/V LEARN	Engine: Running	Idle air volume learning has not been performed yet.	YET
	gcg	Idle air volume learning has already been performed successfully.	CMPLT
ENG OIL TEMP	Engine: After warming up		More than 70°C (158°F)
TRVL AFTER MIL	Ignition switch: ON	Vehicle has traveled after MIL has illuminated.	0 - 65,535 km (0 - 40,723 miles)
A/F S1 HTR (B1)	Engine: After warming up, idle the (More than 140 seconds after star)		4 - 100%
A/F S1 HTR (B2)	Engine: After warming up, idle the (More than 140 seconds after star)		4 - 100%
AC PRESS SEN	Engine: Idle     Both A/C switch and blower fan sv	1.0 - 4.0 V	
VHCL SPEED SE	Turn drive wheels and compare C cation.	Almost the same speed as the speedometer indication	
SET VHCL SPD	Engine: Running	ASCD: Operating	The preset vehicle speed is displayed
MAINI CVA	a lamition quitable ON	MAIN switch: Pressed	ON
MAIN SW	Ignition switch: ON	MAIN switch: Released	OFF
CANCEL SW	• Ignition quitab: ON	CANCEL switch: Pressed	ON
CANCEL SW	Ignition switch: ON	CANCEL switch: Released	OFF
DECLIME/ACC CVA	a Ignition quitable ON	RESUME/ACCELERATE switch: Pressed	ON
RESUME/ACC SW	Ignition switch: ON	RESUME/ACCELERATE switch: Released	OFF
SET SW	• Ignition switch: ON	SET/COAST switch: Pressed	ON
SELOW	Ignition switch: ON	SET/COAST switch: Released	OFF
BRAKE SW1	e Ignition quitable ON	Brake pedal: Fully released	ON
(ASCD brake switch)	Ignition switch: ON	Brake pedal: Slightly depressed	OFF
BRAKE SW2	a lamition quitale ON	Brake pedal: Fully released	OFF
(Stop lamp switch)	Ignition switch: ON	Brake pedal: Slightly depressed	ON
VHCL SPD CUT	Ignition switch: ON		NON
LO SPEED CUT	Ignition switch: ON		NON
AT OD MONITOR	Ignition switch: ON	-	
AT OD CANCEL	Ignition switch: ON		OFF
CRUISE LAMP	Ignition switch: ON	MAIN switch: Pressed at the 1st time $\rightarrow$ at the 2nd time	$ON \to OFF$
	MAIN switch: ON	ASCD: Operating	ON
SET LAMP	When vehicle speed is between 40 km/h (25 MPH) and 144 km/h (89 MPH)  **Telling**  When vehicle speed is between the speed is between	ASCD: Not operating	OFF

Monitor Item	Condition	Values/Status
ALT DUTY	Engine: Idle	0 - 80%
A/F ADJ-B1	Engine: Running	-0.330 - 0.330
A/F ADJ-B2	Engine: Running	-0.330 - 0.330
BAT CUR SEN	<ul> <li>Engine speed: Idle</li> <li>Battery: Fully charged*<sup>2</sup></li> <li>Selector lever: P or N position</li> <li>Air conditioner switch: OFF</li> <li>No load</li> </ul>	Approx. 2,600 - 3,500 mV
ALT DUTY SIG	Power generation voltage variable control: Operating	ON
ALI DOTT SIG	Power generation voltage variable control: Not operating	OFF
HO2 S2 DIAG1 (B1)	DTC P0139 self-diagnosis (delayed response) is incomplete.	INCMP
HO2 32 DIAG1 (B1)	DTC P0139 self-diagnosis (delayed response) is complete.	CMPLT
HO2 S2 DIAG1 (B2)	DTC P0159 self-diagnosis (delayed response) is incomplete.	INCMP
HO2 32 DIAG1 (B2)	DTC P0159 self-diagnosis (delayed response) is complete.	CMPLT
UO2 92 DIAG2 (B1)	DTC P0139 self-diagnosis (slow response) is incomplete.	INCMP
HO2 S2 DIAG2 (B1)	DTC P0139 self-diagnosis (slow response) is complete.	CMPLT
HO2 62 DIA C2 (B2)	DTC P0159 self-diagnosis (slow response) is incomplete.	INCMP
HO2 S2 DIAG2 (B2)	DTC P0159 self-diagnosis (slow response) is complete.	CMPLT
A/F SEN1 DIAG1	DTC P015A and P015B self-diagnosis is incomplete.	INCMP
(B1)	DTC P015A and P015B self-diagnosis is complete.	CMPLT
A/F SEN1 DIAG1	DTC P015C and P015D self-diagnosis is incomplete.	INCMP
(B2)	DTC P015C and P015D self-diagnosis is complete.	CMPLT
A/F SEN1 DIAG2	DTC P014C and P014D self-diagnosis is incomplete.	INCMP
(B1)	DTC P014C and P014D self-diagnosis is complete.	CMPLT
A/F SEN1 DIAG2	DTC P014E and P014F self-diagnosis is incomplete.	INCMP
(B2)	DTC P014E and P014F self-diagnosis is complete.	CMPLT
A/F SEN1 DIAG3	The vehicle condition is not within the diagnosis range of DTC P014C, P014D, P015A or P015B.	ABSNT
(B1)	The vehicle condition is within the diagnosis range of DTC P014C, P014D, P015A or P015B.	PRSNT
A/F SEN1 DIAG3	The vehicle condition is not within the diagnosis range of DTC P014E, P014F, P015C or P015D.	ABSNT
(B2)	The vehicle condition is within the diagnosis range of DTC P014E, P014F, P015C or P015D.	PRSNT
THRTL STK CNT B1 <sup>*3</sup>	_	_
EVAP LEAK DIAG	Ignition switch: ON	Indicates the condition of EVAP leak diagnosis.
EVAP DIAG READY	Ignition switch: ON	Indicates the ready condition of EVAP leak diagnosis.

<sup>\*1:</sup> 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.

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

<sup>\*3:</sup> The item is indicated, but not used.

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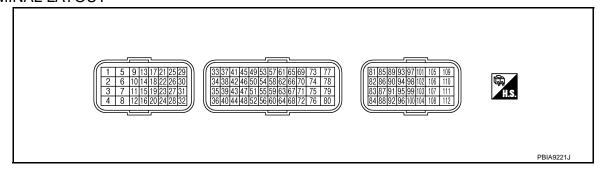
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### TERMINAL LAYOUT



### PHYSICAL VALUES

#### NOTE:

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

Termin	al No.	Description			Value											
+		Signal name	Input/ Output	Condition	(Approx.)	G										
1 (P/B)		Fuel injector No. 6			BATTERY VOLTAGE (11 - 14 V)★	-										
3 (L/W)		Fuel injector No. 5		<ul><li>[Engine is running]</li><li>Warm-up condition</li><li>Idle speed</li><li>NOTE:</li></ul>	50mSec/div	Н										
29 (LG/R)	112	Fuel injector No. 4		The pulse cycle changes de- pending on rpm at idle	10V/div JMBIA0047GB	НА										
30 (R/Y)	(B)	Fuel injector No. 3	Output		BATTERY VOLTAGE (11 - 14 V)★	J										
31 (R/W)		Fuel injector No. 2		[Engine is running] • Warm-up condition	50mSec/div	K										
32 (R/B)		Fuel injector No. 1												Engine speed: 2,000 rpm	10V/div JMBIA0048GB	L
2 (G/W)	112 (B)	Throttle control motor power supply	Input	[Ignition switch: ON]	BATTERY VOLTAGE (11 - 14 V)	M										
4 (BR/Y)	112 (B)	A/F sensor 1 heater (bank 1)	Output	<ul><li>[Engine is running]</li><li>Warm-up condition</li><li>Idle speed (More than 140 seconds after starting engine)</li></ul>	2.9 - 8.8 V★  50mSec/div  5V/div  JMBIA0902GB	N										

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Termin	al No.	Description			Value
+		Signal name	Input/ Output	Condition	(Approx.)
5	112	Throttle control motor (Open)	Output	[Ignition switch: ON]  • Engine stopped  • Selector lever: D position  • Accelerator pedal: Fully depressed	0 - 14 V★  500μSec/div  5V/div  JMBIA0031GB
(L)	(B)	Throate control motor (open)	Cuput	<ul><li>[Ignition switch: ON]</li><li>Engine stopped</li><li>Selector lever: D position</li><li>Accelerator pedal: Fully released</li></ul>	0 - 14 V★  500μSec/div  5V/div  JMBIA0032GB
6 (P)	112 (B)	Throttle control motor (Close)	Output	[Ignition switch: ON]  • Engine stopped  • Selector lever: D position  • Accelerator pedal: Fully released	0 - 14 V★  500 μSec/div  5V/div  JMBIA1125GB
8 (SB)	112 (B)	A/F sensor 1 heater (bank 2)	Output	<ul><li>[Engine is running]</li><li>Warm-up condition</li><li>Idle speed (More than 140 seconds after starting engine)</li></ul>	2.9 - 8.8 V★  50mSec/div  5V/div  JMBIA0030GB
9 (L/B) 10 (G/R)		Ignition signal No. 3 Ignition signal No. 2		<ul> <li>[Engine is running]</li> <li>Warm-up condition</li> <li>Idle speed</li> <li>NOTE:</li> <li>The pulse cycle changes de-</li> </ul>	0 - 0.2 V★  50mSec/div
11 (Y/R)	112	Ignition signal No. 1	Output	pending on rpm at idle	2V/div JMBIA0035GB
18 (GR/R)	(B)	Ignition signal No. 6	Output		0.1 - 0.4 V★ 50mSec/div
19 (P) 21 (W)		Ignition signal No. 5 Ignition signal No. 4		<ul><li>[Engine is running]</li><li>Warm-up condition</li><li>Engine speed: 2,000 rpm</li></ul>	2V/div JMBIA0036GB
12 (B)	_	ECM ground	_	_	

Termina	al No.	Description			Value	
+		Signal name	Input/ Output	Condition	Value (Approx.)	
13 (P/B)	112 (B)	Heated oxygen sensor 2 heater (bank 1)	Output	<ul> <li>[Engine is running]</li> <li>Engine speed: Below 3,600 rpm after the following conditions are met</li> <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>	10 V★  50mSec/div  5V/div  JMBIA0902GB	
				[Ignition switch: ON] • Engine stopped [Engine is running] • Engine speed: Above 3,600 rpm	BATTERY VOLTAGE (11 - 14 V)	
14 (GR)	112 (B)	Fuel pump relay	Output	[Ignition switch: ON] • For 1 second after turning ignition switch ON [Engine is running]	0 - 1.5 V	
(GIV)	(D)			[Ignition switch: ON]  • More than 1 second after turning ignition switch ON	BATTERY VOLTAGE (11 - 14 V)	
15 (O)	112 (B)	Throttle control motor relay	Output	[Ignition switch: $ON \rightarrow OFF$ ]	0 - 1.0 V $\rightarrow$ BATTERY VOLTAGE (11 - 14 V) $\rightarrow$ 0 V	
	` '			[Ignition switch: ON]	0 - 1.0 V	
16 (B/Y)	_	ECM ground	_	_	_	ŀ
17 (R)	112 (B)	Heated oxygen sensor 2 heater (bank 2)	Output	<ul> <li>[Engine is running]</li> <li>Engine speed: Below 3,600 rpm after the following conditions are met</li> <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>	10 V★  50mSec/div  5V/div  JMBIA0902GB	
				[Ignition switch: ON] • Engine stopped [Engine is running] • Engine speed: Above 3,600 rpm	BATTERY VOLTAGE (11 - 14 V)	
24 (W/B)	112 (B)	ECM relay (Self shut-off)	Output	<ul><li>[Engine is running]</li><li>[Ignition switch: OFF]</li><li>A few seconds after turning ignition switch OFF</li></ul>	0 - 1.5 V	
(··· <b>-</b> )	(-)	(,		<ul><li>[Ignition switch: OFF]</li><li>More than a few seconds after turning ignition switch OFF</li></ul>	BATTERY VOLTAGE (11 - 14 V)	

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Termina	al No.	Description			Value											
+		Signal name	Input/ Output	Condition	(Approx.)											
25	112	EVAP canister purge volume	Output	<ul><li>[Engine is running]</li><li>Idle speed</li><li>Accelerator pedal: Not depressed even slightly, after engine starting</li></ul>	BATTERY VOLTAGE  (11 - 14 V)  50mSec/div  10V/div  JMBIA0039GB											
(P/L)	(B)	control solenoid valve	Output -	[Engine is running] • Engine speed: approximately 2,000 rpm (More than 100 seconds after starting engine)	BATTERY VOLTAGE  (11 - 14 V)  50mSec/div  10V/div  JMBIA0040GB											
26	112	VIAS control solenoid valve 2		12	112		<ul><li>[Engine is running]</li><li>Warm-up condition</li><li>Idle speed</li></ul>	BATTERY VOLTAGE (11 - 14 V) BATTERY VOLTAGE (11 - 14 V)								
(GR/B)	(B)		Output	<ul><li>[Engine is running]</li><li>Warm-up condition</li><li>When revving engine up to 5,000 rpm quickly</li></ul>	↓ 0 - 1.0 V ↓ BATTERY VOLTAGE (11 - 14 V)											
				<ul><li>[Engine is running]</li><li>Warm-up condition</li><li>Idle speed</li></ul>	BATTERY VOLTAGE (11 - 14 V)											
27 (V)	112 (B)	VIAS control solenoid valve 1	Output	Output	Output	Output	Output	Output	Output	Output	Output	Output	Output	Output	<ul><li>[Engine is running]</li><li>Warm-up condition</li><li>When revving engine up to 5,000 rpm quickly</li></ul>	BATTERY VOLTAGE (11 - 14 V) ↓ 0 - 1.0 V ↓ BATTERY VOLTAGE (11 - 14 V)
				[Engine is running] • Engine speed: For 2 seconds after reaching 950 rpm or less	0 - 1.0 V											
28 (BR/W)	112 (B)	Electronic controlled engine mount control solenoid valve	Output	<ul><li>[Engine is running]</li><li>Engine speed: After a lapse of 2 seconds after reaching 950 rpm or less</li></ul>	2.0 - 3.0 V											
				<ul><li>[Engine is running]</li><li>Engine speed: 950 rpm or more</li></ul>	BATTERY VOLTAGE (11 - 14 V)											
33 (W)	112 (B)	Heated oxygen sensor 2 (bank 1)	Input	<ul> <li>[Engine is running]</li> <li>Revving engine from idle to 3,000 rpm quickly after the following conditions are met</li> <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>	0 - 1.0 V											

Termin	al No.	Description			Value		
+		Signal name	Input/ Output	Condition	value (Approx.)		
34 (W/L)	112 (B)	Heated oxygen sensor 2 (bank 2)	Input	<ul> <li>[Engine is running]</li> <li>Revving engine from idle to 3,000 rpm quickly after the following conditions are met</li> <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>	0 - 1.0 V		
35 (B)	_	Sensor ground (Heated oxygen sensor 2)	_	_	_		
36 (B)	_	Sensor ground (Throttle position sensor)	_	_	_		
37	112	Through no distribution of the second of the	lee. (	<ul> <li>[Ignition switch: ON]</li> <li>Engine stopped</li> <li>Selector lever: D position</li> <li>Accelerator pedal: Fully released</li> </ul>	More than 0.36 V		
(W)	(B)	Throttle position sensor 1	Input	<ul><li>[Ignition switch: ON]</li><li>Engine stopped</li><li>Selector lever: D position</li><li>Accelerator pedal: Fully depressed</li></ul>	Less than 4.75 V		
38	112	Through position conser 2	lanut	<ul> <li>[Ignition switch: ON]</li> <li>Engine stopped</li> <li>Selector lever: D position</li> <li>Accelerator pedal: Fully released</li> </ul>	Less than 4.75 V		
(R)	(B)	Throttle position sensor 2	Input	put	-	<ul> <li>[Ignition switch: ON]</li> <li>Engine stopped</li> <li>Selector lever: D position</li> <li>Accelerator pedal: Fully depressed</li> </ul>	More than 0.36 V
39 (R)	40 (G)	Refrigerant pressure sensor	Input	<ul><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		
40 (G)	_	Sensor ground (Refrigerant pressure sensor)	_	_	_		
41	48	Power steering pressure sen-		[Engine is running] • Steering wheel: Being turned	0.5 - 4.5 V		
(O/B)	(B/P)	sor	Output	<ul><li>[Engine is running]</li><li>Steering wheel: Not being turned</li></ul>	0.4 - 0.8 V		
42 (BR)	44 (G/B)	Battery current sensor	Input	<ul> <li>[Engine is running]</li> <li>Battery: Fully charged*<sup>2</sup></li> <li>Idle speed</li> </ul>	2.6 - 3.5 V		
44 (G/B)	_	Sensor ground (Battery current sensor)	_	_	_		
45 (P)	49 (L)	A/F sensor 1 (bank 1)	Input	[Ignition switch: ON]	2.2 V		
46 (Y)	52 (B/R)	Engine coolant temperature sensor	Input	[Engine is running]	0 - 4.8 V Output voltage varies with engine coolant temperature.		

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

Termin	al No.	Description			Value	Δ.
+		Signal name	Input/ Output	Condition	(Approx.)	Α
65	60	Crankshaft position sensor		<ul> <li>[Engine is running]</li> <li>Warm-up condition</li> <li>Idle speed</li> <li>NOTE:</li> <li>The pulse cycle changes depending on rpm at idle</li> </ul>	4.0 - 5.0 V★  1mSec/div  2V/div  JMBIA0041GB	ВС
(W/B)	(Y/B)	(POS)	Input	[Engine is running] • Engine speed: 2,000 rpm	4.0 - 5.0 V★  1mSec/div  2V/div  JMBIA0042GB	E
67 (—)	_	Sensor ground (Knock sensor)	_	_	_	G
68 (Y/G)	_	Sensor ground [Camshaft position sensor (PHASE) (bank 2)]	_	_	_	Н
69 (BR/W)	68 (Y/G)	Camshaft position sensor (PHASE) (bank 2)	Input	<ul> <li>[Engine is running]</li> <li>Warm-up condition</li> <li>Idle speed NOTE: The pulse cycle changes depending on rpm at idle</li> </ul>	3.0 - 5.0 V★  20mSec/div  2V/div  JMBIA0045GB	HAC
(BIVW)	(176)	(FIIASE) (Balik 2)		[Engine is running] • Engine speed is 2,000 rpm	3.0 - 5.0 V★  20mSec/div  2V/div  JMBIA0046GB	K L
70	64	Camshaft position sensor	Input	<ul> <li>[Engine is running]</li> <li>Warm-up condition</li> <li>Idle speed</li> <li>NOTE:</li> <li>The pulse cycle changes depending on rpm at idle</li> </ul>	3.0 - 5.0 V★  20mSec/div  2V/div  JMBIA0045GB	N O
(W/R)	(B/R)	(PHASE) (bank 1)		[Engine is running] • Engine speed is 2,000 rpm	3.0 - 5.0 V★  20mSec/div  2V/div  JMBIA0046GB	Р

Termin	al No.	Description			Value	
+		Signal name	Input/ Output	Condition	(Approx.)	
72 (BR/W)	40 (G)	Sensor power supply (Refrigerant pressure sensor)	_	[Ignition switch: ON]	5 V	
				<ul><li>[Engine is running]</li><li>Warm-up condition</li><li>Idle speed</li></ul>	BATTERY VOLTAGE (11 - 14 V)	
75 (Y)	112 (B)	Intake valve timing control so- lenoid valve (bank 2)	Output	<ul><li>[Engine is running]</li><li>Warm-up condition</li><li>Engine speed: 2,000 rpm</li></ul>	7 - 12 V★  5V/div JMBIA0038GB	
76 (R/G)	60 (Y/B)	Sensor power supply [Crankshaft position sensor (POS)]	_	[Ignition switch: ON]	5 V	
77 (W/L)	112 (B)	Power supply for ECM (Back-up)	Input	[Ignition switch: OFF]	BATTERY VOLTAGE (11 - 14 V)	
				[Engine is running]  • Warm-up condition  • Idle speed	BATTERY VOLTAGE (11 - 14 V)	
78 (R/L)	3	Output	[Engine is running] • Warm-up condition • Engine speed: 2,000 rpm	7 - 12 V★  5V/div JMBIA0038GB		
81	84	Accelerator pedal position		[Ignition switch: ON] • Engine stopped • Accelerator pedal: Fully released	0.5 - 1.0 V	
(W)	(B)	sensor 1	Input	[Ignition switch: ON]  • Engine stopped  • Accelerator pedal: Fully depressed	4.2 - 4.8 V	
82	100	Accelerator pedal position	Input	<ul><li>[Ignition switch: ON]</li><li>Engine stopped</li><li>Accelerator pedal: Fully released</li></ul>	0.25 - 0.50 V	
(O)	(G)	sensor 2	прис	<ul><li>[Ignition switch: ON]</li><li>Engine stopped</li><li>Accelerator pedal: Fully depressed</li></ul>	2.0 - 2.5 V	
83 (BR)	84 (B)	Sensor power supply (Accelerator pedal position sensor 1)	_	[Ignition switch: ON]	5 V	
84 (B)	_	Sensor ground (Accelerator pedal position sensor 1)		_	_	

Termin	al No.	Description			Value
+		Signal name	Input/ Output	Condition	value (Approx.)
				[Ignition switch: ON] • ASCD steering switch: OFF	4 V
				[Ignition switch: ON]  • MAIN switch: Pressed	0 V
85 (Y)	92 (BR)	ASCD steering switch	Input	[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
86 (SB)	96 (GR)	EVAP control system pressure sensor	Input	[Ignition switch: ON]	1.8 - 4.8 V
87 (GR)	100 (G)	Sensor power supply (Accelerator pedal position sensor 2)	_	[Ignition switch: ON]	5 V
88 (O)	_	Data link connector	Input/ Output	_	_
91 (L)	96 (GR)	Sensor power supply (EVAP control system pres- sure sensor)		[Ignition switch: ON]	5 V
92 (BR)	_	Sensor ground (ASCD steering switch)	_	_	_
93	112			[Ignition switch: OFF]	0 V
(BR)	(B)	Ignition switch	Input	[Ignition switch: ON]	BATTERY VOLTAGE (11 - 14 V)
94	112	Fngine speed output signal	Output	<ul> <li>[Engine is running]</li> <li>Warm-up condition</li> <li>Idle speed NOTE: The pulse cycle changes depending on rpm at idle</li> </ul>	1 V★  10mSec/div  2V/div  JMBIA0076GB
(GR)		Cuput	[Engine is running] • Engine speed: 2,000 rpm	1 V★  10mSec/div  2V/div  JMBIA0077GB	
95 (Y)	104 (SB)	Fuel tank temperature sensor	Input	[Engine is running]	0 - 4.8 V Output voltage varies with fuel tank temperature.
96 (GR)	_	Sensor ground (EVAP control system pressure sensor)	_	_	_
97 (P)	_	CAN communication line (CAN-L)	Input/ Output	_	_
98	_	CAN communication line (CAN-H)	Input/ Output	_	_

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

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

<sup>\*1:</sup> This may vary depending on internal resistance of the tester.

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

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### A/C AUTO AMP.

Reference Value

#### VALUES ON THE DIAGNOSIS TOOL

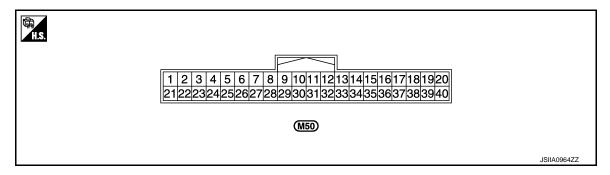
#### NOTE:

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

#### CONSULT MONITOR ITEM

Monitor item	Co	Value/Status				
COMP REQ SIG	Engine: Run at idle after warming up	A/C switch: ON (Compressor operation status)	On			
		A/C switch: OFF	Off			
FAN REQ SIG	Engine: Run at idle after	Blower fan: ON	On			
FAIN REQ SIG	warming up	Blower fan: OFF	Off			
AMB TEMP SEN	Ignition switch ON	_	22 - 131°F (-30 - 55°C)			
IN-VEH TEMP	Ignition switch ON	_	22 - 131°F (-30 - 55°C)			
INT TEMP SEN	Ignition switch ON	_	22 - 131°F (-30 - 55°C)			
SUNLOAD SEN	Ignition switch ON	_	0 - 1045 w/m <sup>2</sup> (0 - 900 kcal/m <sup>2</sup> ·h)			
AMB SEN CAL	Ignition switch ON	_	22 - 131°F (-30 - 55°C)			
IN-VEH CAL	Ignition switch ON	_	22 - 131°F (-30 - 55°C)			
INT TEMP CAL	Ignition switch ON	_	22 - 131°F (-30 - 55°C)			
SUNL SEN CAL	Ignition switch ON	_	0 - 1045 w/m² (0 - 900 kcal/m²⋅h)			
FAN DUTY	Engine: Run at idle after	Blower fan: ON	25 - 81			
FAN DUTY	warming up	Blower fan: OFF	0			
XM	Ignition switch ON	_	-100 <b>-</b> 155			
ENG COOL TEMP	Ignition switch ON	_	Values according to coolant temperature			
VEHICLE SPEED	Driving	_	Equivalent to speedometer reading			

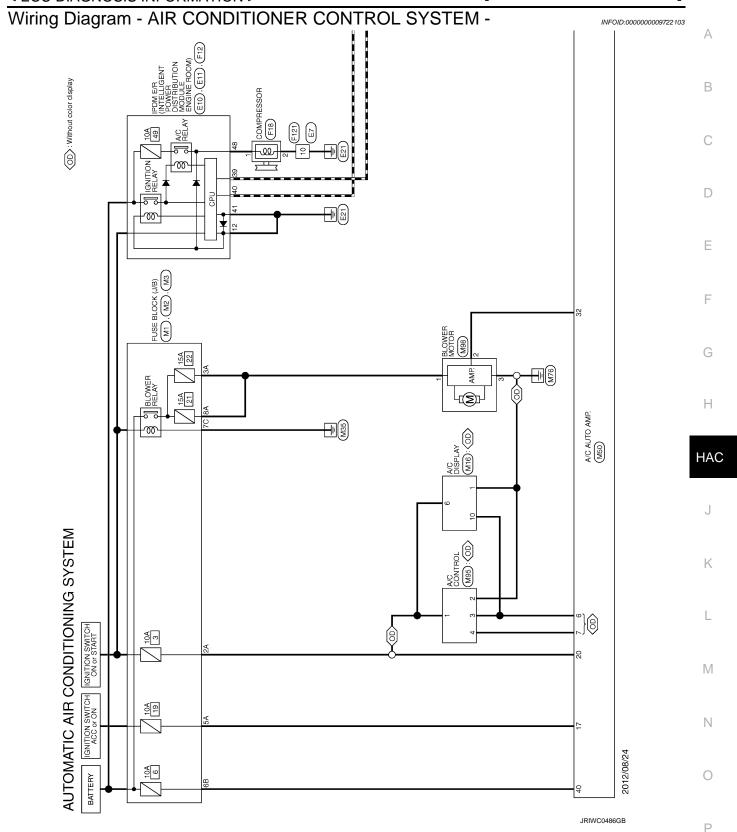
### **TERMINAL LAYOUT**

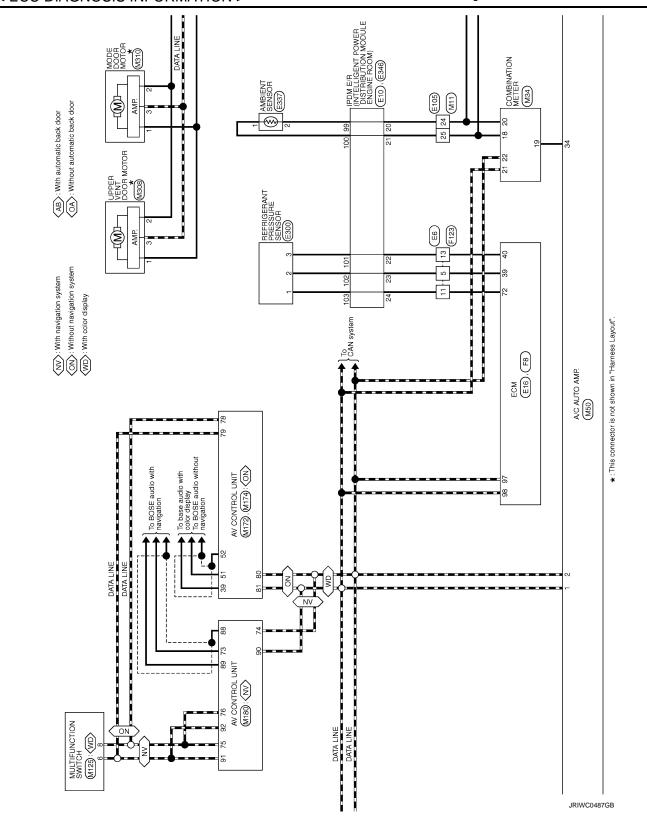


PHYSICAL VALUES

### < ECU DIAGNOSIS INFORMATION >

Termin (Wire		Description		Condition	Value
+	_	Signal name	Input/ Output	Condition	(Approx.)
1 (L)	_	CAN-H	Input/ Output	_	_
2 (P)	_	CAN-L	Input/ Output	_	_
6 (L)	Ground	TX (AMP > SW·DISP)	Input	_	_
7 (P)	Ground	RX (SW > AMP)	Output	_	_
10 (G)	Ground	LAN signal	Input/ Output	_	(V) 15 10 5 10 - 20 ms
11 (R)	Ground	Power supply for each door motor	Input	Ignition switch ON	Battery voltage
15 (BR)	Ground	Sunload sensor	Input	_	_
16 (R)	Ground	Intake sensor	Input	_	_
17 (W)	Ground	Power supply from ACC	1	Ignition switch ACC	Battery voltage
19 (B)	Ground	Ground	_	Ignition switch ON	0 V
20 (G)	Ground	Power supply from IGN	_	Ignition switch ON	Battery voltage
32 (L)	Ground	Blower motor control signal	Output	Ignition switch ON     Blower speed: 1st speed (manual)	(V) 6 4 2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
34 (V)	Ground	Power supply for ambient meter	Output	Ignition switch ON	5V
35 (G)	Ground	Ambient sensor	Input		
36 (LG)	Ground	In-vehicle sensor	Input	_	_
37 (SB)	Ground	Sensor ground	_	Ignition switch ON	0 V
39 (B)	Ground	Ground	_	Ignition switch ON	0 V
40 (Y)	Ground	Power supply from BATT	_	Ignition switch OFF	Battery voltage





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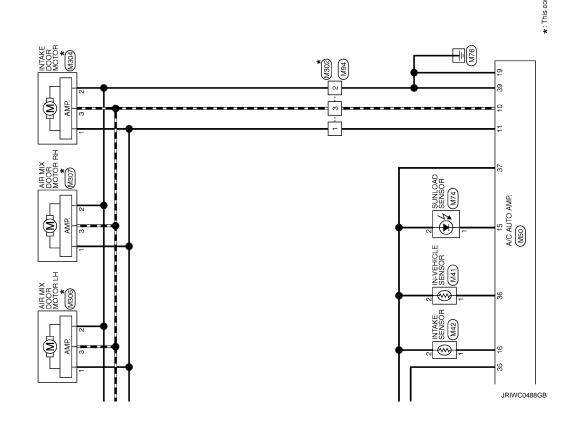
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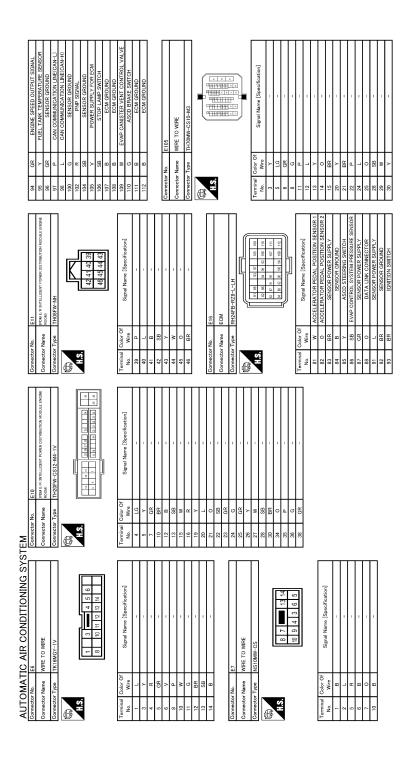
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	G SEI	В/В		L/Y INTA	R/Y SENSOR POWER SUPPLY	×	G ENGIN	SB	g/B	D7	0	G/W SE	4/B	80	W	R/W SENSOR POWER SUPPLY	B/R	W/B CRANKSHAFT POSITION SENSOR(POS)	SHIELD	Y/G SENSOR GROUND	BR/W	W/R CRANKSHAFT POSITION SENSOR(PHASE) (BANK 1)	BR/W SENSOR POWER SUPPLY	Y INTAKE VAL	R/G	W/L POWER SUPPLY FOR ECM (BACK-UP)	R/L INTAKE VALVE TIMING CONTROL SOLENOID VALVE (BANK 1)			Connector No. F12	Connector Name ROOM!	Commenter Time Timenia Octobre									_	Wire	*		t	2 :	1	R/W -	100	=
	_	Connector Name IPOM E.P. (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE 48	KOOM	Connector Type THI6FW-NH 50				4 2 0	7 8 9 10 11 12 13 14 56	29		Color Of Signal Name [Specification]	Wire Opening Opening		92 LG - 62	99 BR – 63	SB	101 L = - 65	102 B = - 67	103 P - 68	69	07	Connector No. F8 72	75		Connector Type RH40FBR-RZ8-L-LH	2 2		37 41 45 49 53 57 61 65 69 77	34 35 42 46 50 54 58 62 70 78	39 47 51 55 59 63 67 75	(		Terminal Color Of	Wire Signal Name [Specification]	3	f	35 B SENSOR GROUND	8	W	R THROTTLE POSITION SENSOR 2 Te	R REFRIGERANT PRESSURE SENSOR	40 G SENSOR GROUND 48	41 0/B POWER STEERING PRESSURE SENSOR 49	BR RATTERY CURRENT SENSOR	DATIENT CONNENT SENSON		45 P A/F SENSOR 1 (BANK 1) 53	CNOWE COOL ANT TEMPEDATION SENSOD	ENGINE COOLANT TEMPERATURE SENSOR
	E300	REFRIGERANT PRESSURE SENSOR		RK03FB	•	≪		(3)				Of Signal Name [Specification]	4	-	-	_			E337	AMBIENT SENSOR	SENT SENSON	RS02FB			[		((2)1)	)			Signal Name [Specification]																			
EM	Connector No.	Connector Name		Connector Type	<b>€</b>		ė					la C	No. Wire		2 B	3			Connector No. E	Connector Name		Connector Type R:	¢	厚	Į.	į					No Min	+	9 9	+																
	- Connector No.	Connector Name		Connector Type		- B0			-	BR -			- No.	-	- 2	L/0 - 3 L	- 10	-	- Connector No.	- Connector Name	-	- Connector Type	88		-		-			- [With iPod without navigation system]	- [Without iPod and navigation system]   lerminal		$^{+}$																	

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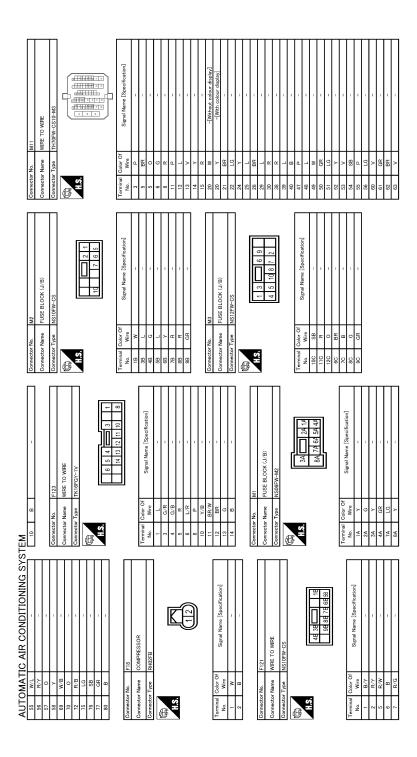
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Connector Name   COMBINATION METER   Connector Name   IN-VERIOR	Connector Name
Commentor Type   TH40EW-NH   Commentor Type   ADZEWY   Commentor Type   Commento	
Connector Type   ThirdPW-NH   Connector Type   A02PW	Connection type
Connector Number   Connector N	Towns   Color City
Terminal Color Of   Term	Terminal Color Of Wire
Connector Name   Conn	Tominal Octor Of Tominal Octor
	12   Terminal Color Of No
	1   2
Terminal Outer Of Signal Name [Specification]   No.   Wire   No.   W	Terminal Color of No. 1.04
Terminal Color Of Signal Name [Specification]   No. Wire   Number   No. Wire   Number   No. Wire   Number   No. Wire   Number	Terminal Color Of Terminal Col
Terminal Golor Of Nine   Signal Manne [Specification]   Nine   Wire   Nine   Specification]   Nine   Wire   Nine   Signal Manne   Specification]   Nine   Wire   Nine	Terminal Color Of No. Wire
Terminal   Color Of   Signal Name [Specification]   No   Wire	Terminal Calor Of Terminal Cal
Terminal Color Of Name   Signal Name (Specification)   No.   No.	Terminal Code Of Forminal Code of Form
No. Wire   No. Wire	No. Wire
1	1   1   1   1   1   1   1   1   1   1
2   1.0   109 100 100	1   1   1   1   1   1   1   1   1   1
1	1   1   1   1   1   1   1   1   1   1
1	1   1   1   1   1   1   1   1   1   1
1	10   P   P   P   P   P   P   P   P   P
S	10   C     10   L     11   R     11   R     12   R     16   C     17   C     18   R     19   R     19   R     19   R     10   C     20   C     21   R     22   R     24   C     24   C     25   C     26   C     27   R     27   R     27   R     28   C     29   C     20   C
8   SB   TIER FOOTER STORAGE, Connector Name   INTAKE STORAGE, CONNECTOR STORAGE, CONNEC	10   1   1   1   1   1   1   1   1   1
Value   Valu	11   R   R     11   R   R     12   R   R     16   G   R     16   R   R     19   R   R     19   R   R     10   R   R     10   R   R     11   R   R     12   R   R     13   R   R     14   R     15   R   R     16   R   R     17   R   R     18   R     19   R     10   R     10   R     10   R     11   R     12   R     13   R     14   R     15   R     16   R     17   R     18   R     19   R     10   R     10   R     10   R     11   R     12   R     13   R     14   R     15   R     15   R     16   R     17   R     18   R     19   R     10
1	15   8   8   16   17   18   18   18   18   18   18   18
10   METER FOUNTION MICHAEL ROUND   Connector Type   COZEWY     12   R   RELEASE WITCH SIGNAL   CONNECTOR SIGNAL     13   V   AUBINITOR SIGNAL   CONNECTOR SIGNAL	16   16   16   16   16   16   16   16
1   L   EFFICE MOTH SIGNAL   Connector Type   Connector	16 R R R R R R R R R R R R R R R R R R R
12   N	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
12   V   1   1   1   1   1   1   1   1   1	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
14   GR   14	20
14   GR   ALLMANATON CONTION STORMAL   AMBERT SENSOR STORMAL   18   L   AMBERT SENSOR STORMAL   19   L   AMBERT SENSOR STORMAL   19   L   AMBERT SENSOR POWER   20   Y   AMBERT SENSOR POWER   20   Y   AMBERT SENSOR POWER   22   Y   AMBERT SENSOR POWER   23   Y   AMBERT SENSOR POWER   24   Y   AMBERT SENSOR POWER   25   Y   Y   AMBERT SENSOR POWER   25   Y   Y   Y   Y   Y   Y   Y   Y   Y	20 G G G G G G G G G G G G G G G G G G G
15   BR   AMBERT SENSOR SIGNAL   Inch   In	26 GR
18   L   AMBIENT SENSOR FOURE     19   L   AMBIENT SENSOR FOURE     19   P   AMBIENT SENSOR FOURE     19   P   AMBIENT SENSOR FOURE     19   P   AMBIENT SENSOR FOURE     22   L   CANH     22   L   CANH     23   R   CIANH     31   W   FUEL LEVEL SENSOR ROUND     1   R   GROWN     24   W   FUEL LEVEL SENSOR ROUND     1   R   GROWN     25   BR   PARKTON SENSOR SIGNAL     26   GROWN     27   W   SENSOR FOUR SIGNAL     28   R   ANTERON SENSOR SIGNAL     29   R   ANTERON SENSOR SIGNAL     20   R   ANTERON SENSOR SIGNAL     21   R   ANTERON SENSOR SIGNAL     22   R   ANTERON SENSOR SIGNAL     23   R   ANTERON SENSOR SIGNAL     24   R   ANTERON SENSOR SIGNAL     25   R   ANTERON SENSOR SIGNAL     26   R   ANTERON SENSOR SIGNAL     27   V   VENDER LEVEL SWITCH SIGNAL     28   R   ANTERON SENSOR SIGNAL     29   R   ANTERON SENSOR SIGNAL     20   ANTERON SENSOR SIGNAL     20   ANTERON SENSOR SIGNAL     20   ANTERON SENSOR SIGNAL     20   ANTERON SENSOR SIGNAL     21   ANTERON SENSOR SIGNAL     22   R   ANTERON SENSOR SIGNAL     31   V   VENDER LEVEL SENSOR SIGNAL     31   V   VENDER SENSOR SENSOR SENSOR SIGNAL     31   V   VENDER SENSOR SENS	8 2 2 2 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3
18   L   AMBIENT SERIOR SIGNAL	27 BR 22 L L 24 L 25 L 25 L 25 L 25 L 25 L 25
19   P   AMBIENT SENSOR POWER	98 S S S S S S S S S S S S S S S S S S S
10   8   6   20	34 V 35 C G 35 C G 35 C G 35 C G G 35 C G G 35 C G G G G G G G G G G G G G G G G G G
1   1   1   1   1   1   2   2   2   1   1	34 V V V V V V V V V V V V V V V V V V V
1d   8   6   22   P	34 V 35 G 35 C 36 C 36 C 37 S S S S S S S S S S S S S S S S S S
14   5   6   15   15   15   15   15   15	35 G 35 L 36 LG 37 SB
23   B   CROUND   1   C   CROUND   1   CROUND   1   C   CROUND   1   C   CROUND   1   C   CROUND   1   CROUND   1   C   CRO	35 L 36 LG 37 SB
Color Of Signal Name (Specification)   23 km   FLEL LEG GROUND   10 Wire	35 LG 36 LG 37 SB
Marker   Signati Name   Spacerification    24   W   FELL LEVEL SERVISOR GROUND   1   C	36 LG 37 SB
Mine   Signal Name   Specification    24   R   PACHI LEFEE STOROM UNDULUD.   1   R   R   PACHI LEFEE STOROM UNDULUD.   1   R   R   R   PACHI LEFEE STOROM UNDULUD.   1   R   R   R   R   R   R   R   R   R	37 SB
Mire	37 SB
GROUND   26   C   PARRIOR BANE CHE SIGNAL   2   SB	7
Control   Cont	
Clay	
	39 B GND
1LL- 30 P P P P P P P P P P P P P P P P P P	>
ILL- 30 P RX (AMP DISP) 31 V	
RX (AMP DISP) 31 V	
>	
32 LG OVERDRIVE CONTROL SWITCH SIGNAL	
34 G FILEL EVEL SENSOR SIGNAL	
+	
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8 2	
9 ~	
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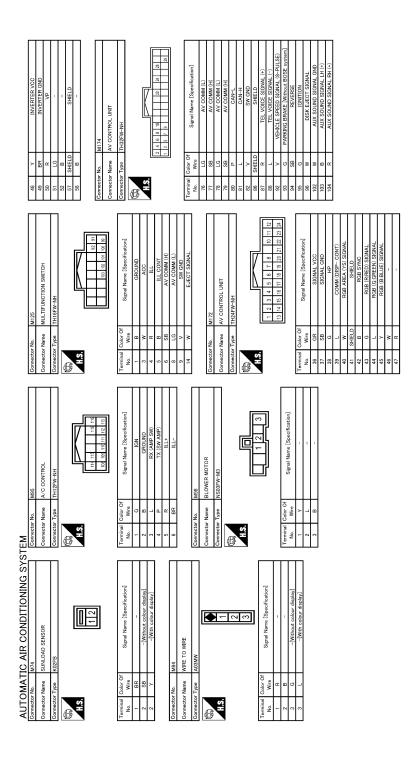
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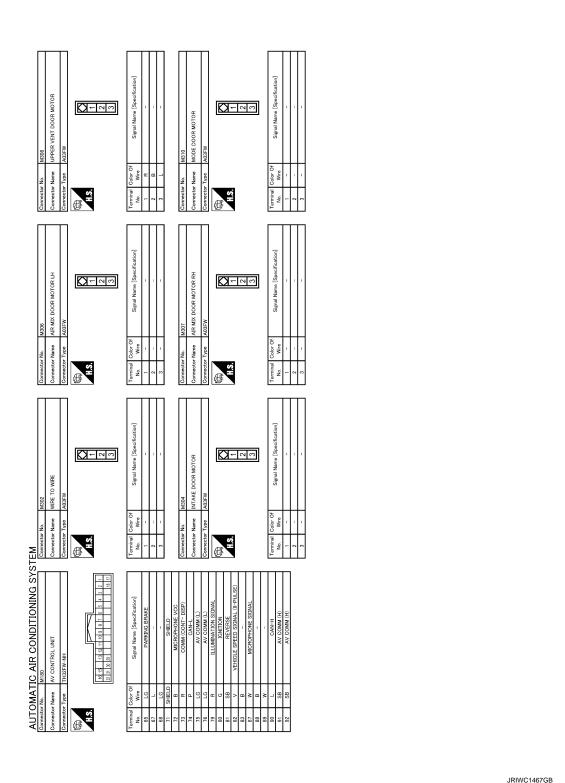
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Fail-Safe

#### **FAIL-SAFE FUNCTION**

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

Compressor : ON
Air outlet : AUTO

Air inlet : FRE (Fresh air intake)

Fan speed : AUTO

Set temperature : Setting before communication error occurs

## DTC Inspection Priority Chart

INFOID:0000000009722105

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

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

DTC Index

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

### A/C AUTO AMP.

### < ECU DIAGNOSIS INFORMATION >

## [WITHOUT 7 INCH DISPLAY]

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

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

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# SYMPTOM DIAGNOSIS

# AIR CONDITIONER CONTROL

# Diagnosis Chart By Symptom

INFOID:0000000009722107

Symptom	Reference	
A/C system does not activate.	Go to Trouble Diagnosis Procedure for A/C Control Signal Circuit.	HAC-76, "Diagnosis Procedure"
A/C display dose not work.	Go to Trouble Diagnosis Procedure for A/C Display.	HAC-79, "A/C DISPLAY : Diagnosis Procedure"
Air outlet does not change.	Co to Trouble Diagnosis Precedure for Mode Deer Motor	HAC-63, "Diagnosis Proce-
Mode door motor does not operate normally.	Go to Trouble Diagnosis Procedure for Mode Door Motor. (LAN)	dure"
Discharge air temperature does not change.	Go to Trouble Diagnosis Procedure for Air Mix Door Motor.	HAC-59, "Diagnosis Procedure" (driver side) or HAC-61,
Air mix door motor does not operate normally.	(LAN)	" <u>Diagnosis Procedure"</u> (pas- senger side)
Intake door does not change.	Go to Trouble Diagnosis Procedure for Intake Door Motor.	HAC-66, "Diagnosis Proce-
Intake door motor does not operate normally.	(LAN)	dure"
Blower motor operation is malfunctioning.	Go to Trouble Diagnosis Procedure for Blower Motor.	HAC-70, "Diagnosis Procedure"
Magnet clutch does not engage.	Go to Trouble Diagnosis Procedure for Magnet Clutch.	HAC-74, "Diagnosis Procedure"
Insufficient cooling		HAC-109, "Inspection proce-
No cool air comes out. (Air flow volume is normal.)	Go to Trouble Diagnosis Procedure for Insufficient Cooling.	dure"
Insufficient heating		HAC 442 "Increation proces
No warm air comes out. (Air flow volume is normal.)	Go to Trouble Diagnosis Procedure for Insufficient Heating.	HAC-112, "Inspection proce- dure"
Noise	Go to Trouble Diagnosis Procedure for Noise.	HAC-115, "Inspection procedure"
Memory function does not operate.	Go to Trouble Diagnosis Procedure for Memory Function.	HAC-117, "Inspection procedure"

### INSUFFICIENT COOLING

Description INFOID:0000000009722108

Symptom

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

### Inspection procedure

# ${f 1}$ .CHECK WITH A GAUGE OF RECOVERY/RECYCLING RECHARGING EQUIPMENT

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

### Is there refrigerant?

YES >> GO TO 2.

NO-1 >> Check for refrigerant leakages with the refrigerant leakage detecting fluorescent leak detector. Refer to HA-30, "Inspection".

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

# 2.CHECK CHARGED REFRIGERANT AMOUNT

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

### Is the inspection result normal?

YES >> GO TO 3.

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

### $oldsymbol{3}.$ CHECK REFRIGERANT CYCLE PRESSURE

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

### Is the inspection result normal?

YES >> GO TO 4.

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

### 4. CHECK SETTING OF TEMPERATURE SETTING TRIMMER

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

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

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

2. Set temperature control dial to "0".

#### Are the malfunction solved?

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

NO >> GO TO 5.

### ${f 5.}$ CHECK WITH SELF-DIAGNOSIS FUNCTION OF CONSULT

- Using CONSULT, perform "SELF-DIAGNOSIS RESULTS" of HVAC.
- 2. Check if any DTC No. is displayed in the trouble diagnosis results.

### NOTE:

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

#### Is any DTC No. displayed?

YES >> Perform the diagnosis that is applicable to the sensor and the door motor. Refer to HAC-106. "DTC Index".

NO >> GO TO 6.

### $oldsymbol{6}.$ CHECK WITH ACTIVE TEST OF CONSULT

**HAC-109** Revision: 2013 August 2014 MURANO

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1. Using CONSULT, perform "HVAC TEST" "ACTIVE TEST" of HVAC to check each output device. Refer to HAC-40, "CONSULT Function".

### NOTE:

Perform the ACTIVE TEST after starting the engine because the compressor is operated.

2. Refer to the table and check the outlet, inlet, air flow temperature, blower motor control signal, magnet clutch operation, and air mix ratio. Visually check each operating condition, by listening for noise, touching air outlets with a hand, etc.

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

#### NOTE:

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

Discharge air flow									
Mode position			Air outlet/distribution						
indication	Condition		VENT		FO	ОТ	DEE		
		Front	Upper	Rear	Front	Rear	DEF		
<b>ن</b> ړ-		81%	8%	11%	_	_	_		
***	DUAL switch: OFF	41%	10%	17%	24%	8%	_		
نړ ،	UPPER VENT switch : ON	12%	12%	16%	27%	10%	23%		
**	SWILCH : ON	11%	11%	14%	25%	10%	29%		
<b>*</b>		11%	11%	12%	_	_	66%		

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Discharge air flow								
Mode position				Air outlet/d	distribution			
indication	Condition		VENT		FO	ОТ	DEE	
		Front	Upper	Rear	Front	Rear	DEF	
نبر		88%	_	12%	_	_	_	
**	DUAL switch: OFF	47%	_	18%	26%	9%	_	
<b>`~</b> i	UPPER VENT switch : OFF	13%	_	17%	33%	12%	25%	
**	Switch . Of I	12%	_	16%	28%	12%	32%	
<b>F</b> i		11%	_	15%	_	_	74%	

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Does it operate normally?

YES >> GO TO 7.

### **INSUFFICIENT COOLING**

### < SYMPTOM DIAGNOSIS >

### [WITHOUT 7 INCH DISPLAY]

NO-1	>> Air outlet does not change.	Refer to	HAC-63,	"Diagnosis Procedure".

NO-2 >> Air inlet does not change. Refer to <u>HAC-66</u>, "<u>Diagnosis Procedure</u>".

NO-3 >> Discharge air temperature does not change. Refer to <u>HAC-59</u>, "<u>Diagnosis Procedure</u>" and <u>HAC-61</u>, "<u>Diagnosis Procedure</u>".

NO-4 >> Blower motor does not operate normally. Refer to <u>HAC-70</u>, "<u>Diagnosis Procedure</u>".

NO-5 >> Magnet clutch does not operate. Refer to <u>HAC-74</u>, "<u>Diagnosis Procedure</u>".

### 7. CHECK AMBIENT TEMPERATURE DISPLAY

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

#### Is the inspection result normal?

YES >> GO TO 8.

NO >> Perform the diagnosis for the A/C auto amp. connection recognition signal. Refer to <a href="MWI-56">MWI-56</a>, "Diagnosis Procedure".

### 8. CHECK DRIVE BELT

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

### Is the inspection result normal?

YES >> GO TO 9.

NO >> Adjust or replace drive belt.

### 9. CHECK AIR LEAKAGE FROM DUCT

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

### Is the inspection result normal?

YES >> INSPECTION END

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

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[WITHOUT 7 INCH DISPLAY]

### INSUFFICIENT HEATING

Description INFOID:000000009722110

#### Symptom

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

### Inspection procedure

INFOID:0000000009722111

### 1. CHECK COOLING SYSTEM

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

### Is the inspection result normal?

YES >> GO TO 2.

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

### 2. CHECK OPERATION

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

#### Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 3.

### 3.CHECK SETTING OF TEMPERATURE SETTING TRIMMER

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

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

#### NOTE:

The control temperature can be set by the temperature setting trimmer.

2. Set temperature control dial to "0".

### Are the malfunction solved?

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

NO >> GO TO 4.

# 4.CHECK WITH SELF-DIAGNOSIS FUNCTION OF CONSULT

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

#### NOTE:

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

### Is any DTC No. displayed?

YES >> Perform the diagnosis that is applicable to the sensor and the door motor. Refer to <a href="https://example.com/HAC-106">HAC-106</a>, <a href="mailto:">"DTC Index"</a>.

NO >> GO TO 5.

### 5.CHECK WITH ACTIVE TEST OF CONSULT

1. Using CONSULT, perform "HVAC TEST" in "ACTIVE TEST" of HVAC to check each output device. Refer to <a href="https://hac-40."/>HAC-40.</a> "CONSULT Function".

#### NOTE:

Perform the ACTIVE TEST after starting the engine because the compressor is operated.

Refer to the table and check the outlet, inlet, air flow temperature, blower motor control signal, magnet clutch operation, and air mix ratio. Visually check each operating condition, by listening for noise, touching air outlets with a hand, etc.

### [WITHOUT 7 INCH DISPLAY]

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

#### NOTE:

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

Discharge air flo	ow .						
Mode position				Air outlet/d	distribution		
indication	Condition		VENT		FO	ОТ	DEE
		Front	Upper	Rear	Front	Rear	DEF
نه-ّ		81%	8%	11%	_	_	_
ź.	DUAL switch: OFF	41%	10%	17%	24%	8%	_
<b></b>	UPPER VENT	12%	12%	16%	27%	10%	23%
Ţ.	- SWILCH . OIN	11%	11%	14%	25%	10%	29%
**		11%	11%	12%	_	_	66%

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Discharge air flo	ow .						
Mode position				Air outlet/d	distribution		
indication	Condition		VENT		FO	ОТ	DEE
		Front	Upper	Rear	Front	Rear	DEF
نه-ّ		88%	_	12%	_	_	_
₹;	DUAL switch: OFF	47%	_	18%	26%	9%	_
نه.	UPPER VENT	13%	_	17%	33%	12%	25%
<b>*</b>	- SWILCH . OFF	12%	_	16%	28%	12%	32%
¥		11%	_	15%	_	_	74%

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### Does it operate normally?

- YES >> GO TO 6.
- >> Air outlet does not change. Refer to <u>HAC-63. "Diagnosis Procedure"</u>. NO-1
- >> Air inlet does not change. Refer to HAC-66, "Diagnosis Procedure".
- NO-3 >> Discharge air temperature does not change. Refer to <a href="HAC-59">HAC-59</a>, "Diagnosis Procedure" and <a href="HA 61, "Diagnosis Procedure".
- NO-5 >> Magnet clutch does not operate. Refer to <u>HAC-74</u>, "<u>Diagnosis Procedure</u>".

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NO-4 >> Blower motor does not operate normally. Refer to HAC-70, "Diagnosis Procedure".

**HAC-113** Revision: 2013 August 2014 MURANO

### **INSUFFICIENT HEATING**

### < SYMPTOM DIAGNOSIS >

[WITHOUT 7 INCH DISPLAY]

### 6. CHECK AIR LEAKAGE FROM DUCT

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

#### Is the inspection result normal?

YES >> GO TO 7.

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

# 7.CHECK HEATER HOSE INSTALLATION CONDITION

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

#### Is the inspection result normal?

YES >> GO TO 8.

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

### 8.CHECK TEMPERATURE OF HEATER HOSE

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

#### CAUTION:

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

### Is the inspection result normal?

YES >> GO TO 9.

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

### 9. REPLACE HEATER CORE

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

#### Are the malfunction solved?

YES >> INSPECTION END

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

NOISE	
< SYMPTOM DIAGNOSIS > [WITHOU	JT 7 INCH DISPLAY]
NOISE	
Description	INFOID:000000009722112
Symptom • Noise • Noise is heard when the A/C system operates.	
Inspection procedure	INFOID:000000009722113
1.CHECK OPERATION	
<ol> <li>Operate the A/C system and check the operation. Refer to HAC-8. "Description &amp; I</li> <li>Check the parts where noise is occurring.</li> <li>Can the parts where noise is occurring be checked?</li> </ol>	nspection".
YES-1 >> Noise from blower motor: GO TO 2. YES-2 >> Noise from compressor: GO TO 3. YES-3 >> Noise from expansion valve: GO TO 4. YES-4 >> Noise from A/C piping (pipe, flexible hose): GO TO 6. YES-5 >> Noise from drive belt: GO TO 7. NO >> INSPECTION END  2.CHECK BLOWER MOTOR	
<ol> <li>Remove blower motor.</li> <li>Remove foreign materials that are in the blower unit.</li> <li>Check the noise from blower motor again.</li> <li>Is the inspection result normal?</li> <li>YES &gt;&gt; INSPECTION END</li> <li>NO &gt;&gt; Replace blower motor.</li> <li>CHECK COMPRESSOR</li> </ol>	H
Perform trouble diagnosis for the compressor and check the compressor. Refer to HA-	11, "Symptom Table"
$\begin{tabular}{ll} \hline \textbf{Is the inspection result normal?} \\ \hline \textbf{YES} & >> \textbf{INSPECTION END} \\ \hline \textbf{NO} & >> \textbf{Refill the refrigerant or replace the compressor according to the inspection} \\ \hline \textbf{4.CHECK WITH GAUGE PRESSURE} \\ \hline \end{tabular}$	results.
Perform the diagnosis with the gauge pressure. Refer to <u>HA-8, "Trouble Diagnosis For Is the inspection result normal?</u>	Unusual Pressure".
YES >> GO TO 5. NO >> Repair or replace parts according to the inspection results.  5. CHECK EXPANSION VALVE	ı
<ol> <li>Correct the refrigerant with recovery/recycling recharging equipment.</li> <li>Recharge with the proper amount of the collected refrigerant after recycling or new</li> <li>Check for the noise from expansion valve again.</li> </ol>	refrigerant.
Are the malfunction solved?  YES >> INSPECTION END NO >> Replace expansion valve.	(
6.CHECK A/C PIPING (PIPE, FLEXIBLE HOSE)	

Check the A/C piping (pipes, flexible hoses) (for deformation and damage, etc.).

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

>> Repair or replace parts according to the inspection results.

Is the inspection result normal?

7. CHECK DRIVE BELT

YES

NO

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

Check tension of the drive belt. Refer to EM-17, "Checking". Is the inspection result normal?

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

### **MEMORY FUNCTION DOES NOT OPERATE**

< SYMPTOM DIAGNOSIS >

[WITHOUT 7 INCH DISPLAY]

# MEMORY FUNCTION DOES NOT OPERATE

Description INFOID:00000000007722114

### Symptom

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

### Inspection procedure

# 1. CHECK OPERATION

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

### Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 2.

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

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

#### Is the inspection result normal?

YES >> Replace the A/C auto amp.

NO >> Repair or replace malfunctioning parts.

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### **PRECAUTION**

# PRECAUTIONS FOR USA AND CANADA

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

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

#### **WARNING:**

Always observe the following items for preventing accidental activation.

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

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

#### WARNING:

Always observe the following items for preventing accidental activation.

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

FOR USA AND CANADA: Precautions for Removing of Battery Terminal INFOID-00000010092838

 When removing the 12V battery terminal, turn OFF the ignition switch and wait at least 30 seconds.

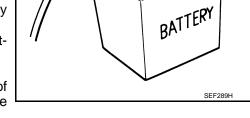
#### NOTE:

ECU may be active for several tens of seconds after the ignition switch is turned OFF. If the battery terminal is removed before ECU stops, then a DTC detection error or ECU data corruption may occur

• For vehicles with the 2-batteries, be sure to connect the main battery and the sub battery before turning ON the ignition switch.

#### NOTE:

If the ignition switch is turned ON with any one of the terminals of main battery and sub battery disconnected, then DTC may be detected.



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After installing the 12V battery, always check "Self Diagnosis Result" of all ECUs and erase DTC.
 NOTE:

The removal of 12V battery may cause a DTC detection error.

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

#### **CAUTION:**

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

Revision: 2013 August HAC-118 2014 MURANO

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

#### CONTAMINATED REFRIGERANT

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

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

### FOR USA AND CANADA: General Refrigerant Precaution

#### **WARNING:**

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

# FOR USA AND CANADA: Refrigerant Connection

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

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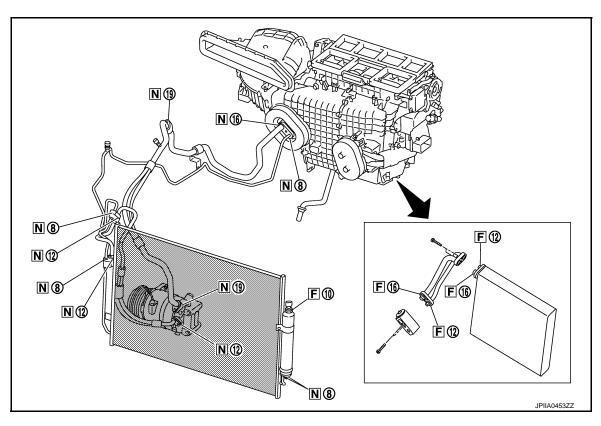
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**HAC-119** 2014 MURANO Revision: 2013 August

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

### O-RING AND REFRIGERANT CONNECTION



- F. Former type refrigerant connection N. New type refrigerant connection
- O: O-ring size

### **CAUTION:**

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

O-Ring Part Numbers and Specifications

Connection type	Piping connection point	Part number	QTY	O-ring size	
	Low-pressure flexible hose to low-pressure pip	е	92474 N8210	1	ф19
	High-pressure pipe to condenser pipe assemble	y (Outlet)	92471 N8210	1	ф8
	Condenser pipe assembly (Inlet) to high-pressure hose (One-touch joint)	ure flexible	92472 N8210	1	ф12
	Condenser assembly to condenser pipe as-	Inlet	92472 N8210	1	φ12
	sembly	Outlet	92471 N8210	1	ф8
New	Low-pressure pipe to expansion valve	92473 N8210	1	ф16	
	High-pressure pipe to expansion valve	92471 N8210	1	ф8	
	Compressor to low-pressure flexible hose	92474 N8210	1	φ19	
	Compressor to high-pressure flexible hose		92472 N8210	1	φ12
	Linuid to the condenses and the	Inlet	00474 N0040	1	10
	Liquid tank to condenser assembly	Outlet	92471 N8210	1	ф8

### < PRECAUTION >

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

### **WARNING:**

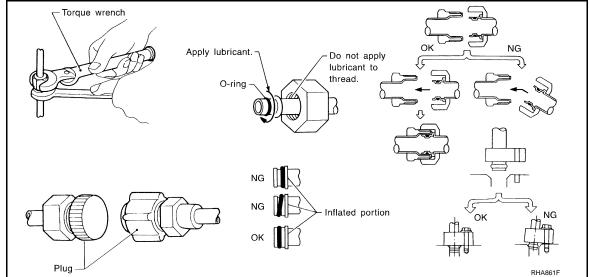
Check that all refrigerant is discharged into the recycling equipment and the pressure in the system is less than atmospheric pressure. Then gradually loosen the discharge side hose fitting and remove it. **CAUTION**:

Observe the following when replacing or cleaning refrigerant cycle components.

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

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

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



### FOR USA AND CANADA: Service Equipment

### RECOVERY/RECYCLING EQUIPMENT

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

#### ELECTRICAL LEAK DETECTOR

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

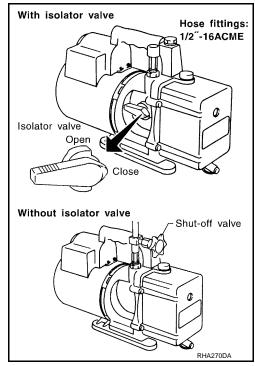
### **VACUUM PUMP**

The lubricant contained inside the vacuum pump is not compatible with the specified lubricant for HFC-134a (R-134a) A/C systems. The vent side of the vacuum pump is exposed to atmospheric pressure. So the vacuum pump lubricant may migrate out of the pump into the service hose. This is possible when the pump is switched OFF after evacuation (vacuuming) and hose is connected to it.

To prevent this migration, use a manual valve placed near the hose-to-pump connection, as per the following.

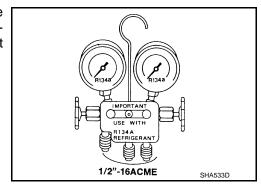
- Vacuum pumps usually have a manual isolator valve as part of the pump. Close this valve to isolate the service hose from the pump.
- Use a hose equipped with a manual shut-off valve near the pump end for pumps without an isolator. Close the valve to isolate the hose from the pump.
- Disconnect the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

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



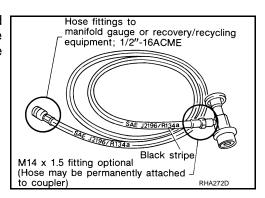
#### MANIFOLD GAUGE SET

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



#### SERVICE HOSES

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

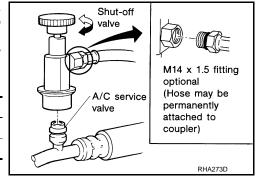


SERVICE COUPLERS

### [WITHOUT 7 INCH DISPLAY]

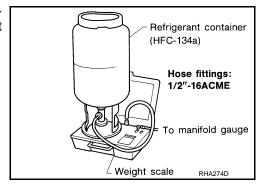
Never attempt to connect HFC-134a (R-134a) service couplers to a CFC-12 (R-12) A/C system. The HFC-134a (R-134a) couplers do not properly connect to the CFC-12 (R-12) system. However, if an improper connection is attempted, discharge and contamination may occur.

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



#### REFRIGERANT WEIGHT SCALE

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



### **CHARGING CYLINDER**

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

FOR MEXICO

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

The Supplemental Restraint System such as "AIR BAG" and "SEAT BELT PRE-TENSIONER", used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. Information necessary to service the system safely is included in the "SRS AIR BAG" and "SEAT BELT" of this Service Manual.

### **WARNING:**

Always observe the following items for preventing accidental activation.

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

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

### **WARNING:**

Always observe the following items for preventing accidental activation.

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

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### FOR MEXICO: Precautions for Removing of Battery Terminal

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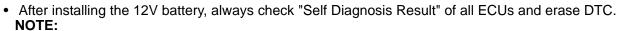
 When removing the 12V battery terminal, turn OFF the ignition switch and wait at least 30 seconds.

#### NOTE:

ECU may be active for several tens of seconds after the ignition switch is turned OFF. If the battery terminal is removed before ECU stops, then a DTC detection error or ECU data corruption may occur.

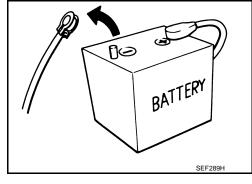
For vehicles with the 2-batteries, be sure to connect the main battery and the sub battery before turning ON the ignition switch.
 NOTE:

If the ignition switch is turned ON with any one of the terminals of main battery and sub battery disconnected, then DTC may be detected.



The removal of 12V battery may cause a DTC detection error.

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



#### **CAUTION:**

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

### CONTAMINATED REFRIGERANT

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

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

### FOR MEXICO: General Refrigerant Precaution

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### **WARNING:**

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

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

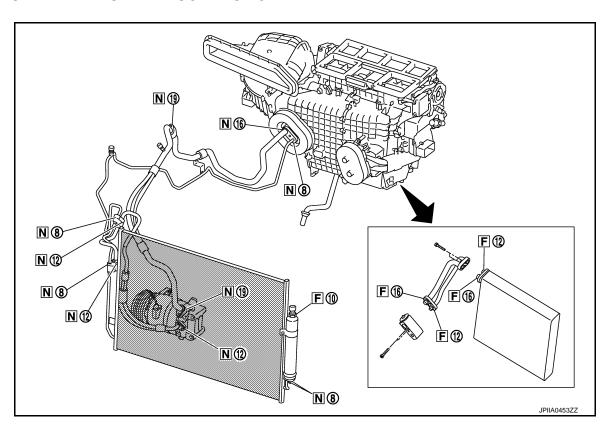
- Never release refrigerant into the air. Use approved recovery/recycling equipment to capture the refrigerant each time an air conditioning system is discharged.
- Always wear eye and hand protection (goggles and gloves) when working with any refrigerant or air conditioning system.
- Never store or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

### FOR MEXICO: Refrigerant Connection

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

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

#### O-RING AND REFRIGERANT CONNECTION



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

O: O-ring size

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

O-Ring Part Numbers and Specifications

Connection type	Piping connection point		Part number	QTY	O-ring size
	Low-pressure flexible hose to low-pressure pipe	Э	92474 N8210	1	φ19
	High-pressure pipe to condenser pipe assembly	y (Outlet)	92471 N8210	1	ф8
	Condenser pipe assembly (Inlet) to high-pressult hose (One-touch joint)	ire flexible	92472 N8210	1	φ12
	Condenser assembly to condenser pipe as-	Inlet	92472 N8210	1	φ12
	sembly	Outlet	92471 N8210	1	ф8
New	Low-pressure pipe to expansion valve	92473 N8210	1	φ16	
	High-pressure pipe to expansion valve	92471 N8210	1	ф8	
	Compressor to low-pressure flexible hose	92474 N8210	1	φ19	
	Compressor to high-pressure flexible hose	92472 N8210	1	φ12	
	Linuid to the condenses and the	Inlet	00474 N0040	1	
	Liquid tank to condenser assembly	Outlet	92471 N8210	1	φ8
	Refrigerant pressure sensor to liquid tank	+	J2476 89956	1	φ10
		Inlet	92475 71L00	1	φ12
Former	Expansion valve to evaporator pipe assembly	Outlet	92475 72L00	1	φ16
	Francisco de consente de conse	Inlet	92475 71L00	1	φ12
	Evaporator to evaporator pipe assembly	Outlet	92475 72L00	1	φ16

#### WARNING.

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

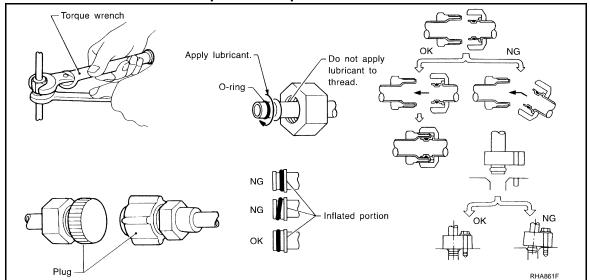
Observe the following when replacing or cleaning refrigerant cycle components.

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

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

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

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



### FOR MEXICO: Service Equipment

### RECOVERY/RECYCLING EQUIPMENT

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

#### ELECTRICAL LEAK DETECTOR

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

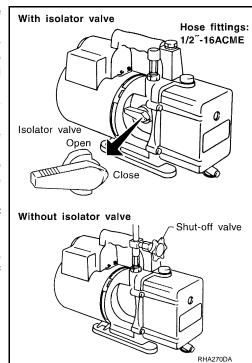
### **VACUUM PUMP**

The lubricant contained inside the vacuum pump is not compatible with the specified lubricant for HFC-134a (R-134a) A/C systems. The vent side of the vacuum pump is exposed to atmospheric pressure. So the vacuum pump lubricant may migrate out of the pump into the service hose. This is possible when the pump is switched OFF after evacuation (vacuuming) and hose is connected to it.

To prevent this migration, use a manual valve placed near the hose-to-pump connection, as per the following.

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

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



MANIFOLD GAUGE SET

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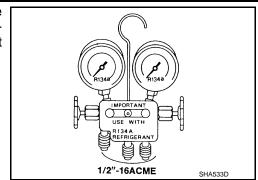
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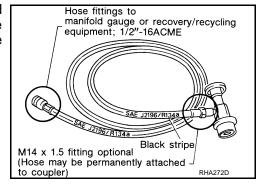
### [WITHOUT 7 INCH DISPLAY]

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



### SERVICE HOSES

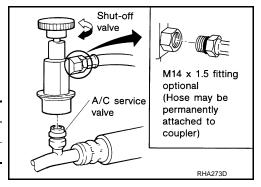
Be certain that the service hoses display the markings described (colored hose with a black stripe). All hoses must equip positive shut-off devices (either manual or automatic) near the end of the hoses opposite to the manifold gauge.



### SERVICE COUPLERS

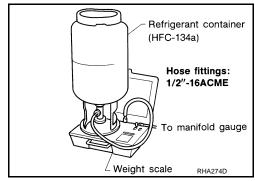
Never attempt to connect HFC-134a (R-134a) service couplers to a CFC-12 (R-12) A/C system. The HFC-134a (R-134a) couplers do not properly connect to the CFC-12 (R-12) system. However, if an improper connection is attempted, discharge and contamination may occur.

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



### REFRIGERANT WEIGHT SCALE

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



### CHARGING CYLINDER

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

### **COMPRESSOR**

< PRECAUTION >

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### **COMPRESSOR**

**General Precautions** 

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#### **CAUTION:**

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

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### FLUORESCENT LEAK DETECTOR

< PRECAUTION >

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### FLUORESCENT LEAK DETECTOR

### **General Precautions**

#### **CAUTION:**

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

### **IDENTIFICATION**

#### NOTE:

Vehicles with factory installed fluorescent dye have a green label.

Vehicles without factory installed fluorescent dye have a blue label.

#### IDENTIFICATION LABEL FOR VEHICLE

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

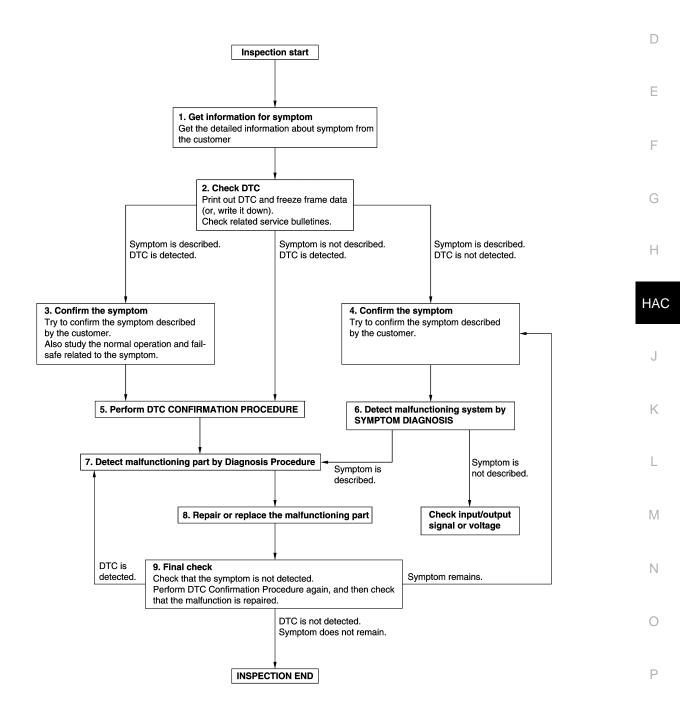
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# **BASIC INSPECTION**

### DIAGNOSIS AND REPAIR WORKFLOW

Work Flow INFOID:0000000009722128 В

**OVERALL SEQUENCE** 



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### DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

[WITH 7 INCH DISPLAY]

# 1.GET INFORMATION FOR SYMPTOM

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

>> GO TO 2.

# 2. CHECK DTC

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

### Are any symptoms described and any DTC detected?

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

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

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

### 3.CONFIRM THE SYMPTOM

Try to confirm the symptom described by the customer.

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

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

>> GO TO 5.

### 4. CONFIRM THE SYMPTOM

Try to confirm the symptom described by the customer.

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

>> GO TO 6.

### 5. PERFORM DTC CONFIRMATION PROCEDURE

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

#### NOTE:

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

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

### Is DTC detected?

YES >> GO TO 7.

NO >> Check according to GI-44, "Intermittent Incident".

# 6.DETECT MALFUNCTIONING SYSTEM BY SYMPTOM DIAGNOSIS

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

#### Is the symptom described?

YES >> GO TO 7.

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

### 7.DETECT MALFUNCTIONING PART BY DIAGNOSIS PROCEDURE

### **DIAGNOSIS AND REPAIR WORKFLOW**

### < BASIC INSPECTION >

[WITH 7 INCH DISPLAY]

Inspect according to Diagnosis Procedure of the system.

Is malfunctioning part detected?

YES >> GO TO 8.

NO >> Check according to GI-44, "Intermittent Incident".

# 8.repair or replace the malfunctioning part

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

>> GO TO 9.

### 9. FINAL CHECK

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

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

### Is DTC detected and does symptom remain?

YES-1 >> DTC is detected: GO TO 7.

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

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

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### INSPECTION AND ADJUSTMENT

< BASIC INSPECTION >

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### INSPECTION AND ADJUSTMENT

### **Description & Inspection**

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### DESCRIPTION

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

### Conditions : Engine running at normal operating temperature

### INSPECTION PROCEDURE

# 1. CHECK MEMORY FUNCTION

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

### Is the inspection result normal?

YES >> GO TO 2.

NO >> Memory function malfunction: HAC-241, "Inspection procedure".

### 2.CHECK BLOWER MOTOR SPEED

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

### Is the inspection result normal?

YES >> GO TO 3.

NO >> Blower motor system malfunction: <u>HAC-196</u>, "<u>Diagnosis Procedure</u>".

# 3.check discharge air(mode switch and def switch)

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

#### NOTE:

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

#### Is the inspection result normal?

YES >> GO TO 4.

NO >> Mode door system malfunction: HAC-189, "Diagnosis Procedure".

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

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

< BASIC INSPECTION >

### [WITH 7 INCH DISPLAY]

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

Discharge air flow							
Mode position	Condition	Air outlet/distribution					
indication		VENT			FOOT		DEE
		Front	Upper	Rear	Front	Rear	DEF
نه-ّ	DUAL switch: OFF UPPER VENT switch : ON	81%	8%	11%	_	_	_
**		41%	10%	17%	24%	8%	_
<b>`~</b> i		12%	12%	16%	27%	10%	23%
<b>*</b>		11%	11%	14%	25%	10%	29%
¥		11%	11%	12%	_	_	66%

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

#### Does it operate normally?

YES >> GO TO 5.

>> Upper ventilator door system malfunction: <u>HAC-194, "Diagnosis Procedure"</u>. NO

### CHECK INTAKE AIR

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

#### NOTE:

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

### Is the inspection result normal?

YES >> GO TO 6.

>> Intake door system malfunction: <u>HAC-192</u>, "Diagnosis Procedure". NO

### 6.CHECK A/C SWITCH

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

#### Is the inspection result normal?

YES >> GO TO 7.

NO >> Magnet clutch system malfunction: <u>HAC-200</u>, "Diagnosis Procedure".

### 7.CHECK WITH TEMPERATURE SETTING LOWERED

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

#### Is the inspection result normal?

YES >> GO TO 8.

NO >> Insufficient cooling: <u>HAC-233</u>, "Inspection procedure".

### f 8.CHECK WITH TEMPERATURE SETTING RAISED

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

### Is the inspection result normal?

YES >> GO TO 9.

NO >> Insufficient heating: <u>HAC-236</u>, "Inspection procedure". HAC

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[WITH 7 INCH DISPLAY]

# $9.\mathsf{CHECK}\ \mathsf{LH/RH}\ \mathsf{INDEPENDENT}\ \mathsf{TEMPERATURE}\ \mathsf{ADJUSTMENT}\ \mathsf{FUNCTION}$

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

#### Is the inspection result normal?

YES >> GO TO 10.

NO >> Refer to <u>HAC-232</u>. "<u>Diagnosis Chart By Symptom</u>" and perform the appropriate diagnosis.

### 10. CHECK AUTO MODE

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

### Is the inspection result normal?

YES >> INSPECTION END

NO >> Refer to <u>HAC-232</u>, "<u>Diagnosis Chart By Symptom</u>" and perform the appropriate diagnosis.

### Temperature Setting Trimmer

INFOID:0000000009722130

### Description

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

#### How to set

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

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

#### NOTE:

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

# Foot Position Setting Trimmer

INFOID:0000000009722131

### Description

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

[WITH 7 INCH DISPLAY]

How to set

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

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

#### NOTE:

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

### Inlet Port Memory Function (FRE)

### Description

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

#### How to set

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

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

#### NOTE:

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

### Inlet Port Memory Function (REC)

### Description

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

#### How to set

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

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

### NOTE:

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

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# SYSTEM DESCRIPTION

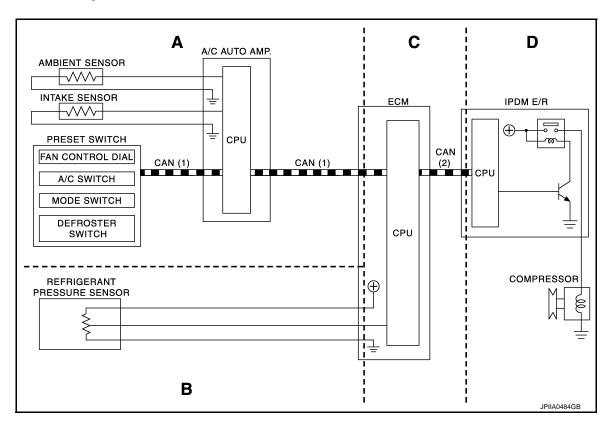
### **COMPRESSOR CONTROL FUNCTION**

Description INFOID:000000009722134

### 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

x: Applicable

						×: Applicable
Control unit Diagnosis item	Location					
Control unit	t Diagnosis item		А	В	С	D
		Self-diagnosis	×	_	_	_
A/C auto amp.	(HVAC"	Data monitor	×	_	_	_
		Active test	×	_	_	×
ECM (P) "ENGINE"	Self-diagnosis function (CAN system diagnosis)	_	_	×	_	
		Data monitor	_	×	×	_
IPDM E/R	Self-diagnosis function (CAN system diagnosis)	_	_	_	×	
		Data monitor	_	_	×	_
	Auto active test		_	_	_	×

### **COMPRESSOR CONTROL FUNCTION**

### < SYSTEM DESCRIPTION >

[WITH 7 INCH DISPLAY]

Fail-Safe

### **FAIL-SAFE FUNCTION**

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

Compressor : ON
Air outlet : AUTO

Air inlet : FRE (Fresh)

Blower fan speed : AUTO

Set temperature : Setting before communication error occurs

Component Part Location INFOID:000000009722136

ENGINE COMPARTMENT

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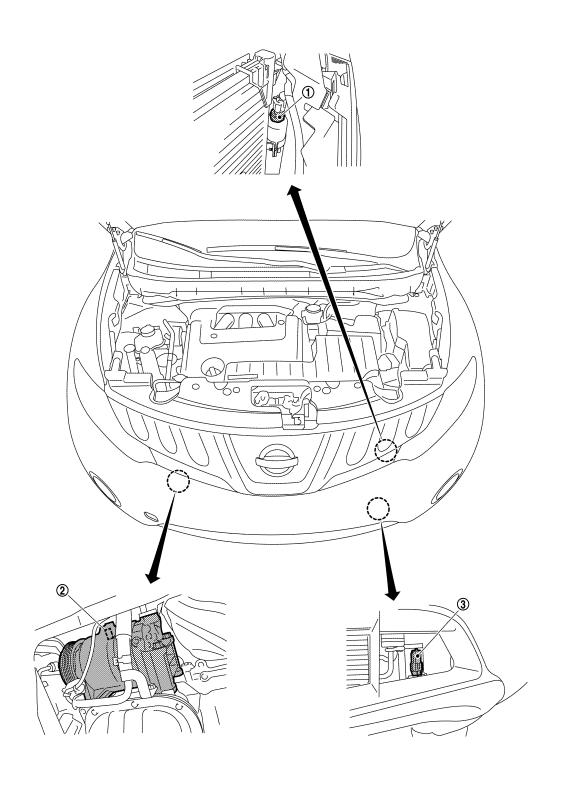
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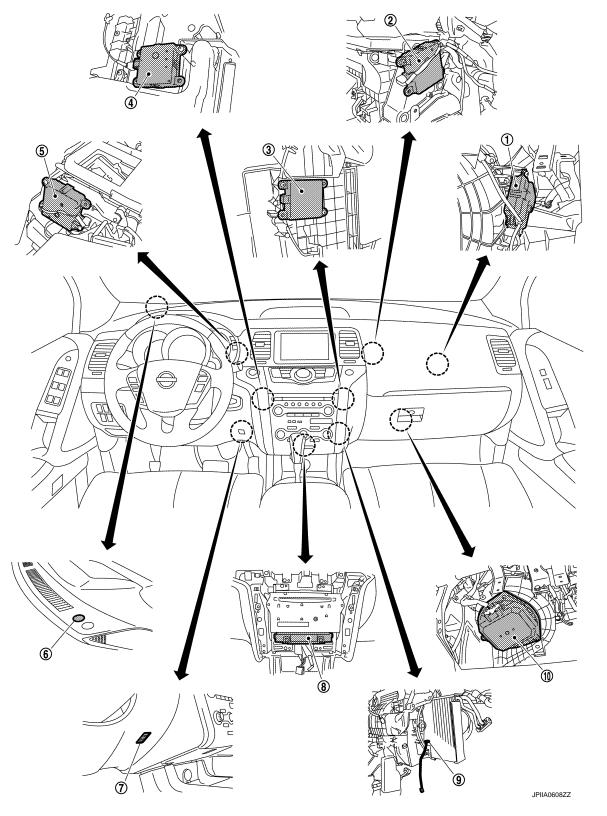


JPIIA0607ZZ

Refrigerant pressure sensor

2. Compressor (magnet clutch) 3. Ambient sensor

### PASSENGER COMPARTMENT



- Intake door motor
- 4. Air mix door motor (driver side)
- 7. In-vehicle sensor
- 10. Blower motor

- 2. Upper ventilator door motor
- 5. Mode door motor
- 8. A/C auto amp.

- 3. Air mix door motor (passenger side)
- 6. Sunload sensor
- 9. Intake sensor

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### **COMPRESSOR CONTROL FUNCTION**

### < SYSTEM DESCRIPTION >

### [WITH 7 INCH DISPLAY]

# Component's Role

INFOID:0000000009722137

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

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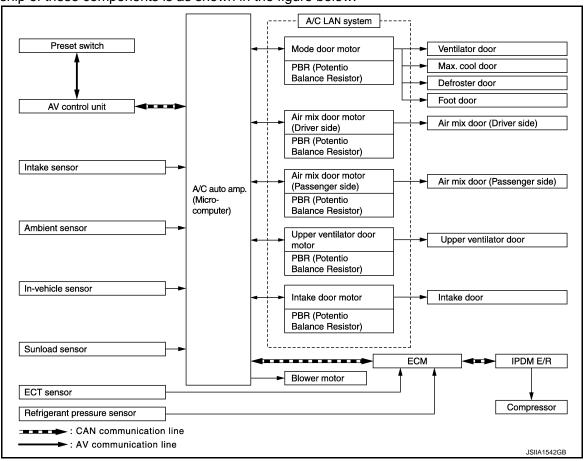
INFOID:0000000009722139

### **AUTOMATIC AIR CONDITIONER SYSTEM**

System Diagram

### CONTROL SYSTEM

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



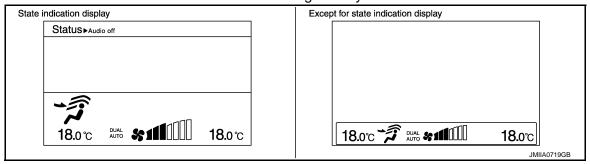
# System Description

### **CONTROL OPERATION**

Display

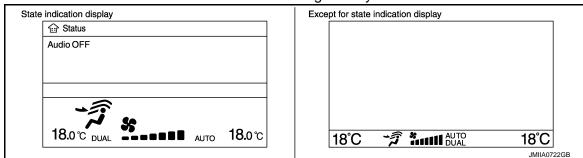
The operation status of the system is displayed on the screen.

### Models with navigation system

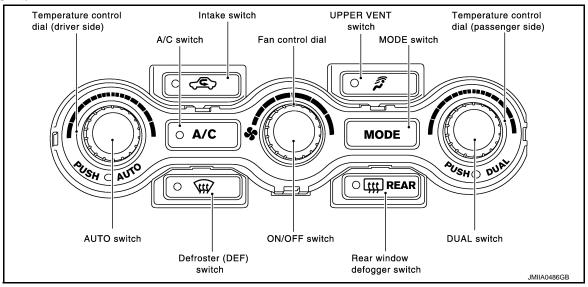


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### Models without navigation system



#### Preset Switch



#### MODE Switch

The air discharge outlets are controlled with this switch.

Temperature Control Dial (Driver Side)

The set temperature is increased or decreased with this dial.

Temperature Control Dial (Passenger Side)

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

#### **AUTO Switch**

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

### Defroster (DEF) Switch

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

### **UPPER VENT Switch**

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

#### A/C Switch

Compressor turns ON or OFF with this switch.

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

#### Fan Control Dial

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

### **AUTOMATIC AIR CONDITIONER SYSTEM**

### < SYSTEM DESCRIPTION >

[WITH 7 INCH DISPLAY]

ON/OFF Switch

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

Rear Window Defogger Switch

When indicator is ON, rear window is defogged.

#### Intake Switch

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

#### DUAL Switch

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

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**HAC-145** Revision: 2013 August 2014 MURANO

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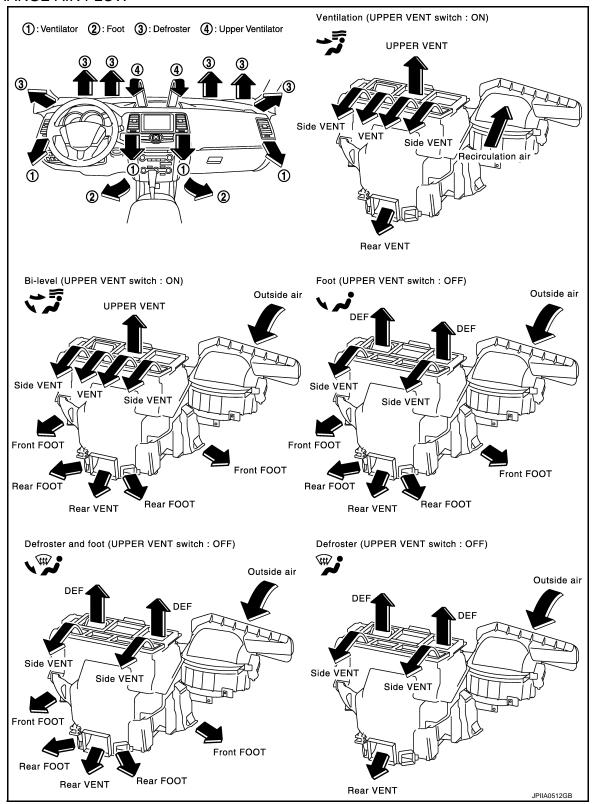
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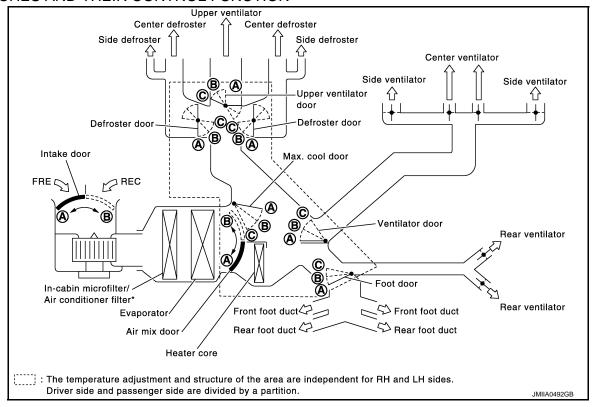
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### **DISCHARGE AIR FLOW**



### SWITCHES AND THEIR CONTROL FUNCTION



\* : Models for Mexico.

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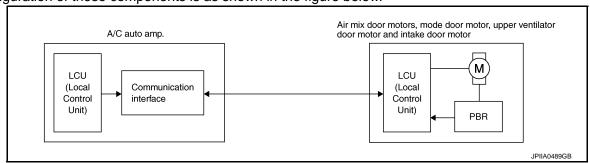
							Door p	osition				
Switch position			Ventilator door	Max. cool door	Defroster door	Foot door	Upper ventila- tor door	Intake door	Air mix door (Driver side)	Air mix door (Pas- senger side)		
AUTO switch		*			AUTO					AU	ТО	
	VENT	7		А	Α	Α	Α					
MODE	B/L	<b>3</b> 7		В	В	А	В					
switch	FOOT		,j	С	В	В	С	_				
	D/F	9	Pi	С	В	В	В		В			
DEF switch	<b>(4)</b>	*		С	С	С	Α		В	_	_	
UPPER VENT	ON	<b>Î</b>	*			_		A-B				
switch	OFF	~	0					С				
Intake	ON	ڪ	*						A <sup>*</sup>			
switch	OFF		0						B <sup>*</sup>			
Townsorotors	DUAL switch: OFF	(60	0°C 0°F)							А		
Temperature control dial (Driver side)		switch:	witch: 18.5°C ¢	⇒ 31.5°C ⇒ 89°F)							AUTO	
,		32.0°C (90°F)							В			
_			.0°C )°F)	_	_	_		_		Α		
Temperature control dial (Driver side)			18.5°C ⇔ 31.5°C (61°F ⇔ 89°F)						_	AUTO	_	
(= 5. 5.25)	DUAL switch:		.0°C )°F)							В		
Temperature	ON ON		18.0°C (60°F)								А	
control dial (Passenger		rol dial $18.5^{\circ}\text{C} \Leftrightarrow 31.5^{\circ}\text{C}$ senger $(61^{\circ}\text{F} \Leftrightarrow 89^{\circ}\text{F})$								_	AUTO	
side)			32.0°C (90°F)								В	
	ON/OFF switch			С	С	В	С		В	_		

<sup>\*:</sup> Inlet status is displayed by indicator when activating automatic control.

### AIR CONDITIONER LAN CONTROL SYSTEM

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

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



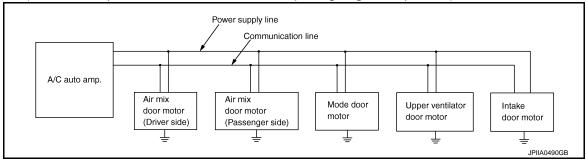
#### SYSTEM CONSTRUCTION

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

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

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

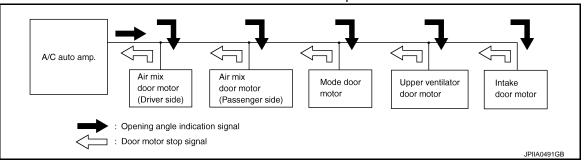
- Address
- · Motor opening angle signals
- Data transmission
- · Motor stop and drive decision
- Opening angle sensor (PBR function)
- Comparison
- Decision (A/C auto amp. indicated value and motor opening angle comparison)



#### Operation

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

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



Transmission Data and Transmission Order

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

#### START:

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

#### ADDRESS:

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

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[WITH 7 INCH DISPLAY]

#### **OPENING ANGLE:**

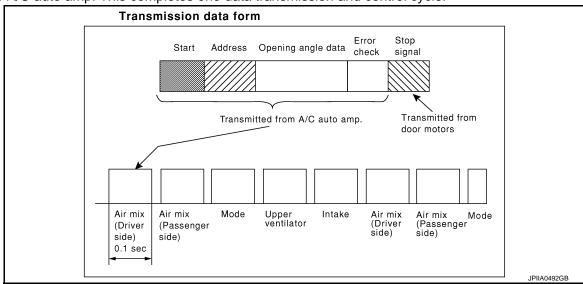
Data that shows the indicated door opening angle of each door motor.

#### ERROR CHECK:

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

#### STOP SIGNAL:

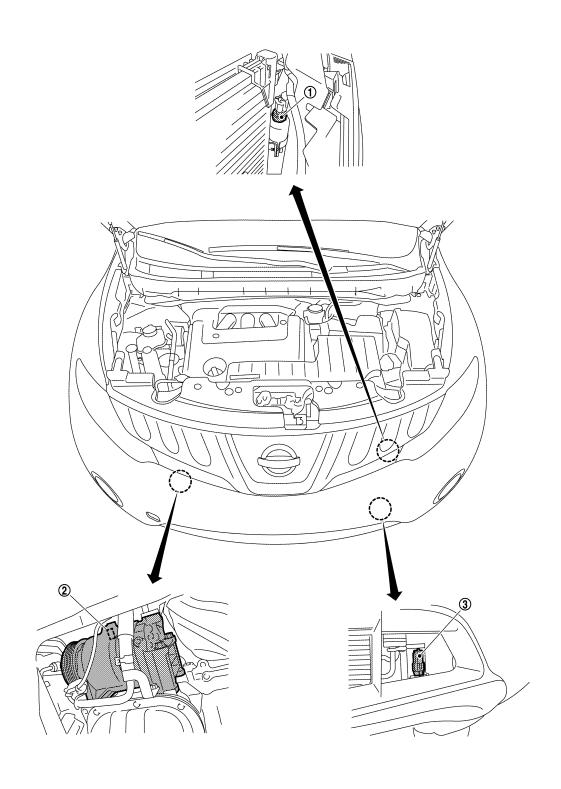
• At the end of each transmission, a stop operation, in-operation, or internal malfunction message is delivered to the A/C auto amp. This completes one data transmission and control cycle.



Component Part Location

**ENGINE COMPARTMENT** 

INFOID:0000000009722140



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1. Refrigerant pressure sensor

2. Compressor (magnet clutch)

3. Ambient sensor

PASSENGER COMPARTMENT

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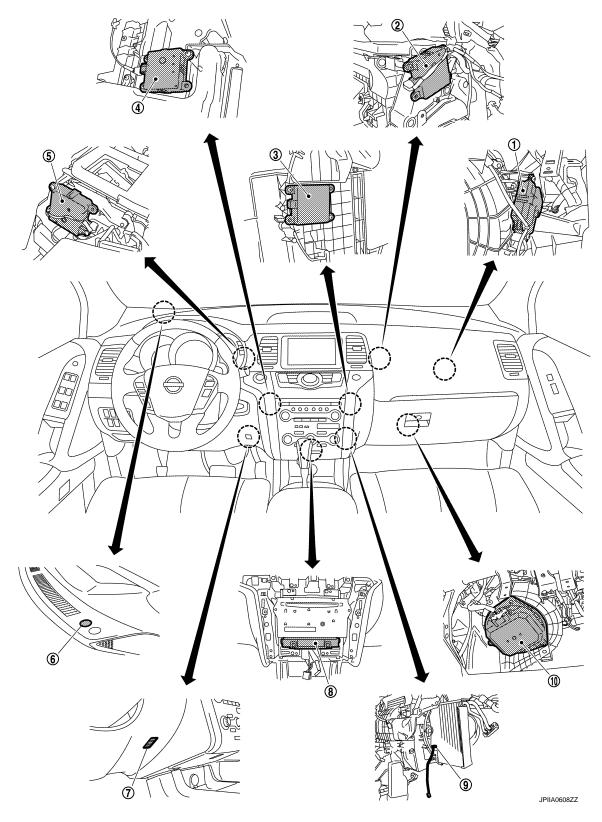
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- 1. Intake door motor
- 4. Air mix door motor (driver side)
- 7. In-vehicle sensor
- 10. Blower motor

- 2. Upper ventilator door motor
- 5. Mode door motor
- 8. A/C auto amp.

- 3. Air mix door motor (passenger side)
- 6. Sunload sensor
- 9. Intake sensor

## **AUTOMATIC AIR CONDITIONER SYSTEM**

< SYSTEM DESCRIPTION >

## [WITH 7 INCH DISPLAY]

# **Component Description**

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

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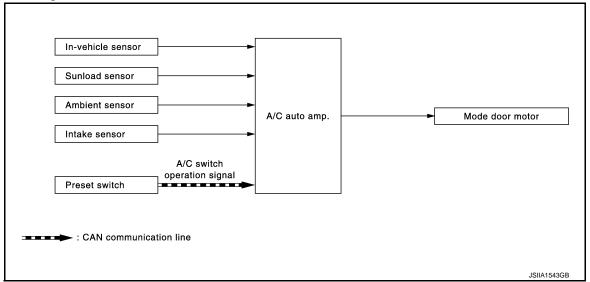
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## MODE DOOR CONTROL SYSTEM

## System Diagram

INFOID:0000000009722142



## System Description

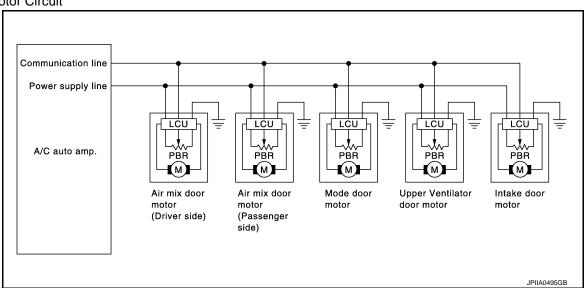
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The mode door is automatically controlled by the temperature setting, ambient temperature, in-vehicle temperature, intake temperature and amount of sunload.

#### SYSTEM OPERATION

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

#### **Door Motor Circuit**



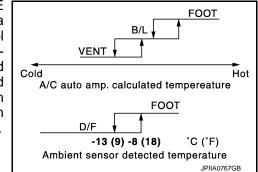
Mode Door Control Specification

### MODE DOOR CONTROL SYSTEM

### < SYSTEM DESCRIPTION >

### [WITH 7 INCH DISPLAY]

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



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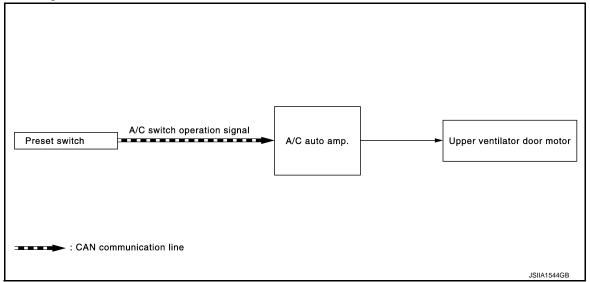
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## UPPER VENTILATOR DOOR CONTROL SYSTEM

## System Diagram

INFOID:00000000009722144



## System Description

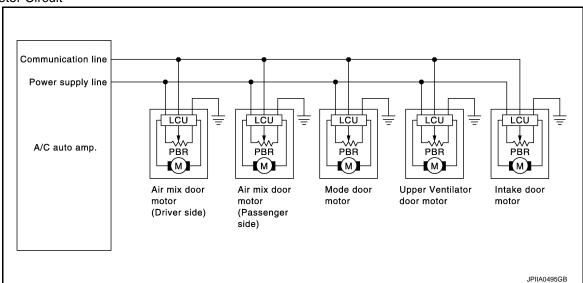
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The upper ventilator door motor is attached to the heater & cooling unit assembly. The upper ventilator door motor operates by the UPPER VENT switch ON/OFF. Motor rotation is conveyed to a rod which activates the upper ventilator door.

### SYSTEM OPERATION

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

#### **Door Motor Circuit**



## **UPPER VENTILATOR DOOR CONTROL SYSTEM**

< SYSTEM DESCRIPTION >

[WITH 7 INCH DISPLAY]

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

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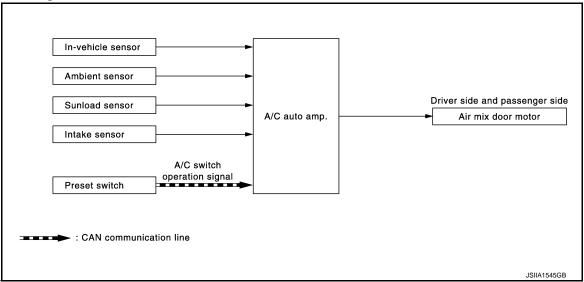
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## AIR MIX DOOR CONTROL SYSTEM

## System Diagram

INFOID:0000000009722146



## System Description

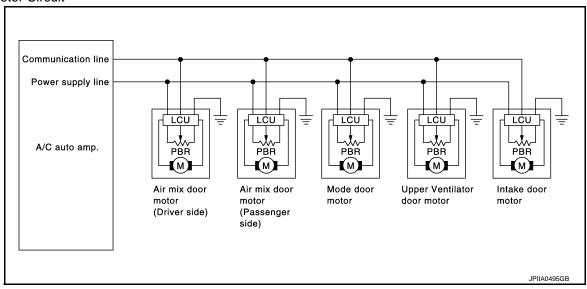
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The air mix doors are automatically controlled so that in-vehicle temperature is maintained at a predetermined value by the temperature setting, ambient temperature, intake temperature and amount of sunload.

### SYSTEM OPERATION

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

#### **Door Motor Circuit**



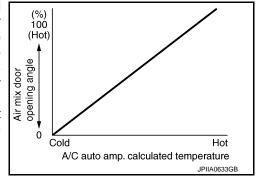
Air Mix Door Control Specification

### AIR MIX DOOR CONTROL SYSTEM

### < SYSTEM DESCRIPTION >

### [WITH 7 INCH DISPLAY]

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



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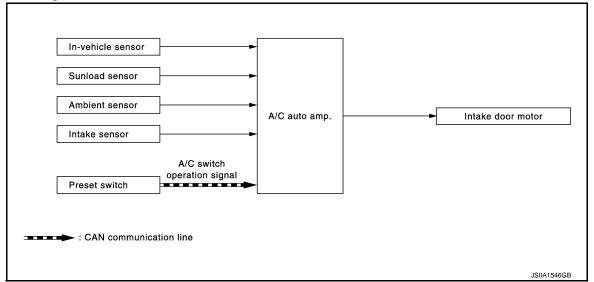
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## INTAKE DOOR CONTROL SYSTEM

## System Diagram

INFOID:0000000009722148



## System Description

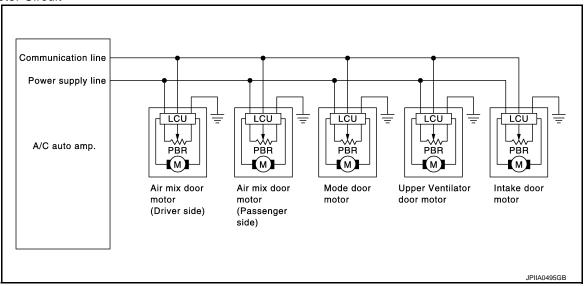
INFOID:0000000009722149

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

#### SYSTEM OPERATION

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

#### **Door Motor Circuit**



Intake Door Control Specification

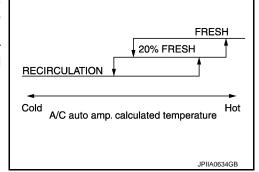
### INTAKE DOOR CONTROL SYSTEM

## < SYSTEM DESCRIPTION >

### [WITH 7 INCH DISPLAY]

Intake door position is basically set to the FRE when the FRE indicator of the DEF switch and the intake switch turn ON, and set on the REC when the REC indicator of intake switch turns ON.

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



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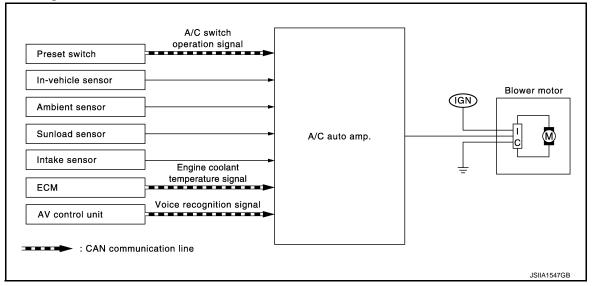
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## **BLOWER MOTOR CONTROL SYSTEM**

## System Diagram

INFOID:0000000009722150



## System Description

INFOID:0000000009722151

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

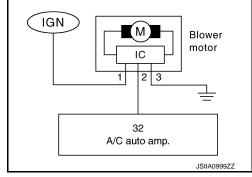
By pressing the AUTO switch, the blower motor starts to gradually increase air flow volume.

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

#### SYSTEM OPERATION

### System operation

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



#### Normal automatic air flow control

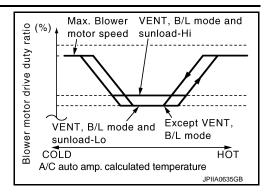
- When the target temperature is set by the temperature control dial of preset switch, the A/C auto amp. performs the calculation and decides the target according to the signal from each sensor.
- The A/C auto amp. changes the duty ratio of blower motor drive signal and controls the air flow continuously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

### **BLOWER MOTOR CONTROL SYSTEM**

### < SYSTEM DESCRIPTION >

[WITH 7 INCH DISPLAY]

Fan Speed Control Specification



Starting air flow control

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

Starting Fan Speed Control

Start up from COLD SOAK Condition (Automatic mode)

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

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

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

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

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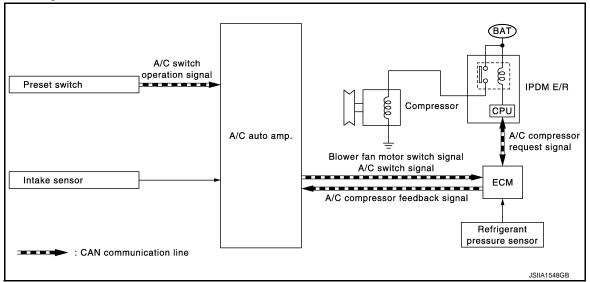
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## MAGNET CLUTCH CONTROL SYSTEM

## System Diagram

INFOID:0000000009722152



## System Description

INFOID:0000000009722153

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

#### SYSTEM OPERATION

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

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

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

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

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

### Compressor Protection Control

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

### Low Temperature Protection Control

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

### **CAN COMMUNICATION SYSTEM**

< SYSTEM DESCRIPTION >

[WITH 7 INCH DISPLAY]

## CAN COMMUNICATION SYSTEM

## System Description

INFOID:0000000009722154

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

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## **CONSULT Function**

INFOID:0000000009722155

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

**CONSULT** application items

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

### SELF DIAGNOSTIC RESULT

Refer to HAC-230, "DTC Index".

Display Item List

DTC	Items (CONSULT screen terms)	Diagnostic item is detected when	Possible cause
U1000	CAN COMM CIRCUIT	When A/C auto amp. is not transmitting or receiving CAN communication signal for 2 or more seconds.	CAN communication system
U1010	CONTROL UNIT (CAN)	When detecting error during the initial diagnosis of CAN controller of A/C auto amp.	A/C auto amp.
B257B	AMB TEMP SEN SHORT	Detected temperature at ambient sensor –44°C (–47°F) or less	<ul><li>Ambient sensor</li><li>A/C auto amp.</li></ul>
B257C	AMB TEMP SEN OPEN	Detected temperature at ambient sensor 100°C (212°F) or more	<ul> <li>Harness and connector (Ambient sensor circuit is open, or there is a short in the circuit)</li> </ul>
B2578	IN CAR SEN SHORT	Detected temperature at in-vehicle sensor –44°C (–47°F) or less	In-vehicle sensor     A/C auto amp.
B2579	IN CAR SEN OPEN	Detected temperature at in-vehicle sensor 100°C (212°F) or more	Harness and connector     (In-vehicle sensor circuit is open, or there is a short in the circuit)
B2581	EVAP TEMP SEN SHORT	Detected temperature at intake sensor –33°C (–27°F) or less	Intake sensor     A/C auto amp.
B2582	EVAP TEMP SEN OPEN	Detected temperature at intake sensor 69°C (156°F) or more	Harness and connector     (Intake sensor circuit is open, or there is a short in the circuit)
B2630*	SUNLOAD SEN SHORT	Detected calorie at sunload sensor 64.7 w/m² (56 kcal/m²·h) or less	Sunload sensor     A/C auto amp.
B2631*	SUNLOAD SEN OPEN	Detected calorie at sunload sensor 2832 w/m² (2436 kcal/m²·h) or more	<ul> <li>Harness and connector (Sunload sensor circuit is open, or there is a short in the circuit)</li> </ul>
B2632	DR AIRMIX ACTR SHORT	Air mix door PBR (driver side) position 5% or less	Air mix door motor (driver side)     A/C auto amp.
B2633	DR AIRMIX ACTR OPEN	Air mix door PBR (driver side) position 95% or more	Harness and connector     (CAN communication line is open     or shorted)     (Air mix door motor is open or     shorted)

### < SYSTEM DESCRIPTION >

### [WITH 7 INCH DISPLAY]

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

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

### **DATA MONITOR**

### NOTE:

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

Display item list

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

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## < SYSTEM DESCRIPTION >

## [WITH 7 INCH DISPLAY]

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

## **ACTIVE TEST**

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

### **HVAC TEST**

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

### NOTE:

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

### **WORK SUPPORT**

Work item	Description	Reference
TEMP SET CORRECT (Setting of difference between temperature setting and control temperature)	If the temperature felt by the customer is different than the air flow temperature controlled by the temperature setting, the auto amplifier control temperature can be adjusted to compensate for the temperature setting.	HAC-136, "Temperature Setting Trimmer"
BLOW SET (Blow setting to DEF in FOOT mode)	In the FOOT mode, the air blowing to the DEF can change ON/ OFF.	HAC-136, "Foot Position Setting Trimmer"

## < SYSTEM DESCRIPTION >

## [WITH 7 INCH DISPLAY]

Work item	Description	Reference	
FRE MEMORY SET (FRE memory function setting)	<ul> <li>If the ignition switch is turned to the OFF position while the FRE switch is set to ON (fresh air intake), "Perform the memory" or "Do not perform the memory" of the FRE switch ON (fresh air intake) condition can be selected.</li> <li>If "Perform the memory" was set, the FRE switch will be ON (fresh air intake) when turning the ignition switch to the ON position again.</li> <li>If "Do not perform the memory" was set, the air inlets will be controlled automatically when turning the ignition switch to the ON position again.</li> </ul>	HAC-137, "Inlet Port Memory Function (FRE)"	
REC MEMORY SET (REC memory function setting)	If the ignition switch is turned to the OFF position while the REC switch is set to ON (recirculation), "Perform the memory" or "Do not perform the memory" of the REC switch ON (recirculation) condition can be selected.     If "Perform the memory" was set, the REC switch will be ON (recirculation) when turning the ignition switch to the ON position again.     If "Do not perform the memory" was set, the air inlets will be controlled automatically when turning the ignition switch to the ON position again.	HAC-137, "Inlet Port Memory Function (REC)"	[

### NOTE:

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

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# DTC/CIRCUIT DIAGNOSIS

### U1000 CAN COMM CIRCUIT

Description INFOID:000000009722156

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

CAN Communication Signal Chart. Refer to LAN-17, "How to Use CAN Communication Signal Chart".

DTC Logic

### DTC DETECTION LOGIC

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

## Diagnosis Procedure

INFOID:0000000009722158

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

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

### Is "CAN COMM CIRCUIT" displayed?

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

## **U1010 CONTROL UNIT (CAN)**

### < DTC/CIRCUIT DIAGNOSIS >

### [WITH 7 INCH DISPLAY]

# U1010 CONTROL UNIT (CAN)

Description INFOID:000000000722159

Initial diagnosis of A/C auto amp.

DTC Logic

### DTC DETECTION LOGIC

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

## Diagnosis Procedure

1.check with self-diagnosis function of consult

Using CONSULT, perform "SELF-DIAGNOSIS RESULTS" of HVAC.

Is DTC No. "U1010" displayed?

YES >> Replace A/C auto amp.

NO >> INSPECTION END

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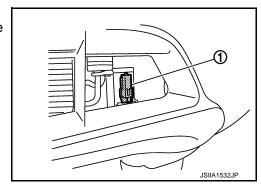
## B257B, B257C AMBIENT SENSOR

Description INFOID:000000009722162

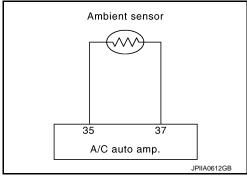
#### COMPONENT DESCRIPTION

#### **Ambient Sensor**

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



**Ambient Sensor Circuit** 



### AMBIENT TEMPERATURE INPUT PROCESS

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

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

DTC Logic

#### DTC DETECTION LOGIC

### NOTE:

- If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to <a href="HAC-170">HAC-171</a>, "DTC Logic" or <a href="HAC-171">HAC-171</a>, "DTC Logic".
- If there is an open circuit in the ambient sensor, A/C auto amp. registers extreme cold [-44°C (-47°F)] and adjusts the temperature control warmer.

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

### DTC CONFIRMATION PROCEDURE

 ${f 1}$  .CHECK WITH SELF-DIAGNOSIS FUNCTION OF CONSULT

## **B257B, B257C AMBIENT SENSOR**

### < DTC/CIRCUIT DIAGNOSIS >

[WITH 7 INCH DISPLAY]

INFOID:0000000009722164

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

#### NOTE:

- If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to HAC-170, "DTC Logic" or HAC-171, "DTC Logic".
- If there is an open circuit in the ambient sensor, A/C auto amp. registers extreme cold [-44°C (-47°F)] and adjusts the temperature control warmer.

### Is DTC No. "B257B" or "B257C" displayed?

YES >> Perform trouble diagnosis for the ambient sensor. Refer to HAC-173, "Diagnosis Procedure".

NO >> INSPECTION END

## Diagnosis Procedure

# 1. CHECK VOLTAGE BETWEEN AMBIENT SENSOR AND GROUND

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

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

#### Is the inspection result normal?

YES >> GO TO 2.

NO >> GO TO 4.

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

Turn ignition switch OFF.

- 2. Disconnect A/C auto amp. connector.
- 3. Check continuity between ambient sensor harness connector and A/C auto amp. harness connector.

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

#### Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair harness or connector.

## 3.CHECK AMBIENT SENSOR

Check ambient sensor. Refer to <a href="HAC-174">HAC-174</a>, "Component Inspection".

### Is the inspection result normal?

YES >> Replace A/C auto amp.

NO >> Replace ambient sensor.

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

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

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

Check continuity between ambient sensor harness connector and ground.

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Revision: 2013 August HAC-173 2014 MURANO

## **B257B, B257C AMBIENT SENSOR**

### < DTC/CIRCUIT DIAGNOSIS >

[WITH 7 INCH DISPLAY]

Ambient sensor			Continuity	
Connector	Terminal	_	Continuity	
E337	1	Ground	Not existed	

### Is the inspection result normal?

YES >> Replace A/C auto amp.

NO >> Repair harness or connector.

## Component Inspection

INFOID:0000000009722165

# 1. CHECK AMBIENT SENSOR

- 1. Turn ignition switch OFF.
- 2. Disconnect ambient sensor connector. Refer to VTL-90, "Exploded View".
- 3. Check resistance between ambient sensor terminals.

Tor	minal	Condition	Resistance kΩ	
161	IIIIIai	Temperature °C (°F)	Nesistance K22	
		-15 (5)	12.73	
		-10 (14)	9.92	
		-5 (23)	7.80	
		0 (32)	6.19	
		5 (41)	4.95	
		10 (50)	3.99	
1	2	15 (59)	3.24	
		20 (68)	2.65	
		25 (77)	2.19	
		30 (86)	1.81	
		35 (95)	1.51	
	_	40 (104)	1.27	
		45 (113)	1.07	

### Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace ambient sensor.

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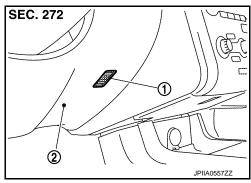
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## B2578, B2579 IN-VEHICLE SENSOR

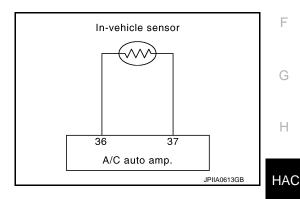
Description INFOID:0000000009722166

#### In-vehicle Sensor

- The in-vehicle sensor (1) is located on instrument driver lower SEC. 272 panel (2).
- It converts variations in compartment air temperature drawn from the aspirator into a resistance value. It is then input into the A/C auto amp.

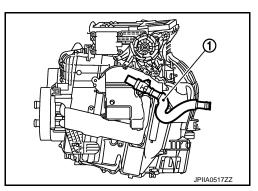


In-vehicle Sensor Circuit



#### Aspirator

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



Aspirator Aspirator duct ot Heater & cooling unit case RJIA1804E

**DTC** Logic INFOID:0000000009722167

DTC DETECTION LOGIC

**HAC-175** Revision: 2013 August 2014 MURANO

### B2578, B2579 IN-VEHICLE SENSOR

### < DTC/CIRCUIT DIAGNOSIS >

[WITH 7 INCH DISPLAY]

#### NOTE:

If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to <a href="HAC-170">HAC-171</a>, "DTC Logic" or <a href="HAC-171">HAC-171</a>, "DTC Logic".

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

### DTC CONFIRMATION PROCEDURE

## ${f 1}$ .CHECK WITH SELF-DIAGNOSIS FUNCTION OF CONSULT

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

#### NOTE:

If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to <a href="HAC-170">HAC-171</a>, "DTC Logic" or <a href="HAC-171">HAC-171</a>, "DTC Logic".

### Is DTC No. "B2578" or "B2579" displayed?

YES >> Perform trouble diagnosis for the in-vehicle sensor. Refer to <a href="HAC-176">HAC-176</a>, "Diagnosis Procedure".

NO >> INSPECTION END

## Diagnosis Procedure

INFOID:0000000009722168

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

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

(+)		(–)	
In-vehicle sensor			Voltage
Connector	Terminal	<del>_</del>	
M41	1	Ground	Approx. 5 V

#### Is the inspection result normal?

YES >> GO TO 2.

NO >> GO TO 4.

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

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

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

#### Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair harness or connector.

# 3.check in-vehicle sensor

Check in-vehicle sensor. Refer to HAC-177, "Component Inspection".

#### Is the inspection result normal?

YES >> Replace A/C auto amp.

## **B2578, B2579 IN-VEHICLE SENSOR**

### < DTC/CIRCUIT DIAGNOSIS >

[WITH 7 INCH DISPLAY]

NO >> Replace in-vehicle sensor.

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

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

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

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

In-vehic	le sensor		Continuity
Connector	Terminal	_	Continuity
M41	1	Ground	Not existed

### Is the inspection result normal?

YES >> Replace A/C auto amp.

NO >> Repair harness or connector.

## Component Inspection

# 1. CHECK IN-VEHICLE SENSOR

- 1. Turn ignition switch OFF.
- 2. Disconnect in-vehicle sensor connector. Refer to VTL-91, "Exploded View".
- 3. Check resistance between in-vehicle sensor terminals.

Torr	minal	Condition	Resistance kΩ
1611	IIIIIai	Temperature °C (°F)	Nesistance K22
		-15 (5)	12.73
		-10 (14)	9.92
		-5 (23)	7.80
		0 (32)	6.19
		5 (41)	4.95
		10 (50)	3.99
1	2	15 (59)	3.24
		20 (68)	2.65
		25 (77)	2.19
		30 (86)	1.81
		35 (95)	1.51
		40 (104)	1.27
		45 (113)	1.07

### Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace in-vehicle sensor.

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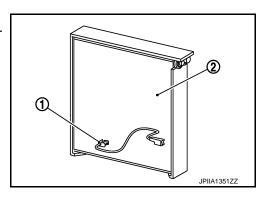
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## B2581, B2582 INTAKE SENSOR

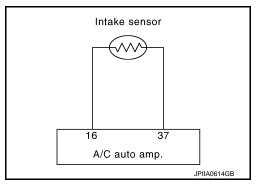
Description INFOID:000000009722170

#### Intake Sensor

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



Intake Sensor Circuit



DTC Logic

#### DTC DETECTION LOGIC

#### NOTE:

If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to <a href="HAC-170">HAC-171</a>, "DTC Logic" or <a href="HAC-171">HAC-171</a>, "DTC Logic".

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

### DTC CONFIRMATION PROCEDURE

# 1. CHECK WITH SELF-DIAGNOSIS FUNCTION OF CONSULT

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

#### NOTE:

If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to <a href="HAC-170">HAC-171</a>, "DTC Logic" or <a href="HAC-171">HAC-171</a>, "DTC Logic".

### Is DTC No. "B2581" or "B2582" displayed?

YES >> Perform trouble diagnosis for the intake sensor. Refer to <u>HAC-178</u>, "Diagnosis Procedure".

NO >> INSPECTION END

## **Diagnosis Procedure**

INFOID:0000000009722172

 ${f 1}$  .CHECK VOLTAGE BETWEEN INTAKE SENSOR AND GROUND

## B2581, B2582 INTAKE SENSOR

### < DTC/CIRCUIT DIAGNOSIS >

[WITH 7 INCH DISPLAY]

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

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

#### Is the inspection result normal?

>> GO TO 2. YES

NO >> GO TO 4.

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

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

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

#### Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair harness or connector.

# 3. CHECK INTAKE SENSOR

Check intake sensor. Refer to HAC-179, "Component Inspection".

#### Is the inspection result normal?

YES >> Replace A/C auto amp.

NO >> Replace intake sensor.

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

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

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

Check continuity between intake sensor harness connector and ground.

Intake	sensor	_	Continuity
Connector	Terminal	_	Continuity
M42	1	Ground	Not existed

#### Is the inspection result normal?

YES >> Replace A/C auto amp.

NO >> Repair harness or connector.

## Component Inspection

# 1. CHECK INTAKE SENSOR

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

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Terminal		Condition	Resistance kΩ
		Temperature °C (°F)	Resistance K12
		-15 (5)	18.63
		-10 (14)	14.15
		-5 (23)	10.86
		0 (32)	8.41
		5 (41)	6.58
		10 (50)	5.19
1	2	15 (59)	4.12
		20 (68)	3.30
		25 (77)	2.67
		30 (86)	2.17
		35 (95)	1.78
		40 (104)	1.46
		45 (113)	1.21

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace intake sensor.

## B2630, B2631 SUNLOAD SENSOR

Description INFOID:0000000009722174

#### COMPONENT DESCRIPTION

#### Sunload Sensor

- The sunload sensor (1) is located on the driver's side instrument SEC. 272 panel & pad.
- It detects sunload entering through windshield by means of a photo diode. The sensor converts the sunload into a current value which is then input into the A/C auto amp.

1 JPIIA055977

Sunload sensor 37 15 A/C auto amp. JPIIA0615GE

Sunload Sensor Circuit

#### SUNLOAD INPUT PROCESS

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

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

DTC Logic INFOID:0000000009722175

#### DTC DETECTION LOGIC

#### NOTE:

- If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to HAC-170, "DTC Logic" or HAC-171, "DTC Logic".
- Sunload sensor may register a malfunction when indoors, at dusk, or at other times when light is insufficient. When performing the diagnosis indoors, light the sunload sensor with a lamp (60W or more).

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

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#### B2630, B2631 SUNLOAD SENSOR

#### < DTC/CIRCUIT DIAGNOSIS >

[WITH 7 INCH DISPLAY]

#### DTC CONFIRMATION PROCEDURE

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

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

#### NOTE:

- If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to <u>HAC-170, "DTC Logic"</u> or <u>HAC-171, "DTC Logic"</u>.
- Sunload sensor may register a malfunction when indoors, at dusk, or at other times when light is insufficient. When performing the diagnosis indoors, light the sunload sensor with a lamp (60W or more).

#### Is DTC No. "B2630" or "B2631" displayed?

YES >> Perform trouble diagnosis for the sunload sensor. Refer to <u>HAC-182</u>, "Diagnosis Procedure".

NO >> INSPECTION END

## Diagnosis Procedure

INFOID:0000000009722176

## 1. CHECK VOLTAGE BETWEEN SUNLOAD SENSOR AND GROUND

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

(	+)		
Sunload sensor		_	Voltage
Connector	Terminal		
M74	1	Ground	Approx. 5 V

#### Is the inspection result normal?

YES >> GO TO 2.

NO >> GO TO 4.

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

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

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

#### Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair harness or connector.

#### 3.CHECK SUNLOAD SENSOR

- 1. Reconnect sunload sensor connector and A/C auto amp. connector.
- Check sunload sensor. Refer to <u>HAC-183</u>, "Component Inspection".

#### Is the inspection result normal?

YES >> Replace A/C auto amp.

NO >> Replace sunload sensor.

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

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

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

Check continuity between sunload sensor harness connector and ground.

Sunload sensor			Continuity
Connector	Terminal		Continuity
M74	1	Ground	Not existed

#### Is the inspection result normal?

YES >> Replace A/C auto amp.

NO >> Repair harness or connector.

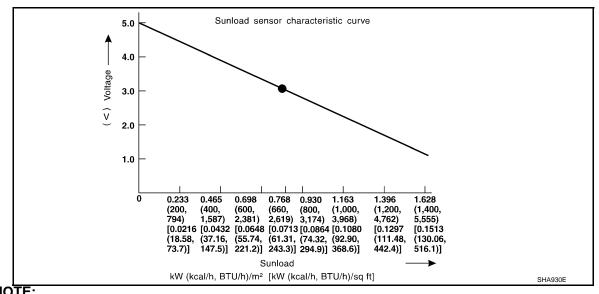
### Component Inspection

## 1. CHECK SUNLOAD SENSOR

Turn ignition switch ON.

Check voltage between A/C auto amp. harness connector and ground.

(-	+)	(–)
A/C au	to amp.	
Connector Terminal		
M50	15	Ground



NOTE:

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

#### Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace sunload sensor. HAC

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

< DTC/CIRCUIT DIAGNOSIS >

[WITH 7 INCH DISPLAY]

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

Description INFOID:000000009722178

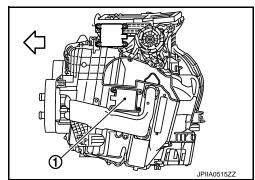
#### COMPONENT DESCRIPTION

Air Mix Door Motor (Driver Side)

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

∀
 ∀ehicle front

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



DTC Logic

#### DTC DETECTION LOGIC

#### NOTE:

If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to <a href="HAC-170">HAC-171</a>, "DTC Logic" or <a href="HAC-171">HAC-171</a>, "DTC Logic".

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

#### DTC CONFIRMATION PROCEDURE

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

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

#### NOTE:

If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to HAC-170, "DTC Logic" or HAC-171, "DTC Logic".

#### Is DTC No. "B2632" or "B2633" displayed?

YES >> Perform trouble diagnosis for the air mix door motor (driver side). Refer to <u>HAC-185</u>, "<u>Diagnosis Procedure"</u>.

NO >> GO TO 2.

## 2.function inspection

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

#### Does it operate normally?

YES >> END.

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

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

### < DTC/CIRCUIT DIAGNOSIS >

[WITH 7 INCH DISPLAY]

## **Diagnosis Procedure**

INFOID:0000000009722180

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

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

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

#### Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair the harnesses or connectors.

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

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

(+)		(–)	
Air mix door mo	otor (driver side)		Voltage
Connector	Terminal	_	
M306	3	Ground	(V) 15 10 5 0 

#### Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair the harnesses or connectors.

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

- 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		Continuity
M306	2	Ground	Existed

#### Is the inspection result normal?

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

NO >> Repair harness or connector.

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

< DTC/CIRCUIT DIAGNOSIS >

[WITH 7 INCH DISPLAY]

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

Description INFOID:0000000009722181

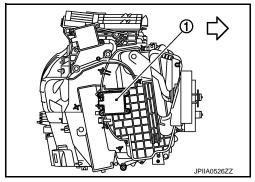
#### COMPONENT DESCRIPTION

Air Mix Door Motor (Passenger Side)

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

∀
 ∀ehicle front

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



DTC Logic

#### DTC DETECTION LOGIC

#### NOTE:

If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to <a href="HAC-170">HAC-171</a>, "DTC Logic" or <a href="HAC-171">HAC-171</a>, "DTC Logic".

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

#### DTC CONFIRMATION PROCEDURE

## ${f 1}$ .CHECK WITH SELF-DIAGNOSIS FUNCTION OF CONSULT

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

#### NOTE:

If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to <a href="HAC-170">HAC-171</a>, "DTC Logic" or <a href="HAC-171">HAC-171</a>, "DTC Logic".

#### Is DTC No. "B2634" or "B2635" displayed?

YES >> Perform trouble diagnosis for the air mix door motor (passenger side). Refer to <a href="HAC-187">HAC-187</a>, "Diagnosis Procedure".

NO >> GO TO 2.

## 2.function inspection

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

#### Does it operate normally?

YES >> END.

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

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

#### < DTC/CIRCUIT DIAGNOSIS >

[WITH 7 INCH DISPLAY]

Diagnosis Procedure

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

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

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

#### Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair the harnesses or connectors.

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

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

(	+)	(–)	
Air mix door moto	r (passenger side)		Voltage
Connector	Terminal		
M307	3	Ground	(V) 15 10 5 0 

#### Is the inspection result normal?

>> GO TO 3. YES

NO >> Repair the harnesses or connectors.

## 3.check air mix door motor (passenger side) ground circuit

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

Air mix door moto	or (passenger side)		Continuity
Connector	Terminal	_	Continuity
M307	2	Ground	Existed

#### Is the inspection result normal?

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

>> Repair harness or connector. NO

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**HAC-187** Revision: 2013 August 2014 MURANO

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

< DTC/CIRCUIT DIAGNOSIS >

[WITH 7 INCH DISPLAY]

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

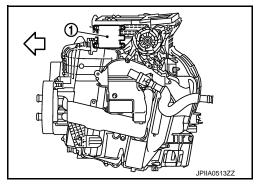
Description INFOID:0000000009722184

#### COMPONENT DESCRIPTION

Mode Door Motor

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





DTC Logic

#### DTC DETECTION LOGIC

#### NOTE:

If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to <a href="HAC-170">HAC-171</a>, "DTC Logic" or <a href="HAC-171">HAC-171</a>, "DTC Logic".

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

#### DTC CONFIRMATION PROCEDURE

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

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

#### NOTE:

If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to <a href="HAC-170">HAC-171</a>, "DTC Logic" or <a href="HAC-171">HAC-171</a>, "DTC Logic".

#### Is DTC No." B2636 ", "B2637 ", "B2638 ", "B2639 ", "B2654 " or "B2655 " displayed?

YES >> Perform trouble diagnosis for the mode door motor. Refer to <u>HAC-189, "Diagnosis Procedure"</u>. NO >> GO TO 2.

## 2. FUNCTION INSPECTION

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

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

< DTC/CIRCUIT DIAGNOSIS >

[WITH 7 INCH DISPLAY]

 Confirm that air discharge comes out according to the air distribution table at below. Refer to <u>HAC-143</u>, <u>"System Description"</u>.

Discharge air flo	ow .						
Mode position				Air outlet/d	distribution		
indication	Condition		VENT		FO	ОТ	DEE
		Front	Upper	Rear	Front	Rear	DEF
نہ۔		81%	8%	11%	_	_	_
**	DUAL switch: OFF	41%	10%	17%	24%	8%	_
<b>'~</b> i	UPPER VENT - switch : ON	12%	12%	16%	27%	10%	23%
<b>*</b>	SWILCH . ON	11%	11%	14%	25%	10%	29%
<b>*</b>		11%	11%	12%	_	_	66%

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Discharge air flo	Discharge air flow						
Mode position				Air outlet/d	distribution		
indication	Condition		VENT		FO	ОТ	DEE
		Front	Upper	Rear	Front	Rear	DEF
<b>ن</b> ہ ً		88%	_	12%	_	_	_
*;	DUAL switch: OFF	47%	_	18%	26%	9%	_
<b>`~i</b>	UPPER VENT	13%	_	17%	33%	12%	25%
,#i	SWILCH . OFF	12%	_	16%	28%	12%	32%
¥		11%	_	15%	_	_	74%

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#### NOTE:

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

#### Does it operate normally?

YES >> INSPECTION END

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

### Diagnosis Procedure

1. CHECK POWER SUPPLY FOR MODE DOOR MOTOR

Check voltage between mode door motor harness connector and ground.

(	+)	(–)	
Mode do	oor motor		Voltage
Connector	Terminal		
M310	1	Ground	Battery voltage

#### Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair harness or connector.

## 2. CHECK SIGNAL FOR MODE DOOR MOTOR

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

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

< DTC/CIRCUIT DIAGNOSIS >

[WITH 7 INCH DISPLAY]

(-	+)	(-)	
Mode do	oor motor		Voltage
Connector	Terminal	_	
M310	3	Ground	(V) 15 10 5 0 

#### Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair harness or connector.

## 3.CHECK MODE DOOR MOTOR GROUND CIRCUIT

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

Mode de	oor motor		Continuity	
Connector	Terminal	_	Continuity	
M310	2	Ground	Existed	

#### Is the inspection result normal?

YES >> Replace mode door motor.

NO >> Repair harness or connector.

### B263D, B263E, B263F INTAKE DOOR MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[WITH 7 INCH DISPLAY]

## B263D, B263E, B263F INTAKE DOOR MOTOR

Description INFOID:0000000009722187

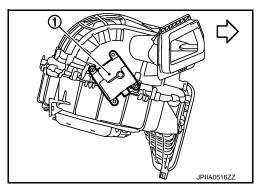
#### COMPONENT DESCRIPTION

Intake Door Motor

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

Vehicle front

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



**DTC Logic** INFOID:00000000009722188

#### DTC DETECTION LOGIC

#### NOTE:

If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to HAC-170, "DTC Logic" or HAC-171, "DTC Logic".

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

#### DTC CONFIRMATION PROCEDURE

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

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

#### NOTE:

If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to HAC-170, "DTC Logic" or HAC-171, "DTC Logic".

#### Is DTC No. "B263D", "B263E" or "B263F" displayed?

YES >> Perform trouble diagnosis for the intake door motor. Refer to <u>HAC-192</u>, "Diagnosis <u>Procedure"</u>.

NO >> GO TO 2.

## 2. FUNCTION INSPECTION

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

#### Does it operate normally?

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

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**HAC-191** Revision: 2013 August 2014 MURANO

## B263D, B263E, B263F INTAKE DOOR MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[WITH 7 INCH DISPLAY]

Diagnosis Procedure

INFOID:0000000009722189

## 1. CHECK POWER SUPPLY FOR INTAKE DOOR MOTOR

Check voltage between intake door motor harness connector and ground.

(	+)	(–)		
Intake d	oor motor		Voltage	
Connector	Terminal	<del></del>		
M304	1	Ground	Battery voltage	

#### Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair harness or connector.

## 2. CHECK SIGNAL FOR INTAKE DOOR MOTOR

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

(	+)	(–)	
Intake de	oor motor		Voltage
Connector	Terminal	_	
M304	3	Ground	(V) 15 10 5 0 

#### Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair harness or connector.

## 3.CHECK INTAKE DOOR MOTOR GROUND CIRCUIT

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

Intake d	oor motor		Continuity
Connector	Terminal	_	Continuity
M304	2	Ground	Existed

#### Is the inspection result normal?

YES >> Replace intake door motor.

NO >> Repair harness or connector.

### B2661, B2662, B2663 UPPER VENTILATOR DOOR MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[WITH 7 INCH DISPLAY]

## B2661, B2662, B2663 UPPER VENTILATOR DOOR MOTOR

Description INFOID:0000000009722190

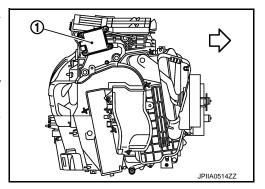
#### COMPONENT DESCRIPTION

**Upper Ventilator Door Motor** 

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

> $\langle \neg$ Vehicle front

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



**DTC** Logic

#### DTC DETECTION LOGIC

NOTE:

If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to HAC-170, "DTC Logic" or HAC-171, "DTC Logic".

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

### DTC CONFIRMATION PROCEDURE

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

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

#### NOTE:

If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to HAC-170, "DTC Logic" or HAC-171, "DTC Logic".

#### Is DTC No. "B2661", "B2662" or "B2663" displayed?

YES >> Perform trouble diagnosis for the upper ventilator door motor. Refer to HAC-194, "Diagnosis Procedure".

NO >> GO TO 2.

## 2.function inspection

- Press the UPPER VENT switch.
- The UPPER VENT switch indicator is turned ON.

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## B2661, B2662, B2663 UPPER VENTILATOR DOOR MOTOR

#### < DTC/CIRCUIT DIAGNOSIS >

[WITH 7 INCH DISPLAY]

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

Discharge air flo	ow .						
Mode position				Air outlet/d	distribution		
indication	Condition		VENT		FO	ОТ	DEE
		Front	Upper	Rear	Front	Rear	DEF
~ <i>i</i> ~		81%	8%	11%	_	_	_
**	DUAL switch: OFF	41%	10%	17%	24%	8%	_
<b>`</b> ~i	UPPER VENT	12%	12%	16%	27%	10%	23%
<b>*</b>	SWILCH . OIN	11%	11%	14%	25%	10%	29%
<b>*</b>		11%	11%	12%	_	_	66%

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

#### Does it operate normally?

YES >> INSPECTION END

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

### Diagnosis Procedure

INFOID:0000000009722192

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

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

(	+)	(–)	
Upper ventila	tor door motor		Voltage
Connector	Terminal		
M308	1	Ground	Battery voltage

#### Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair harness or connector.

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

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

(-	+)	(–)	
Upper ventila	tor door motor		Voltage
Connector	Terminal	_	
M308	3	Ground	(V) 15 10 5 0 

#### Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair harness or connector.

## B2661, B2662, B2663 UPPER VENTILATOR DOOR MOTOR

#### < DTC/CIRCUIT DIAGNOSIS >

[WITH 7 INCH DISPLAY]

## $\overline{3}$ .check upper ventilator door motor ground circuit

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

Upper ventila	tor door motor		Continuity
Connector	Terminal		Continuity
M308	2	Ground	Existed

#### Is the inspection result normal?

YES >> Replace upper ventilator door motor.

NO >> Repair harness or connector.

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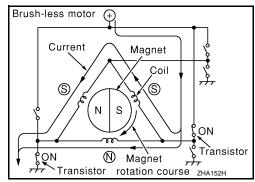
## **BLOWER MOTOR**

Description INFOID:000000009722193

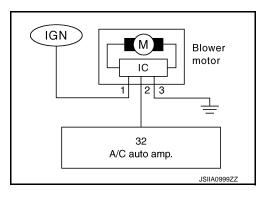
#### COMPONENT DESCRIPTION

#### **Brush-less Motor**

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



Blower Motor Circuit



## Component Function Check

INFOID:0000000009722194

## 1. CHECK OPERATION

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

#### Does it operate normally?

YES >> INSPECTION END

NO >> Perform trouble diagnosis for the blower motor. Refer to HAC-196, "Diagnosis Procedure".

## Diagnosis Procedure

INFOID:0000000009722195

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

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

#### NOTE

If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to <a href="HAC-170">HAC-171</a>, "DTC Logic" or <a href="HAC-171">HAC-171</a>, "DTC Logic".

#### Is any DTC No. displayed?

YES >> Perform the diagnosis that is applicable to the sensor and actuator. Refer to <u>HAC-230, "DTC Index".</u>

NO >> GO TO 2.

## 2. CHECK WITH ACTIVE TEST OF CONSULT

1. Using CONSULT, perform "HVAC TEST" "ACTIVE TEST" of HVAC to check each output device. Refer to HAC-166, "CONSULT Function".

#### NOTE:

Perform the ACTIVE TEST after starting the engine because the compressor is operated.

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

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

#### NOTE:

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

#### Does it operate normally?

YES >> INSPECTION END

NO >> GO TO 3.

## 3.CHECK POWER SUPPLY FOR BLOWER MOTOR

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

(	+)	(–)	
Blowe	r motor		Voltage
Connector	Terminal	_	
M98	1	Ground	Battery voltage

#### Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 7.

## 4. CHECK BLOWER MOTOR GROUND CIRCUIT

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

Blowe	r motor	_	Continuity
Connector	Terminal	_	Continuity
M98	3	Ground	Existed

#### Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair harness or connector.

## 5. CHECK BLOWER MOTOR CIRCUIT CONTINUITY

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

Blowe	r motor	A/C au	ito amp.	Continuity
Connector	Terminal	Connector	Terminal	Continuity
M98	2	M50	32	Existed

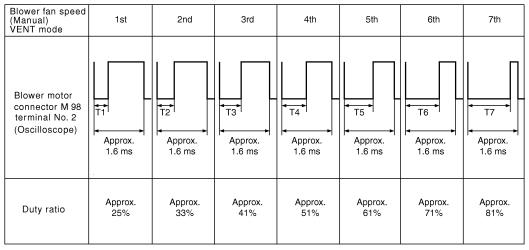
#### Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair harness or connector.

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

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



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

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#### Is the inspection result normal?

YES >> Replace the blower motor.

NO >> Replace the A/C auto amp.

## 7. CHECK POWER VOLTAGE OF BLOWER RELAY

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

(+)	(–)	Voltage
Blower relay	_	voltage
1	Ground	Battery voltage
3	Giodila	Battery Voltage

#### Is the inspection result normal?

YES >> GO TO 8.

NO >> Inspection the power supply circuit. Refer to <u>PG-47, "Wiring Diagram - IGNITION POWER SUP-PLY -"</u>.

## 8. CHECK BLOWER RELAY

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

#### Is the inspection result normal?

YES >> GO TO 9.

NO >> Replace the blower relay.

### 9.CHECK FUSE

Check 15A fuses (Nos. 21 and 22).

NOTE:

#### **BLOWER MOTOR**

[WITH 7 INCH DISPLAY] < DTC/CIRCUIT DIAGNOSIS > Refer to PG-91, "Fuse, Connector and Terminal Arrangement" for fuse location. Α Is the inspection result normal? YES >> Repair the harnesses or connectors. NO >> Replace the fuse after repairing the applicable circuit. В Component Inspection INFOID:0000000009722196 1. CHECK BLOWER MOTOR Remove the blower motor. Refer to VTL-97, "Exploded View". Check that the blower motor rotates smoothly. 2. Is the inspection result normal? D YES >> INSPECTION END NO >> Replace blower motor. Е F Н HAC K 

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#### MAGNET CLUTCH

Description INFOID:000000009722197

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

## Component Function Check

INFOID:0000000009722198

## 1. FUNCTION INSPECTION

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

#### Does it operate normally?

YES >> INSPECTION END

NO >> Perform trouble diagnosis for the compressor. Refer to HAC-200, "Diagnosis Procedure".

## Diagnosis Procedure

INFOID:0000000009722199

## 1. INSPECTION IN AUTO ACTIVE TEST MODE

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

#### Does it operate normally?

YES >> GO TO 6.

NO >> GO TO 2.

## 2. CHECK MAGNET CLUTCH POWER SUPPLY

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

	+		
Comp	ressor	_	Voltage
Connector	Terminal		
F18	1	Ground	0 V ⇔ Battery voltage

#### Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 3.

3.CHECK FUSE

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

#### NOTE:

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

#### Is the inspection result normal?

YES >> GO TO 4.

NO >> Replace the blown fuse after repairing the affected circuit if a fuse is blown.

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

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

## **MAGNET CLUTCH**

< DTC/CIRCUIT DIAGNOSIS >

IPDN	/I E/R	Comp	ressor	Continuity	
Connector	Terminal	Connector	Terminal	Continuity	
F12	48	F18	1	Existed	
the inspection re	esult normal?				
NO >> Repair	harness or conne	er to <u>PCS-37, "Rem</u> ector. DUND CIRCUIT FO		on".	
heck continuity b	etween compress	or harness connect	tor and ground.		
Comp	ressor		O-atia-it-	•	
Connector	Terminal	_	Continuity		
F18	2	Ground	Existed		
NO >> Repair	ce magnet clutch. harness or conne			: Removal and Installation".	
		F-DIAGNOSIS RES			
OTE: DTC is displayed	. ,			TC U1000 or U1010. Refer to <u>HAC-</u>	
any DTC No. dis	splayed?				
Index"		that is applicable t	o the sensor and	actuator. Refer to <u>HAC-230, "DTC</u>	
NO >> GO TO					
.CHECK A/C AL	JTO AMP. INPUT	SIGNAL			
	check "On/Off" of "CONSULT Func		and "FAN REQ S	SIG" in "DATA MONITOR" of HVAC.	
A/C SWITC	CH ON	: COMP REQ SI	G On		
A/C SWITC		: COMP REQ SI			
	ROL DIAL ON	: FAN REQ SIG			
	ROL DIAL OFF				
			UII		
	sult normal?		Oli		
the inspection re			Oli		
the inspection re			Oli		
the inspection re YES >> GO TO NO >> Replace	O 8.		Oli		
the inspection re YES >> GO TO NO >> Replace CHECK REFRI	D 8. ce A/C auto amp. GERANT PRESS			<u>e"</u> .	
the inspection reverse the inspection reverse the the inspection reverse the inspection rev	0 8. ce A/C auto amp. GERANT PRESS pressure sensor. F	URE SENSOR		<u>e"</u> .	
the inspection reverse	D 8. ce A/C auto amp. GERANT PRESS pressure sensor. Fesult normal? CCTION END	URE SENSOR Refer to <u>EC-465, "D</u>		<u>e"</u> .	
the inspection reverse	O 8. ce A/C auto amp. GERANT PRESS pressure sensor. F esult normal?	URE SENSOR Refer to <u>EC-465, "D</u>		<u>e"</u> .	

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

A/C AUTO AMP.: Description

INFOID:0000000009722200

#### COMPONENT DESCRIPTION

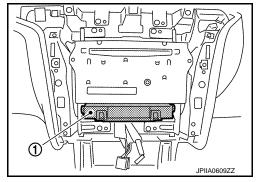
A/C Auto Amp. (Air Conditioner Automatic Amplifier)

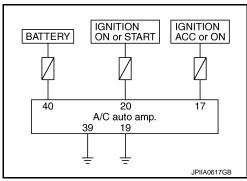
The A/C auto amp. (1) has a built-in microcomputer that processes information sent from various sensors needed for air conditioner operation. The air mix door motor(s), the mode door motor, the intake door motor, the upper ventilator door motor, the blower motor and the compressor are then controlled.

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

The A/C auto amp. is operated with control mechanisms. Signals from various switches and Potentio Temperature Control (PTC) are directly entered into the A/C auto amp.

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





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

INFOID:0000000009722201

#### 1. CHECK OPERATION

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

#### Does it operate normally?

YES >> INSPECTION END

NO >> Perform trouble diagnosis for the A/C system. Refer to <a href="HAC-202">HAC-202</a>, "A/C AUTO AMP. : Diagnosis <a href="Procedure">Procedure</a>.

## A/C AUTO AMP.: Diagnosis Procedure

INFOID:0000000009722202

## 1.INSPECTION BY FAIL-SAFE FUNCTION

- 1. Turn the ignition switch ON.
- 2. After approximately 30 seconds, check that the air conditioner is operated by the fail-safe function (the operation display of air conditioner is not performed). Refer to <a href="HAC-229">HAC-229</a>, "Fail-Safe".

#### Is the fail-safe function operated?

YES >> GO TO 5.

NO >> GO TO 2.

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

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

#### POWER SUPPLY AND GROUND CIRCUIT

#### < DTC/CIRCUIT DIAGNOSIS >

#### [WITH 7 INCH DISPLAY]

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

Is the inspection result normal?

YES >> GO TO 4. NO >> GO TO 3.

3.check fuse

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

NOTE:

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

Is the inspection result normal?

YES >> Repair the harnesses or connectors.

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

4. CHECK A/C AUTO AMP. CIRCUIT CONTINUITY

Turn ignition switch OFF.

2. Check continuity between A/C auto amp. harness connector and ground.

A/C au	A/C auto amp.		Continuity	
Connector	Terminal	<del>-</del>	Continuity	
M50	19	Ground	Existed	
WISO	39	Giodila	Existed	

#### Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair the harnesses or connectors.

#### **5.**CHECK PRESET SWITCH

Check the preset switch. Refer to <u>AV-155</u>, "<u>Removal and Installation</u>" (base audio without navigation), <u>AV-286</u>, "<u>Removal and Installation</u>" (bose audio without navigation) or <u>AV-458</u>, "<u>Removal and Installation</u>" (bose audio with navigation).

#### Is the inspection result normal?

YES >> Replace the A/C auto amp.

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

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## **ECU DIAGNOSIS INFORMATION**

### **ECM**

Reference Value

#### VALUES ON THE DIAGNOSIS TOOL

#### NOTE

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

The ignition timing shown by the timing light may differ from the ignition timing displayed on the data monitor. This occurs because the timing light shows a value calculated by ECM according to signals received from the cam shaft position sensor and other sensors related to ignition timing.

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

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

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

Monitor Item	C	ondition	Values/Status
PURG VOL C/V	Engine: After warming up     Selector lever: P or N position     Air conditioner switch: OFF	Idle (Accelerator pedal: Not depressed even slightly, after engine starting.)	0%
	No load	2,000 rpm	_
INT/V TIM (B1)	Engine: After warming up     Selector lever: P or N position	Idle	_5 - 5°CA
,	<ul><li>Air conditioner switch: OFF</li><li>No load</li></ul>	2,000 rpm	Approx. 0 - 30°CA
	<ul><li>Engine: After warming up</li><li>Selector lever: P or N position</li></ul>	Idle	–5 - 5°CA
INT/V TIM (B2)	Air conditioner switch: OFF     No load	2,000 rpm	Approx. 0 - 30°CA
	<ul><li>Engine: After warming up</li><li>Selector lever: P or N position</li></ul>	Idle	0 - 2%
INT/V SOL (B1)	Air conditioner switch: OFF     No load	2,000 rpm	Approx. 0 - 50%
	Engine: After warming up	Idle	0 - 2%
INT/V SOL (B2)	<ul><li>Selector lever: P or N position</li><li>Air conditioner switch: OFF</li><li>No load</li></ul>	2,000 rpm	Approx. 0 - 50%
VIAS S/V-1	<ul> <li>Engine: After warming up</li> <li>Selector lever: P or N position</li> <li>Air conditioner switch: OFF</li> <li>No load</li> </ul>	When revving engine up to 5,000 rpm quickly	$OFF \to ON \to OFF$
VIAS S/V-2	<ul> <li>Engine: After warming up</li> <li>Selector lever: P or N position</li> <li>Air conditioner switch: OFF</li> <li>No load</li> </ul>	When revving engine up to 5,000 rpm quickly	$OFF \to ON \to OFF$
	Facility Affacts and the disc	Air conditioner switch: OFF	OFF
AIR COND RLY	Engine: After warming up, idle the engine	Air conditioner switch: ON (Compressor operates)	ON
ENGINE MOUNT	Engine: After warming up	Idle (With vehicle stopped)	IDLE
LINGINE MOONT	Eligilie. Alter waitiling up	Except above conditions	TRVL
FUEL PUMP RLY	<ul><li>For 1 second after turning ignition</li><li>Engine running or cranking</li></ul>	switch: ON	ON
	Except above	OFF	
VENT CONT/V	Ignition switch: ON		OFF
THRTL RELAY	Ignition switch: ON		ON
		Engine coolant temperature: 97°C (206°F) or less	OFF
COOLING FAN	Engine: After warming up, idle the engine	Engine coolant temperature: Between 98°C (208°F) and 99°C (210°F)	LOW
	Air conditioner switch: OFF	Engine coolant temperature: Between 100°C (212°F) and 104°C (219°F)	MID
		Engine coolant temperature: 105°C (221°F) or more	н
HO2S2 HTR (B1)	Engine speed: Below 3,600 rpm a     Engine: After warming up     Keeping the engine speed betwee     idle for 1 minute under no load	ON	
	Engine speed: Above 3,600 rpm		OFF

Monitor Item	C	condition	Values/Status		
HO2S2 HTR (B2)	- Engine: After warming up	- Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at			
	Engine speed: Above 3,600 rpm		OFF		
I/P PULLY SPD	Vehicle speed: More than 20 km/h	Almost the same speed as the tachometer indication			
VEHICLE SPEED	Turn drive wheels and compare C cation.	ONSULT value with the speedometer indi-	Almost the same speed as the speedometer indication		
IDL A/V LEARN	Engine: Running	Idle air volume learning has not been performed yet.	YET	-	
		Idle air volume learning has already been performed successfully.	CMPLT	-	
ENG OIL TEMP	Engine: After warming up		More than 70°C (158°F)		
TRVL AFTER MIL	Ignition switch: ON	Vehicle has traveled after MIL has illuminated.	0 - 65,535 km (0 - 40,723 miles)	=,	
A/F S1 HTR (B1)	Engine: After warming up, idle the (More than 140 seconds after star)		4 - 100%		
A/F S1 HTR (B2)	Engine: After warming up, idle the (More than 140 seconds after star)		4 - 100%		
AC PRESS SEN	<ul><li>Engine: Idle</li><li>Both A/C switch and blower fan sv</li></ul>	witch: ON (Compressor operates)	1.0 - 4.0 V		
VHCL SPEED SE	<ul> <li>Turn drive wheels and compare C cation.</li> </ul>	Turn drive wheels and compare CONSULT value with the speedometer indication.			
SET VHCL SPD	Engine: Running	ASCD: Operating	The preset vehicle speed is displayed		
MAIN SW	Ignition switch: ON	MAIN switch: Pressed	ON		
WAIN OW	- Ignition switch. Oil	MAIN switch: Released	OFF		
CANCEL SW	Ignition switch: ON	CANCEL switch: Pressed	ON		
CANCLE SVV	- Ignition switch. Oil	CANCEL switch: Released	OFF		
RESUME/ACC SW	Ignition switch: ON	RESUME/ACCELERATE switch: Pressed	ON		
NEGOME/AGG GW	- Igiliuon switch. ON	RESUME/ACCELERATE switch: Released	OFF		
SET SW	Ignition switch: ON	SET/COAST switch: Pressed	ON		
	ignition switch. Oiv	SET/COAST switch: Released	OFF	_	
BRAKE SW1	Ignition switch: ON	Brake pedal: Fully released	ON	_	
(ASCD brake switch)	- Igililloti Swiloti. ON	Brake pedal: Slightly depressed	OFF		
BRAKE SW2	Ignition switch: ON	Brake pedal: Fully released	OFF		
(Stop lamp switch)	- Ignilion switch. ON	Brake pedal: Slightly depressed	ON		
VHCL SPD CUT	Ignition switch: ON		NON	_	
LO SPEED CUT	Ignition switch: ON		NON		
AT OD MONITOR	Ignition switch: ON	gnition switch: ON		_	
AT OD CANCEL	Ignition switch: ON		OFF	_	
CRUISE LAMP	Ignition switch: ON	MAIN switch: Pressed at the 1st time $\rightarrow$ at the 2nd time	$ON \rightarrow OFF$		
	MAIN switch: ON	ASCD: Operating	ON		
SET LAMP	<ul> <li>When vehicle speed is between 40 km/h (25 MPH) and 144 km/h (89 MPH)</li> </ul>	ASCD: Not operating	OFF		

Monitor Item	Condition	Values/Status
ALT DUTY	Engine: Idle	0 - 80%
A/F ADJ-B1	Engine: Running	-0.330 - 0.330
A/F ADJ-B2	Engine: Running	-0.330 - 0.330
BAT CUR SEN	<ul> <li>Engine speed: Idle</li> <li>Battery: Fully charged*<sup>2</sup></li> <li>Selector lever: P or N position</li> <li>Air conditioner switch: OFF</li> <li>No load</li> </ul>	Approx. 2,600 - 3,500 mV
ALT DUTY SIG	Power generation voltage variable control: Operating	ON
ALI DOTT SIG	Power generation voltage variable control: Not operating	OFF
HO2 S2 DIAG1 (B1)	DTC P0139 self-diagnosis (delayed response) is incomplete.	INCMP
HO2 32 DIAG1 (B1)	DTC P0139 self-diagnosis (delayed response) is complete.	CMPLT
HO2 S2 DIAG1 (B2)	DTC P0159 self-diagnosis (delayed response) is incomplete.	INCMP
HO2 32 DIAG1 (B2)	DTC P0159 self-diagnosis (delayed response) is complete.	CMPLT
UO2 92 DIAG2 (B1)	DTC P0139 self-diagnosis (slow response) is incomplete.	INCMP
HO2 S2 DIAG2 (B1)	DTC P0139 self-diagnosis (slow response) is complete.	CMPLT
HO2 62 DIA C2 (B2)	DTC P0159 self-diagnosis (slow response) is incomplete.	INCMP
HO2 S2 DIAG2 (B2)	DTC P0159 self-diagnosis (slow response) is complete.	CMPLT
A/F SEN1 DIAG1	DTC P015A and P015B self-diagnosis is incomplete.	INCMP
(B1)	DTC P015A and P015B self-diagnosis is complete.	CMPLT
A/F SEN1 DIAG1	DTC P015C and P015D self-diagnosis is incomplete.	INCMP
(B2)	DTC P015C and P015D self-diagnosis is complete.	CMPLT
A/F SEN1 DIAG2	DTC P014C and P014D self-diagnosis is incomplete.	INCMP
(B1)	DTC P014C and P014D self-diagnosis is complete.	CMPLT
A/F SEN1 DIAG2	DTC P014E and P014F self-diagnosis is incomplete.	INCMP
(B2)	DTC P014E and P014F self-diagnosis is complete.	CMPLT
A/F SEN1 DIAG3	The vehicle condition is not within the diagnosis range of DTC P014C, P014D, P015A or P015B.	ABSNT
(B1)	The vehicle condition is within the diagnosis range of DTC P014C, P014D, P015A or P015B.	PRSNT
A/F SEN1 DIAG3	The vehicle condition is not within the diagnosis range of DTC P014E, P014F, P015C or P015D.	ABSNT
(B2)	The vehicle condition is within the diagnosis range of DTC P014E, P014F, P015C or P015D.	PRSNT
THRTL STK CNT B1 <sup>*3</sup>	_	_
EVAP LEAK DIAG	Ignition switch: ON	Indicates the condition of EVAP leak diagnosis.
EVAP DIAG READY	Ignition switch: ON	Indicates the ready condition of EVAP leak diagnosis.

<sup>\*1:</sup> 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.

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

<sup>\*3:</sup> The item is indicated, but not used.

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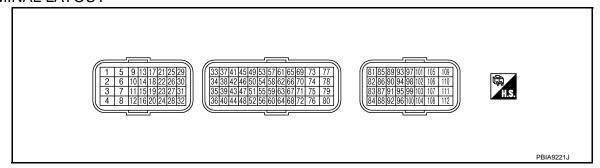
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## TERMINAL LAYOUT



#### PHYSICAL VALUES

#### NOTE:

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

Termin	al No.	Description			Value	_ F
+		Signal name	Input/ Output	Condition	(Approx.)	G
1 (P/B)		Fuel injector No. 6			BATTERY VOLTAGE (11 - 14 V)★	-
3 (L/W)		Fuel injector No. 5		<ul><li>[Engine is running]</li><li>Warm-up condition</li><li>Idle speed</li><li>NOTE:</li></ul>	50mSec/div	Н
29 (LG/R)	112	Fuel injector No. 4		The pulse cycle changes de- pending on rpm at idle	10V/div JMBIA0047GB	НА
30 (R/Y)	(B)	Fuel injector No. 3	Output		BATTERY VOLTAGE (11 - 14 V)★	J
31 (R/W)		Fuel injector No. 2		[Engine is running] • Warm-up condition	50mSec/div	K
32 (R/B)		Fuel injector No. 1		Engine speed: 2,000 rpm	10V/div JMBIA0048GB	L
2 (G/W)	112 (B)	Throttle control motor power supply	Input	[Ignition switch: ON]	BATTERY VOLTAGE (11 - 14 V)	M
4 (BR/Y)	112 (B)	A/F sensor 1 heater (bank 1)	Output	<ul><li>[Engine is running]</li><li>Warm-up condition</li><li>Idle speed (More than 140 seconds after starting engine)</li></ul>	2.9 - 8.8 V★  50mSec/div  5V/div  JMBIA0902GB	N O

Termin	al No.	Description			Value
+		Signal name	Input/ Output	Condition	(Approx.)
5	112	Throttle control motor (Open)	Output	<ul><li>[Ignition switch: ON]</li><li>Engine stopped</li><li>Selector lever: D position</li><li>Accelerator pedal: Fully depressed</li></ul>	0 - 14 V★  500μSec/div  5V/div  JMBIA0031GB
(L)	(B)	Throttle control motor (Open)	Culput	[Ignition switch: ON]  • Engine stopped  • Selector lever: D position  • Accelerator pedal: Fully released	0 - 14 V★  500μSec/div  5V/div  JMBIA0032GB
6 (P)	112 (B)	Throttle control motor (Close)	Output	[Ignition switch: ON]  • Engine stopped  • Selector lever: D position  • Accelerator pedal: Fully released	0 - 14 V★  500 μSec/div  5V/div  JMBIA1125GB
8 (SB)	112 (B)	A/F sensor 1 heater (bank 2)	Output	<ul><li>[Engine is running]</li><li>Warm-up condition</li><li>Idle speed (More than 140 seconds after starting engine)</li></ul>	2.9 - 8.8 V★  50mSec/div  5V/div  JMBIA0030GB
9 (L/B)		Ignition signal No. 3		[Engine is running]	0 - 0.2 V★ 50mSec/div
10 (G/R) 11		Ignition signal No. 2 Ignition signal No. 1		Warm-up condition     Idle speed     NOTE:     The pulse cycle changes depending on rpm at idle	Sullisectur
(Y/R)	112	ignition signal No. 1	Output	pending on tpm at idie	2V/div JMBIA0035GB
18 (GR/R)	(B)	Ignition signal No. 6	-		0.1 - 0.4 V★ 50mSec/div
19 (P)		Ignition signal No. 5		<ul><li>[Engine is running]</li><li>Warm-up condition</li><li>Engine speed: 2,000 rpm</li></ul>	-
21 (W)		Ignition signal No. 4			2V/div JMBIA0036GB
12 (B)		ECM ground			

Termina	al No.	Description			Value	
+		Signal name	Input/ Output	Condition	Value (Approx.)	
13 (P/B)	112 (B)	Heated oxygen sensor 2 heater (bank 1)	Output	<ul> <li>[Engine is running]</li> <li>Engine speed: Below 3,600 rpm after the following conditions are met</li> <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>	10 V★  50mSec/div  5V/div  JMBIA0902GB	
				[Ignition switch: ON] • Engine stopped [Engine is running] • Engine speed: Above 3,600 rpm	BATTERY VOLTAGE (11 - 14 V)	
14 (GR)	112 (B)	Fuel pump relay	Output	[Ignition switch: ON] • For 1 second after turning ignition switch ON [Engine is running]	0 - 1.5 V	
(GIV)	(6)			[Ignition switch: ON] • More than 1 second after turning ignition switch ON	BATTERY VOLTAGE (11 - 14 V)	
15 (O)	112 (B)	Throttle control motor relay	Output	[Ignition switch: $ON \rightarrow OFF$ ]	0 - 1.0 V $\rightarrow$ BATTERY VOLTAGE (11 - 14 V) $\rightarrow$ 0 V	
	, ,			[Ignition switch: ON]	0 - 1.0 V	
16 (B/Y)	_	ECM ground	_	_	_	i
17 (R)	112 (B)	Heated oxygen sensor 2 heater (bank 2)	Output	<ul> <li>[Engine is running]</li> <li>Engine speed: Below 3,600 rpm after the following conditions are met</li> <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>	10 V★  50mSec/div  5V/div  JMBIA0902GB	
				[Ignition switch: ON] • Engine stopped [Engine is running] • Engine speed: Above 3,600 rpm	BATTERY VOLTAGE (11 - 14 V)	
24 (W/B)	112 (B)	ECM relay (Self shut-off)	Output	<ul><li>[Engine is running]</li><li>[Ignition switch: OFF]</li><li>A few seconds after turning ignition switch OFF</li></ul>	0 - 1.5 V	
,,	(-,	,		[Ignition switch: OFF]     More than a few seconds after turning ignition switch OFF	BATTERY VOLTAGE (11 - 14 V)	

Termin	al No.	Description			Value
+		Signal name	Input/ Output	Condition	(Approx.)
25	112	EVAP canister purge volume	Output	<ul><li>[Engine is running]</li><li>Idle speed</li><li>Accelerator pedal: Not depressed even slightly, after engine starting</li></ul>	BATTERY VOLTAGE  (11 - 14 V)★  50mSec/div  10V/div  JMBIA0039GB
(P/L)	(B)	control solenoid valve	[Engine is running] • Engine speed: approxir 2,000 rpm (More than 1	<ul><li>[Engine is running]</li><li>Engine speed: approximately 2,000 rpm (More than 100 seconds after starting engine)</li></ul>	BATTERY VOLTAGE (11 - 14 V)★  50mSec/div  10V/div  JMBIA0040GB
				<ul><li>[Engine is running]</li><li>Warm-up condition</li><li>Idle speed</li></ul>	BATTERY VOLTAGE (11 - 14 V)
26 (GR/B)	112 (B)	VIAS control solenoid valve 2	Output	<ul><li>[Engine is running]</li><li>Warm-up condition</li><li>When revving engine up to 5,000 rpm quickly</li></ul>	BATTERY VOLTAGE (11 - 14 V) ↓ 0 - 1.0 V ↓ BATTERY VOLTAGE (11 - 14 V)
				<ul><li>[Engine is running]</li><li>Warm-up condition</li><li>Idle speed</li></ul>	BATTERY VOLTAGE (11 - 14 V)
27 (V)	112 (B)	VIAS control solenoid valve 1	Output	<ul><li>[Engine is running]</li><li>Warm-up condition</li><li>When revving engine up to 5,000 rpm quickly</li></ul>	BATTERY VOLTAGE (11 - 14 V) ↓ 0 - 1.0 V ↓ BATTERY VOLTAGE (11 - 14 V)
				<ul><li>[Engine is running]</li><li>Engine speed: For 2 seconds after reaching 950 rpm or less</li></ul>	0 - 1.0 V
28 (BR/W)	112 (B)	Electronic controlled engine mount control solenoid valve	Output	<ul><li>[Engine is running]</li><li>Engine speed: After a lapse of 2 seconds after reaching 950 rpm or less</li></ul>	2.0 - 3.0 V
				<ul><li>[Engine is running]</li><li>Engine speed: 950 rpm or more</li></ul>	BATTERY VOLTAGE (11 - 14 V)
33 (W)	112 (B)	Heated oxygen sensor 2 (bank 1)	Input	<ul> <li>[Engine is running]</li> <li>Revving engine from idle to 3,000 rpm quickly after the following conditions are met</li> <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>	0 - 1.0 V

Termin	al No.	Description			Value	
+		Signal name	Input/ Output	Condition	Value (Approx.)	
34 (W/L)	112 (B)	Heated oxygen sensor 2 (bank 2)	Input	<ul> <li>[Engine is running]</li> <li>Revving engine from idle to 3,000 rpm quickly after the following conditions are met</li> <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>	0 - 1.0 V	
35 (B)	_	Sensor ground (Heated oxygen sensor 2)	_	_	_	
36 (B)	_	Sensor ground (Throttle position sensor)	_	_	_	
37	112	Throttle position sensor 1	Input	<ul><li>[Ignition switch: ON]</li><li>Engine stopped</li><li>Selector lever: D position</li><li>Accelerator pedal: Fully released</li></ul>	More than 0.36 V	
(W)	(B)	Throtae position sensor 1	три	<ul><li>[Ignition switch: ON]</li><li>Engine stopped</li><li>Selector lever: D position</li><li>Accelerator pedal: Fully depressed</li></ul>	Less than 4.75 V	
38	112	Throttle position sensor 2	Innut	<ul><li>[Ignition switch: ON]</li><li>Engine stopped</li><li>Selector lever: D position</li><li>Accelerator pedal: Fully released</li></ul>	Less than 4.75 V	
(R)	(B)	Throate position seriou 2	Input	pat	<ul><li>[Ignition switch: ON]</li><li>Engine stopped</li><li>Selector lever: D position</li><li>Accelerator pedal: Fully depressed</li></ul>	More than 0.36 V
39 (R)	40 (G)	Refrigerant pressure sensor	Input	<ul> <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	
40 (G)	_	Sensor ground (Refrigerant pressure sensor)	_	_	_	
41	48	Power steering pressure sen-		[Engine is running] • Steering wheel: Being turned	0.5 - 4.5 V	
(O/B)	(B/P)	sor	Output	<ul><li>[Engine is running]</li><li>Steering wheel: Not being turned</li></ul>	0.4 - 0.8 V	
42 (BR)	44 (G/B)	Battery current sensor	Input	[Engine is running]  • Battery: Fully charged*2  • Idle speed	2.6 - 3.5 V	
44 (G/B)	_	Sensor ground (Battery current sensor)	_	_	_	
45 (P)	49 (L)	A/F sensor 1 (bank 1)	Input	[Ignition switch: ON]	2.2 V	
46 (Y)	52 (B/R)	Engine coolant temperature sensor	Input	[Engine is running]	0 - 4.8 V Output voltage varies with engine coolant temperature.	

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

Terminal No.		Description			Value	Δ.
+		Signal name	Input/ Output	Condition	(Approx.)	Α
65 (W/B)	60 (Y/B)	Crankshaft position sensor (POS)	Input -	<ul> <li>[Engine is running]</li> <li>Warm-up condition</li> <li>Idle speed</li> <li>NOTE:</li> <li>The pulse cycle changes depending on rpm at idle</li> </ul>	4.0 - 5.0 V★  1mSec/div  2V/div  JMBIA0041GB	ВС
				[Engine is running] • Engine speed: 2,000 rpm	4.0 - 5.0 V★  1mSec/div  2V/div  JMBIA0042GB	E
67 (—)	_	Sensor ground (Knock sensor)	_	_	_	G
68 (Y/G)	_	Sensor ground [Camshaft position sensor (PHASE) (bank 2)]	_	_	_	Н
69 (BR/W)	68 (Y/G)	Camshaft position sensor (PHASE) (bank 2)	Input -	<ul> <li>[Engine is running]</li> <li>Warm-up condition</li> <li>Idle speed NOTE: The pulse cycle changes depending on rpm at idle</li> </ul>	3.0 - 5.0 V★  20mSec/div  2V/div  JMBIA0045GB	HAC
				[Engine is running] • Engine speed is 2,000 rpm	3.0 - 5.0 V★  20mSec/div  2V/div  JMBIA0046GB	K L
70 (W/R)	64 (B/R)	Camshaft position sensor (PHASE) (bank 1)	Input -	<ul> <li>[Engine is running]</li> <li>Warm-up condition</li> <li>Idle speed</li> <li>NOTE:</li> <li>The pulse cycle changes depending on rpm at idle</li> </ul>	3.0 - 5.0 V★  20mSec/div  2V/div  JMBIA0045GB	N O
				[Engine is running] • Engine speed is 2,000 rpm	3.0 - 5.0 V★  20mSec/div  2V/div  JMBIA0046GB	Р

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

### [WITH 7 INCH DISPLAY]

Termina	al No.	Description			Value
+		Signal name	Input/ Output	Condition	value (Approx.)
				[Ignition switch: ON]  • ASCD steering switch: OFF	4 V
				[Ignition switch: ON]  • MAIN switch: Pressed	0 V
85 (Y)	92 (BR)	ASCD steering switch	Input	[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
86 (SB)	96 (GR)	EVAP control system pressure sensor	Input	[Ignition switch: ON]	1.8 - 4.8 V
87 (GR)	100 (G)	Sensor power supply (Accelerator pedal position sensor 2)	_	[Ignition switch: ON]	5 V
(O)	_	Data link connector	Input/ Output	_	_
91 (L)	96 (GR)	Sensor power supply (EVAP control system pres- sure sensor)	_	[Ignition switch: ON]	5 V
92 (BR)	_	Sensor ground (ASCD steering switch)	_	_	_
93	112	195	1	[Ignition switch: OFF]	0 V
(BR)	(B)	Ignition switch	Input	[Ignition switch: ON]	BATTERY VOLTAGE (11 - 14 V)
94	112	Engine speed output signal	Outout	<ul> <li>[Engine is running]</li> <li>Warm-up condition</li> <li>Idle speed</li> <li>NOTE:</li> <li>The pulse cycle changes depending on rpm at idle</li> </ul>	1 V★  10mSec/div  2V/div  JMBIA0076GB
(GR)	(B)	Engine speed output signal	Output	[Engine is running] • Engine speed: 2,000 rpm	1 V★  10mSec/div  2V/div  JMBIA0077GB
95 (Y)	104 (SB)	Fuel tank temperature sensor	Input	[Engine is running]	0 - 4.8 V Output voltage varies with fuel tank temperature.
96 (GR)	_	Sensor ground (EVAP control system pressure sensor)	_	_	_
97 (P)	_	CAN communication line (CAN-L)	Input/ Output	_	_
98	_	CAN communication line (CAN-H)	Input/ Output	_	_

### [WITH 7 INCH DISPLAY]

Termin	al No.	Description			Value
+		Signal name	Input/ Output	Condition	(Approx.)
100 (G)	_	Sensor ground (Accelerator pedal position sensor 2)	_	_	_
102	112			[Ignition switch: ON] • Selector lever: P or N position	BATTERY VOLTAGE (11 - 14 V)
(R)	(B)	PNP signal	Input	[Ignition switch: ON] • Selector lever: Except above position	0 V
104 (SB)	_	Sensor ground (Fuel tank temperature sensor)	_		_
105 (V)	112 (B)	Power supply for ECM	Input	[Ignition switch: ON]	BATTERY VOLTAGE (11 - 14 V)
400	440			[Ignition switch: OFF] • Brake pedal: Fully released	0 V
106 (SB)	112 (B)	Stop lamp switch	Input	[Ignition switch: OFF]  • Brake pedal: Slightly depressed	BATTERY VOLTAGE (11 - 14 V)
107 (B) 108 (B)	_	ECM ground	_	_	_
109 (W)	112 (B)	EVAP canister vent control valve	Output	[Ignition switch: ON]	BATTERY VOLTAGE (11 - 14 V)
110 (G)	112 (B)	ASCD brake switch	Input	[Ignition switch: ON] • Brake pedal: Slightly depressed	0 V
(G)	(D)			[Ignition switch: ON] • Brake pedal: Fully released	BATTERY VOLTAGE (11 - 14 V)
111 (B) 112 (B)	_	ECM ground	_	_	_

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

<sup>\*1:</sup> This may vary depending on internal resistance of the tester.

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

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### A/C AUTO AMP.

Reference Value

#### VALUES ON THE DIAGNOSIS TOOL

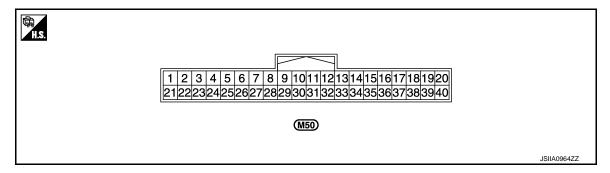
#### NOTE:

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

CONSULT MONITOR ITEM

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

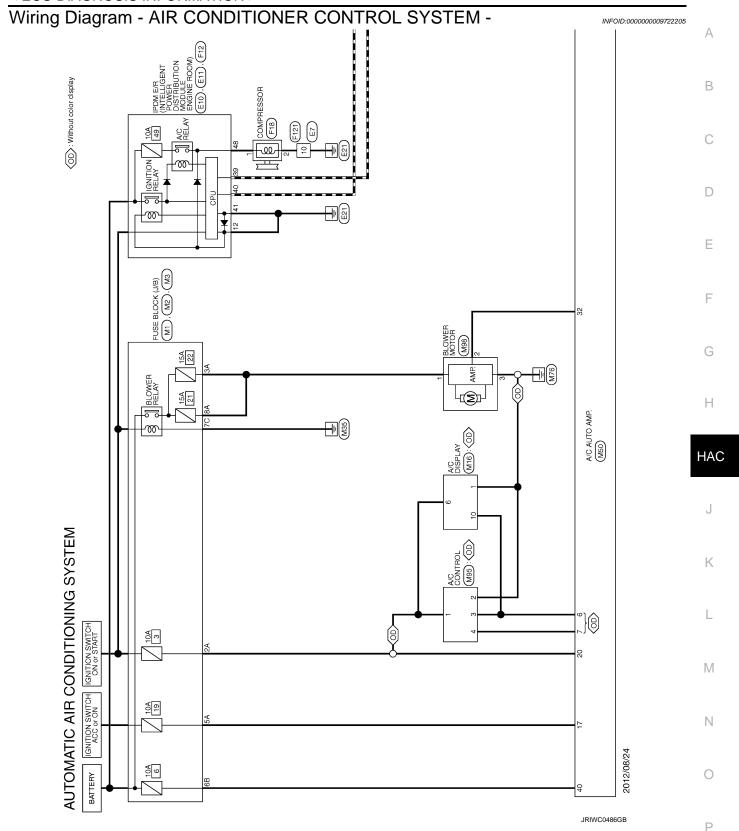
#### **TERMINAL LAYOUT**

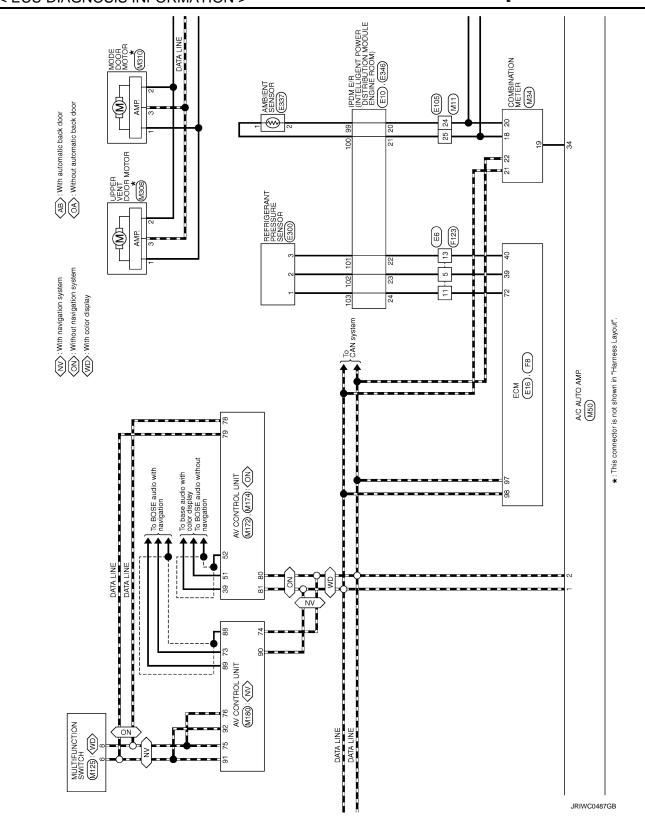


PHYSICAL VALUES

### < ECU DIAGNOSIS INFORMATION >

Termin (Wire		Description		Condition	Value
+	_	Signal name	Input/ Output	Condition	(Approx.)
1 (L)	_	CAN-H	Input/ Output	_	_
2 (P)	_	CAN-L	Input/ Output	_	_
10 (L)	Ground	LAN signal	Input/ Output	_	(V) 15 10 5 0 
11 (R)	Ground	Power supply for each door motor	Input	Ignition switch ON	Battery voltage
15 (BR)	Ground	Sunload sensor	Input	_	_
16 (G)	Ground	Intake sensor	Input	_	_
17 (R)	Ground	Power supply from ACC	_	Ignition switch ACC	Battery voltage
19 (B)	Ground	Ground	_	Ignition switch ON	0 V
20 (G)	Ground	Power supply from IGN	_	Ignition switch ON	Battery voltage
32 (L)	Ground	Blower motor control signal	Output	Ignition switch ON     Blower speed:1st speed     (manual)	(V) 6 4 2 0 
34 (P)	Ground	Power supply for ambient meter	Output	Ignition switch ON	5V
35 (L)	Ground	Ambient sensor	Input	_	_
36 (LG)	Ground	In-vehicle sensor	Input	_	_
37 (Y)	Ground	Sensor ground	_	Ignition switch ON	0 V
39 (B)	Ground	Ground	_	Ignition switch ON	0 V
40 (Y)	Ground	Power supply from BATT	_	Ignition switch OFF	Battery voltage





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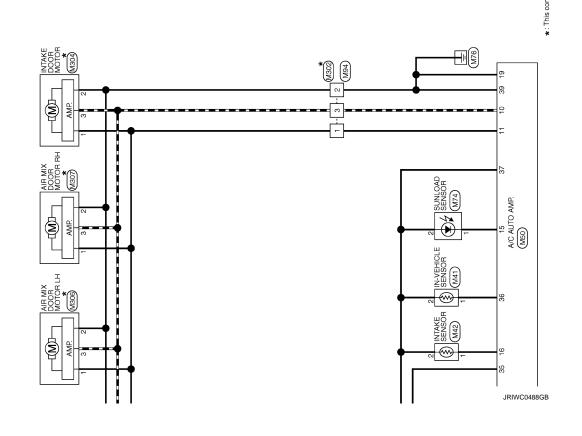
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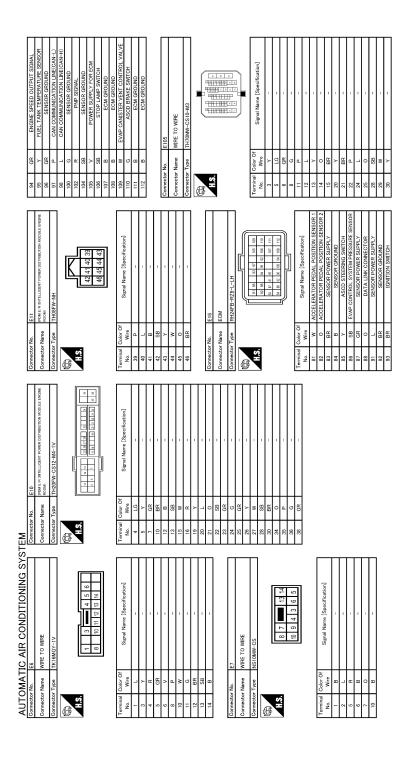
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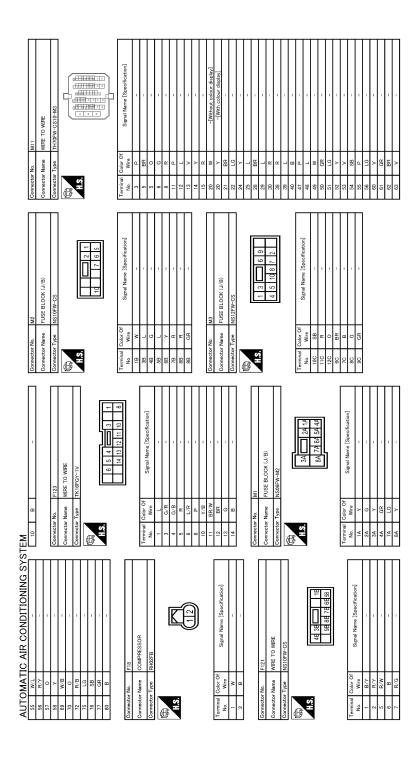
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Auto-Continue of the condition of the	A7 O CENEOD DOMED SLIDDLY	B/P	49 L A/F SENSOR I (BANK I) 50 L/Y INTAKE AIR TEMPERATURE SENSOR	R/Y	B/R	>	0 8	B 5	56 G/B SENSOR GROUND	30	W/S	60 Y/B SENSOR GROUND	В	W	R/W	B/R		SPIELL V/V	MAG.	t	BR/W	Y INTAKE VALI	R/G	W/L	78 R/L INTAKE VALVE TIMING CONTROL SOLENOID VALVE (BANK 1)		N-married N-	Т	Connector Name ROOM)	Connector Type TH20FW-CS12-M4	đ	<b>幸</b> 与	ST	53 54 55 56 57 58	49 86 67 82					No. Wire	40 W	. 14	5 6	23 25	54 G/W –											
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Revision: 2013 August HAC-225 2014 MURANO



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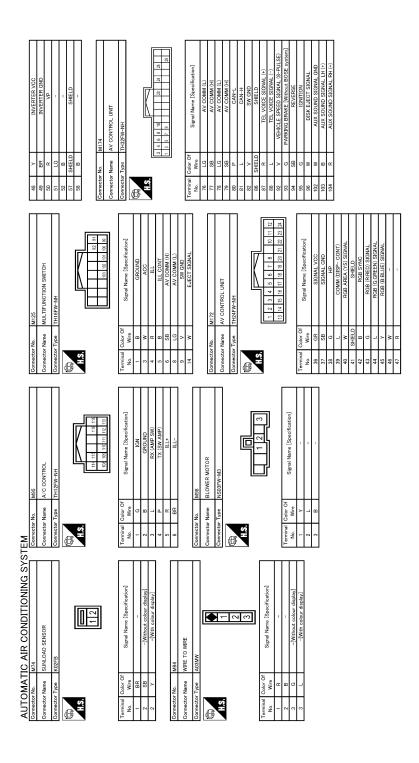
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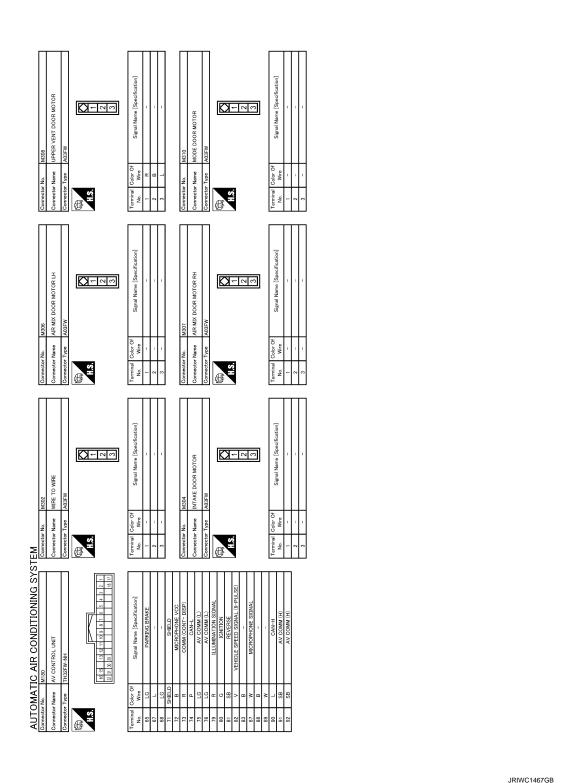
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Fail-Safe

#### **FAIL-SAFE FUNCTION**

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

Compressor : ON
Air outlet : AUTO

Air inlet : FRE (Fresh)

Blower fan speed : AUTO

Set temperature : Setting before communication error occurs

### DTC Inspection Priority Chart

INFOID:0000000009722207

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

Priority	Detected items (DTC)
1	U1000: CAN COMM CIRCUIT     U1010: CONTROL UNIT (CAN)
2	<ul> <li>B2578: IN-VEHICLE SENSOR</li> <li>B2579: IN-VEHICLE SENSOR</li> <li>B257B: AMBIENT SENSOR</li> <li>B257C: AMBIENT SENSOR</li> <li>B2581: INTAKE SENSOR</li> <li>B2581: INTAKE SENSOR</li> <li>B2630: SUNLOAD SENSOR</li> <li>B2631: SUNLOAD SENSOR</li> <li>B2631: SUNLOAD SENSOR</li> <li>B2632: DR AIR MIX DOOR MOT</li> <li>B2633: DR AIR MIX DOOR MOT</li> <li>B2634: PASS AIR MIX DOOR MOT</li> <li>B2635: PASS AIR MIX DOOR MOT</li> <li>B2636: DR VENT DOOR FAIL</li> <li>B2637: DR B/L DOOR FAIL</li> <li>B2639: DR D/F1 DOOR FAIL</li> <li>B2639: DR DFF DOOR FAIL</li> <li>B2639: TRE DOOR FAIL</li> <li>B2639: TRE DOOR FAIL</li> <li>B2635: DR D/F2 DOOR FAIL</li> <li>B2635: B/L2 DOOR FAIL</li> <li>B2655: B/L2 DOOR FAIL</li> <li>B2661: UPPER VENT DOOR MOT</li> <li>B2662: UPPER VENT DOOR MOT</li> <li>B2663: UPPER VENT DOOR MOT</li> <li>B2663: UPPER VENT DOOR MOT</li> </ul>

DTC Index

DTC	Items (CONSULT screen terms)	Reference
U1000	CAN COMM CIRCUIT	HAC-170, "DTC Logic"
U1010	CONTROL UNIT (CAN)	HAC-171, "DTC Logic"
B257B	IN-VEHICLE SENSOR	HAC-172, "DTC Logic"
B257C	IN-VEHICLE SENSOR	HAC-172, "DTC Logic"
B2578	AMBIENT SENSOR	HAC-175, "DTC Logic"
B2579	AMBIENT SENSOR	HAC-175, "DTC Logic"
B2581	INTAKE SENSOR	HAC-178, "DTC Logic"
B2582	INTAKE SENSOR	HAC-178, "DTC Logic"
B2630*	SUNLOAD SENSOR	HAC-181, "DTC Logic"
B2631*	SUNLOAD SENSOR	HAC-181, "DTC Logic"
B2632	DR AIR MIX DOOR MOT	HAC-184, "DTC Logic"
B2633	DR AIR MIX DOOR MOT	HAC-184, "DTC Logic"

### A/C AUTO AMP.

### < ECU DIAGNOSIS INFORMATION >

### [WITH 7 INCH DISPLAY]

DTC	Items (CONSULT screen terms)	Reference
B2634	PASS AIR MIX DOOR MOT	HAC-186, "DTC Logic"
B2635	PASS AIR MIX DOOR MOT	HAC-186, "DTC Logic"
B2636	DR VENT DOOR FAIL	HAC-188, "DTC Logic"
B2637	DR B/L DOOR FAIL	HAC-188, "DTC Logic"
B2638	DR D/F1 DOOR FAIL	HAC-188, "DTC Logic"
B2639	DR DEF DOOR FAIL	HAC-188, "DTC Logic"
B263D	FRE DOOR FAIL	HAC-191, "DTC Logic"
B263E	20P FRE DOOR FAIL	HAC-191, "DTC Logic"
B263F	REC DOOR FAIL	HAC-191, "DTC Logic"
B2654	D/F2 DOOR FAIL	HAC-188, "DTC Logic"
B2655	B/L2 DOOR FAIL	HAC-188, "DTC Logic"
B2661	UPPER VENT DOOR MOT	HAC-193, "DTC Logic"
B2662	UPPER VENT DOOR MOT	HAC-193, "DTC Logic"
B2663	UPPER VENT DOOR MOT	HAC-193, "DTC Logic"

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

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## SYMPTOM DIAGNOSIS

## AIR CONDITIONER CONTROL

### Diagnosis Chart By Symptom

INFOID:0000000009722209

Symptom	Reference	
A/C system does not activate.	Go to Trouble Diagnosis Procedure for A/C System.	HAC-202, "A/C AUTO AMP. : Diagnosis Procedure"
A/C system cannot be controlled.	Go to Trouble Diagnosis Procedure for Preset Switch System.	AV-142, "Symptom Table" (base audio without navigation), AV-269, "Symptom Table" (BOSE audio without navigation) or AV-436, "Symptom Table" (BOSE audio with navigation)
Air outlet does not change.	Go to Trouble Diagnosis Procedure for Mode Door Motor.	HAC-189, "Diagnosis Proce-
Mode door motor does not operate normally.	(LAN)	dure"
Discharge air temperature does not change.	Go to Trouble Diagnosis Procedure for Air Mix Door Motor.	HAC-185, "Diagnosis Procedure" (driver side) or HAC-187,
Air mix door motor does not operate normally.	(LAN)	" <u>Diagnosis Procedure</u> " (passenger side)
Intake door does not change.	Go to Trouble Diagnosis Procedure for Intake Door Motor.	HAC-192, "Diagnosis Proce-
Intake door motor does not operate normally.	(LAN)	dure"
Blower motor operation is malfunctioning.	Go to Trouble Diagnosis Procedure for Blower Motor.	HAC-196, "Diagnosis Procedure"
Magnet clutch does not engage.	Go to Trouble Diagnosis Procedure for Magnet Clutch.	HAC-200, "Diagnosis Procedure"
Insufficient cooling		HAC-233, "Inspection proce-
No cool air comes out. (Air flow volume is normal.)	Go to Trouble Diagnosis Procedure for Insufficient Cooling.	dure"
Insufficient heating		HAC-236, "Inspection proce-
No warm air comes out. (Air flow volume is normal.)	Go to Trouble Diagnosis Procedure for Insufficient Heating.	dure"
Noise	Go to Trouble Diagnosis Procedure for Noise.	HAC-239, "Inspection procedure"
Memory function does not operate.	Go to Trouble Diagnosis Procedure for Memory Function.	HAC-241, "Inspection procedure"

INFOID:00000000009722211

### INSUFFICIENT COOLING

Description INFOID:0000000009722210

Symptom

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

### Inspection procedure

### ${f 1}$ .CHECK WITH A GAUGE OF RECOVERY/RECYCLING RECHARGING EQUIPMENT

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

#### Is there refrigerant?

YES >> GO TO 2.

NO-1 >> Check for refrigerant leakages with the refrigerant leakage detecting fluorescent leak detector. Refer to HA-30, "Inspection".

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

### 2.CHECK CHARGED REFRIGERANT AMOUNT

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

#### Is the inspection result normal?

YES >> GO TO 3.

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

### $oldsymbol{3}.$ CHECK REFRIGERANT CYCLE PRESSURE

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

#### Is the inspection result normal?

YES >> GO TO 4.

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

### 4.CHECK SETTING OF TEMPERATURE SETTING TRIMMER

Using CONSULT, check the setting of "TEMP SET CORRECT" on "WORK SUPPORT" of HVAC. Refer to HAC-136, "Temperature Setting Trimmer".

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

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

2. Set temperature control dial to "0".

#### Are the malfunction solved?

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

NO >> GO TO 5.

### ${f 5.}$ CHECK WITH SELF-DIAGNOSIS FUNCTION OF CONSULT

- Using CONSULT, perform "SELF-DIAGNOSIS RESULTS" of HVAC.
- 2. Check if any DTC No. is displayed in the trouble diagnosis results.

#### NOTE:

If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to HAC-170, "DTC Logic" or HAC-171, "DTC Logic".

#### Is any DTC No. displayed?

>> Perform the diagnosis that is applicable to the sensor and the door motor. Refer to HAC-230. YES "DTC Index".

NO >> GO TO 6.

### $oldsymbol{6}.$ CHECK WITH ACTIVE TEST OF CONSULT

**HAC-233** Revision: 2013 August 2014 MURANO

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1. Using CONSULT, perform "HVAC TEST" "ACTIVE TEST" of HVAC to check each output device. Refer to HAC-166, "CONSULT Function".

#### NOTE:

Perform the ACTIVE TEST after starting the engine because the compressor is operated.

2. Refer to the table and check the outlet, inlet, air flow temperature, blower motor control signal, magnet clutch operation, and air mix ratio. Visually check each operating condition, by listening for noise, touching air outlets with a hand, etc.

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

#### NOTE:

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

Discharge air flo	ow .						
Mode position	_			Air outlet/d	distribution		
indication	Condition		VENT		FO	ОТ	DEE
		Front	Upper	Rear	Front	Rear	DEF
- <b>,</b> i		81%	8%	11%	_	_	_
**	DUAL switch: OFF	41%	10%	17%	24%	8%	_
نړ ،	UPPER VENT - switch : ON	12%	12%	16%	27%	10%	23%
**	SWILCH : OIN	11%	11%	14%	25%	10%	29%
**		11%	11%	12%	_	_	66%

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Discharge air flow								
Mode position		Air outlet/distribution				n		
indication	Condition		VENT		FO	OT	DEE	
		Front	Upper	Rear	Front	Rear	DEF	
نه-		88%	_	12%	ı	_	_	
ずん	DUAL switch: OFF UPPER VENT switch : OFF	47%	_	18%	26%	9%	_	
<b>`~i</b>		13%	_	17%	33%	12%	25%	
**		12%	_	16%	28%	12%	32%	
<b>*</b>		11%	_	15%	_	_	74%	

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Does it operate normally?

YES >> GO TO 7.

INSUFFICIENT COOLING							
< SYMPTOM DIAGNOSIS > [WITH 7 INCH DISPLAY]							
<ul> <li>NO-1 &gt;&gt; Air outlet does not change. Refer to <u>HAC-189, "Diagnosis Procedure"</u>.</li> <li>NO-2 &gt;&gt; Air inlet does not change. Refer to <u>HAC-192, "Diagnosis Procedure"</u>.</li> <li>NO-3 &gt;&gt; Discharge air temperature does not change. Refer to <u>HAC-185, "Diagnosis Procedure"</u> and <u>HAC-187, "Diagnosis Procedure"</u>.</li> </ul>	А						
NO-4 >> Blower motor does not operate normally. Refer to <a href="HAC-196">HAC-196</a> , "Diagnosis Procedure".  NO-5 >> Magnet clutch does not operate. Refer to <a href="HAC-200">HAC-200</a> , "Diagnosis Procedure".	В						
7. CHECK AMBIENT TEMPERATURE DISPLAY							
Check that there is not much difference between actual ambient temperature and indicated temperature on information display in combination meter.	С						
Is the inspection result normal?							
YES >> GO TO 8.  NO >> Perform the diagnosis for the A/C auto amp. connection recognition signal. Refer to MWI-56, "Diagnosis Procedure".	D						
8. CHECK DRIVE BELT	Е						
Check tension of the drive belt. Refer to EM-17, "Checking".							
Is the inspection result normal?	F						
YES >> GO TO 9.							
NO >> Adjust or replace drive belt.							
9. CHECK AIR LEAKAGE FROM DUCT	G						

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

### Is the inspection result normal?

YES >> INSPECTION END

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

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[WITH 7 INCH DISPLAY]

#### INSUFFICIENT HEATING

Description INFOID:000000009722212

#### Symptom

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

### Inspection procedure

INFOID:0000000009722213

### 1. CHECK COOLING SYSTEM

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

#### Is the inspection result normal?

YES >> GO TO 2.

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

### 2. CHECK OPERATION

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

#### Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 3.

### 3.CHECK SETTING OF TEMPERATURE SETTING TRIMMER

Using CONSULT, check the setting of "TEMP SET CORRECT" on "WORK SUPPORT" of HVAC. Refer to HAC-136, "Temperature Setting Trimmer".

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

#### NOTE:

The control temperature can be set by the temperature setting trimmer.

2. Set temperature control dial to "0".

#### Are the malfunction solved?

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

NO >> GO TO 4.

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

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

#### NOTE:

If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to HAC-170, "DTC Logic" or HAC-171, "DTC Logic".

#### Is any DTC No. displayed?

YES >> Perform the diagnosis that is applicable to the sensor and the door motor. Refer to <a href="https://example.com/HAC-230">HAC-230</a>, <a href="mailto:">"DTC Index"</a>.

NO >> GO TO 5.

#### 5. CHECK WITH ACTIVE TEST OF CONSULT

 Using CONSULT, perform "HVAC TEST" in "ACTIVE TEST" of HVAC to check each output device. Refer to <u>HAC-166</u>, "CONSULT Function".

#### NOTE:

Perform the ACTIVE TEST after starting the engine because the compressor is operated.

Refer to the table and check the outlet, inlet, air flow temperature, blower motor control signal, magnet clutch operation, and air mix ratio. Visually check each operating condition, by listening for noise, touching air outlets with a hand, etc.

#### < SYMPTOM DIAGNOSIS >

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

#### NOTE:

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

Discharge air flo	ow						
Mode position				Air outlet/d	distribution		
indication	Condition		VENT		FOOT		DEE
		Front	Upper	Rear	Front	Rear	DEF
نه	DUAL switch: OFF	81%	8%	11%	_	_	_
**		41%	10%	17%	24%	8%	-
نه:	UPPER VENT	12%	12%	16%	27%	10%	23%
<b>*</b>	SWITCH . OIV	11%	11%	14%	25%	10%	29%
<b>*</b>		11%	11%	12%	_	_	66%

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Discharge air flow							
Mode position				Air outlet/d	distribution		
indication	Condition		VENT			FOOT	
		Front	Upper	Rear	Front	Rear	DEF
, '		88%	_	12%	-	_	_
<u> </u>	DUAL switch: OFF	47%	_	18%	26%	9%	_
<b>~~i</b>	UPPER VENT switch : OFF	13%	_	17%	33%	12%	25%
¥;	SWILCH . OF I	12%	_	16%	28%	12%	32%
<b>*</b>		11%	_	15%	_	_	74%

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#### Does it operate normally?

- YES >> GO TO 6.
- NO-1 >> Air outlet does not change. Refer to <u>HAC-189</u>, "Diagnosis Procedure".
- NO-2 >> Air inlet does not change. Refer to <u>HAC-192, "Diagnosis Procedure"</u>.
- NO-3 >> Discharge air temperature does not change. Refer to <u>HAC-185, "Diagnosis Procedure"</u> and <u>HAC-187, "Diagnosis Procedure"</u>.
- NO-4 >> Blower motor does not operate normally. Refer to <u>HAC-196</u>, "<u>Diagnosis Procedure</u>".
- NO-5 >> Magnet clutch does not operate. Refer to <u>HAC-200, "Diagnosis Procedure"</u>.

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#### **INSUFFICIENT HEATING**

#### < SYMPTOM DIAGNOSIS >

[WITH 7 INCH DISPLAY]

### 6. CHECK AIR LEAKAGE FROM DUCT

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

#### Is the inspection result normal?

YES >> GO TO 7.

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

### 7.CHECK HEATER HOSE INSTALLATION CONDITION

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

#### Is the inspection result normal?

YES >> GO TO 8.

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

### 8.CHECK TEMPERATURE OF HEATER HOSE

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

#### CAUTION:

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

#### Is the inspection result normal?

YES >> GO TO 9.

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

### 9. REPLACE HEATER CORE

Replace the heater core. Refer to heater core. Refer to VTL-111, "Exploded View".

#### Are the malfunction solved?

YES >> INSPECTION END

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

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Check the A/C piping (pipes, flexible hoses) (for deformation and damage, etc.).

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

>> Repair or replace parts according to the inspection results.

Is the inspection result normal?

7. CHECK DRIVE BELT

YES

NO

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

Check tension of the drive belt. Refer to EM-17, "Checking". Is the inspection result normal?

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

#### **MEMORY FUNCTION DOES NOT OPERATE**

< SYMPTOM DIAGNOSIS >

[WITH 7 INCH DISPLAY]

### MEMORY FUNCTION DOES NOT OPERATE

Description

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Symptom

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

### Inspection procedure

#### INFOID:0000000009722217

### 1. CHECK OPERATION

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

#### Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 2.

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

Check power supply and ground circuit of the A/C auto amp. Refer to <u>HAC-202, "A/C AUTO AMP. : Diagnosis Procedure"</u>.

#### Is the inspection result normal?

YES >> Replace the A/C auto amp.

NO >> Repair or replace malfunctioning parts.

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### **PRECAUTION**

# PRECAUTIONS FOR USA AND CANADA

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

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

#### **WARNING:**

Always observe the following items for preventing accidental activation.

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

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

#### WARNING:

Always observe the following items for preventing accidental activation.

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

FOR USA AND CANADA: Precautions for Removing of Battery Terminal INFOID-00000010092880

When removing the 12V battery terminal, turn OFF the ignition

#### NOTE:

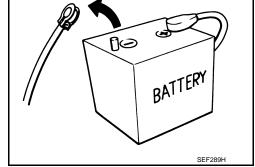
switch and wait at least 30 seconds.

ECU may be active for several tens of seconds after the ignition switch is turned OFF. If the battery terminal is removed before ECU stops, then a DTC detection error or ECU data corruption may occur

• For vehicles with the 2-batteries, be sure to connect the main battery and the sub battery before turning ON the ignition switch.

#### NOTE:

If the ignition switch is turned ON with any one of the terminals of main battery and sub battery disconnected, then DTC may be detected.



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After installing the 12V battery, always check "Self Diagnosis Result" of all ECUs and erase DTC.
 NOTE:

The removal of 12V battery may cause a DTC detection error.

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

#### **CAUTION:**

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

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

#### CONTAMINATED REFRIGERANT

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

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

### FOR USA AND CANADA: General Refrigerant Precaution

#### **WARNING:**

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

### FOR USA AND CANADA: Refrigerant Connection

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

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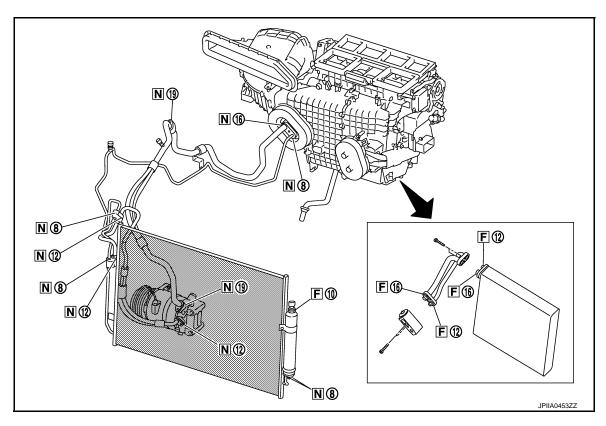
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- Expansion valve to evaporator
- Refrigerant pressure sensor to liquid tank

#### O-RING AND REFRIGERANT CONNECTION



- F. Former type refrigerant connection N. New type refrigerant connection
- O: O-ring size

#### **CAUTION:**

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

O-Ring Part Numbers and Specifications

Connection type	Piping connection point	Part number	QTY	O-ring size	
	Low-pressure flexible hose to low-pressure pip	е	92474 N8210	1	φ19
	High-pressure pipe to condenser pipe assemb	y (Outlet)	92471 N8210	1	ф8
	Condenser pipe assembly (Inlet) to high-press hose (One-touch joint)	ure flexible	92472 N8210	1	φ12
	Condenser assembly to condenser pipe as-	Inlet	92472 N8210	1	φ12
	sembly	Outlet	92471 N8210	1	ф8
New	Low-pressure pipe to expansion valve	-	92473 N8210	1	φ16
	High-pressure pipe to expansion valve		92471 N8210	1	ф8
	Compressor to low-pressure flexible hose		92474 N8210	1	φ19
	Compressor to high-pressure flexible hose		92472 N8210	1	φ12
	Limid to all to a series	Inlet	00474 NI0040	1	ф8
	Liquid tank to condenser assembly	Outlet	92471 N8210	1	

#### < PRECAUTION >

Connection type	Piping connection point	Part number	QTY	O-ring size	
	Refrigerant pressure sensor to liquid tank		J2476 89956	1	φ10
	Expansion valve to evaporator pipe assembly  Evaporator to evaporator pipe assembly	Inlet	92475 71L00	1	ф12
Former		Outlet	92475 72L00	1	ф16
		Inlet	92475 71L00	1	ф12
Evaporator to evaporation	Evaporator to evaporator pipe assembly	Outlet	92475 72L00	1	φ16

#### **WARNING:**

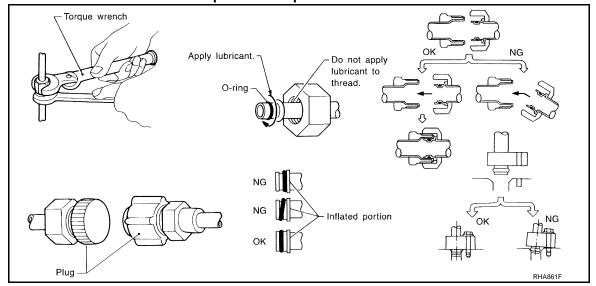
Check that all refrigerant is discharged into the recycling equipment and the pressure in the system is less than atmospheric pressure. Then gradually loosen the discharge side hose fitting and remove it. **CAUTION**:

Observe the following when replacing or cleaning refrigerant cycle components.

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

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

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



### FOR USA AND CANADA: Service Equipment

#### RECOVERY/RECYCLING EQUIPMENT

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

#### ELECTRICAL LEAK DETECTOR

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

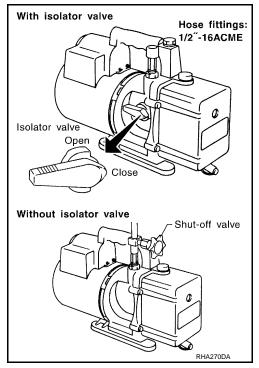
#### **VACUUM PUMP**

The lubricant contained inside the vacuum pump is not compatible with the specified lubricant for HFC-134a (R-134a) A/C systems. The vent side of the vacuum pump is exposed to atmospheric pressure. So the vacuum pump lubricant may migrate out of the pump into the service hose. This is possible when the pump is switched OFF after evacuation (vacuuming) and hose is connected to it.

To prevent this migration, use a manual valve placed near the hose-to-pump connection, as per the following.

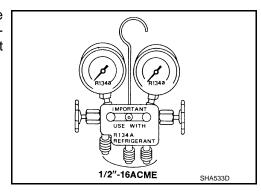
- Vacuum pumps usually have a manual isolator valve as part of the pump. Close this valve to isolate the service hose from the pump.
- Use a hose equipped with a manual shut-off valve near the pump end for pumps without an isolator. Close the valve to isolate the hose from the pump.
- Disconnect the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

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



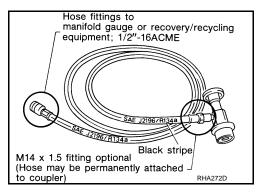
#### MANIFOLD GAUGE SET

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



#### SERVICE HOSES

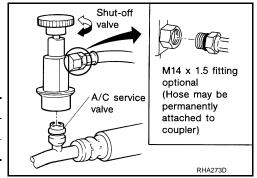
Be certain that the service hoses display the markings described (colored hose with a black stripe). All hoses must equip positive shut-off devices (either manual or automatic) near the end of the hoses opposite to the manifold gauge.



SERVICE COUPLERS

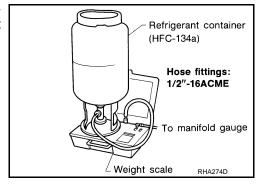
Never attempt to connect HFC-134a (R-134a) service couplers to a CFC-12 (R-12) A/C system. The HFC-134a (R-134a) couplers do not properly connect to the CFC-12 (R-12) system. However, if an improper connection is attempted, discharge and contamination may occur.

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



#### REFRIGERANT WEIGHT SCALE

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



#### **CHARGING CYLINDER**

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

FOR MEXICO

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

The Supplemental Restraint System such as "AIR BAG" and "SEAT BELT PRE-TENSIONER", used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. Information necessary to service the system safely is included in the "SRS AIR BAG" and "SEAT BELT" of this Service Manual.

#### **WARNING:**

Always observe the following items for preventing accidental activation.

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

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

#### **WARNING:**

Always observe the following items for preventing accidental activation.

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

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### FOR MEXICO: Precautions for Removing of Battery Terminal

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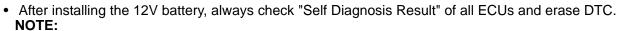
 When removing the 12V battery terminal, turn OFF the ignition switch and wait at least 30 seconds.

#### NOTE:

ECU may be active for several tens of seconds after the ignition switch is turned OFF. If the battery terminal is removed before ECU stops, then a DTC detection error or ECU data corruption may occur.

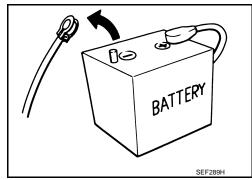
For vehicles with the 2-batteries, be sure to connect the main battery and the sub battery before turning ON the ignition switch.
 NOTE:

If the ignition switch is turned ON with any one of the terminals of main battery and sub battery disconnected, then DTC may be detected.



The removal of 12V battery may cause a DTC detection error.

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



#### **CAUTION:**

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

#### CONTAMINATED REFRIGERANT

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

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

### FOR MEXICO: General Refrigerant Precaution

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#### **WARNING:**

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

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

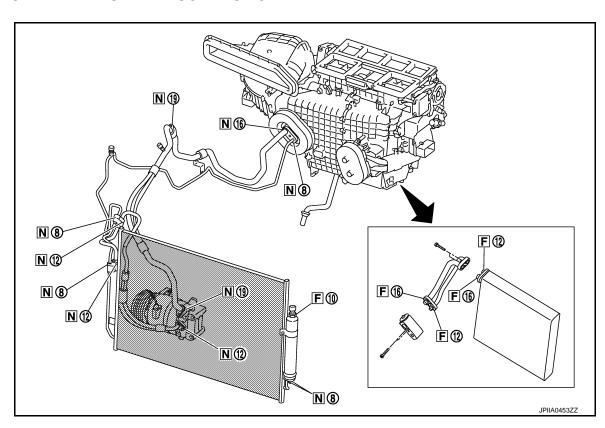
- Never release refrigerant into the air. Use approved recovery/recycling equipment to capture the refrigerant each time an air conditioning system is discharged.
- Always wear eye and hand protection (goggles and gloves) when working with any refrigerant or air conditioning system.
- Never store or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

### FOR MEXICO: Refrigerant Connection

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

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

#### O-RING AND REFRIGERANT CONNECTION



- F. Former type refrigerant connection N. New type refrigerant connection
- O: O-ring size

#### **CAUTION:**

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

O-Ring Part Numbers and Specifications

Connection type	Piping connection point	Part number	QTY	O-ring size	
	Low-pressure flexible hose to low-pressure pipe	Э	92474 N8210	1	φ19
	High-pressure pipe to condenser pipe assembly	y (Outlet)	92471 N8210	1	ф8
	Condenser pipe assembly (Inlet) to high-pressure flexible hose (One-touch joint)		92472 N8210	1	φ12
	Condenser assembly to condenser pipe as-	Inlet	92472 N8210	1	φ12
	sembly	Outlet	92471 N8210	1	ф8
New	Low-pressure pipe to expansion valve	1	92473 N8210	1	φ16
	High-pressure pipe to expansion valve		92471 N8210	1	ф8
	Compressor to low-pressure flexible hose	92474 N8210	1	φ19	
	Compressor to high-pressure flexible hose		92472 N8210	1	φ12
	Linuid to the condensate to	Inlet		1	ф8
	Liquid tank to condenser assembly	Outlet	92471 N8210	1	
	Refrigerant pressure sensor to liquid tank	1	J2476 89956	1	φ10
	F	Inlet	92475 71L00	1	φ12
Former	Expansion valve to evaporator pipe assembly	Outlet	92475 72L00	1	φ16
	Francisco de la constante de l	Inlet	92475 71L00	1	φ12
	Evaporator to evaporator pipe assembly	Outlet	92475 72L00	1	φ16

#### WARNING.

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

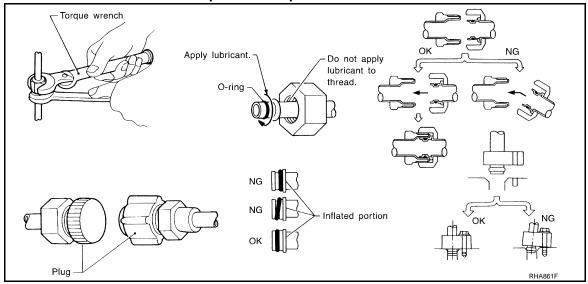
Observe the following when replacing or cleaning refrigerant cycle components.

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

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

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

• Perform leakage test and make sure that there is no leakage from connections after connecting line. Disconnect the line and replace the O-ring when the refrigerant leaking point is found. Then tighten the connections of seal seat to the specified torque.



### FOR MEXICO: Service Equipment

#### RECOVERY/RECYCLING EQUIPMENT

Be certain to follow the manufacturer instructions for machine operation and machine maintenance. Never introduce any refrigerant other than that specified into the machine.

#### ELECTRICAL LEAK DETECTOR

Be certain to follow the manufacturer instructions for tester operation and tester maintenance.

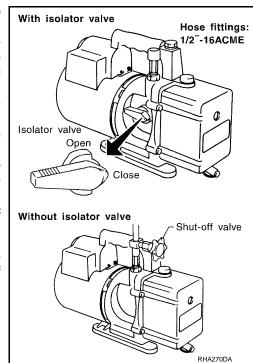
#### **VACUUM PUMP**

The lubricant contained inside the vacuum pump is not compatible with the specified lubricant for HFC-134a (R-134a) A/C systems. The vent side of the vacuum pump is exposed to atmospheric pressure. So the vacuum pump lubricant may migrate out of the pump into the service hose. This is possible when the pump is switched OFF after evacuation (vacuuming) and hose is connected to it.

To prevent this migration, use a manual valve placed near the hose-to-pump connection, as per the following.

- Vacuum pumps usually have a manual isolator valve as part of the pump. Close this valve to isolate the service hose from the pump.
- Use a hose equipped with a manual shut-off valve near the pump end for pumps without an isolator. Close the valve to isolate the hose from the pump.
- Disconnect the hose from the pump if the hose has an automatic shut-off valve. As long as the hose is connected, the valve is open and lubricating oil may migrate.

Some one-way valves open when vacuum is applied and close under no vacuum condition. Such valves may restrict the ability of the pump to create a deep vacuum and are not recommended.



MANIFOLD GAUGE SET

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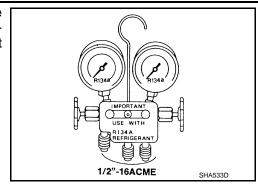
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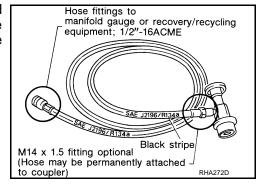
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Be certain that the gauge face indicates HFC-134a or R-134a. Be sure the gauge set has 1/2"-16 ACME threaded connections for service hoses. Confirm the set has been used only with refrigerant HFC-134a (R-134a) and specified lubricants.



#### SERVICE HOSES

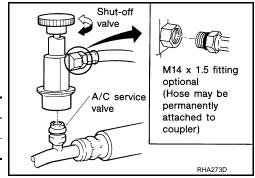
Be certain that the service hoses display the markings described (colored hose with a black stripe). All hoses must equip positive shut-off devices (either manual or automatic) near the end of the hoses opposite to the manifold gauge.



#### SERVICE COUPLERS

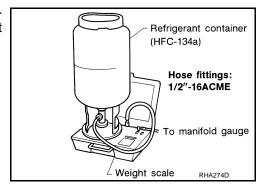
Never attempt to connect HFC-134a (R-134a) service couplers to a CFC-12 (R-12) A/C system. The HFC-134a (R-134a) couplers do not properly connect to the CFC-12 (R-12) system. However, if an improper connection is attempted, discharge and contamination may occur.

Shut-off valve rotation	A/C service valve
Clockwise	Open
Counterclockwise	Close



#### REFRIGERANT WEIGHT SCALE

Verify that no refrigerant other than HFC-134a (R-134a) and specified lubricants have been used with the scale. The hose fitting must be 1/2"-16 ACME if the scale controls refrigerant flow electronically.



#### CHARGING CYLINDER

Use of a charging cylinder is not recommended. Refrigerant may be vented into the air from the top valve of the cylinder when filling the cylinder with refrigerant. Also, the accuracy of the cylinder is generally less than that of an electronic scale or of quality recycle/recharge equipment.

#### **COMPRESSOR**

[WITH 7 INCH DISPLAY] < PRECAUTION >

### **COMPRESSOR**

#### **General Precautions** INFOID:0000000009722228

#### **CAUTION:**

- Plug all openings to prevent moisture and foreign matter from entering.
- Store it in the same way at it is when mounted on the car when the compressor is removed.
- Follow "Maintenance of Lubricant Quantity in Compressor" exactly when replacing or repairing the compressor. Refer to HA-25, "Maintenance of Lubricant Quantity".
- Keep friction surfaces between clutch and pulley clean. Wipe it off by using a clean waste cloth moistened with thinner if the surface is contaminated with lubricant.
- Turn the compressor shaft by hand more than five turns in both directions after compressor service operation. This equally distributes lubricant inside the compressor. Let the engine idle and operate the compressor for one hour after the compressor is installed.
- Apply voltage to the new compressor and check for normal operation after replacing the compressor magnet clutch.

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#### FLUORESCENT LEAK DETECTOR

< PRECAUTION > [WITH 7 INCH DISPLAY]

#### FLUORESCENT LEAK DETECTOR

### General Precautions

#### **CAUTION:**

- The A/C system contains a fluorescent leak detection dye used for locating refrigerant leakages. An
  ultraviolet (UV) lamp is required to illuminate the dye when inspecting for leakages.
- Always wear fluorescence enhancing UV safety goggles to protect eyes and enhance the visibility of the fluorescent dye.
- The fluorescent dye leak detector is not a replacement for an electrical leak detector (SST: J-41995).
   The fluorescent dye leak detector should be used in conjunction with an electrical leak detector (SST: J-41995) to pin-point refrigerant leakages.
- Read and follow all manufacture operating instructions and precautions prior to performing the work for the purpose of safety and customer satisfaction.
- A compressor shaft seal should not necessarily be repaired because of dye seepage. The compressor shaft seal should only be repaired after confirming the leakage with an electrical leak detector (SST: J-41995).
- Always remove any remaining dye from the leakage area after repairs are completed to avoid a misdiagnosis during future service.
- Never allow dye to come into contact with painted body panels or interior components. Clean immediately with the approved dye cleaner if dye is spilled. Fluorescent dye left on a surface for an extended period of time cannot be removed.
- Never spray the fluorescent dye cleaning agent on hot surfaces (engine exhaust manifold, etc.).
- Never use more than one refrigerant dye bottle (1/4 ounce /7.4 cc) per A/C system.
- Leak detection dyes for HFC-134a (R-134a) and CFC-12 (R-12) A/C systems are different. Never use HFC-134a (R-134a) leak detection dye in CFC-12 (R-12) A/C system, or CFC-12 (R-12) leak detection dye in HFC-134a (R-134a) A/C system, or A/C system damage may result.
- The fluorescent properties of the dye remains for three or more years unless a compressor malfunction occurs.

#### **IDENTIFICATION**

#### NOTE:

Vehicles with factory installed fluorescent dye have a green label.

Vehicles without factory installed fluorescent dye have a blue label.

#### IDENTIFICATION LABEL FOR VEHICLE

Vehicles with factory installed fluorescent dye have an identification label on the front side of hood.