

SECTION

ATC

AUTOMATIC AIR CONDITIONER

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PRECAUTIONS

PRECAUTIONS

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Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER”

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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 and SB section of this Service Manual.

WARNING:

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

Precautions Necessary for Steering Wheel Rotation After Battery Disconnect

BJS000F2

NOTE:

- This Procedure is applied only to models with Intelligent Key system and NATS (NISSAN ANTI-THEFT SYSTEM).
- Remove and install all control units after disconnecting both battery cables with the ignition knob in the “LOCK” position.
- Always use CONSULT-II to perform self-diagnosis as a part of each function inspection after finishing work. If DTC is detected, perform trouble diagnosis according to self-diagnostic results.

For models equipped with the Intelligent Key system and NATS, an electrically controlled steering lock mechanism is adopted on the key cylinder.

For this reason, if the battery is disconnected or if the battery is discharged, the steering wheel will lock and steering wheel rotation will become impossible.

If steering wheel rotation is required when battery power is interrupted, follow the procedure below before starting the repair operation.

OPERATION PROCEDURE

1. Connect both battery cables.

NOTE:

Supply power using jumper cables if battery is discharged.

2. Use the Intelligent Key or mechanical key to turn the ignition switch to the “ACC” position. At this time, the steering lock will be released.
3. Disconnect both battery cables. The steering lock will remain released and the steering wheel can be rotated.
4. Perform the necessary repair operation.
5. When the repair work is completed, return the ignition switch to the “LOCK” position before connecting the battery cables. (At this time, the steering lock mechanism will engage.)
6. Perform a self-diagnosis check of all control units using CONSULT-II.

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

BJS000F4

CAUTION:

- CFC-12 (R-12) refrigerant and HFC-134a (R-134a) refrigerant are not compatible. These refrigerants must never be mixed, even in the smallest amounts. If the refrigerants are mixed and compressor malfunction is likely occur.
- Use only specified lubricant for the HFC-134a (R-134a) A/C system and HFC-134a (R-134a) components. If lubricant other than that specified is used, compressor malfunction is likely to occur.
- The specified HFC-134a (R-134a) lubricant rapidly absorbs moisture from the atmosphere. The following handling precautions must be observed:

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PRECAUTIONS

- When removing refrigerant components from a vehicle, immediately cap (seal) the component to minimize the entry of moisture from the atmosphere.
- When installing refrigerant components to a vehicle, never remove the caps (unseal) until just before connecting the components. Connect all refrigerant loop components as quickly as possible to minimize the entry of moisture into system.
- Only use the specified lubricant from a sealed container. Immediately reseal containers of lubricant. Without proper sealing, lubricant will become moisture saturated and should not be used.
- Never allow lubricant (Nissan A/C System Oil Type S) to come in contact with styrene foam parts. Damage may result.

General Refrigerant Precautions

BJS000F5

WARNING:

- Avoid breathing A/C refrigerant and lubricant vapor or mist. Exposure may irritate eyes, nose and throat. Use only approved recovery/recycling equipment to discharge HFC-134a (R-134a) refrigerant. If accidental system discharge occurs, ventilate work area before resuming service. 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 every 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; if container warming is required, place the bottom of the container in a warm pail of water.
- Never intentionally drop, puncture, or incinerate refrigerant containers.
- Keep refrigerant away from open flames: poisonous gas will be produced if refrigerant burns.
- Refrigerant will displace oxygen, therefore be certain to work in well ventilated areas to prevent suffocation.
- Never pressure test or leak 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.

Precautions for Refrigerant Connection

BJS000F7

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

- Expansion valve to evaporator
- Refrigerant pressure sensor to condenser

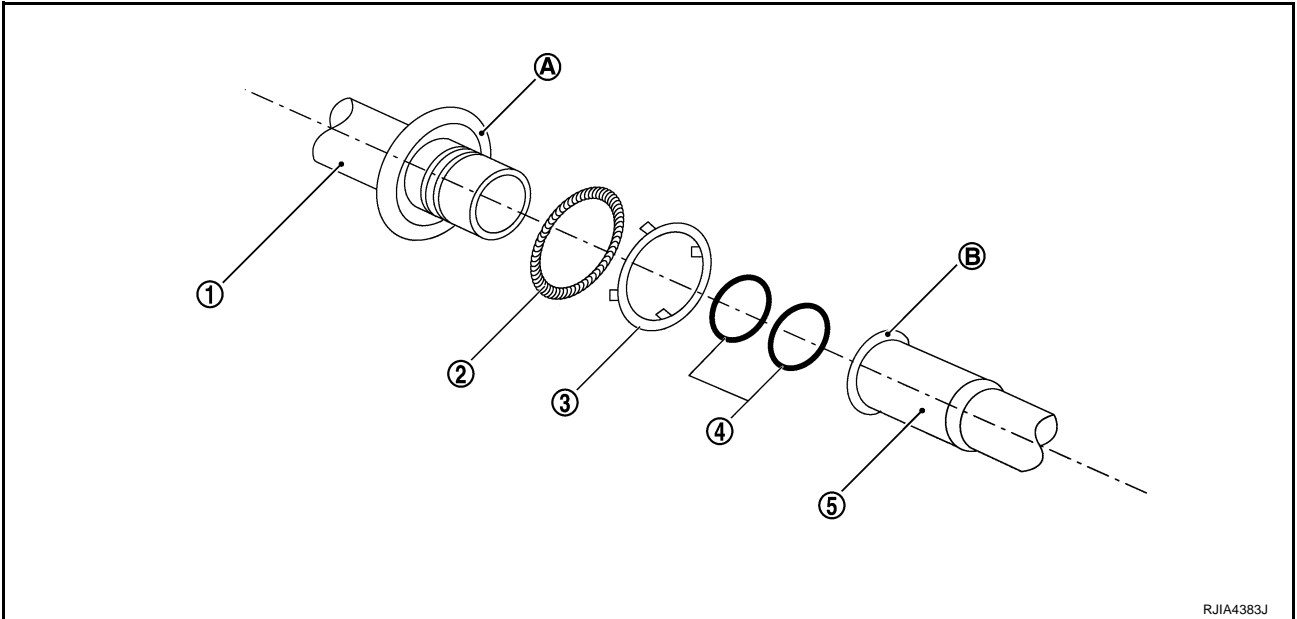
ABOUT ONE-TOUCH JOINT

Description

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

PRECAUTIONS

COMPONENT PARTS



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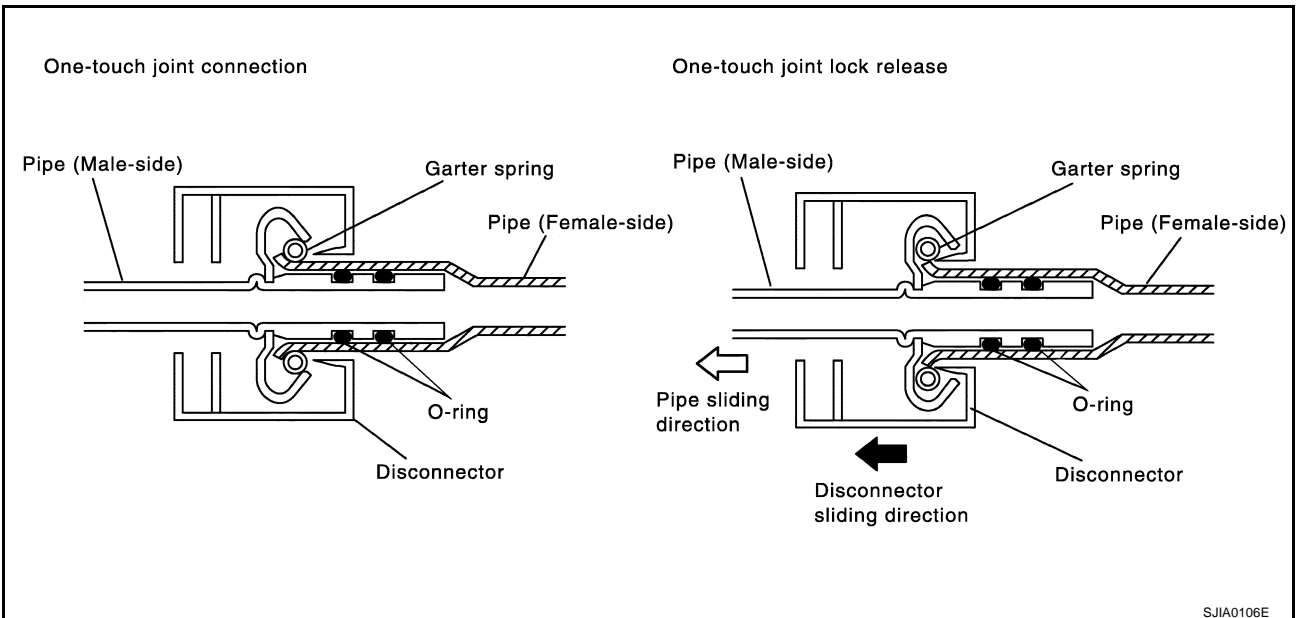
FUNCTIONS OF COMPONENT PARTS

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

NOTE:

- Garter spring (2) cannot be removed from cage (A) of male-side piping.
- Indicator ring (3) remains near piping connection point, however, this is not a malfunction. (This is to check piping connection during factory assembly.)

REMOVAL



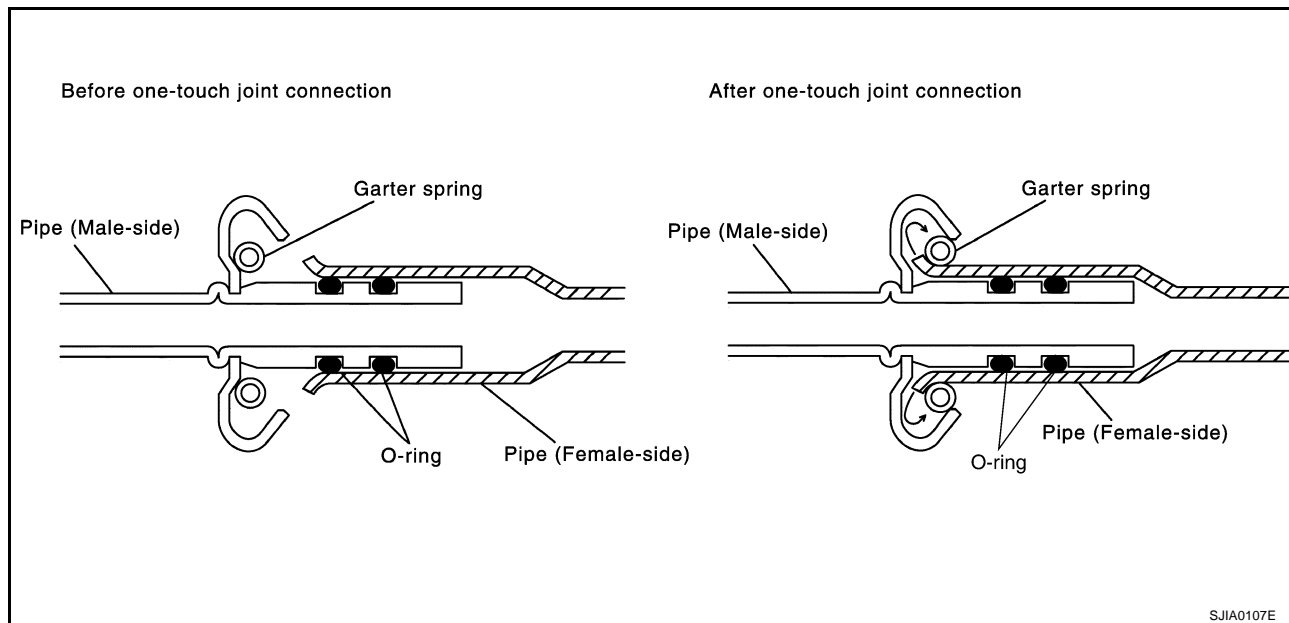
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- Clean piping connection point, and set a disconnecter.

PRECAUTIONS

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

INSTALLATION



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

NOTE:

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

CAUTION:

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

NOTE:

One-touch joint connection is used in points below.

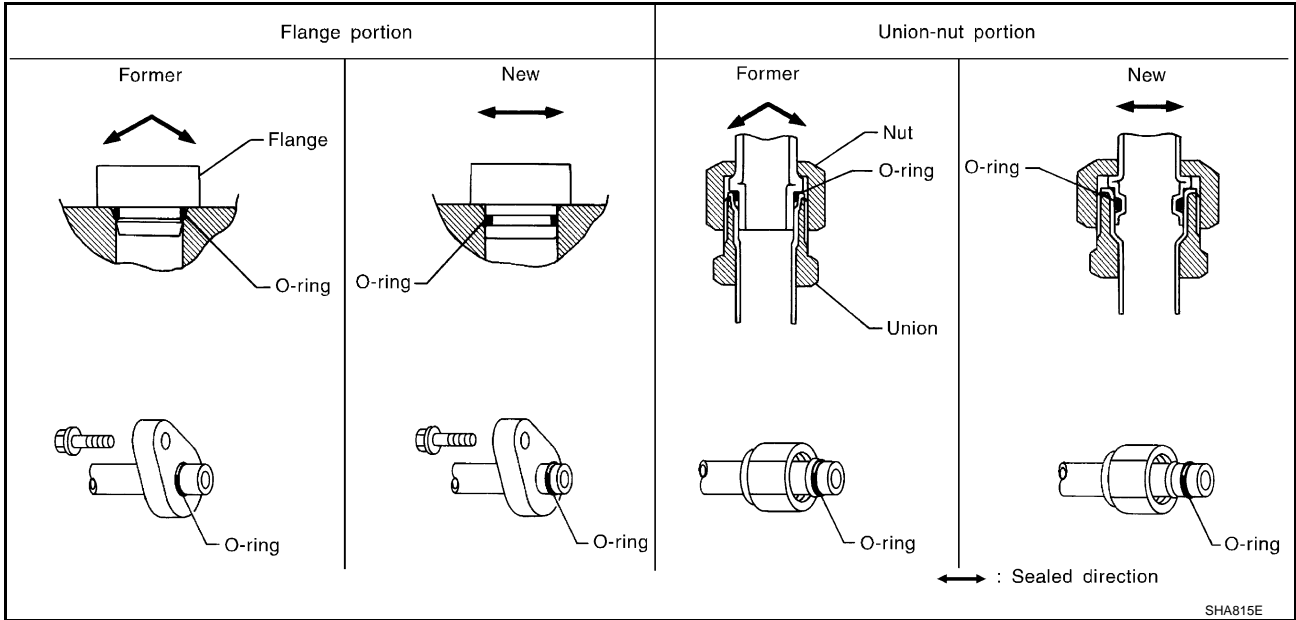
- Low-pressure pipe 1 to low-pressure pipe 2 (O-ring size: 16)
- High-pressure pipe 1 to high-pressure pipe 2 (O-ring size: 8)

FEATURES OF NEW TYPE REFRIGERANT CONNECTION

- The O-ring has been relocated. It has also been provided with a groove for proper installation. This eliminates the possibility of the O-ring being caught in, or damaged by, the mating part. The sealing direction of the O-ring is now set vertically in relation to the contacting surface of the mating part to improve sealing characteristics.

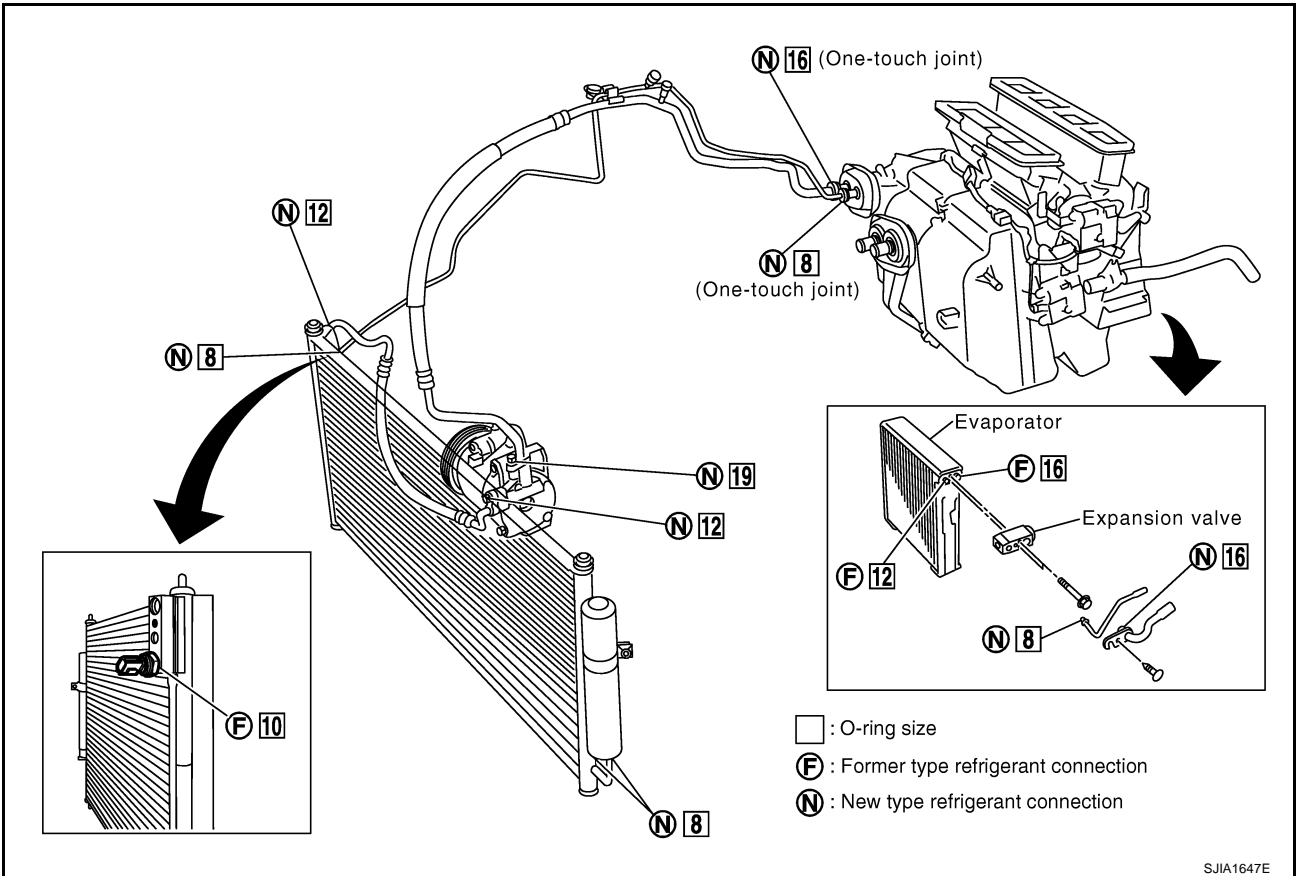
PRECAUTIONS

- The reaction force of the O-ring will not occur in the direction that causes the joint to pull out, thereby facilitating piping connections.



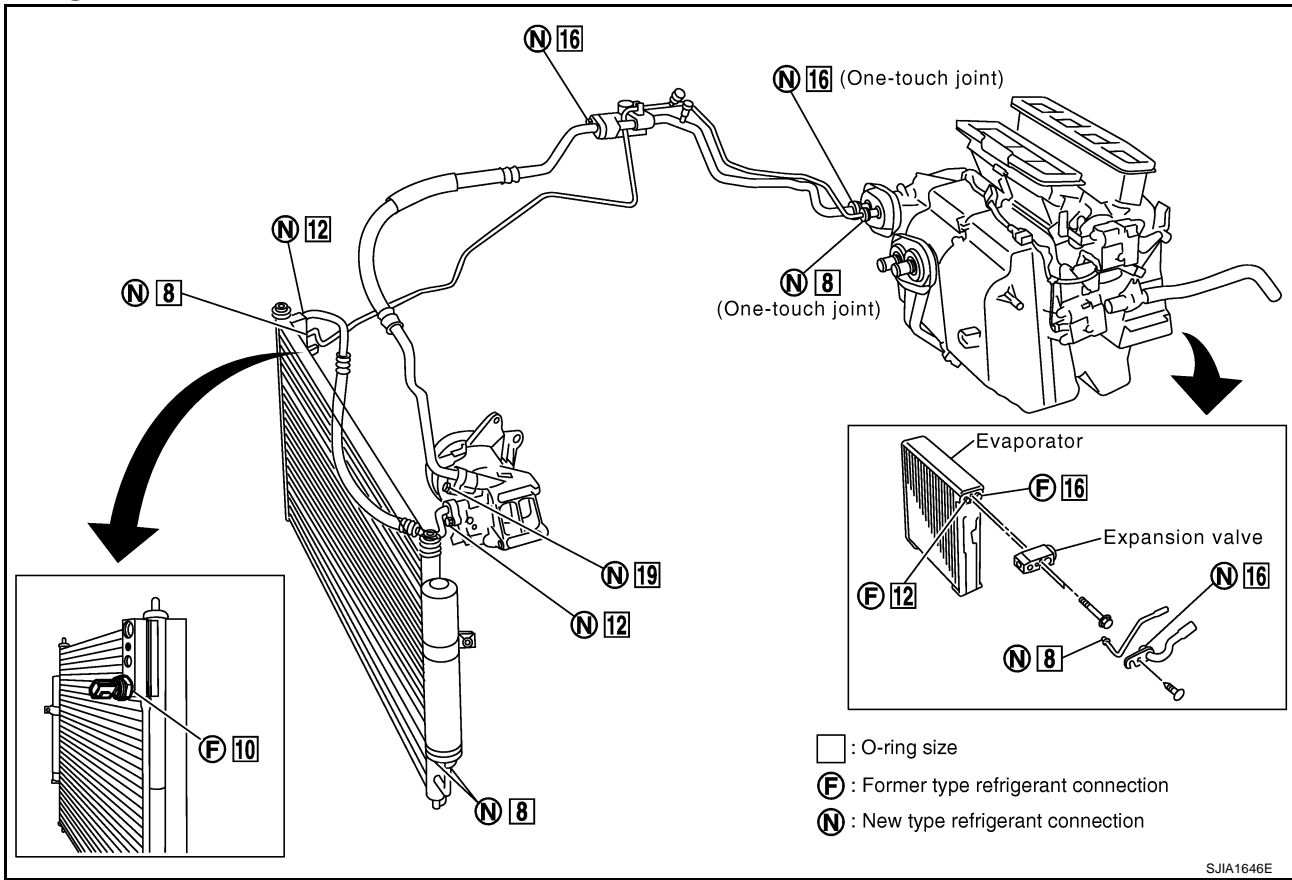
O-RING AND REFRIGERANT CONNECTION

QR Engine



PRECAUTIONS

VQ Engine



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CAUTION:

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

O-Ring Part Numbers and Specifications

Connection type	Piping connection point		Part number	QTY	O-ring size
New	Low-pressure pipe 1 to low-pressure pipe 2 (One-touch joint)		92473 N8221	2	16
	Low-pressure pipe 2 to expansion valve		92473 N8210	1	16
	High-pressure pipe 1 to high-pressure pipe 2 (One-touch joint)		92471 N8221	2	8
	High-pressure pipe 2 to expansion valve		92471 N8210	1	8
	Condenser to high-pressure flexible hose		92472 N8210	1	12
	Condenser to high-pressure pipe 1		92471 N8210	1	8
	Low-pressure flexible hose to low-pressure pipe 1 (VQ engine)		92473 N8210	1	16
	Compressor to low-pressure flexible hose		92474 N8210	1	19
	Compressor to high-pressure flexible hose		92472 N8210	1	12
	Liquid tank to condenser pipe	Inlet	92471 N8210	1	8
		Outlet		1	
Former	Refrigerant pressure sensor to condenser		J2476 89956	1	10
	Expansion valve to evaporator	Inlet	92475 71L00	1	12
		Outlet	92475 72L00	1	16

WARNING:

Make sure 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.

PRECAUTIONS

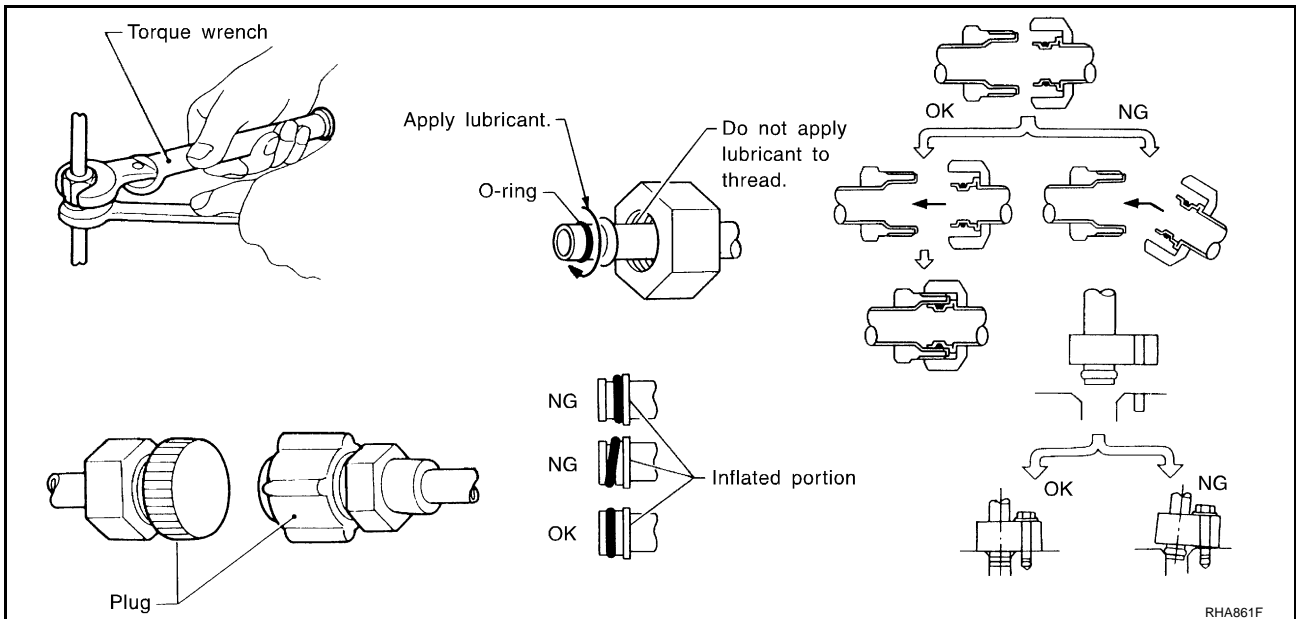
CAUTION:

When replacing or cleaning refrigerant cycle components, observe the following.

- When the compressor is removed, store it in the same way as it is when mounted on the car. Failure to do so will cause lubricant to enter the low-pressure chamber.
- When connecting tubes, always use a torque wrench and a back-up wrench.
- After disconnecting tubes, immediately plug all openings to prevent entry of dirt and moisture.
- When installing an air conditioner in the vehicle, connect the pipes at the final stage of the operation. 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.
- Always replace used O-rings.
- When connecting tubes, apply lubricant to circle of the O-rings shown in illustration. Be careful not to apply lubricant to threaded portion.

Lubricant name : Nissan A/C System Oil Type S

- O-ring must be closely attached to the groove of tube.
- When replacing the O-ring, be careful not to damage O-ring and tube.
- Connect tube until a click can be heard, then tighten the nut or bolt by hand until snug. Make sure that the O-ring is installed to tube correctly.
- After connecting line, perform leak test and make sure that there is no leakage from connections. When the refrigerant leaking point is found, disconnect that line and replace the O-ring. Then tighten connections of seal seat to the specified torque.



Precautions for Servicing Compressor

BJS000F8

- Plug all openings to prevent moisture and foreign matter from entering.
- When the compressor is removed, store it in the same position as it is when mounted on the car.
- When replacing or repairing compressor, follow "Maintenance of Lubricant Quantity in Compressor" exactly. Refer to [ATC-21, "Maintenance of Lubricant Quantity in Compressor"](#).
- Keep friction surfaces between clutch and pulley clean. If the surface is contaminated, with lubricant, wipe it off by using a clean waste cloth moistened with thinner.
- After compressor service operation, turn the compressor shaft by hand more than five turns in both directions. This will equally distribute lubricant inside the compressor. After the compressor is installed, let the engine idle and operate the compressor for one hour.

PRECAUTIONS

- After replacing the compressor magnet clutch, apply voltage to the new one and check for usual operation.

Precautions for Service Equipment RECOVERY/RECYCLING EQUIPMENT

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

ELECTRICAL LEAK DETECTOR

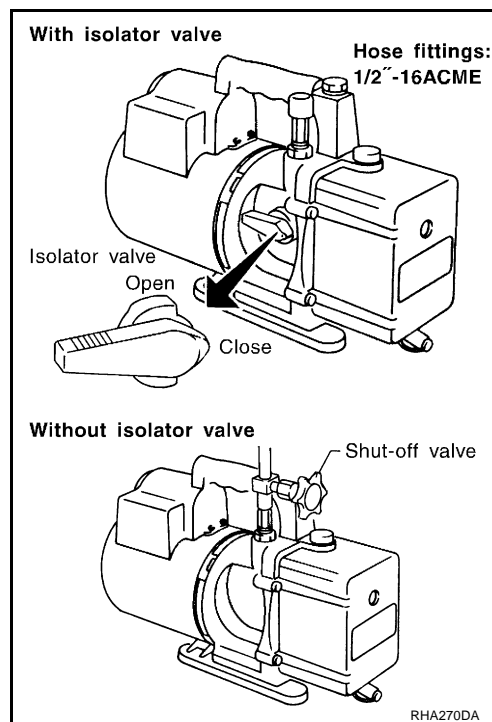
Be certain to follow the manufacturer's instructions for tester operation and tester maintenance.

VACUUM PUMP

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 follows.

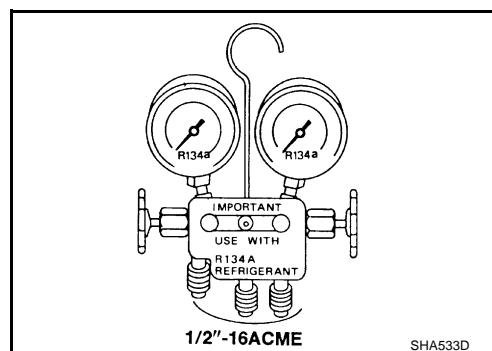
- Usually vacuum pumps have a manual isolator valve as part of the pump. Close this valve to isolate the service hose from the pump.
- For pumps without an isolator, use a hose equipped with a manual shut-off valve near the pump end. Close the valve to isolate the hose from the pump.
- If the hose has an automatic shut-off valve, disconnect the hose from the pump. As long as the hose is connected, the valve is open and lubricating oil may migrate.

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



MANIFOLD GAUGE SET

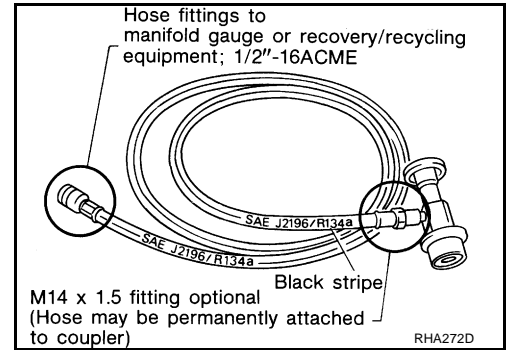
Be certain that the gauge face indicates HFC-134a or R-134a. Be sure the gauge set has 1/2"-16 ACME threaded connections for service hoses. Confirm the set has been used only with refrigerant HFC-134a (R-134a) and specified lubricants.



PRECAUTIONS

SERVICE HOSES

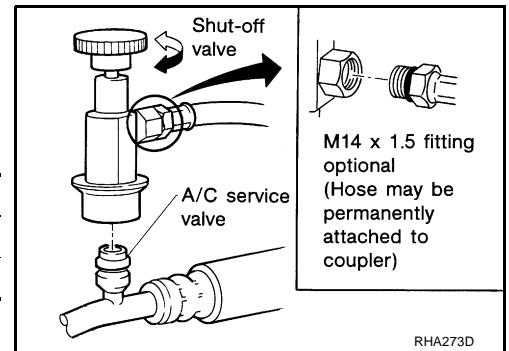
Be certain that the service hoses display the markings described (colored hose with black stripe). All hoses must include positive shut-off devices (either manual or automatic) near the end of the hoses opposite the manifold gauge.



SERVICE COUPLERS

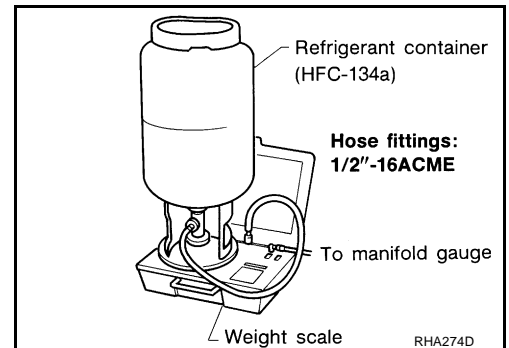
Never attempt to connect HFC-134a (R-134a) service couplers to a CFC-12 (R-12) A/C system. The HFC-134a (R-134a) couplers will not properly connect to the CFC-12 (R-12) system. However, if an improper connection is attempted, discharging and contamination may occur.

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



REFRIGERANT WEIGHT SCALE

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



CALIBRATING ACR4 WEIGHT SCALE

Calibrate the scale every three months.
To calibrate the weight scale on the ACR4:

1. Press **Shift/Reset** and **Enter** at the same time.
2. Press **8787** . "A1 " will be displayed.
3. Remove all weight from the scale.
4. Press **0** , then press **Enter** . "0.00 " will be displayed and change to "A2 ".
5. Place a known weight (dumbbell or similar weight), between 4.5 and 8.6 kg (10 and 19 lb.) on the center of the weight scale.
6. Enter the known weight using four digits. (Example 10 lb. = 10.00, 10.5 lb. = 10.50)
7. Press **Enter** — the display returns to the vacuum mode.
8. Press **Shift/Reset** and **Enter** at the same time.
9. Press **6** — the known weight on the scale is displayed.
10. Remove the known weight from the scale. "0.00 " will be displayed.
11. Press **Shift/Reset** to return the ACR4 to the program mode.

PRECAUTIONS

CHARGING CYLINDER

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

Precautions for Leak Detection Dye

BJ/S000FA

- The A/C system contains a fluorescent leak detection dye used for locating refrigerant leaks. An ultraviolet (UV) lamp is required to illuminate the dye when inspecting for leaks.
- Always wear fluorescence enhancing UV safety goggles to protect your 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 leaks.
- For the purpose of safety and customer's satisfaction, read and follow all manufacture's operating instructions and precautions prior to performing the work.
- A compressor shaft seal should not necessarily be repaired because of dye seepage. The compressor shaft seal should only be repaired after confirming the leak with an electrical leak detector (SST: J-41995).
- Always remove any remaining dye from the leak area after repairs are completed to avoid a misdiagnosis during a future service.
- Never allow dye to come into contact with painted body panels or interior components. If dye is spilled, clean immediately with the approved dye cleaner. 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 will remain for three years or a little over unless a compressor malfunction occurs.

IDENTIFICATION

NOTE:

Vehicles with factory installed fluorescent dye have a green label.

Vehicles without factory installed fluorescent dye have a blue label.

IDENTIFICATION LABEL FOR VEHICLE

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

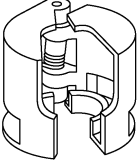
PREPARATION

PREPARATION

PPF:00002

Special Service Tools

BJS000FC

Tool number Tool name		Description
9253089908 (for high-pressure pipe 1) 9253089916 (for low-pressure pipe 1 and low-pressure flexible hose) Disconnecter	 RJIA0391J	Disconnect one-touch joint connection

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PREPARATION

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

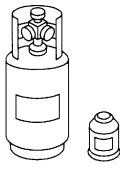

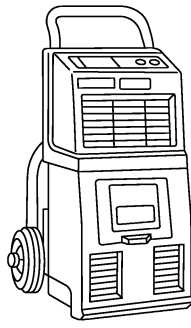
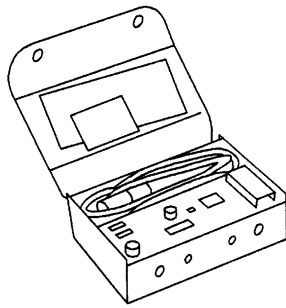
BJS000FD

Never mix HFC-134a (R-134a) refrigerant and/or its specified lubricant with CFC-12 (R-12) refrigerant and/or its lubricant.

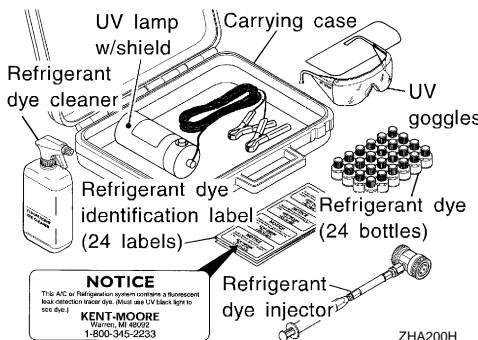
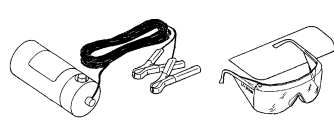

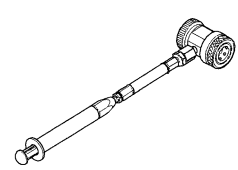

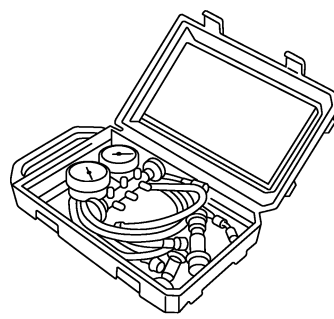
Separate and non-interchangeable service equipment must be used for handling each type of refrigerant/lubricant.

Refrigerant container fittings, service hose fittings and service equipment fittings (equipment which handles refrigerant and/or lubricant) are different between CFC-12 (R-12) and HFC-134a (R-134a). This is to avoid mixed use of the refrigerants/lubricant.

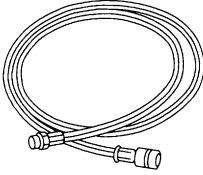
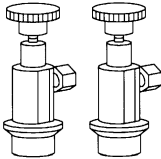

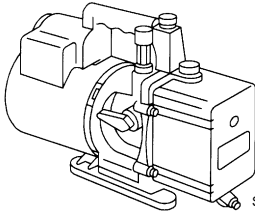
Never use adapters that convert one size fitting to another: refrigerant/lubricant contamination occurs and compressor malfunction may result.

Tool number Tool name	Description
HFC-134a (R-134a) refrigerant  S-NT196	Container color: Light blue Container marking: HFC-134a (R-134a) Fitting size: Thread size ● Large container 1/2" -16 ACME
Nissan A/C System Oil Type S (DH-PS)  S-NT197	Type: Polyalkylene glycol oil (PAG), type S (DH-PS) Application: HFC-134a (R-134a) swash plate compressors (Nissan only) Capacity: 40 m ℓ (1.4 Imp fl oz.)
Recovery/Recycling/Recharging equipment (ACR4)  R/JIA0195E	Function: Refrigerant recovery, recycling and recharging
Electrical A/C leak detector  A/C leak detector SHA705EB	Power supply: DC 12 V (Cigarette lighter)

PREPARATION

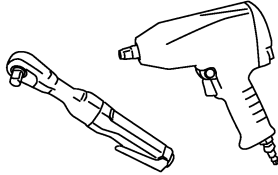
Tool number Tool name		Description	
(J-43926) Refrigerant dye leak detection kit Kit includes: (J-42220) UV lamp and UV safety goggles (J-41459) HFC-134a (R-134a) dye injector Use with J-41447, 1/4 ounce bottle (J-41447) HFC-134a (R-134a) fluorescent leak detection dye (Box of 24, 1/4 ounce bottles) (J-43872) Refrigerant dye cleaner	 <p>NOTICE This A/C or Refrigeration system contains a fluorescent leak detection tracer dye. Should use UV beam light to see dye. KENT-MOORE Warren, MI 48090 1-800-345-2233</p>	Power supply: DC 12 V (Battery terminal)	A B C D E
(J-42220) UV lamp and UV safety goggles	 <p>SHA438F</p>	Power supply: DC 12 V (Battery terminal) For checking refrigerant leak when fluorescent dye is installed in A/C system. Includes: UV lamp and UV safety goggles	F G
(J-41447) HFC-134a (R-134a) fluorescent leak detection dye (Box of 24, 1/4 ounce bottles)	 <p>Refrigerant dye (24 bottles)</p> <p>SHA439F</p>	Application: For HFC-134a (R-134a) PAG oil Container: 1/4 ounce (7.4 cc) bottle (Includes self-adhesive dye identification labels for affixing to vehicle after charging system with dye.)	H I ATC
(J-41459) HFC-134a (R-134a) dye injector Use with J-41447, 1/4 ounce bottle	 <p>SHA440F</p>	For injecting 1/4 ounce of fluorescent leak detection dye into A/C system	K L
(J-43872) Refrigerant dye cleaner	 <p>SHA441F</p>	For cleaning dye spills	M
Manifold gauge set (with hoses and couplers)	 <p>RJIA0196E</p>	Identification: <ul style="list-style-type: none"> The gauge face indicates HFC-134a (R-134a). Fitting size: Thread size <ul style="list-style-type: none"> 1/2" -16 ACME 	

PREPARATION

Tool number Tool name		Description
Service hoses <ul style="list-style-type: none"> ● High-pressure side hose ● Low-pressure side hose ● Utility hose 	 S-NT201	Hose color: <ul style="list-style-type: none"> ● Low hose: Blue with black stripe ● High hose: Red with black stripe ● Utility hose: Yellow with black stripe or green with black stripe Hose fitting to gauge: <ul style="list-style-type: none"> ● 1/2" -16 ACME
Service couplers <ul style="list-style-type: none"> ● High-pressure side coupler ● Low-pressure side coupler 	 S-NT202	Hose fitting to service hose: M14 x 1.5 fitting is optional or permanently attached.
Refrigerant weight scale	 S-NT200	For measuring of refrigerant Fitting size: Thread size 1/2" -16 ACME
Vacuum pump (Including the isolator valve)	 S-NT203	Capacity: <ul style="list-style-type: none"> ● Air displacement: 4 CFM ● Micron rating: 20 microns ● Oil capacity: 482 g (17 oz.) Fitting size: Thread size <ul style="list-style-type: none"> ● 1/2" -16 ACME

Commercial Service Tools

BJS000FE

Tool name		Description
Power tool	 PBIC0190E	For loosening bolts and nuts

REFRIGERATION SYSTEM

REFRIGERATION SYSTEM

PFP:KA990

Refrigerant Cycle REFRIGERANT FLOW

BJS000FF

The refrigerant flows from the compressor through the condenser with liquid tank, through the evaporator, and back to the compressor. The refrigerant evaporation in the evaporator is controlled by an externally equalized expansion valve, located inside the evaporator case.

FREEZE PROTECTION

To prevent evaporator frozen up, the evaporator air temperature is monitored, and the voltage signal to the unified meter and A/C amp. will make the A/C relay go OFF and stop the compressor.

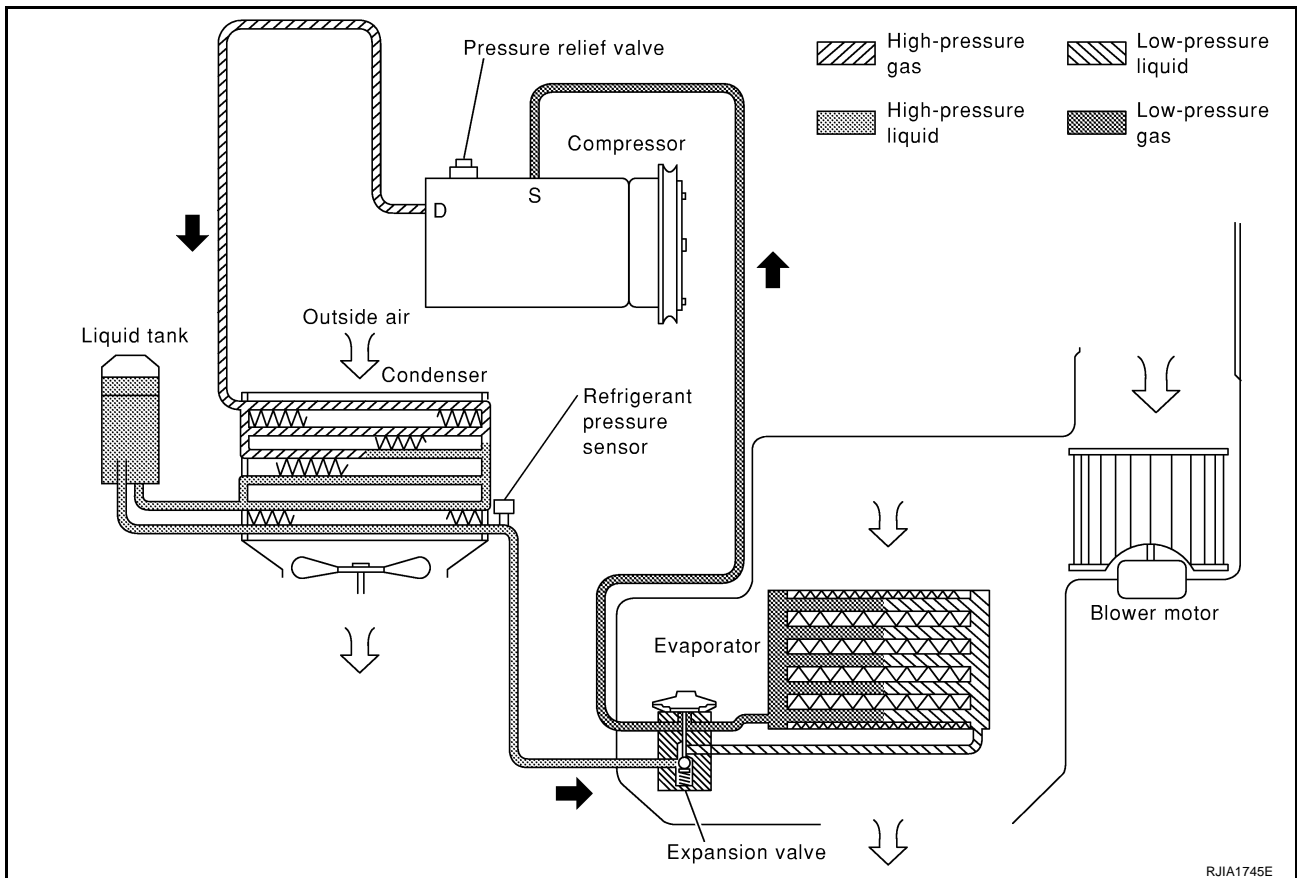
Refrigerant System Protection REFRIGERANT PRESSURE SENSOR

BJS000FG

The refrigerant system is protected against excessively high- or low-pressure by the refrigerant pressure sensor, located on the condenser. If the system pressure rises above, or falls below the specifications, the refrigerant pressure sensor detects the pressure inside the refrigerant line and sends the voltage signal to the ECM. ECM makes the A/C relay go OFF and stops the compressor when pressure on the high-pressure side detected by refrigerant pressure sensor is over about 2,746 kPa (27.46 bar, 28 kg/cm², 398 psi), or below about 134 kPa (1.34 bar, 1.4 kg/cm², 20 psi).

PRESSURE RELIEF VALVE

The refrigerant system is also protected by a pressure relief valve, located in the rear head of the compressor. When the pressure of refrigerant in the system increases to an unusual level [more than 3,727 kPa (37.27 bar, 38 kg/cm², 540 psi)], the release port on the pressure relief valve automatically opens and releases refrigerant into the atmosphere.

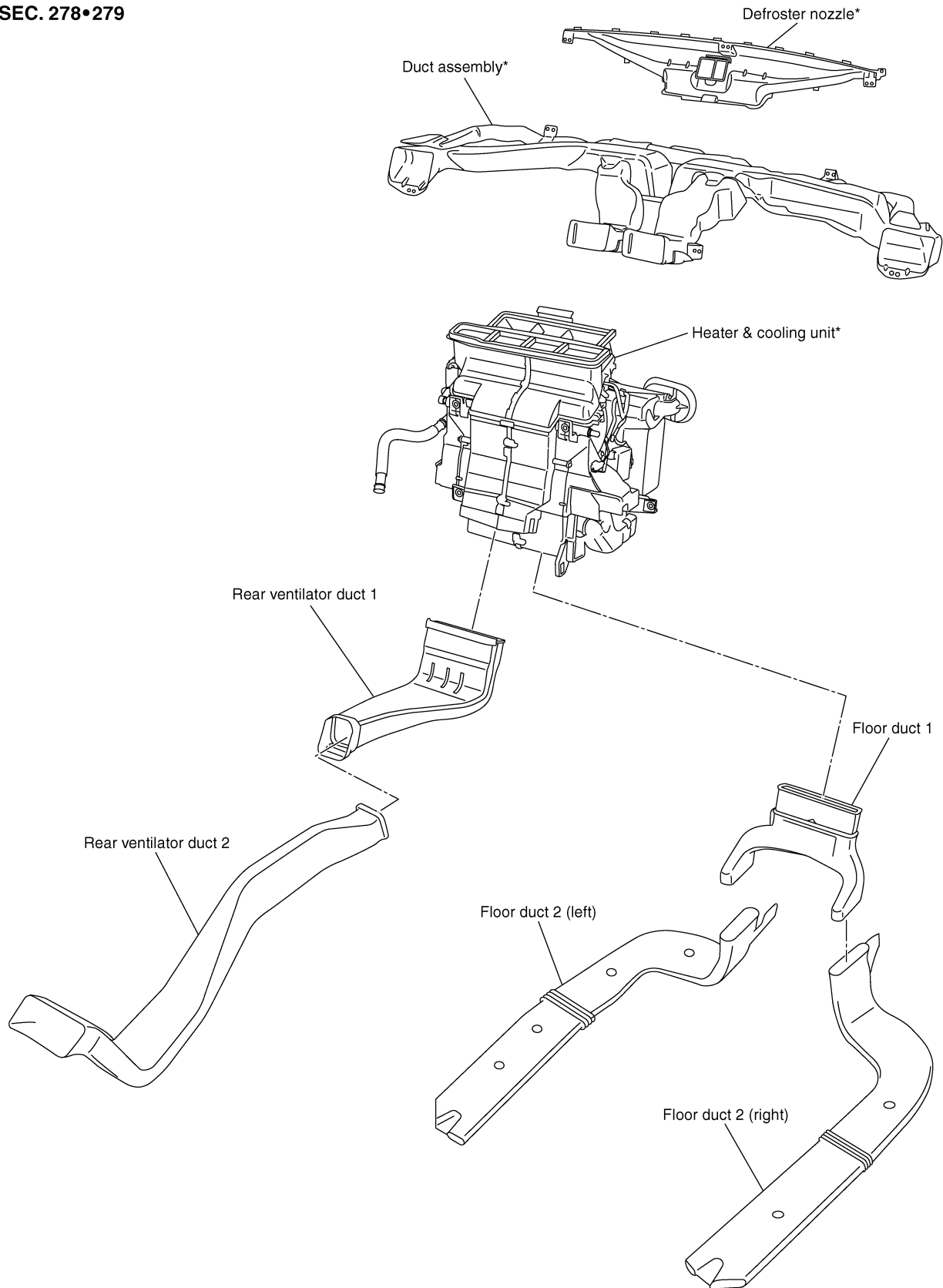


REFRIGERATION SYSTEM

Component Layout

BJS000FH

SEC. 278•279



* : For removal, it necessary to remove instrument panel.

RJIA3234E

LUBRICANT**Maintenance of Lubricant Quantity in Compressor**

BJS000FI

The lubricant in the compressor circulates through the system with the refrigerant. Add lubricant to compressor when replacing any component or after a large refrigerant leakage occurred. It is important to maintain the specified amount.

If lubricant quantity is not maintained properly, the following malfunctions may result:

- Lack of lubricant: May lead to a seized compressor
- Excessive lubricant: Inadequate cooling (thermal exchange interference)

LUBRICANT

Name : NISSAN A/C System Oil Type S

LUBRICANT RETURN OPERATION

Adjust the lubricant quantity according to the test group shown below.

1. CHECK LUBRICANT RETURN OPERATION

Can lubricant return operation be performed?

- A/C system works properly.
- There is no evidence of a large amount of lubricant leakage.

CAUTION:

If excessive lubricant leakage is noted, never perform the lubricant return operation.

OK or NG

- OK >> GO TO 2.
NG >> GO TO 3.

2. PERFORM LUBRICANT RETURN OPERATION, PROCEEDING AS FOLLOWS

1. Start the engine, and set to the following conditions:
 - Engine speed: Idling to 1,200 rpm
 - A/C switch: ON
 - Blower speed: Max. position
 - Temp. control: Optional [Set so that intake air temperature is 25 to 30°C (77 to 86°F).]
 - Intake position: Recirculation (REC)
2. Perform lubricant return operation for about 10 minutes.
3. Stop the engine.

>> GO TO 3.

3. CHECK REPLACEMENT PART

Should the compressor be replaced?

- YES >> GO TO [ATC-22, "LUBRICANT ADJUSTING PROCEDURE FOR COMPRESSOR REPLACEMENT"](#).
- NO >> GO TO [ATC-22, "LUBRICANT ADJUSTING PROCEDURE FOR COMPONENTS REPLACEMENT EXCEPT COMPRESSOR"](#).

LUBRICANT

LUBRICANT ADJUSTING PROCEDURE FOR COMPONENTS REPLACEMENT EXCEPT COMPRESSOR

After replacing any of the following major components, add the correct amount of lubricant to the system.
Amount of lubricant to be added:

Part replaced	Lubricant to be added to system	Remarks
	Amount of lubricant m ℓ (Imp fl oz.)	
Evaporator	75 (2.6)	—
Condenser	35 (1.2)	—
Liquid tank	10 (0.4)	—
In case of refrigerant leak	30 (1.1)	Large leak
	—	Small leak *1

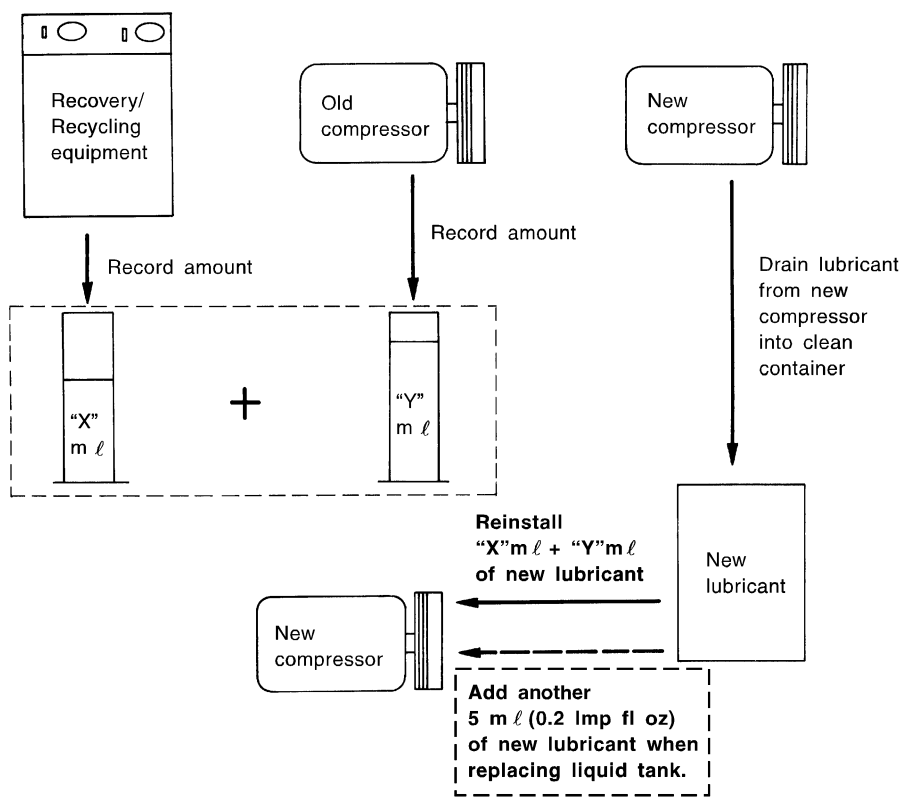
*1: If the refrigerant leak is small, no addition of lubricant is needed.

LUBRICANT ADJUSTING PROCEDURE FOR COMPRESSOR REPLACEMENT

1. Before connecting ACR4 to vehicle, check ACR4 gauges. No refrigerant pressure should be displayed. If NG, recover refrigerant from the equipment lines.
2. Discharge refrigerant into the refrigerant recovery/recycling equipment. Measure lubricant discharged into the recovery/recycling equipment.
3. Drain the lubricant from the old (removed) compressor into a graduated container and recover the amount of lubricant drained.
4. Drain the lubricant from the new compressor into a separate, clean container.
5. Measure an amount of new lubricant installed equal to amount drained from old compressor. Add this lubricant to new compressor through the suction port opening.
6. Measure an amount of new lubricant equal to the amount recovered during discharging. Add this lubricant to new compressor through the suction port opening.
7. If the liquid tank also needs to be replaced, add another 5 m ℓ (0.2 Imp fl oz.) of lubricant at this time. Do not add this 5 m ℓ (0.2 Imp fl oz.) of lubricant when replaces the compressor only.

LUBRICANT

Lubricant adjusting procedure for compressor replacement



SJIA0596E

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AIR CONDITIONER CONTROL

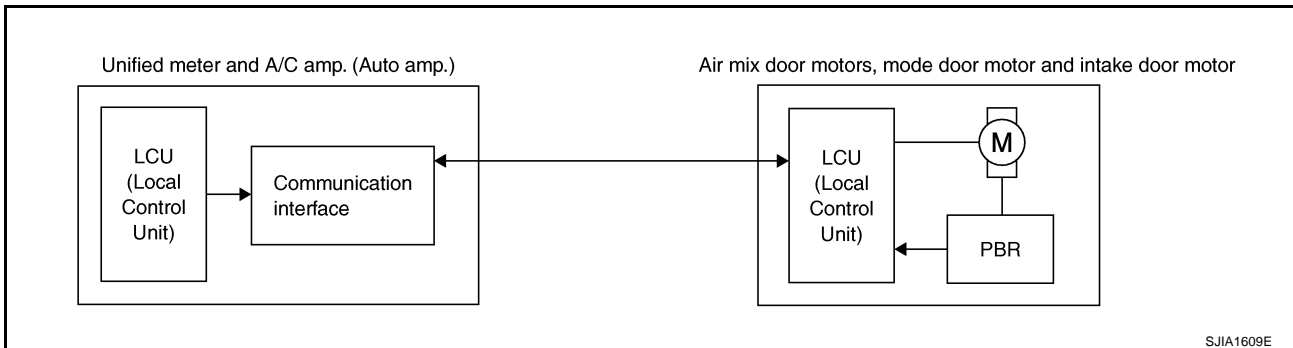
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Description of Air Conditioner LAN Control System

BJS000FJ

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

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

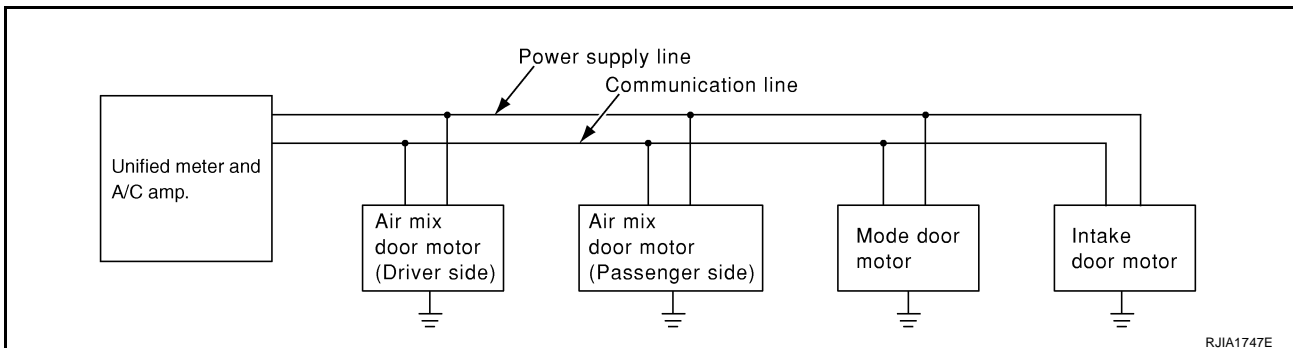


System Construction

BJS000FK

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

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

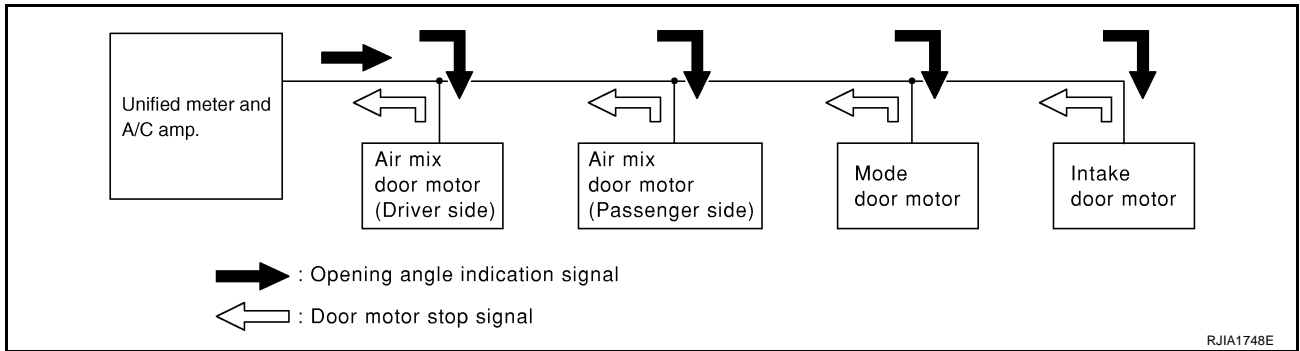


OPERATION

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

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

AIR CONDITIONER CONTROL



TRANSMISSION DATA AND TRANSMISSION ORDER

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

Start:

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

Address:

Data sent from the unified meter and A/C amp. are selected according to data-based decisions made by the air mix door motor, mode door motor and intake door motor.

If the addresses are identical, the opening angle data and error check signals are received by the door motor LCUs. The LCUs then make the appropriate error decision. If the opening angle data have no error, door control begins.

If an error exists, the received data are rejected and corrected data received. Finally, door control is based upon the corrected opening angle data.

Opening Angle:

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

Error Check:

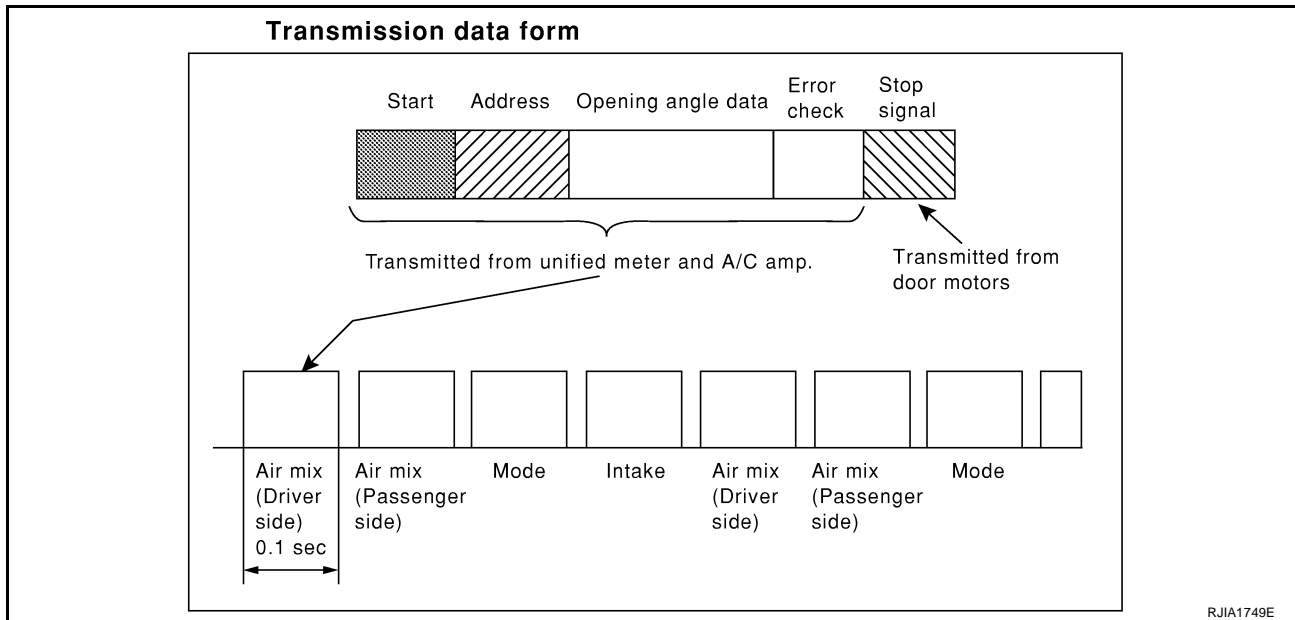
In this procedure, transmitted and received data is checked for errors. Error data are then compiled. The error check prevents corrupted data from being used by the air mix door motor, the mode door motor and the intake door motor. Error data can be related to the following symptoms.

- Malfunction of electrical frequency
- Poor electrical connections
- Signal leakage from transmission lines
- Signal level fluctuation

AIR CONDITIONER CONTROL

Stop Signal:

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



AIR MIX DOOR CONTROL (AUTOMATIC TEMPERATURE CONTROL)

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

FAN SPEED CONTROL

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

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

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

INTAKE DOOR CONTROL

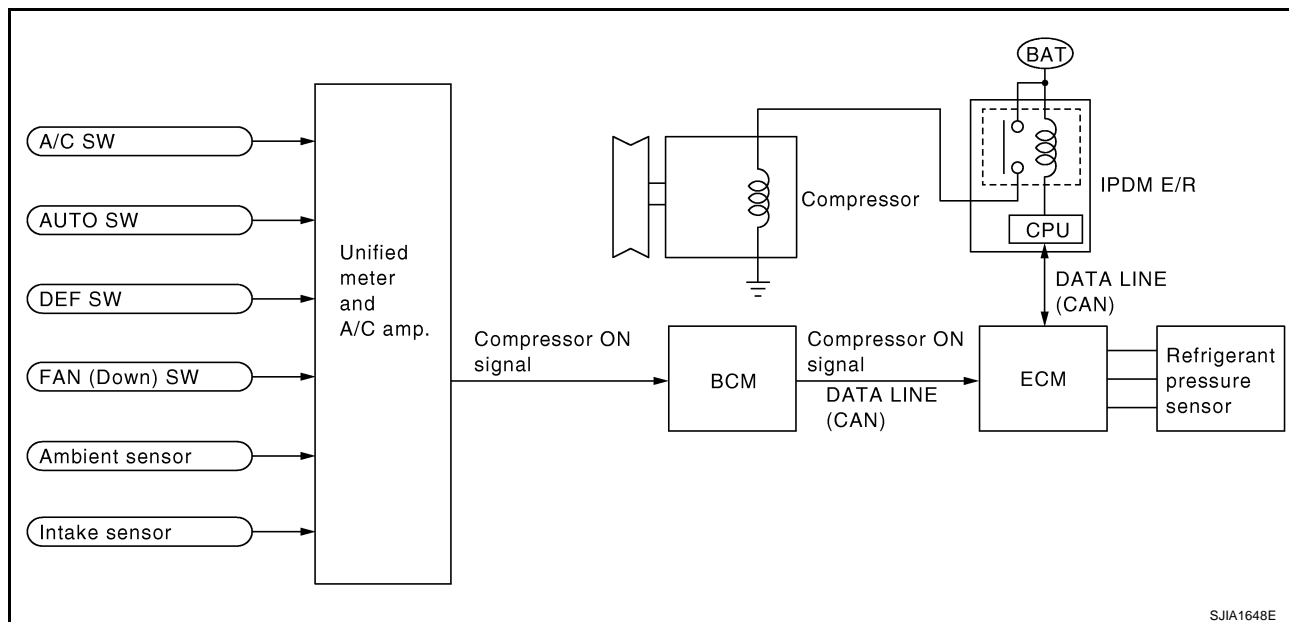
The intake doors are automatically controlled by the temperature setting, ambient temperature, in-vehicle temperature, intake temperature, amount of sunload and ON/OFF operation of the compressor.

MODE DOOR CONTROL

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

AIR CONDITIONER CONTROL

MAGNET CLUTCH CONTROL



When A/C switch is pressed (with FAN ON), press DEF switch, unified meter and A/C amp. transmits compressor ON signal to BCM.

BCM sends compressor ON signal to ECM, via CAN communication.

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

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

SELF-DIAGNOSIS SYSTEM

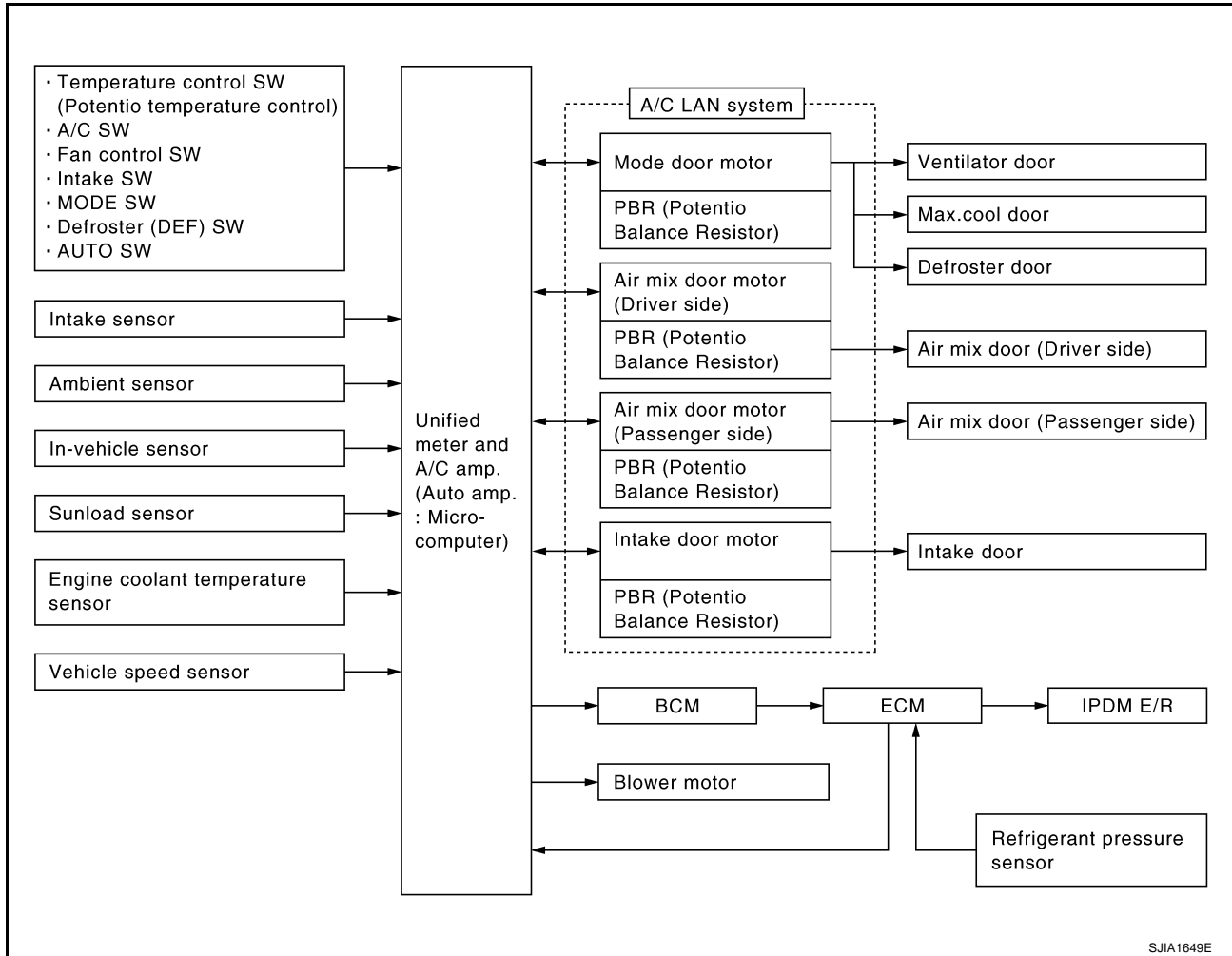
The self-diagnosis system is built into the unified meter and A/C amp. to quickly locate the cause of malfunctions.

AIR CONDITIONER CONTROL

Description of Control System

BJS000FL

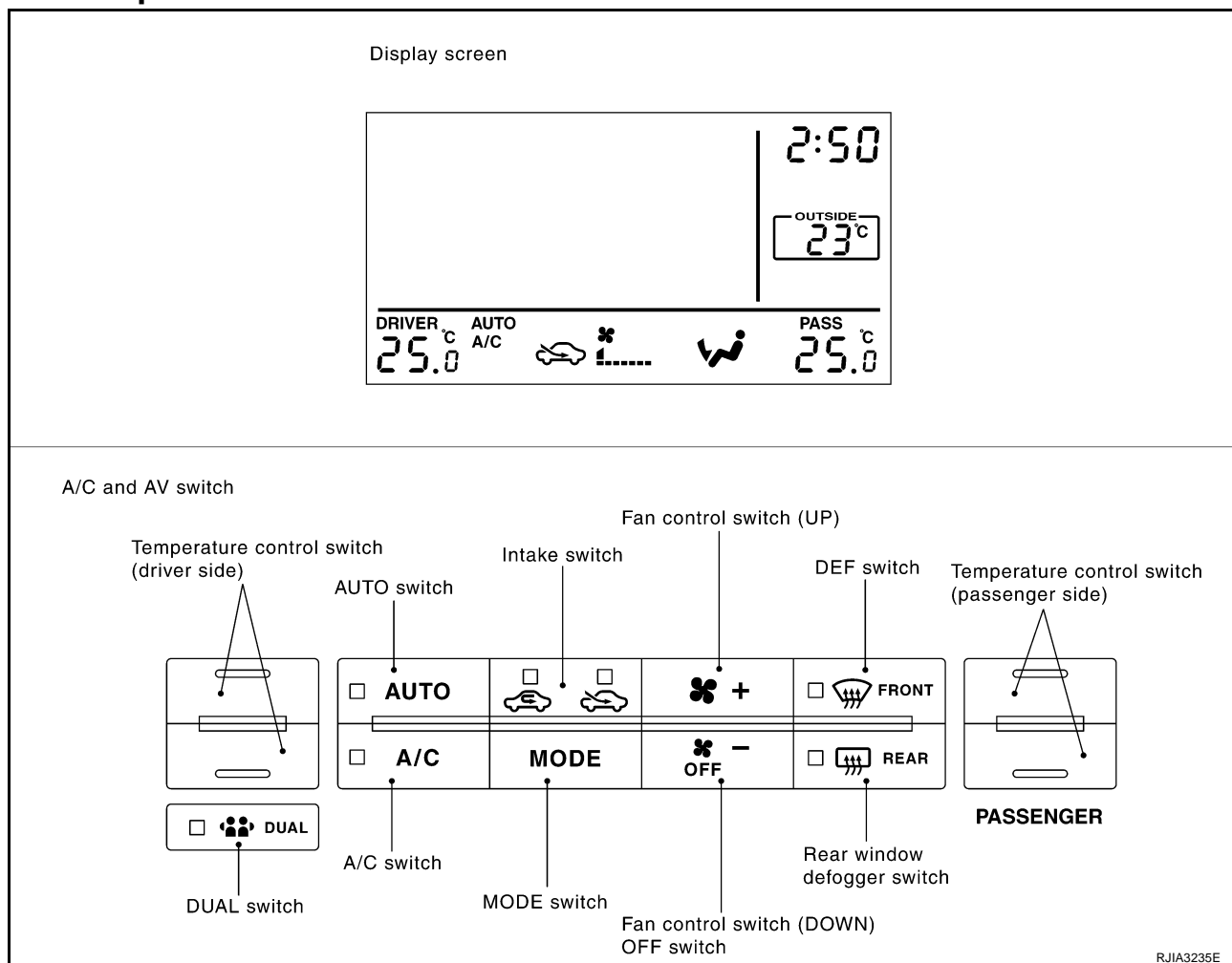
The control system consists of input sensors, switches, the unified meter and A/C amp. (microcomputer) and outputs. The relationship of these components is shown in the figure below:



AIR CONDITIONER CONTROL

Control Operation

BJS000FM



DISPLAY SCREEN

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

TEMPERATURE CONTROL SWITCH (POTENTIO TEMPERATURE CONTROL) (DRIVER SIDE)

The set temperature is increased or decreased with this switch.

TEMPERATURE CONTROL SWITCH (POTENTIO TEMPERATURE CONTROL) (PASSENGER SIDE)

- The set temperature for passenger side is increased or decreased with this switch.
- When the temperature switch is pressed, the DUAL switch indicator will automatically illuminate.

AUTO SWITCH

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

A/C SWITCH

Compressor is ON or OFF with this switch.

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

FAN SWITCH

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

AIR CONDITIONER CONTROL

- When fan control switch (DOWN) is pressed for approximately 2 seconds or longer or press fan control switch when blower fan motor operates at 1st speed, A/C system will turn OFF (The compressor and blower are OFF, the intake doors and the mode doors are automatically controlled).

INTAKE SWITCH

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

MODE SWITCH

The air discharge outlets is controlled with this switch.

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.

REAR WINDOW DEFOGGER SWITCH

When illumination is ON, rear window is defogged.

DUAL SWITCH

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

Fail-safe Function

BJS000FN

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

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

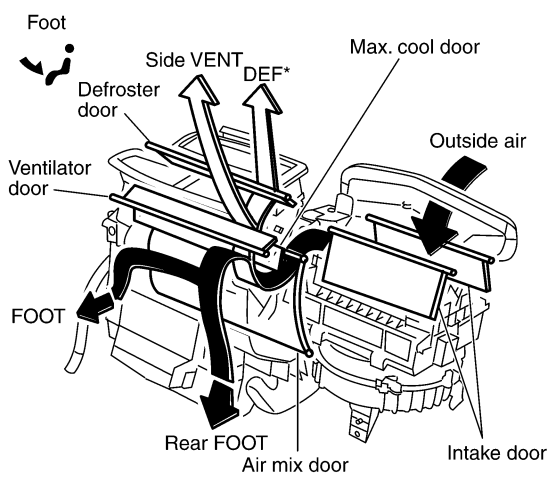
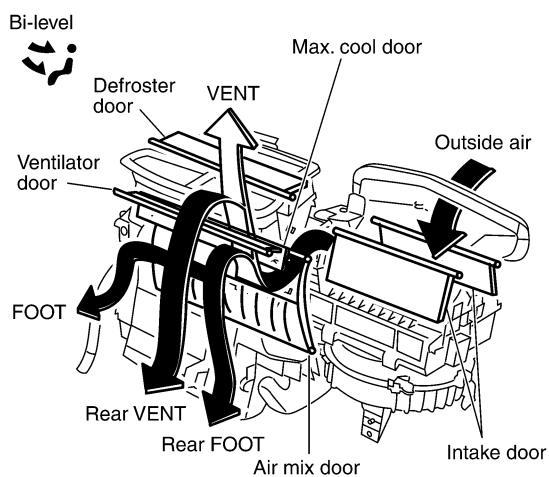
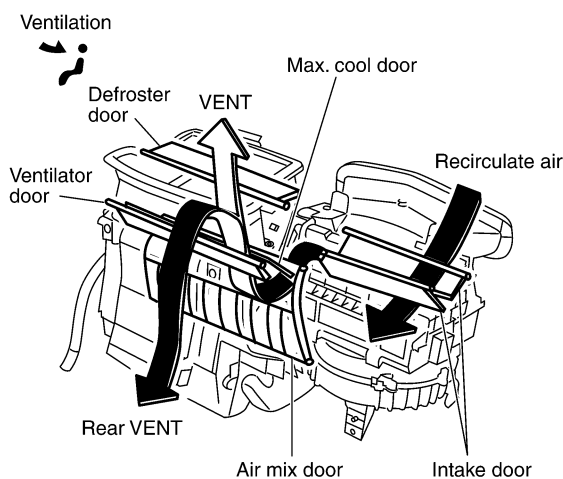
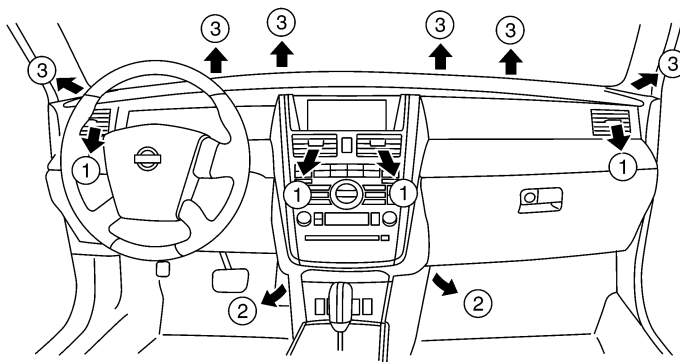
AIR CONDITIONER CONTROL

Discharge Air Flow

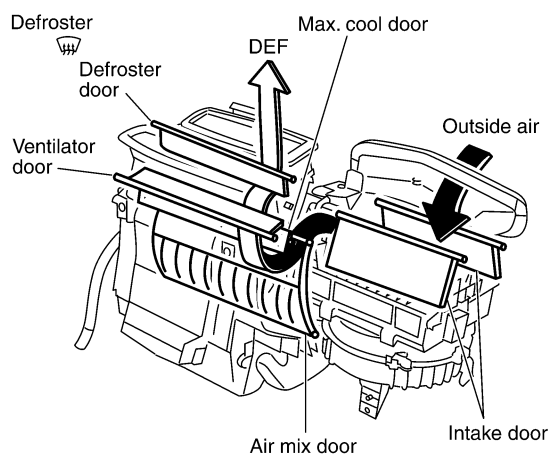
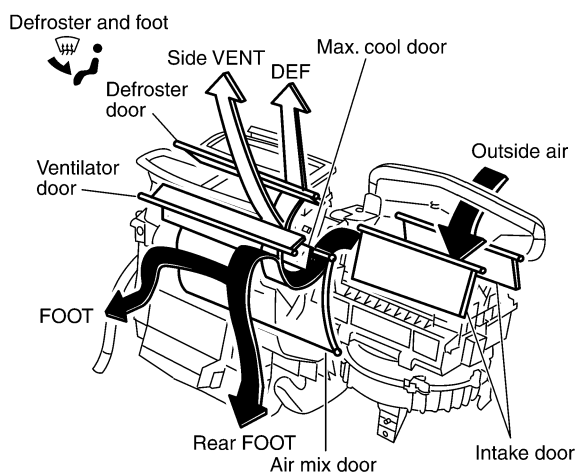
BJS000FO

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① : Ventilation ② : Foot ③ : Defroster



*:Except manual MODE control without display unit.

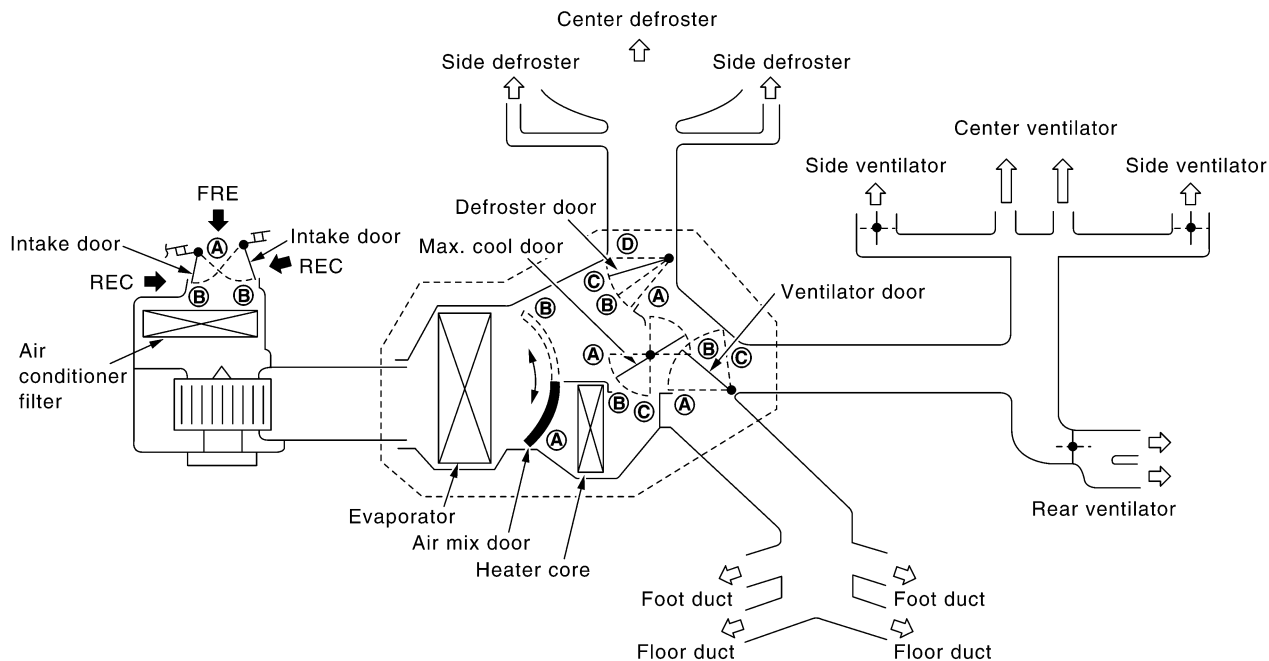


RJIA3236E

AIR CONDITIONER CONTROL

System Description SWITCHES AND THEIR CONTROL FUNCTION

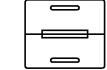












BJS000FP



With display unit

: For models with temperature adjustment, the structure of dotted area is independent in RH and LH sides. Driver side and passenger side are divided by a partition.

SJIA0613E

Door	Position or switch	MODE SW				DEF SW		AUTO SW	Intake SW		Temperature control SW (driver side)			OFF SW
		VENT	B/L	FOOT	D/F	ON	OFF							
						 FRONT								
Ventilator door	(A)	(B)	(C)	(C)	(C)	—	AUTO	—		—			AUTO	
Max. cool door	(A)	(B)	(B)	(B)	(C)			—		—				
Defroster door	(D)	(D)	(C)	(B)	(A)			—		—				
Intake door	—				(B)		—	(A) ^{*1}	(B) ^{*1}	—				
Air mix door	—				—	AUTO	—		(A)	AUTO	(B)	—		

*1: Inlet status is displayed even during automatic control.

PJIA0021E

CAN Communication System Description

BJS000FQ

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN-H line, CAN-L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only. For details, refer to [LAN-4, "CAN Communication System"](#) .

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TROUBLE DIAGNOSIS

TROUBLE DIAGNOSIS

PFP:00004

CONSULT-II Function (BCM)

BJS000FR

CONSULT-II can display each diagnosis item using the diagnosis mode shown following.

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

CONSULT-II BASIC OPERATION

Refer to [GI-34, "CONSULT-II Start Procedure"](#) .

DATA MONITOR

Operation Procedure

1. Touch "AIR CONDITIONER" on "SELECT TEST ITEM" screen.
2. Touch "DATA MONITOR" on "SELECT DIAG MODE" screen.
3. Touch either "ALL SIGNALS" or "SELECTION FROM MENU" on "DATA MONITOR" screen.

All signals	Monitors all the items.
Selection from menu	Selects and monitors the individual item selected.

4. When "SELECTION FROM MENU" is selected, touch items to be monitored. When "ALL SIGNALS" is selected, all the items will be monitored.
5. Touch "START".
6. Touch "RECORD" while monitoring, then the status of the monitored item can be recorded. To stop recording, touch "STOP".

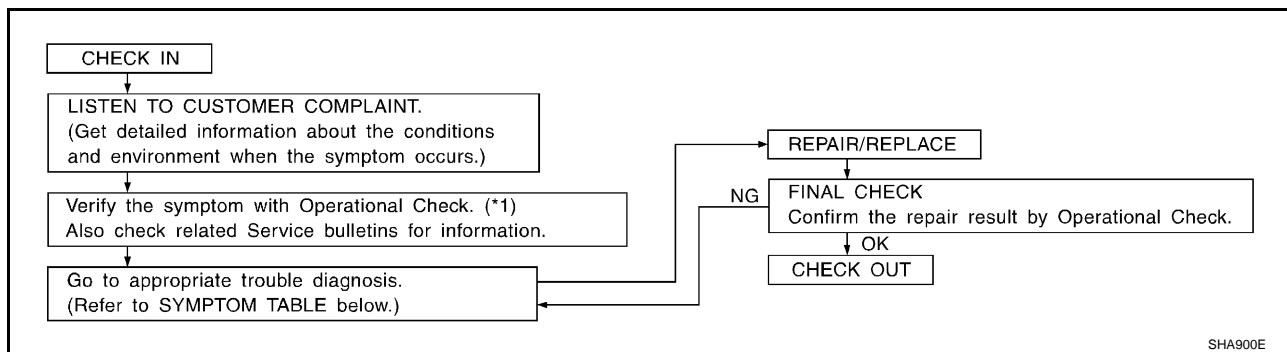
Display Item List

Monitor item name "operation or unit"	Contents
IGN ON SW "ON/OFF"	Displays "IGN position (ON)/OFF, ACC position (OFF)" status as judged from ignition switch signal.
FAN ON SIG "ON/OFF"	Displays "FAN (ON)/FAN (OFF)" status as judged from blower fan motor switch signal.
AIR COND SW "ON/OFF"	Displays "COMP (ON)/COMP (OFF)" status as judged from air conditioner switch signal.

TROUBLE DIAGNOSIS

How to Perform Trouble Diagnosis for Quick and Accurate Repair WORK FLOW

BJS000FS



*1 [ATC-54. "Operational Check"](#)

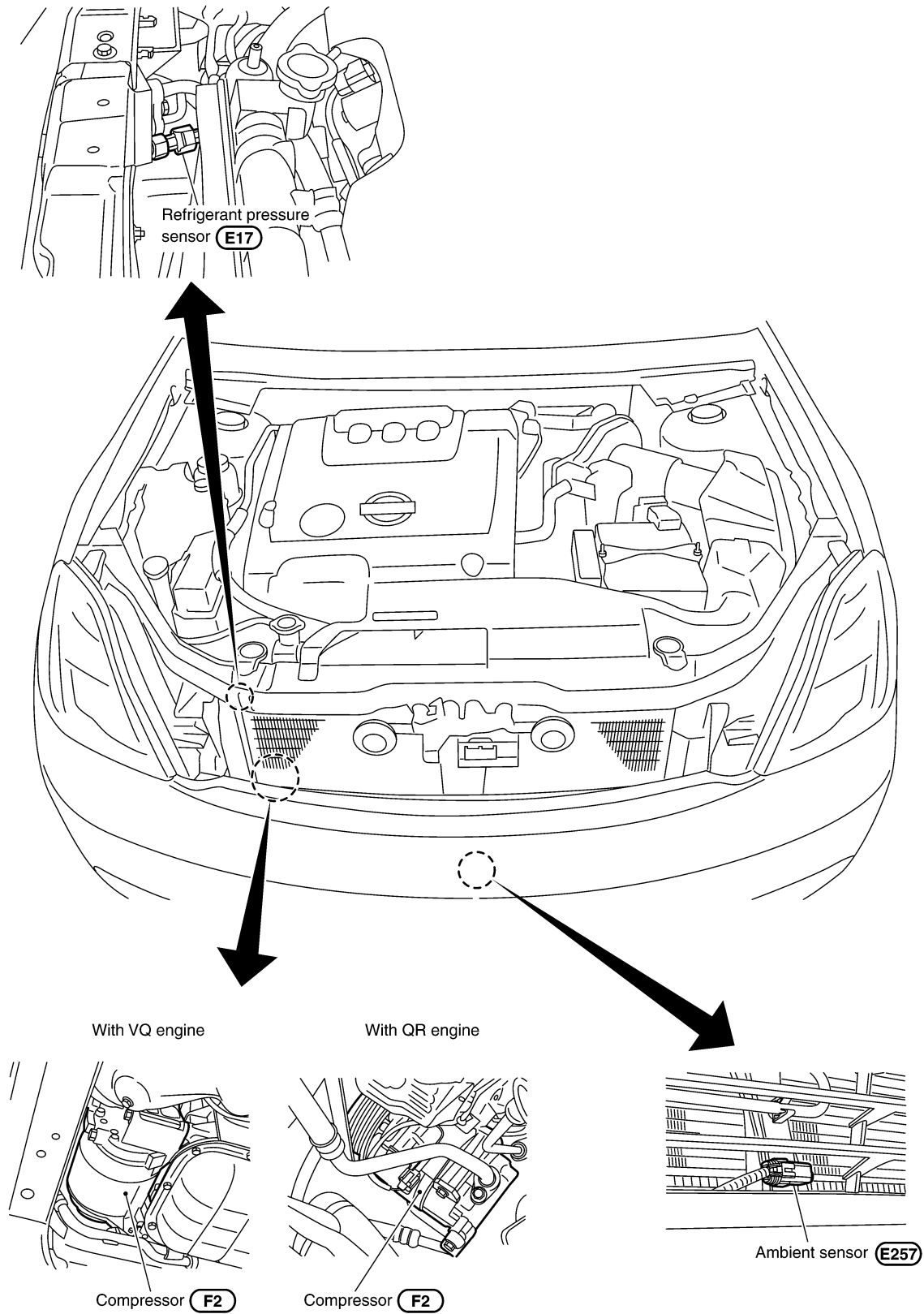
SYMPTOM TABLE

Symptom	Reference Page	
A/C system does not come on.	Go to Trouble Diagnosis Procedure for A/C System.	ATC-56. "Power Supply and Ground Circuit for Auto Amp."
A/C system cannot be controlled.	<ul style="list-style-type: none"> Go to Integrated Display System. Go to Integrated Color Display System. 	AV-58. "Unable to Operate System with A/C and AV Switch" (Integrated display system), AV-97. "Unable to Operate System with A/C and AV Switch" (Integrated color display system)
Air outlet does not change.	Go to Trouble Diagnosis Procedure for Mode Door Motor. (LAN)	ATC-63. "Mode Door Motor Circuit"
Mode door motor does not operate normally.		
Discharge air temperature does not change.	Go to Trouble Diagnosis Procedure for Air Mix Door Motor. (LAN)	ATC-66. "Air Mix Door Motor Circuit"
Air mix door motor does not operate normally.		
Intake door does not change.	Go to Trouble Diagnosis Procedure for Intake Door Motor. (LAN)	ATC-69. "Intake Door Motor Circuit"
Intake door motor does not operate normally.		
Blower motor operation is malfunctioning.	Go to Trouble Diagnosis Procedure for Blower Motor.	ATC-72. "Blower Motor Circuit"
Magnet clutch does not engage.	Go to Trouble Diagnosis Procedure for Magnet Clutch.	ATC-78. "Magnet Clutch Circuit"
Insufficient cooling	Go to Trouble Diagnosis Procedure for Insufficient Cooling.	ATC-84. "Insufficient Cooling"
Insufficient heating	Go to Trouble Diagnosis Procedure for Insufficient Heating.	ATC-91. "Insufficient Heating"
Noise	Go to Trouble Diagnosis Procedure for Noise.	ATC-92. "Noise"
Self-diagnosis cannot be performed.	Go to Trouble Diagnosis Procedure for Self-diagnosis.	ATC-94. "Self-diagnosis"
Memory function does not operate.	Go to Trouble Diagnosis Procedure for Memory Function.	ATC-95. "Memory Function"

TROUBLE DIAGNOSIS

Component Parts and Harness Connector Location ENGINE COMPARTMENT

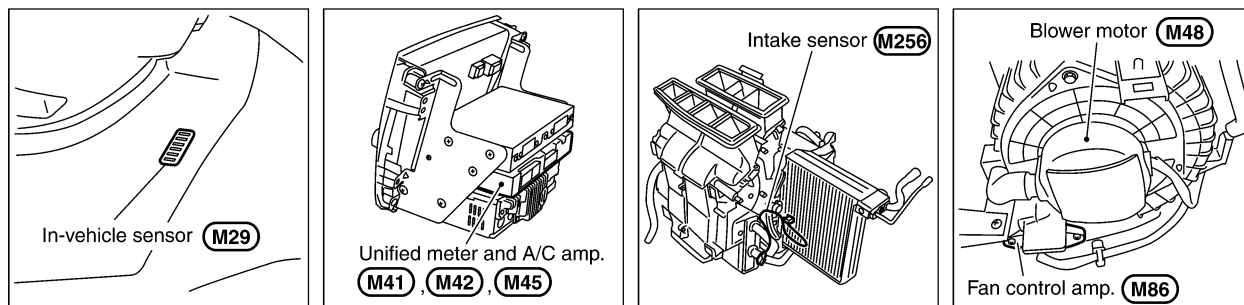
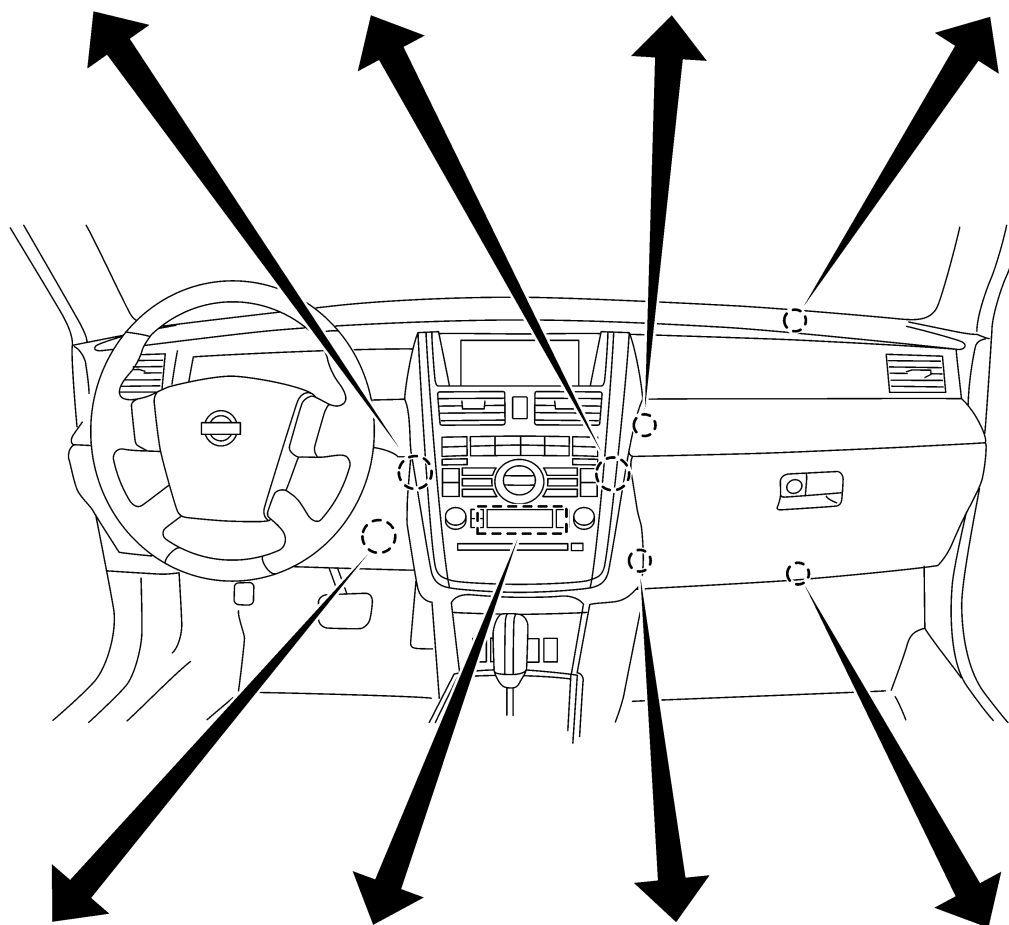
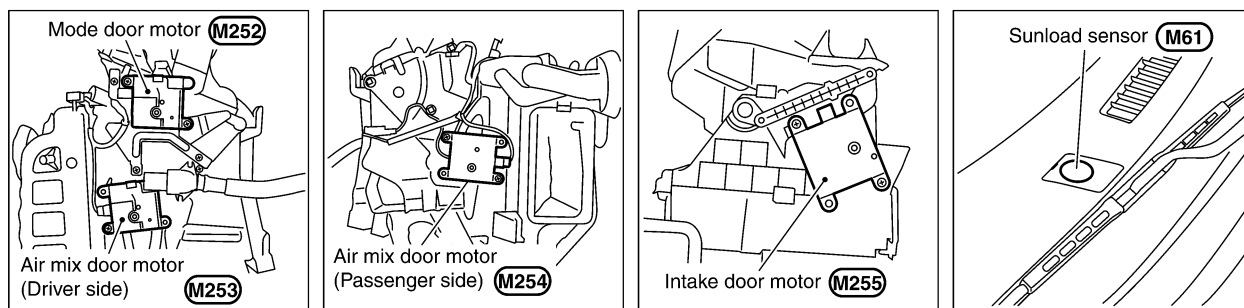
BJS000FT



RJIA2730E

TROUBLE DIAGNOSIS

PASSENGER COMPARTMENT

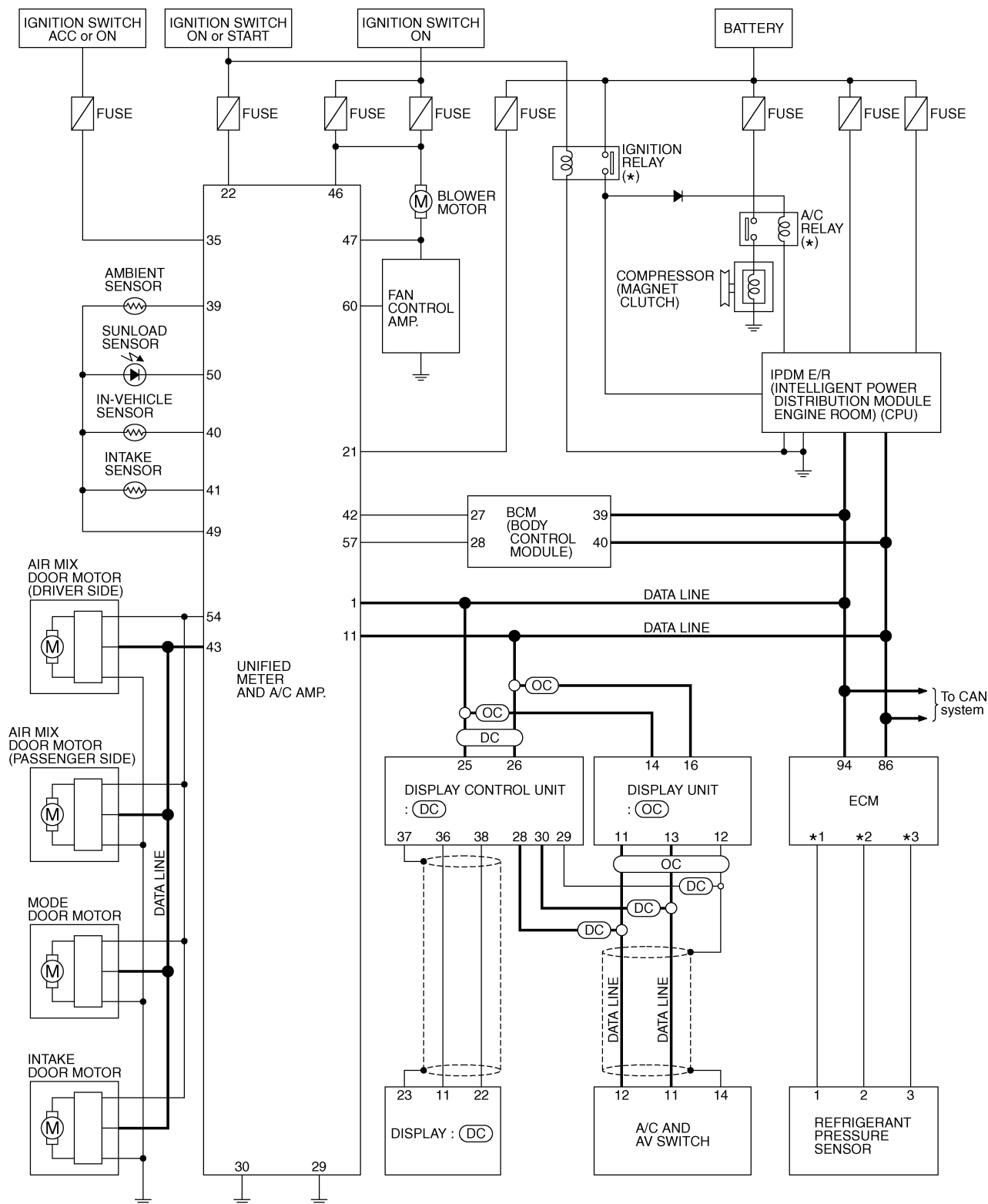


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TROUBLE DIAGNOSIS

Schematic

BJS000FU



(VQ) : With VQ engine

(QR) : With QR engine

(DC) : With display control unit

(OC) : Without display control unit

*1 49 : (VQ) *2 70 : (VQ) *3 67 : (VQ)

46 : (QR) 69 : (QR) 57 : (QR)

* : This relay is built into the IPDM E/R (Intelligent power distribution module engine room).

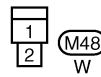
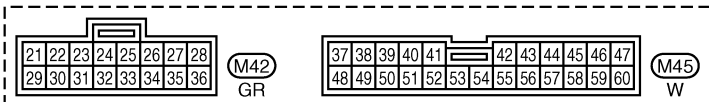
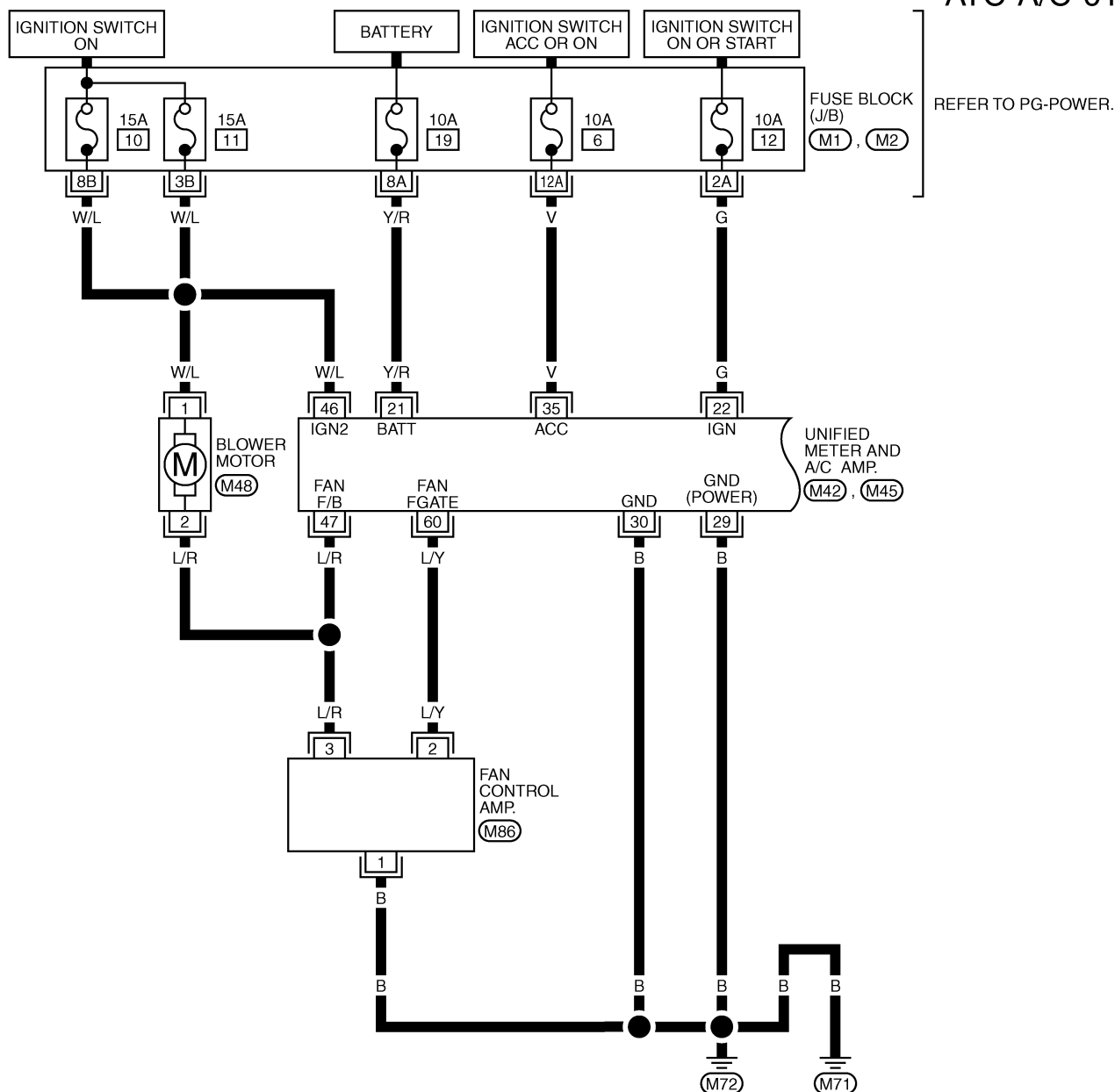
TJWM0261E

TROUBLE DIAGNOSIS

Wiring Diagram — A/C —

BJS000FV

ATC-A/C-01

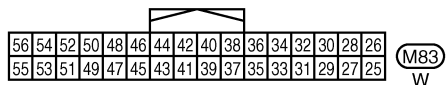
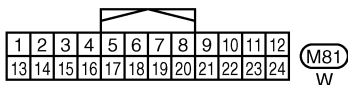
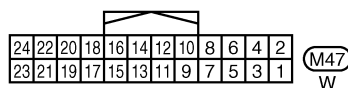
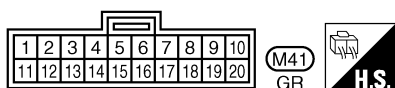
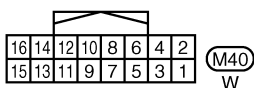
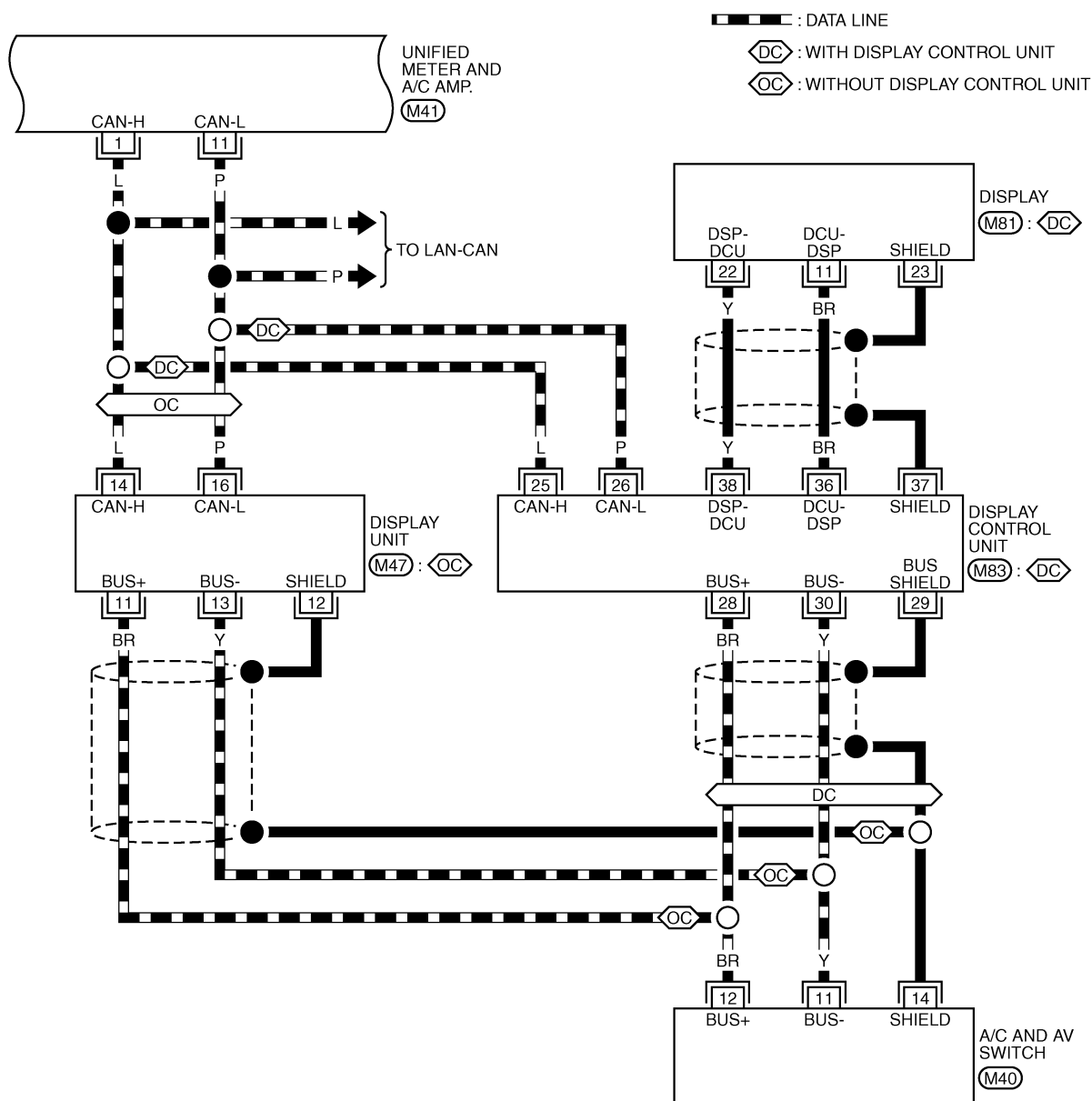


REFER TO THE FOLLOWING.
(M1), (M2) -FUSE BLOCK-JUNCTION BOX (J/B)

TJWM0106E

TROUBLE DIAGNOSIS

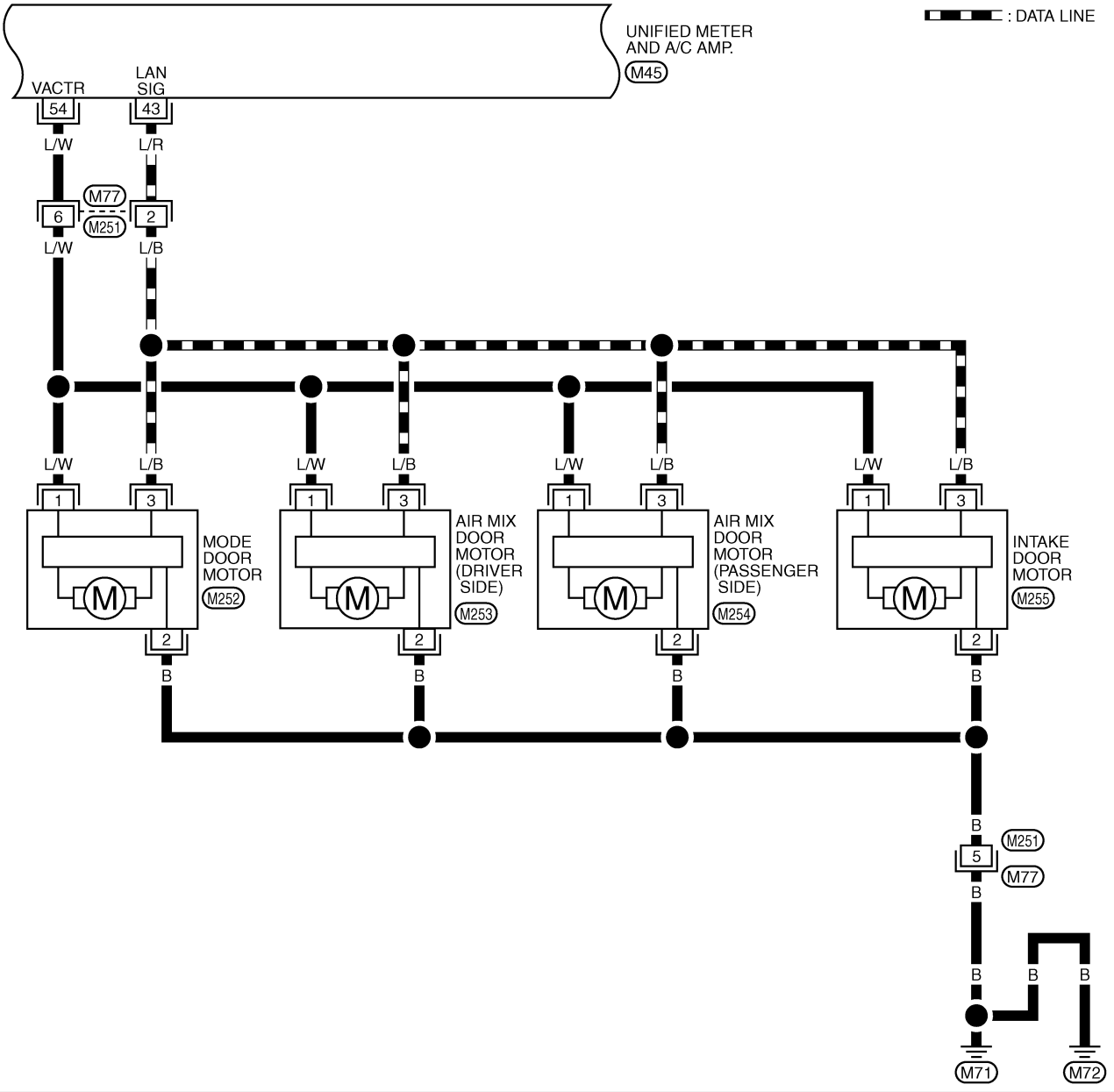
ATC-A/C-02



TJWM0262E

TROUBLE DIAGNOSIS

ATC-A/C-03



37	38	39	40	41			42	43	44	45	46	47
48	49	50	51	52	53	54	55	56	57	58	59	60

(M45)
W



1	2
3	4
5	6

(M77)
W

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(M252)
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(M253)
W

(M254)
W

(M255)
W

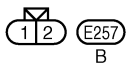
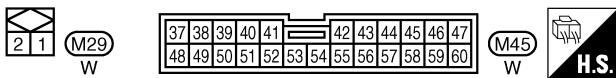
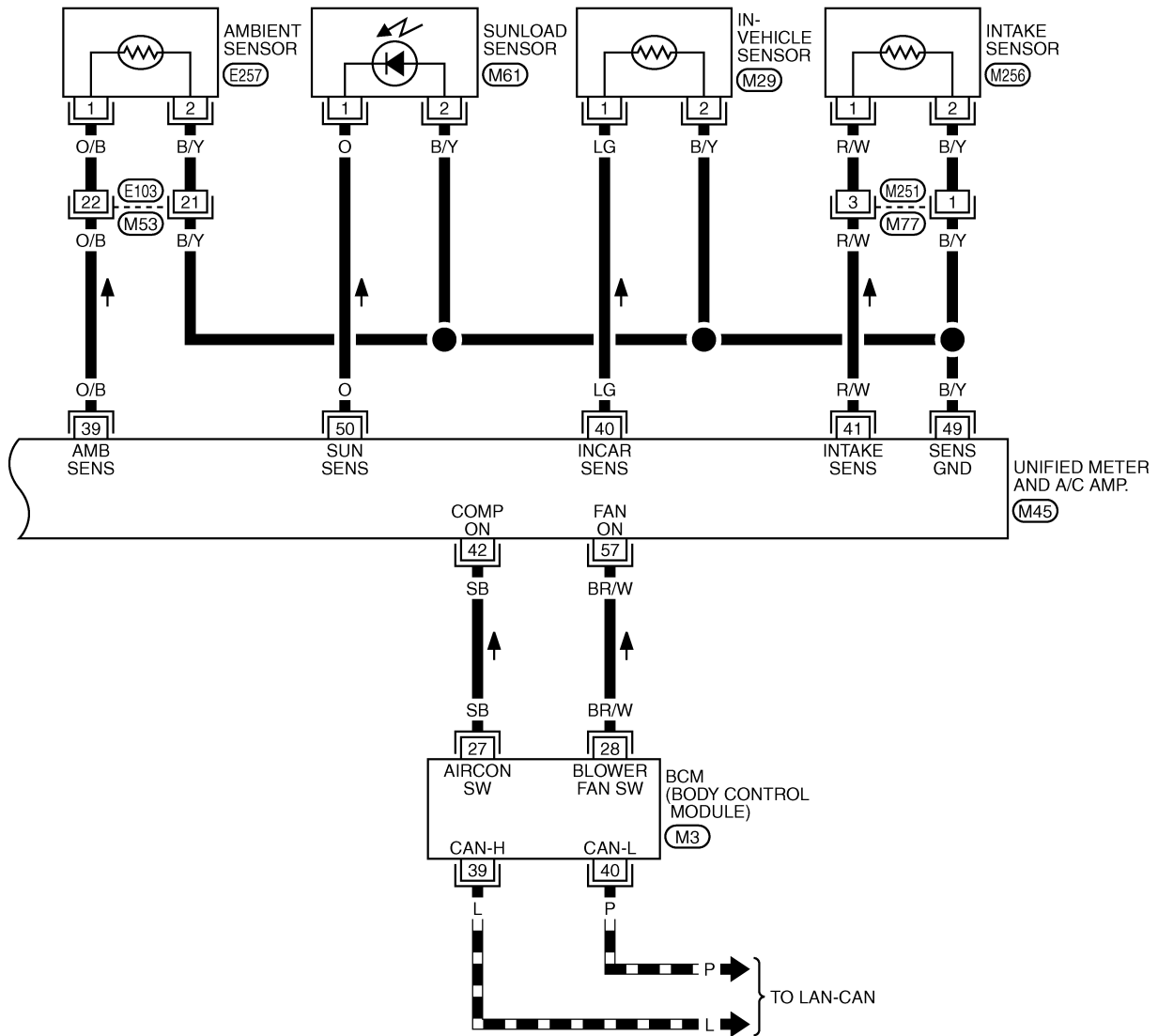
★: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TJWH0045E

TROUBLE DIAGNOSIS

ATC-A/C-04

DATA LINE



*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

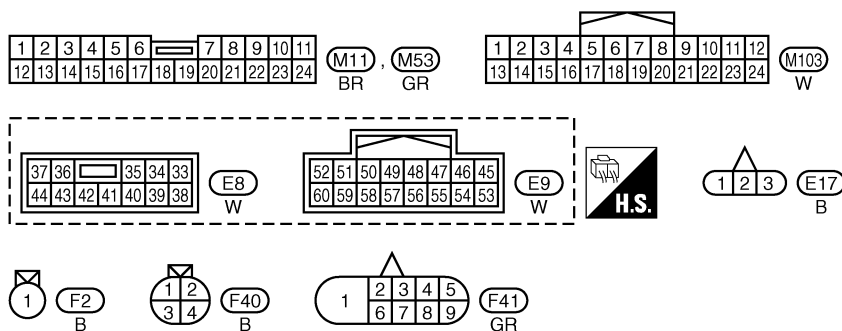
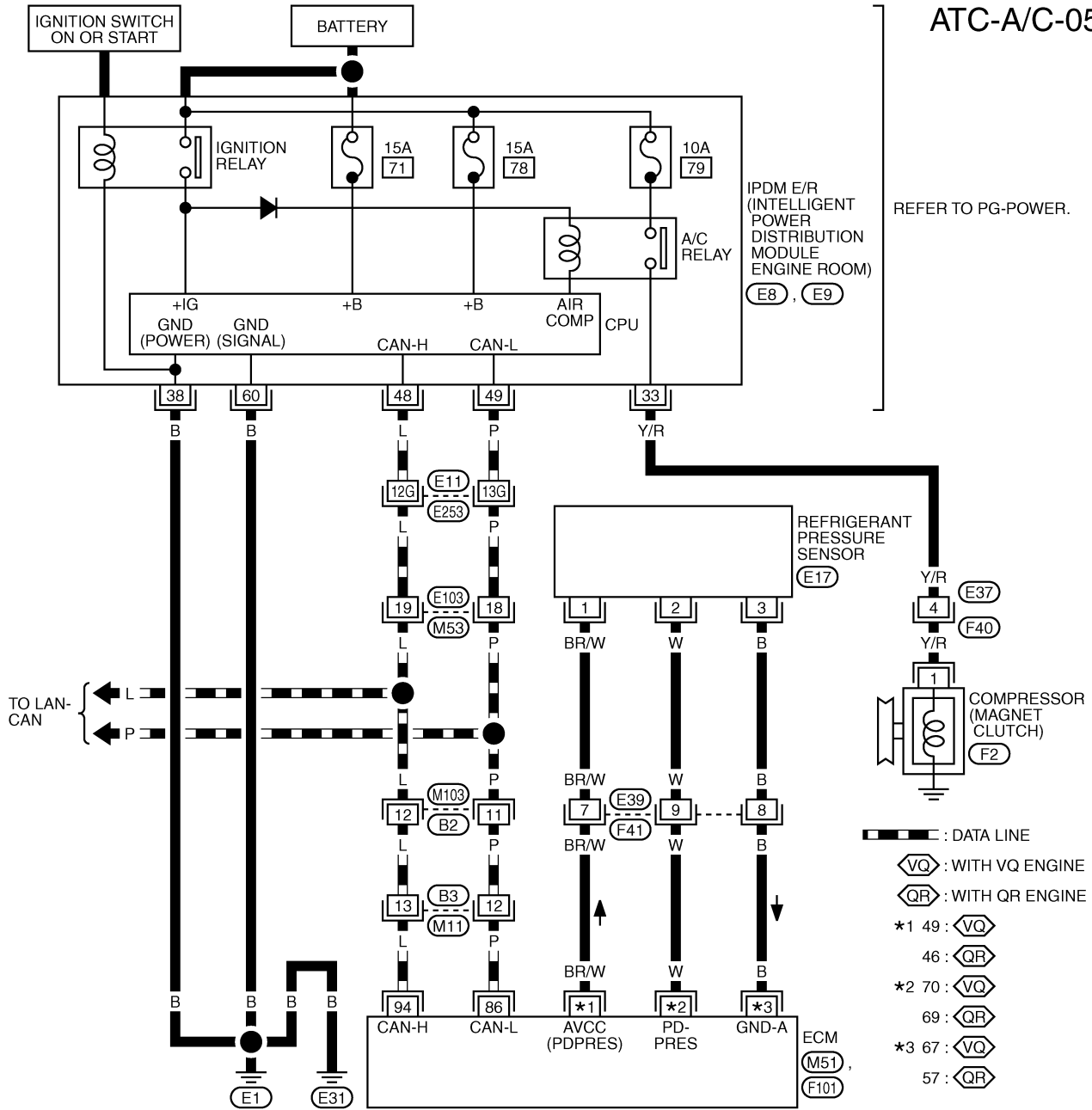
REFER TO THE FOLLOWING.
(M3) -ELECTRICAL UNITS

TJWM0263E

TROUBLE DIAGNOSIS

ATC-A/C-05

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REFER TO THE FOLLOWING.

(E253) -SUPER MULTIPLE JUNCTION (SMJ)

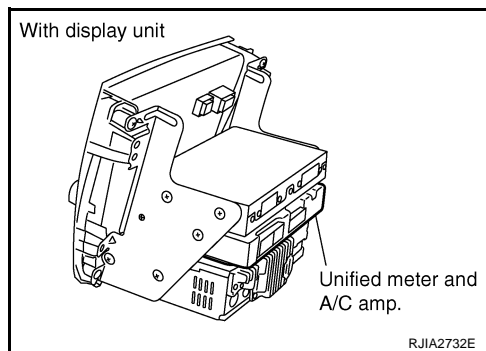
(M51), (F101) -ELECTRICAL UNITS

TROUBLE DIAGNOSIS

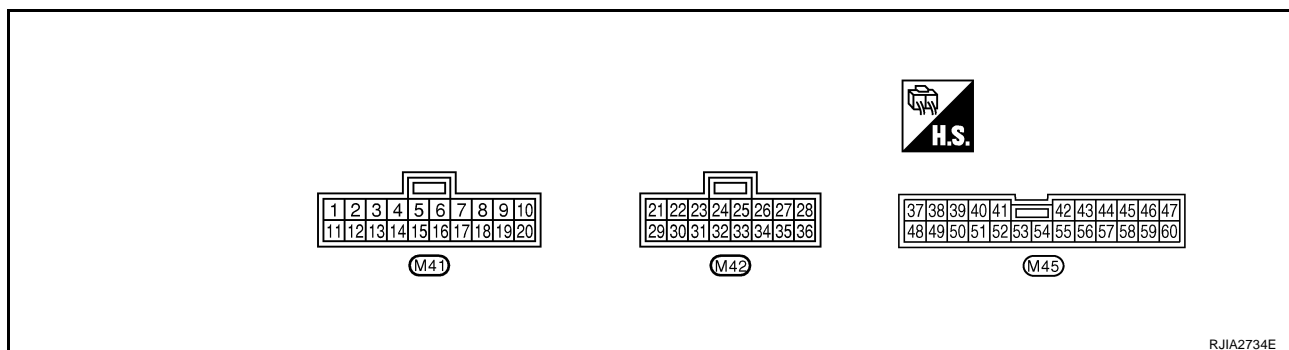
Auto Amp. Terminals and Reference Value

BJS000FW

Measure voltage between each terminal and ground by referring terminals and reference value for unified meter and A/C amp.



PIN CONNECTOR TERMINAL LAYOUT



TERMINALS AND REFERENCE VALUE FOR UNIFIED METER AND A/C AMP.

Terminal No.	Wire color	Item	Ignition switch	Condition	Voltage (V)
1	L	CAN-H	—	—	—
11	P	CAN-L	—	—	—
21	Y/R	Power supply from BATT	OFF	—	Battery voltage
22	G	Power supply from IGN	ON	—	Battery voltage
29	B	Ground (Power)	ON	—	Approx. 0
30	B	Ground	ON	—	Approx. 0
35	V	Power supply from ACC	ACC	—	Battery voltage
39	O/B	Ambient sensor	—	—	—
40	LG	In-vehicle sensor	—	—	—
41	R/W	Intake sensor	—	—	—
42	SB	Compressor ON signal	ON	A/C switch: ON (Blower motor operates.)	Approx. 0
				OFF switch: ON (A/C System: OFF)	<p>SJIA1423J</p>
43	L/R	A/C LAN signal	ON	—	<p>SJIA1453J</p>

TROUBLE DIAGNOSIS

Terminal No.	Wire color	Item	Ignition switch	Condition	Voltage (V)
46	W/L	Power supply from IGN 2	ON	—	Battery voltage
47	L/R	Blower fan motor feedback signal	ON	Fan speed: 1st speed	Approx. 8
49	B/Y	Sensor ground	ON	—	Approx. 0
50	O	Sunload sensor	—	—	—
54	L/W	Power supply for each door motor	ON	—	Battery voltage
57	BR/W	FAN ON signal	ON	AUTO switch: ON (Blower motor operates.)	Approx. 0
				AUTO switch: OFF	Approx. 5
60	L/Y	Blower fan motor control signal	ON	Fan speed: 1st - 4th speed	Approx. 2.5 - 3.5
				Fan speed: 5th speed	Approx. 9.5 - 10.5

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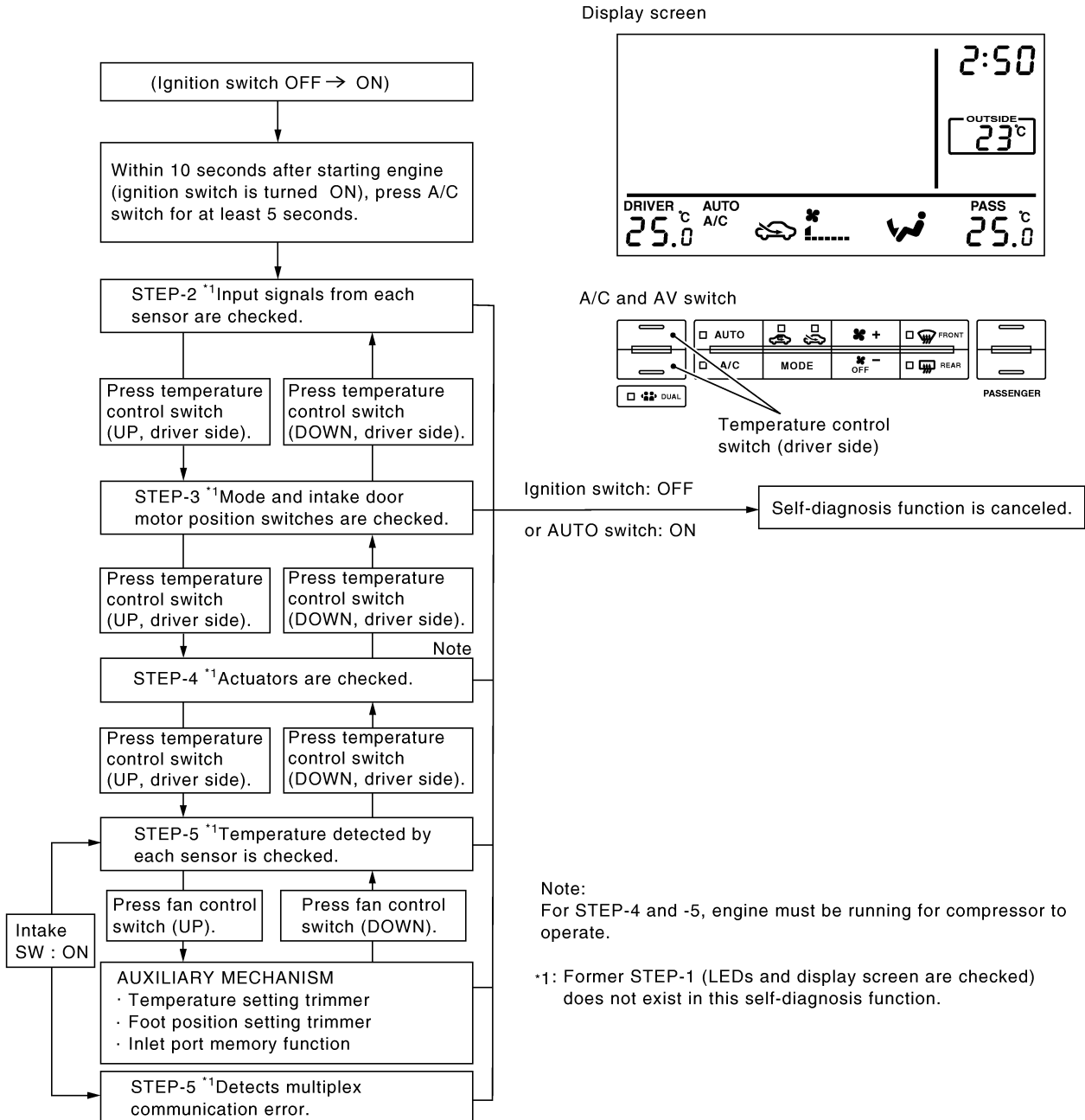
TROUBLE DIAGNOSIS

BJS000FX

Self-diagnosis Function DESCRIPTION

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

Additionally shifting from STEP-5 to AUXILIARY MECHANISM is accomplished by means of pressing  (fan) control switch (UP).



SJIA1670E

TROUBLE DIAGNOSIS

FUNCTION CONFIRMATION PROCEDURE

1. SET IN SELF-DIAGNOSIS MODE

1. Turn ignition switch ON.
2. Set in self-diagnosis mode as follows. Within 10 seconds after starting engine (ignition switch is turned ON.), press A/C switch for at least 5 seconds.

CAUTION:

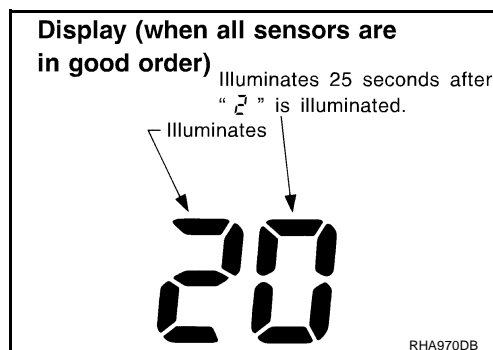
- Press A/C switch after indicating LED of intake switch.
- If battery voltage drops below 12 V during diagnosis STEP-3, door motor speed becomes slower and as a result, the system may generate an error even when operation is normal. To avoid this, start engine before performing this diagnosis.
- Former STEP-1 (LEDs and display screen are checked) does not exist in this self-diagnosis function.

>> GO TO 2.

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

Does code No. 20 appear on the display?

- YES >> GO TO 3.
NO >> GO TO 13.



3. CHECK TO ADVANCE SELF-DIAGNOSIS STEP-3

Press temperature control switch (UP, driver side).

Advance to self-diagnosis STEP-3?

- YES >> GO TO 4.
NO >> Replace A/C and AV switch. (Temperature control switch is malfunctioning.)

4. CHECK TO RETURN SELF-DIAGNOSIS STEP-2

Press temperature control switch (DOWN, driver side).

Return to self-diagnosis STEP-2?

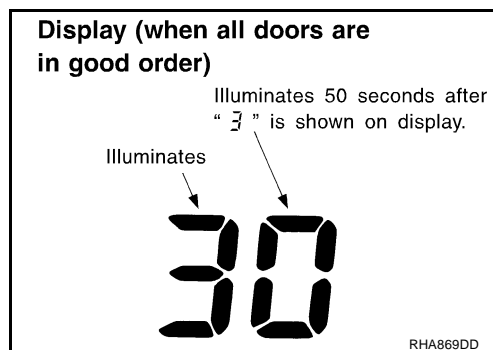
- YES >> GO TO 5.
NO >> Malfunctioning A/C and AV switch or unified meter and A/C amp. Refer to [ATC-94, "Self-diagnosis"](#).

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

Press temperature control switch (UP, driver side).


Does code No. 30 appear on the display?

- YES >> GO TO 6.
NO >> GO TO 14.

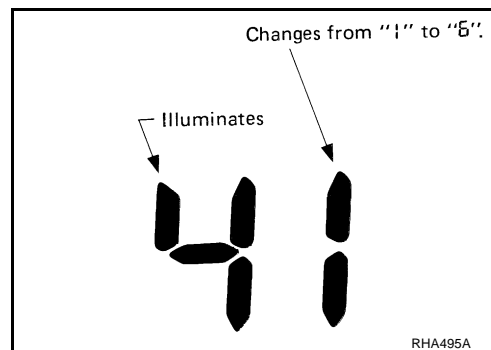


TROUBLE DIAGNOSIS

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






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

>> GO TO 7.



7. CHECK ACTUATORS

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

Discharge air flow			
Mode door position	Air outlet/distribution		
	Vent	Foot	Defroster
	100%	—	—
	60%	40%	—
	20%(22%)	65%(78%)	15%(—)
	17%	43%	40%
	—	—	100%
(): Manually control			SJIA1002E

Code No.	41	42	43	44	45	46
Mode door position	VENT	B/L 1	B/L 2	FOOT*1	D/F	DEF
Intake door position	REC	REC	20%FRE	FRE	FRE	FRE
Air mix door position	FULL COLD	FULL COLD	FULL HOT	FULL HOT	FULL HOT	FULL HOT
Blower motor voltage	5 V	12 V	8.5 V	8.5 V	8.5 V	12 V
Compressor	ON	ON	OFF	OFF	ON	ON

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

*1: FOOT position during automatic control. Refer to [ATC-53, "AUXILIARY MECHANISM: FOOT POSITION SETTING TRIMMER"](#).

OK or NG

OK >> GO TO 8.

- NG >>
- Air outlet does not change.
Go to Mode Door Motor Circuit. Refer to [ATC-63, "Mode Door Motor Circuit"](#).
 - Intake door does not change.
Go to Intake Door Motor Circuit. Refer to [ATC-69, "Intake Door Motor Circuit"](#).
 - Discharge air temperature does not change.
Go to Air Mix Door Motor Circuit. Refer to [ATC-66, "Air Mix Door Motor Circuit"](#).
 - Blower motor operation is malfunctioning.
Go to Blower Motor Circuit. Refer to [ATC-72, "Blower Motor Circuit"](#).
 - Magnet clutch does not engage.
Go to Magnet Clutch Circuit. Refer to [ATC-78, "Magnet Clutch Circuit"](#).


TROUBLE DIAGNOSIS

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

1. Press temperature control switch (UP, driver side).
2. Code No. 51 appears on the display.

>> GO TO 9.

9. CHECK AMBIENT SENSOR

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

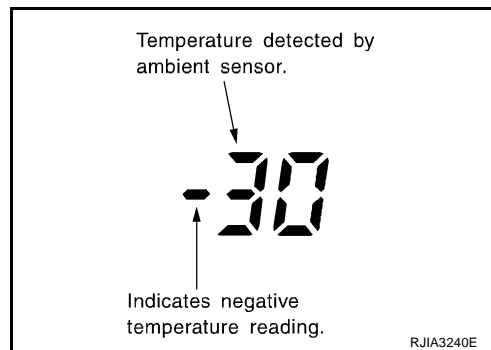
NOTE:

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


OK or NG

OK >> GO TO 10.

NG >> Go to Ambient Sensor Circuit. Refer to [ATC-96, "Ambient Sensor Circuit"](#).



10. CHECK IN-VEHICLE SENSOR

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

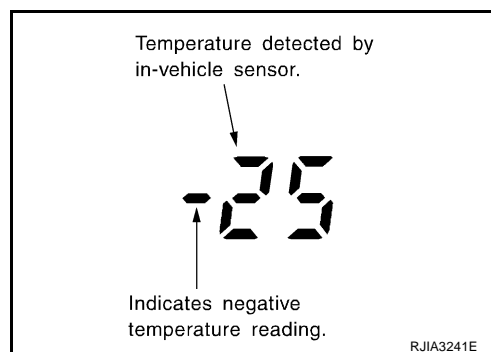
NOTE:

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


OK or NG

OK >> GO TO 11.

NG >> Go to In-vehicle Sensor Circuit. Refer to [ATC-99, "In-vehicle Sensor Circuit"](#).



11. CHECK INTAKE SENSOR

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

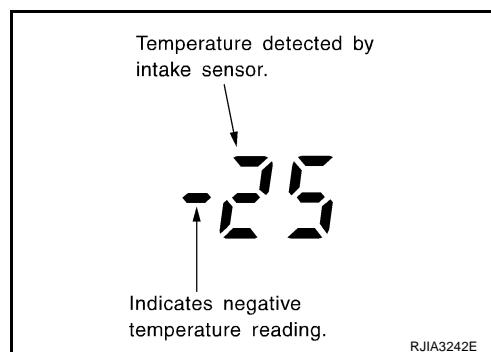
NOTE:

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

OK or NG

OK >> GO TO 12.

NG >> Go to Intake Sensor Circuit. Refer to [ATC-105, "Intake Sensor Circuit"](#).



TROUBLE DIAGNOSIS

12. CHECK CAN COMMUNICATION ERROR

1. Press intake switch.
2. CAN communication error between the unified meter and A/C amp. and the display unit or display control unit can be detected as self-diagnosis results. (If plural errors occur, the display of each error will blink twice for 0-5 second intervals.)



OK or NG

OK >> 1. Turn ignition switch OFF or AUTO switch ON.

2. INSPECTION END

NG >> Go to CAN communication. Refer to [LAN-49, "CAN System Specification Chart"](#).

- Unified meter and A/C amp. - Display unit or Display control unit.

Display	CAN communication error
52	In good order
 52	Display unit or Display control unit ⇨ Unified meter and A/C amp.
 52	Unified meter and A/C amp. ⇨ Display unit or Display control unit

RJIA1762E

13. CHECK MALFUNCTIONING SENSOR

Refer to the following chart for malfunctioning code No.

(If two or more sensors malfunction, corresponding code Nos. blink respectively twice.)

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

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

Code No.	Malfunctioning sensor (Including circuits)	Reference page
21 / -21	Ambient sensor	*2
22 / -22	In-vehicle sensor	*3
24 / -24	Intake sensor	*4
25 / -25	Sunload sensor *1	*5
26 / -26	Air mix door motor PBR (Driver side)	*6
27 / -27	Air mix door motor PBR (Passenger side)	

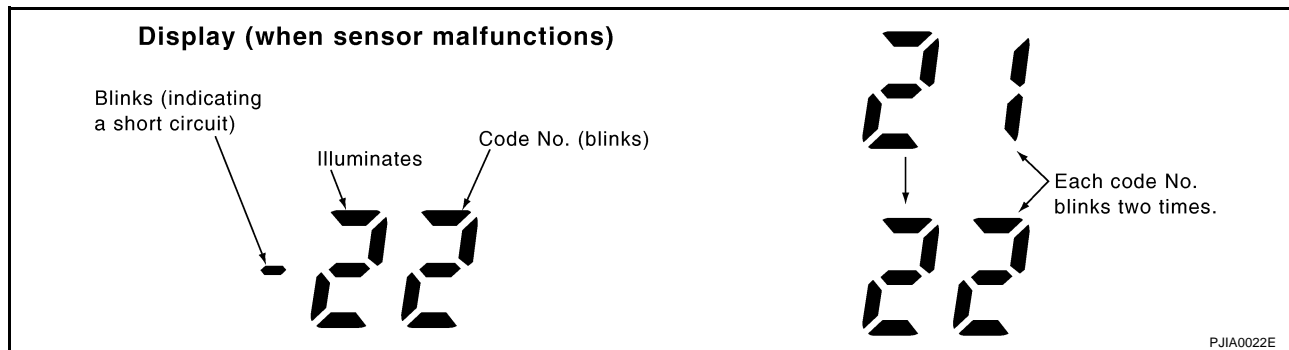
*2: [ATC-96, "DIAGNOSIS PROCEDURE FOR AMBIENT SENSOR"](#).

*3: [ATC-100, "DIAGNOSIS PROCEDURE FOR IN-VEHICLE SENSOR"](#).

*4: [ATC-105, "DIAGNOSIS PROCEDURE FOR INTAKE SENSOR"](#).

*5: [ATC-102, "DIAGNOSIS PROCEDURE FOR SUNLOAD SENSOR"](#).

*6: [ATC-68, "DIAGNOSIS PROCEDURE FOR AIR MIX DOOR MOTOR PBR"](#).



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>> INSPECTION END

TROUBLE DIAGNOSIS

14. CHECK MALFUNCTIONING DOOR MOTOR POSITION SWITCH

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

Code No. *1 *2	Mode or intake door position	Reference page
31	VENT	*4
32	B/L 1	
33	B/L 2	
34	FOOT*3	
35	D/F	
36	DEF	
37	FRE	*5
38	20% FRE	
39	REC	

(If two or more mode or intake doors are out of order, corresponding code numbers blink respectively twice.)

*1: If mode door motor harness connector is disconnected, the following display pattern will appear.

31 → 32 → 33 → 34 → 35 → 36 → Return to 31

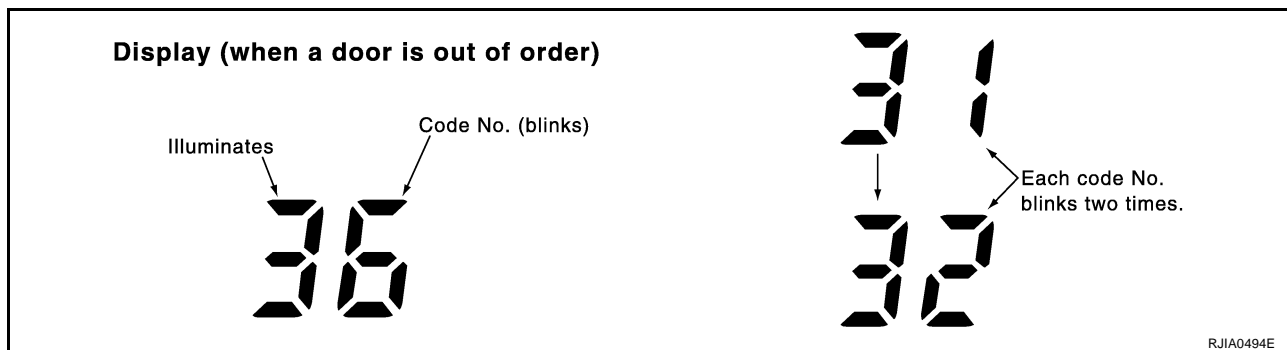
*2: If intake door motor harness connector is disconnected, the following display pattern will appear.

37 → 38 → 39 → Return to 37

*3: FOOT position during automatic control. Refer to [ATC-53, "AUXILIARY MECHANISM: FOOT POSITION SETTING TRIMMER"](#) .

*4: [ATC-65, "DIAGNOSIS PROCEDURE FOR MODE DOOR MOTOR"](#) .

*5: [ATC-71, "DIAGNOSIS PROCEDURE FOR INTAKE DOOR MOTOR"](#) .



>> INSPECTION END

TROUBLE DIAGNOSIS

AUXILIARY MECHANISM: TEMPERATURE SETTING TRIMMER

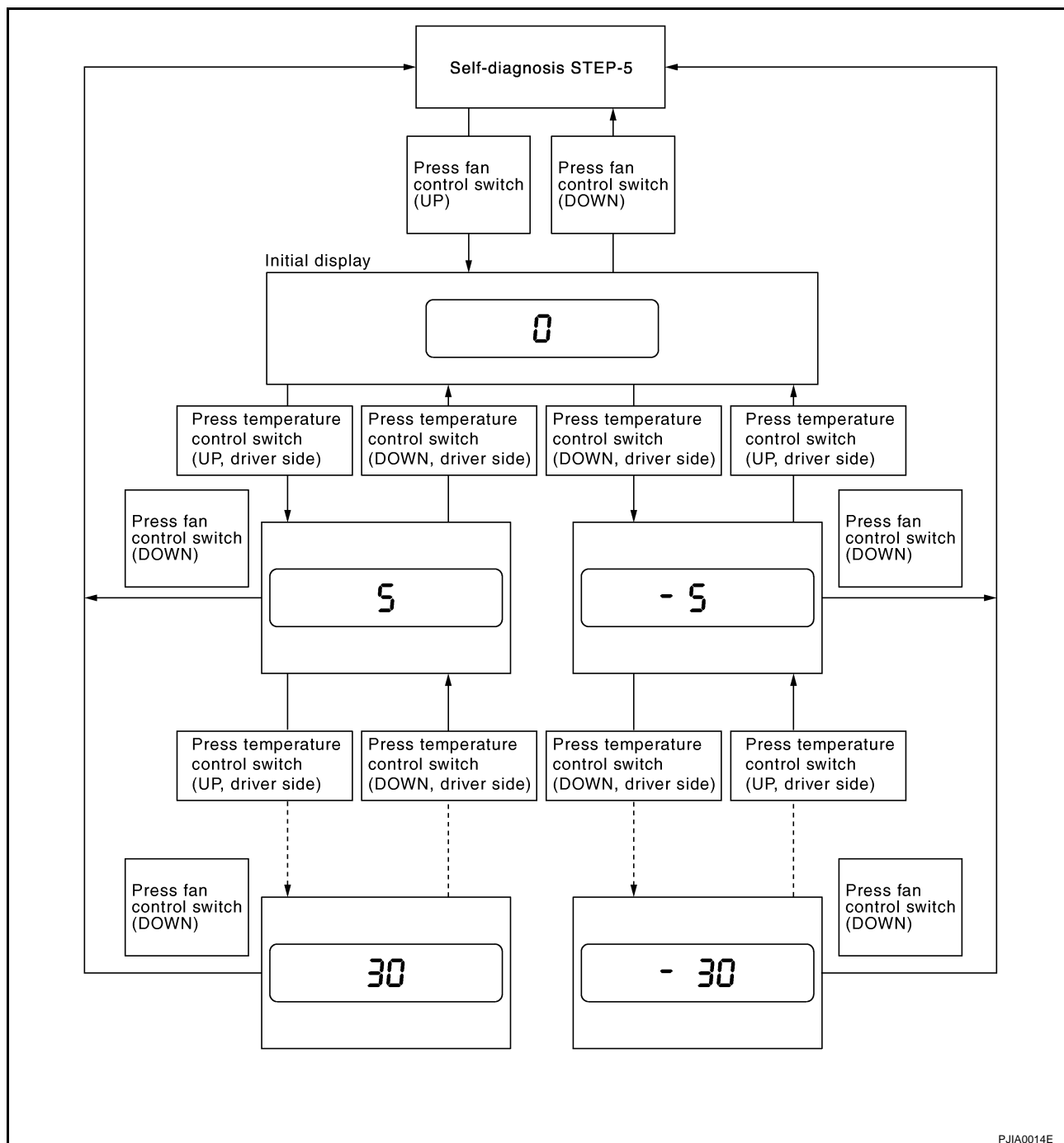
The trimmer compensates for differences in range of $\pm 3^{\circ}\text{C}$ between temperature setting (displayed digitally) and temperature felt by customer.

Operating procedures for this trimmer are as follows:

1. Begin Self-diagnosis STEP-5 mode. Refer to [ATC-46, "Self-diagnosis Function"](#).
2. Press fan control switch (UP) to set system in auxiliary mode.
3. Display shows "61" in auxiliary mechanism. It takes approximately 3 seconds to enable setting operation.
4. Press temperature control switch (driver side) as desired. Temperature will change at a rate of 0.5°C each time a switch is pressed.

CAUTION:

A decimal point is not indicated during a setup of temperature compensation.



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

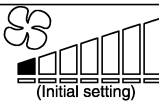



TROUBLE DIAGNOSIS

AUXILIARY MECHANISM: FOOT POSITION SETTING TRIMMER

Wind distribution ratio in FOOT mode can be set.

Operating procedures for this trimmer are as follows:

1. Begin self-diagnosis STEP-5 mode. Refer to [ATC-46, "Self-diagnosis Function"](#) .
2. Press fan control switch (UP) to set system in auxiliary mode.
3. Display shows "61" in auxiliary mechanism. It takes approximately 3 seconds to enable setting operation.
4. Press mode switch as desired.

Display	Discharge air flow					
	Automatically controls the mode door			Manually controls the mode door		
	VENT	FOOT	DEF	VENT	FOOT	DEF
 (Initial setting)	20%	65%	15%	22%	78%	—
	20%	65%	15%	20%	65%	15%
	22%	78%	—	20%	65%	15%
	22%	78%	—	22%	78%	—

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

AUXILIARY MECHANISM: INLET PORT MEMORY FUNCTION

When ignition switch is turned from OFF to ON, inlet port memory function at manual mode can be set.

Operating procedures for this trimmer are as follows:

1. Begin self-diagnosis STEP-5 mode. Refer to [ATC-46, "Self-diagnosis Function"](#) .
2. Press fan control switch (UP) to set system in auxiliary mode.
3. Display shows "61" in auxiliary mechanism.
4. Press the intake switch as desired.

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

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

TROUBLE DIAGNOSIS

Operational Check

BJS000FY

The purpose of the operational check is to confirm that the system operates properly.

Conditions : Engine running at normal operating temperature

CHECKING MEMORY FUNCTION

1. Press temperature control switch (UP, driver side) until 32°C is displayed.
2. Press fan control switch (DOWN) at least 2 seconds.
3. Turn ignition switch OFF.
4. Turn ignition switch ON.
5. Press AUTO switch.
6. Confirm that the set temperature remains at previous temperature.
7. Press fan control switch (DOWN) at least 2 seconds.

If NG, go to trouble diagnosis procedure for [ATC-95, "Memory Function"](#) .

If OK, continue the check.

CHECKING BLOWER

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

If NG, go to trouble diagnosis procedure for [ATC-72, "Blower Motor Circuit"](#) .

If OK, continue the check.

CHECKING DISCHARGE AIR






1. Press MODE switch and DEF switch.
2. Each position indicator should change shape.
3. Confirm that discharge air comes out according to the air distribution table. Refer to [ATC-31, "Discharge Air Flow"](#) .

If NG, go to trouble diagnosis procedure for [ATC-63, "Mode Door Motor Circuit"](#) .

If OK, continue the check.

NOTE:

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

Discharge air flow			
Mode door position	Air outlet/distribution		
	Vent	Foot	Defroster
	100%	—	—
	60%	40%	—
	20%(22%)	65%(78%)	15%(—)
	17%	43%	40%
	—	—	100%
() : Manually control			

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CHECKING INTAKE AIR

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

If NG, go to trouble diagnosis procedure for [ATC-69, "Intake Door Motor Circuit"](#) .

If OK, continue the check.

NOTE:

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

CHECKING TEMPERATURE DECREASE

1. Press temperature control switch (DOWN, driver side) until 18°C is displayed.
2. Check for cold air at discharge air outlets.

If NG, go to trouble diagnosis procedure for [ATC-84, "Insufficient Cooling"](#) .

If OK, continue the check.

TROUBLE DIAGNOSIS

CHECKING TEMPERATURE INCREASE

1. Press temperature control switch (UP, driver side) until 32°C is displayed.
2. Check for hot air at discharge air outlets.

If NG, go to trouble diagnosis procedure for [ATC-91, "Insufficient Heating"](#).

If OK, continue the check.

CHECKING A/C SWITCH

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

If NG, go to trouble diagnosis procedure for [ATC-78, "Magnet Clutch Circuit"](#).

If OK, continue the check.

CHECKING AUTO MODE

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

If NG, go to trouble diagnosis procedure for [ATC-56, "Power Supply and Ground Circuit for Auto Amp."](#), then if necessary, trouble diagnosis procedure for [ATC-78, "Magnet Clutch Circuit"](#).

If all operational checks are OK (symptom cannot be duplicated), go to Incident Simulation Tests in [GI-24, "How to Perform Efficient Diagnosis for an Electrical Incident"](#) and perform tests as outlined to simulate driving conditions environment. If symptom appears, refer to [ATC-35, "SYMPTOM TABLE"](#) and perform applicable trouble diagnosis procedures.

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TROUBLE DIAGNOSIS

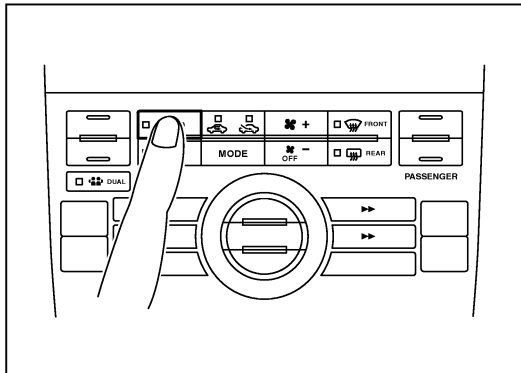
Power Supply and Ground Circuit for Auto Amp.

BJS000FZ

SYMPTOM: A/C system does not come on.

INSPECTION FLOW

1. Confirm symptom by performing the following operational check.



OPERATIONAL CHECK – AUTO mode

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

If OK (symptom cannot be duplicated), perform complete operational check (*2).
If NG (symptom is confirmed), continue with STEP-2 following.

2. Check for any service bulletins.

3. Check main power supply and ground circuit. (*1)

OK

4. Check integrated display system (*3) or integrated color display system (*4).

OK

5. Replace unified meter and A/C amp.

*1 [ATC-57, "DIAGNOSIS PROCEDURE FOR A/C SYSTEM"](#)

*2 [ATC-54, "Operational Check"](#)

*3 [AV-58, "Unable to Operate System with A/C and AV Switch"](#) (Integrated display system)

*4 [AV-97, "Unable to Operate System with A/C and AV Switch"](#) (Integrated color display system)

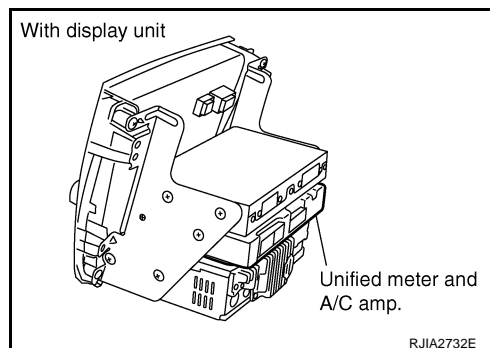
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TROUBLE DIAGNOSIS

COMPONENT DESCRIPTION

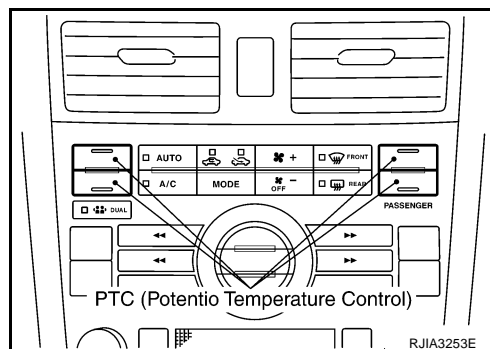
Unified Meter and A/C amp. (Automatic Amplifier)

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



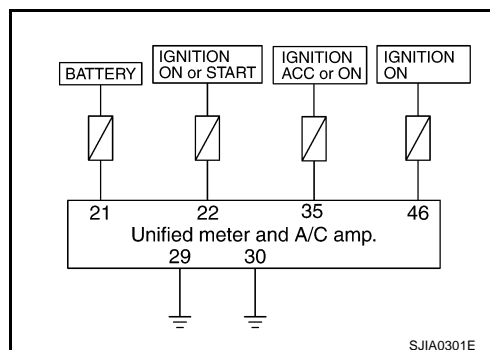
Potential Temperature Control (PTC)

The PTC is built into the A/C and AV switch. It can be set at an interval of 0.5°C in the 18°C to 32°C temperature range by turning temperature control switch. The set temperature is displayed.



DIAGNOSIS PROCEDURE FOR A/C SYSTEM

SYMPTOM: A/C system does not come on.

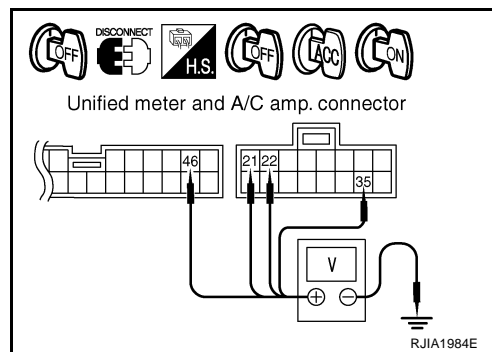


TROUBLE DIAGNOSIS

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

1. Disconnect unified meter and A/C amp. connector.
2. Check voltage between unified meter and A/C amp. harness connector M42 terminals 21, 22 and 35, unified meter and A/C amp. harness connector M45 terminal 46 and ground.

Terminals		Ignition switch position			
(+)		(-)	OFF	ACC	ON
Unified meter and A/C amp. connector	Terminal No.				
M42	21	Ground	Battery voltage	Battery voltage	Battery voltage
M42	22		Approx. 0 V	Approx. 0 V	Battery voltage
M42	35		Approx. 0 V	Battery voltage	Battery voltage
M45	46		Approx. 0 V	Approx. 0 V	Battery voltage



OK or NG

OK >> GO TO 2.

NG >> Check 10A and 15A fuses [Nos. 6, 10, 11, 12 and 19, located in the fuse block (J/B)]. Refer to [PG-79, "FUSE BLOCK - JUNCTION BOX \(J/B\)"](#).

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

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

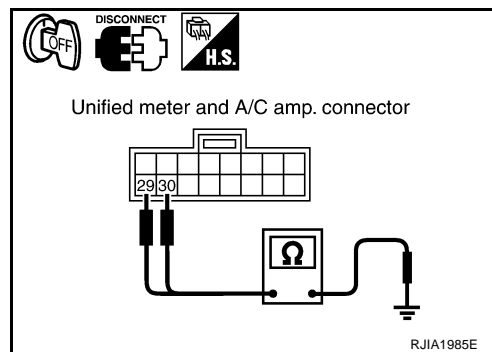
1. Turn ignition switch OFF.
2. Check continuity between unified meter and A/C amp. harness connector M42 terminal 29, 30 and ground.

29, 30 – Ground : Continuity should exist.

OK or NG

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

NG >> Repair harness or connector.

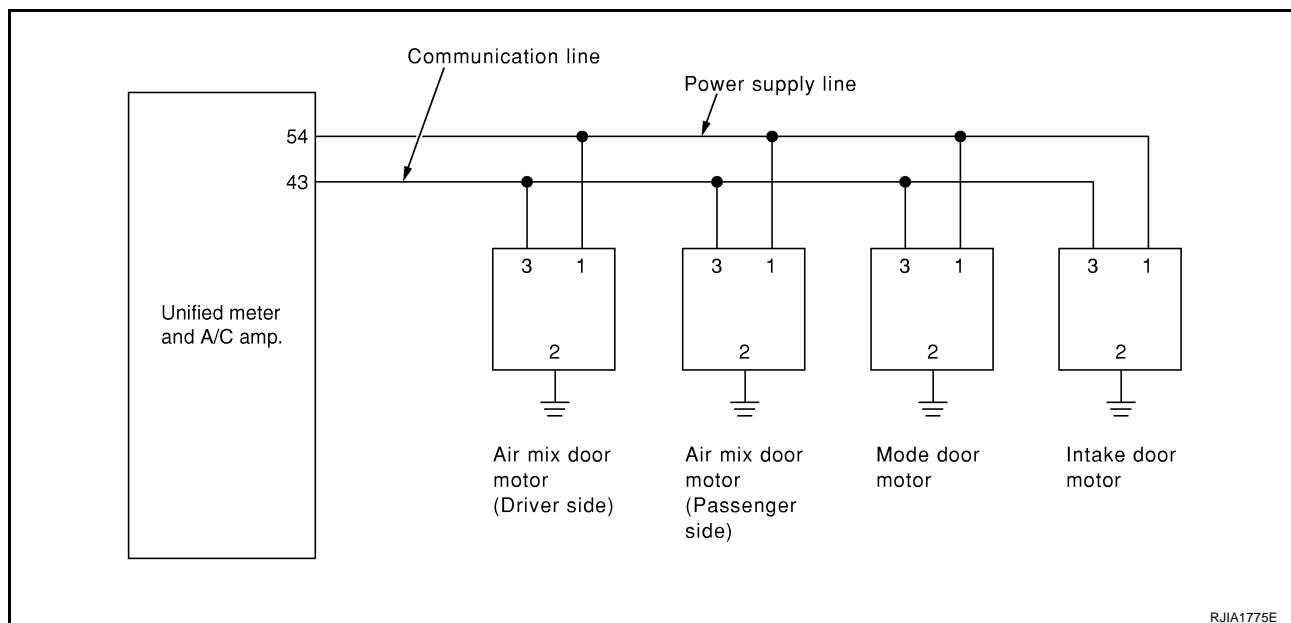


TROUBLE DIAGNOSIS

LAN System Circuit

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SYMPTOM: Mode door motor, intake door motor and/or air mix door motor(s) does not operate normally.



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DIAGNOSIS PROCEDURE FOR LAN CIRCUIT

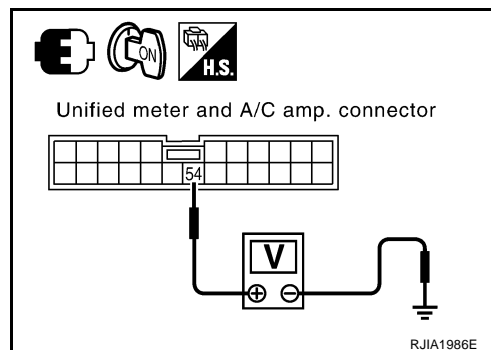
1. CHECK POWER SUPPLY FOR UNIFIED METER AND A/C AMP.

- Turn ignition switch ON.
- Check voltage between unified meter and A/C amp. harness connector M45 terminal 54 and ground.

54 – Ground : Battery voltage

OK or NG

- OK >> GO TO 2.
NG >> Replace unified meter and A/C amp.

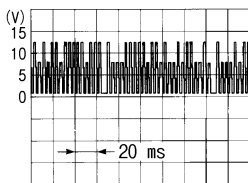


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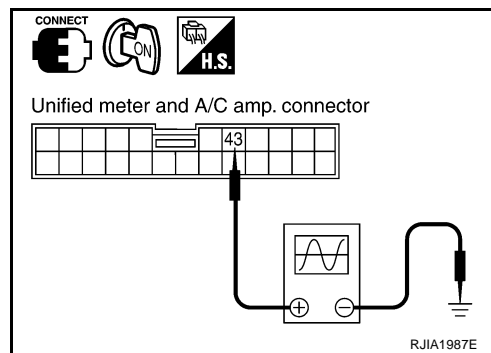
2. CHECK SIGNAL FOR UNIFIED METER AND A/C AMP.

Confirm A/C LAN signal between unified meter and A/C amp. harness connector M45 terminal 43 and ground using an oscilloscope.

Terminals		Voltage
(+)	(-)	
Unified meter and A/C amp. connector	Terminal No.	
M45	43	Ground



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OK or NG

- OK >> GO TO 3.
NG >> Replace unified meter and A/C amp.

TROUBLE DIAGNOSIS

3. CHECK POWER SUPPLY FOR EACH DOOR MOTOR

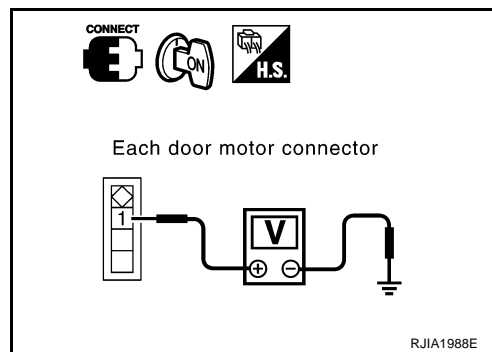
Check voltage between each door motor harness connector M252, M253, M254 and M255 terminal 1 and ground.

1 – Ground : Battery voltage

OK or NG

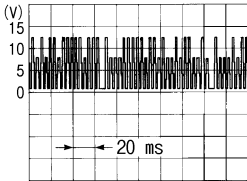
OK >> GO TO 4.

NG >> Repair harness or connector.

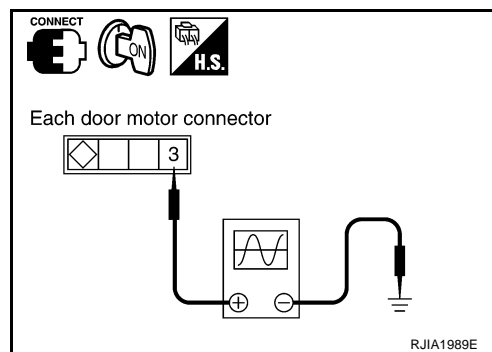
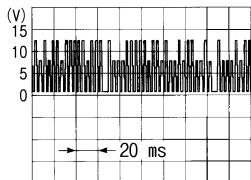


4. CHECK SIGNAL FOR EACH DOOR MOTOR

Confirm A/C LAN signal between each door motor harness connector terminal 3 and ground using an oscilloscope.

Door motor	Terminals		Voltage	
	(+)			(-)
	Con- nector	Terminal No.		
Mode	M252	3	Ground	
Air mix (Driver side)	M253	3		
Air mix (Passen- ger side)	M254	3		
Intake	M255	3		

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OK or NG

OK >> GO TO 5.

NG >> Repair harness or connector.

5. CHECK MOTOR GROUND CIRCUIT

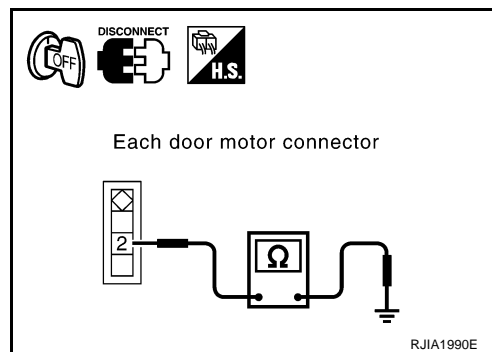
1. Turn ignition switch OFF.
2. Disconnect each door motor connector.
3. Check continuity between each door motor harness connector M252, M253, M254 and M255 terminal 2 and ground.

2 – Ground : Continuity should exist.

OK or NG

OK >> GO TO 6.

NG >> Repair harness or connector.



TROUBLE DIAGNOSIS

6. CHECK MOTOR OPERATION

1. Reconnect each door motor connector.
2. Turn ignition switch ON.
3. Confirm operation of each door motor.

OK or NG

- OK >> (Return to operate normally.)
- Poor contact in motor connector.
- NG >> (Does not operate normally.)
- GO TO 7.

7. CHECK AIR MIX DOOR MOTOR AND INTAKE DOOR MOTOR OPERATION

1. Turn ignition switch OFF.
2. Disconnect mode, air mix (driver side, passenger side), and intake door motor connectors.
3. Reconnect air mix (driver side, passenger side) and intake door motor connectors.
4. Turn ignition switch ON.
5. Confirm operation of air mix door motor (driver side, passenger side) and intake door motor.

OK or NG

- OK >> [Air mix (driver side, passenger side) and intake door motors operate normally.]
- Replace mode door motor.
- NG >> [Air mix (driver side, passenger side) and intake door motors does not operate normally.]
- GO TO 8.

8. CHECK MODE DOOR MOTOR AND INTAKE DOOR MOTOR OPERATION

1. Turn ignition switch OFF.
2. Disconnect air mix door motor (driver side, passenger side) connectors.
3. Reconnect mode door motor connector.
4. Turn ignition switch ON.
5. Confirm operation of mode door motor and intake door motor.

OK or NG

- OK >> (Mode and intake door motors operate normally.)
- GO TO 10.
- NG >> (Mode and intake door motors does not operate normally.)
- GO TO 9.

9. CHECK MODE DOOR MOTOR AND AIR MIX DOOR MOTOR OPERATION

1. Turn ignition switch OFF.
2. Disconnect intake door motor connector.
3. Reconnect air mix door motor (driver side, passenger side) connectors.
4. Turn ignition switch ON.
5. Confirm operation of mode door motor and air mix door motor (driver side, passenger side).

OK or NG

- OK >> [Mode and air mix door motor (driver side, passenger side) operate normally.]
- Replace intake door motor.
- NG >> [Mode and air mix door motor (driver side, passenger side) does not operate normally.]
- Replace unified meter and A/C amp.

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TROUBLE DIAGNOSIS

10. CHECK AIR MIX DOOR MOTOR OPERATION

1. Turn ignition switch OFF.
2. Disconnect air mix door motor (driver side) connector.
3. Turn ignition switch ON.
4. Confirm operation of air mix door motor (passenger side).

OK or NG

- OK >> [Air mix door motor (passenger side) operates normally.]
- Replace air mix door motor (driver side).
- NG >> [Air mix door motor (passenger side) does not operate normally.]
- Replace air mix door motor (passenger side).

TROUBLE DIAGNOSIS

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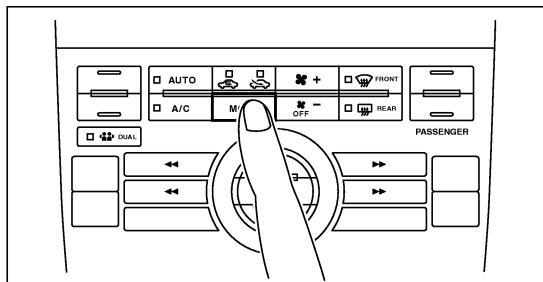
Mode Door Motor Circuit

SYMPTOM

- Air outlet does not change.
- Mode door motor does not operate normally.

INSPECTION FLOW

1. Confirm symptom by performing the following operational check.



OPERATIONAL CHECK – Discharge air

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

Discharge air flow

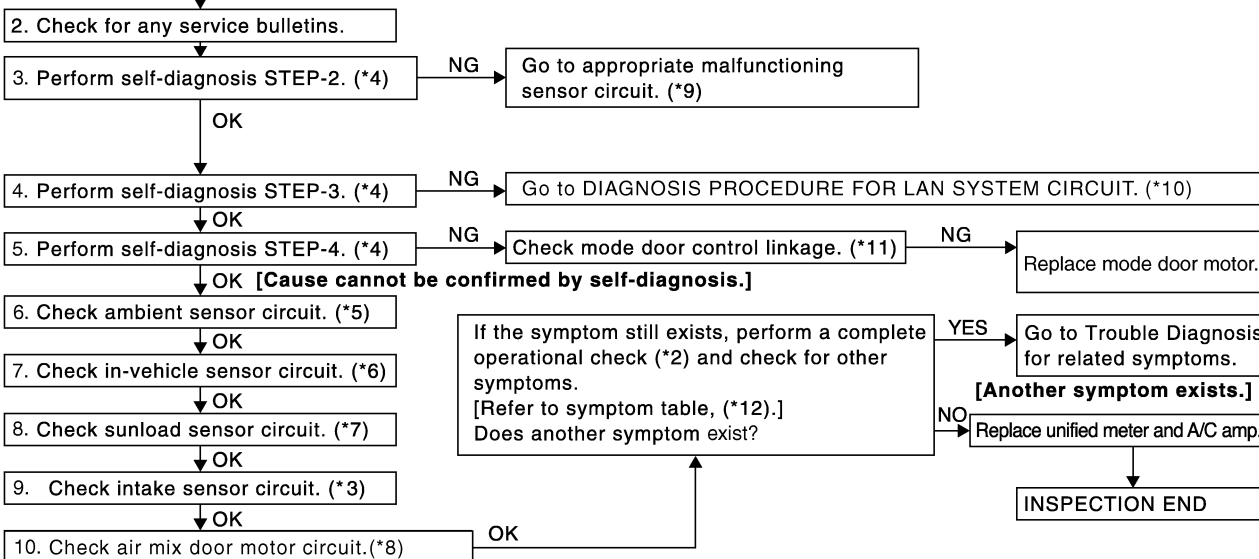
Mode door position	Air outlet/distribution		
	Vent	Foot	Defroster
	100%	–	–
	60%	40%	–
	20%(22%)	65%(78%)	15%(–)
	17%	43%	40%
	–	–	100%

() : Manual control

- Confirm that discharge air comes out according to the air distribution table at left.
Refer to "Discharge Air Flow" (*1).

NOTE:

- If OK (symptom cannot be duplicated), perform complete operational check (*2).
- If NG (symptom is confirmed), continue with STEP-2 following.
- Confirm that the compressor clutch is engaged (sound or visual inspection) and intake door position is at FRESH when DEF is selected.



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*1 [ATC-31, "Discharge Air Flow"](#)
 *4 [ATC-47, "FUNCTION CONFIRMATION PROCEDURE"](#), see No. 2 to 6.

*2 [ATC-54, "Operational Check"](#)
 *5 [ATC-96, "Ambient Sensor Circuit"](#)

*3 [ATC-105, "Intake Sensor Circuit"](#)
 *6 [ATC-99, "In-vehicle Sensor Circuit"](#)

*7 [ATC-102, "Sunload Sensor Circuit"](#)

*8 [ATC-66, "Air Mix Door Motor Circuit"](#)

*9 [ATC-47, "FUNCTION CONFIRMATION PROCEDURE"](#), see No. 13.

*10 [ATC-59, "DIAGNOSIS PROCEDURE FOR LAN CIRCUIT"](#)

*11 [ATC-123, "MODE DOOR MOTOR"](#)

*12 [ATC-35, "SYMPTOM TABLE"](#)

TROUBLE DIAGNOSIS

SYSTEM DESCRIPTION

Component Parts

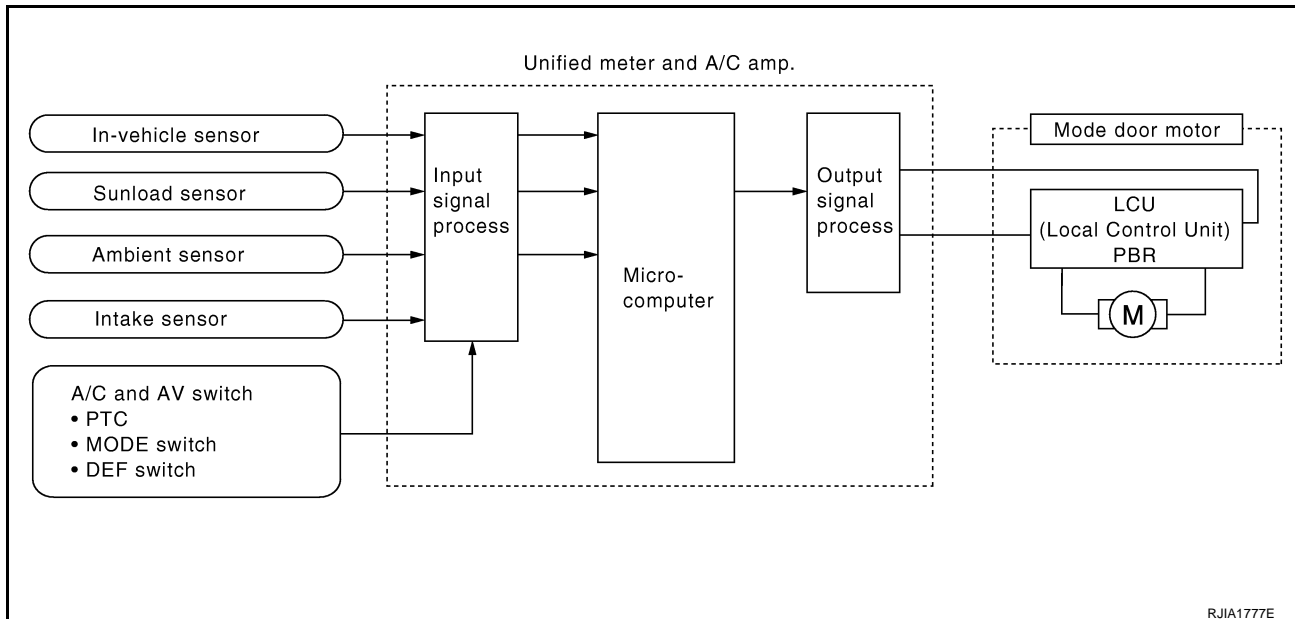
Mode door control system components are:

- Unified meter and A/C amp.
- Mode door motor (LCU)
- A/C LAN system (PBR built-in mode door motor, air mix door motor and intake door motor)
- In-vehicle sensor
- Ambient sensor
- Sunload sensor
- Intake sensor

System Operation

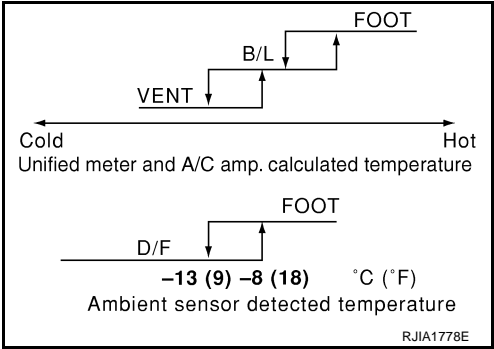
The unified meter and A/C amp. receives data from each of the sensors. The unified meter and A/C amp. sends air mix door, mode door and intake door opening angle data to the air mix door motor LCU, mode door motor LCU and intake door motor LCU.

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



TROUBLE DIAGNOSIS

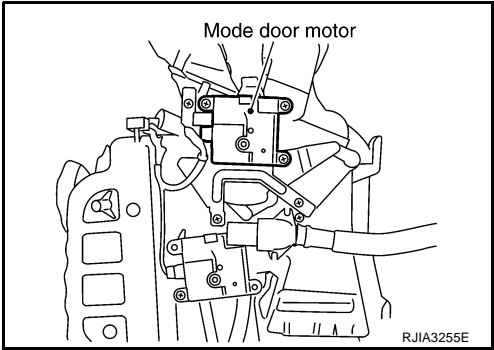
Mode Door Control Specification



COMPONENT DESCRIPTION

Mode Door Motor

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



DIAGNOSIS PROCEDURE FOR MODE DOOR MOTOR

SYMPTOM: Mode door motor does not operate normally.

Perform diagnosis procedure. Refer to [ATC-59, "DIAGNOSIS PROCEDURE FOR LAN CIRCUIT"](#) .

TROUBLE DIAGNOSIS

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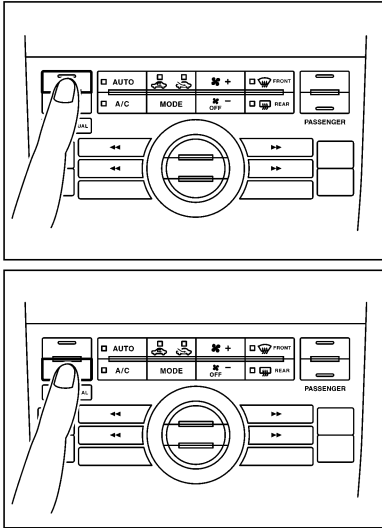
Air Mix Door Motor Circuit

SYMPTOM

- Discharge air temperature does not change.
- Air mix door motor does not operate normally.

INSPECTION FLOW

1. Confirm symptom by performing the following operational check.



OPERATIONAL CHECK

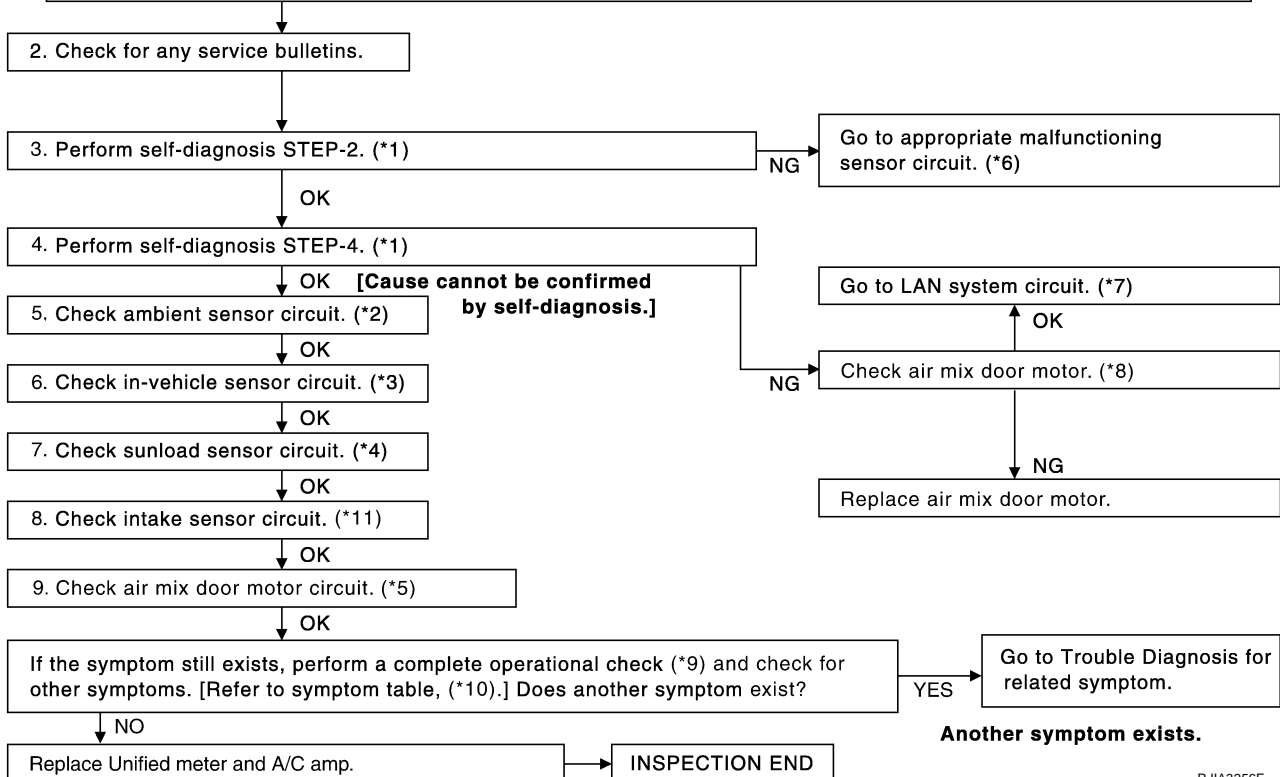
Temperature increase

- Press temperature control switch (UP, driver side) until 32°C is displayed.
- Check for hot air at discharge air outlets.

Temperature decrease

- Press temperature control switch (DOWN, driver side) until 18°C is displayed.
- Check for cold air at discharge air outlets.

If OK (symptom cannot be duplicated), perform complete operational check (*9).
If NG (symptom is confirmed), continue with STEP-2 following.



Another symptom exists.

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*1 [ATC-47, "FUNCTION CONFIRMATION PROCEDURE"](#), see No. 2 to 6.

*2 [ATC-96, "Ambient Sensor Circuit"](#)

*3 [ATC-99, "In-vehicle Sensor Circuit"](#)

*4 [ATC-102, "Sunload Sensor Circuit"](#)

*5 [ATC-66, "Air Mix Door Motor Circuit"](#)

*6 [ATC-47, "FUNCTION CONFIRMATION PROCEDURE"](#), see No. 13.

*7 [ATC-59, "LAN System Circuit"](#)

*8 [ATC-124, "AIR MIX DOOR MOTOR"](#)

*9 [ATC-54, "Operational Check"](#)

*10 [ATC-35, "SYMPTOM TABLE"](#)

*11 [ATC-105, "Intake Sensor Circuit"](#)

TROUBLE DIAGNOSIS

SYSTEM DESCRIPTION

Component Parts

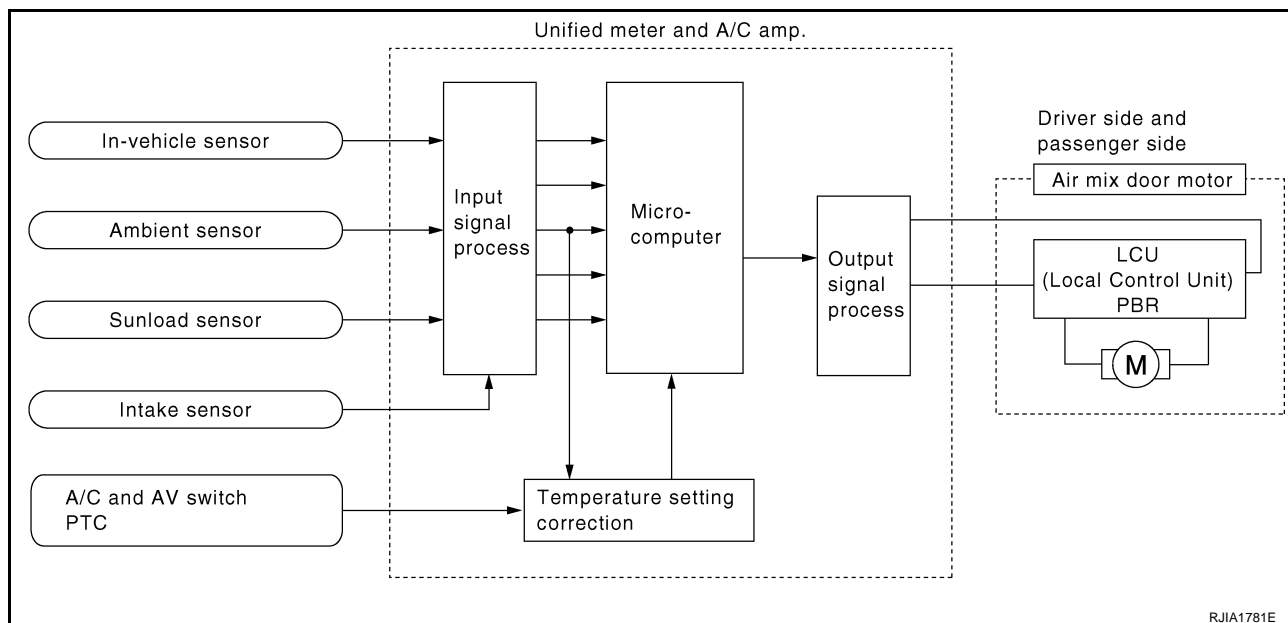
Air mix door control system components are:

- Unified meter and A/C amp.
- Air mix door motor (LCU)
- A/C LAN system (PBR built-in mode door motor, air mix door motor and intake door motor)
- In-vehicle sensor
- Ambient sensor
- Sunload sensor
- Intake sensor

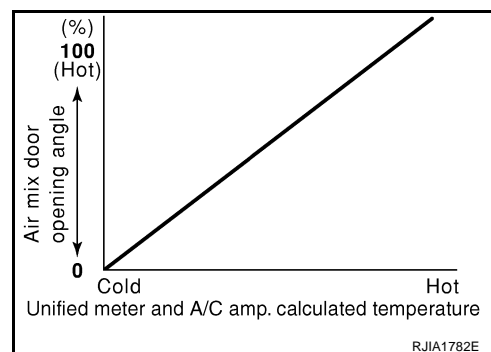
System Operation

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

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



Air Mix Door Control Specification

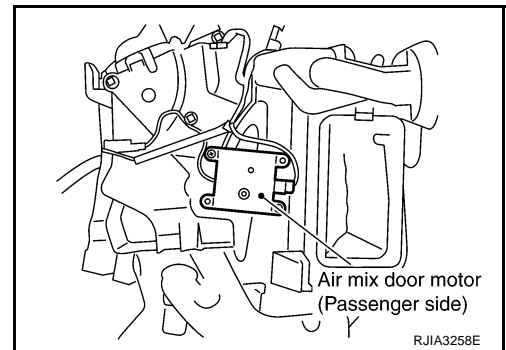
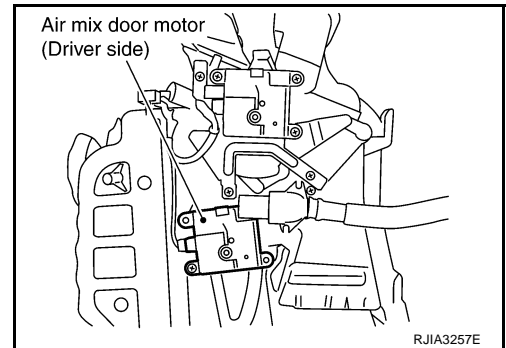


TROUBLE DIAGNOSIS

COMPONENT DESCRIPTION

Air Mix Door Motor

The air mix door motors are attached to the heater & cooling unit assembly. It rotates so that the air mix door is opened or closed to a position set by the unified meter and A/C amp. Air mix door rotates gear of slide door directly and moves slide door.



DIAGNOSIS PROCEDURE FOR AIR MIX DOOR MOTOR

SYMPTOM: Discharge air temperature does not change.

Perform diagnosis procedure. Refer to [ATC-59, "DIAGNOSIS PROCEDURE FOR LAN CIRCUIT"](#) .

Air Mix Door Motor PBR Circuit

BJS000G3

SYMPTOM

- Discharge air temperature does not change.
- PBR circuit is open or shorted.

DIAGNOSIS PROCEDURE FOR AIR MIX DOOR MOTOR PBR

Perform diagnosis procedure. Refer to [ATC-59, "DIAGNOSIS PROCEDURE FOR LAN CIRCUIT"](#) .

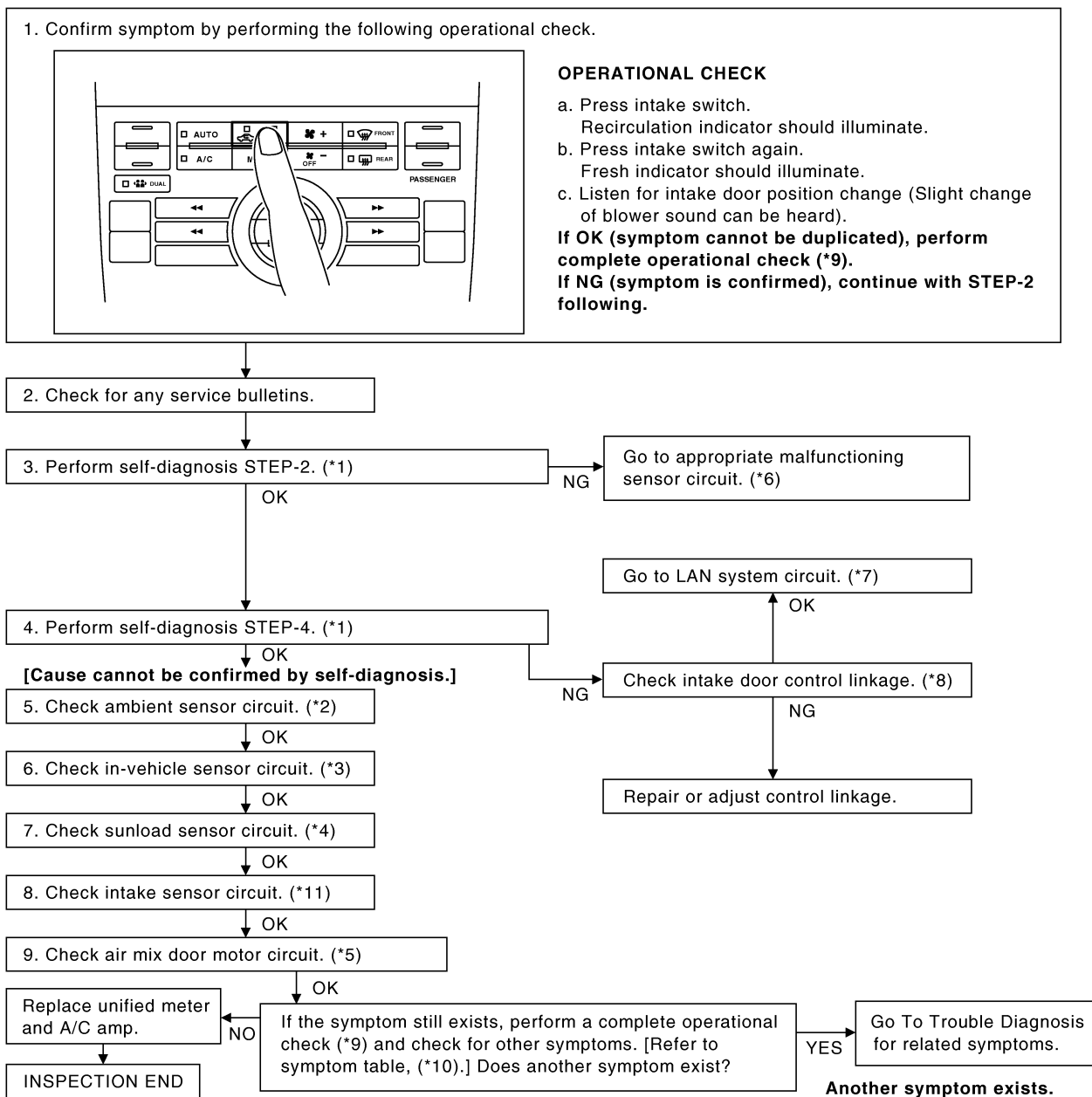
Intake Door Motor Circuit

BJS000G4

SYMPTOM

- Intake door does not change.
- Intake door motor does not operate normally.

INSPECTION FLOW



*1 [ATC-47, "FUNCTION CONFIRMATION PROCEDURE"](#), see No. 2 to 6.

*4 [ATC-102, "Sunload Sensor Circuit"](#)

*7 [ATC-59, "LAN System Circuit"](#)

*10 [ATC-35, "SYMPTOM TABLE"](#)

*2 [ATC-96, "Ambient Sensor Circuit"](#)

*5 [ATC-66, "Air Mix Door Motor Circuit"](#)

*8 [ATC-117, "INTAKE DOOR MOTOR"](#)

*11 [ATC-105, "Intake Sensor Circuit"](#)

*3 [ATC-99, "In-vehicle Sensor Circuit"](#)

*6 [ATC-47, "FUNCTION CONFIRMATION PROCEDURE"](#), see No. 13.

*9 [ATC-54, "Operational Check"](#)

SJIA1650E

TROUBLE DIAGNOSIS

SYSTEM DESCRIPTION

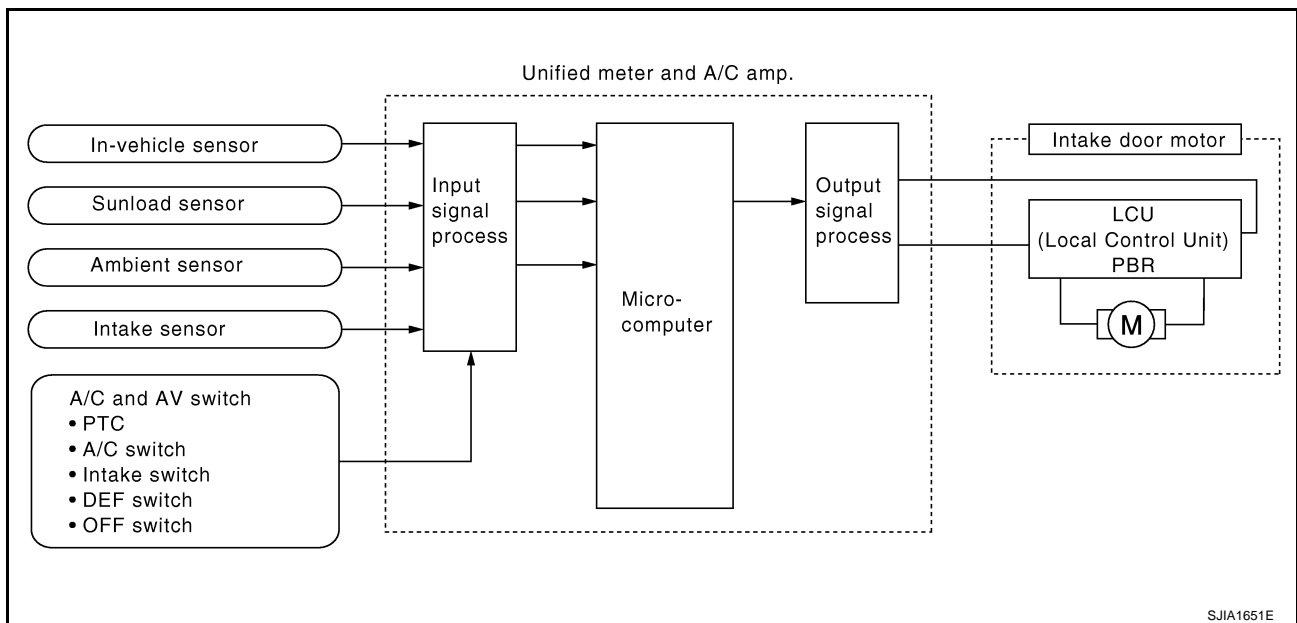
Component Parts

Intake door control system components are:

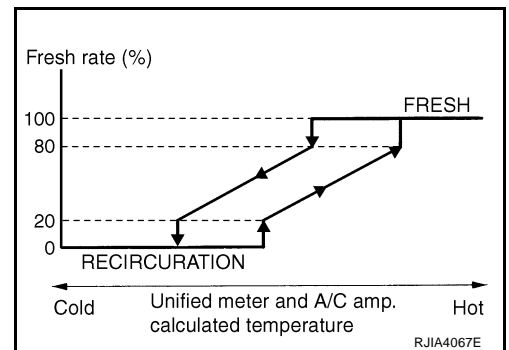
- Unified meter and A/C amp.
- Intake door motor (LCU)
- A/C LAN system (PBR built-in mode door motor, air mix door motor and intake door motor)
- In-vehicle sensor
- Ambient sensor
- Sunload sensor
- Intake sensor

System Operation

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



Intake Door Control Specification

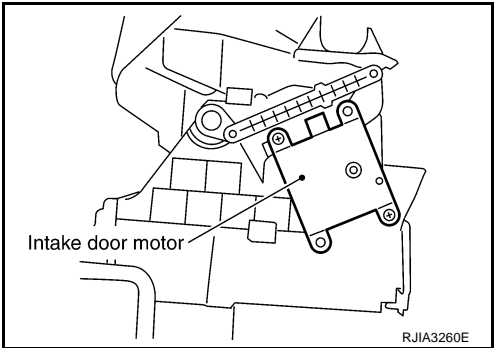


TROUBLE DIAGNOSIS

COMPONENT DESCRIPTION

Intake Door Motor

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



DIAGNOSIS PROCEDURE FOR INTAKE DOOR MOTOR

SYMPTOM: Intake door motor does not operate normally.

Perform diagnosis procedure. Refer to [ATC-59, "DIAGNOSIS PROCEDURE FOR LAN CIRCUIT"](#) .

A
B
C
D
E
F
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K
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M

ATC

TROUBLE DIAGNOSIS

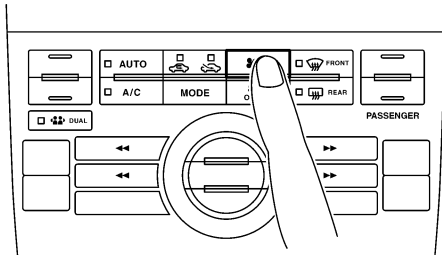
BJS000G5

Blower Motor Circuit

SYMPTOM: Blower motor operation is malfunctioning.

INSPECTION FLOW

1. Confirm symptom by performing the following operational check.



OPERATIONAL CHECK - Blower

- Press fan control switch (UP).
Blower should operate on low speed.
- Press fan control switch (UP).
and continue checking blower speed and fan symbol until all speeds are checked.

If OK (symptom cannot be duplicated), perform complete operational check (*1).

If NG (symptom is confirmed), continue with STEP-2 following.

2. Check for any service bulletins.

3. Perform self-diagnosis STEP-2. (*3)
Code No. 20 should be displayed after approx. 25 seconds.

NG → Go to appropriate malfunctioning sensor circuit. (*5)

4. Perform self-diagnosis STEP-4. (*4)
Does blower motor speed change according to each code No.?

Code No.	41	42	43	44	45	46
Blower motor voltage	5V	12V		8.5V		12V

NO → Go to Blower Motor Circuit. (*6)

YES

5. Is engine coolant temperature below 56°C (133°F)?

NO → Blower motor operation is normal.

YES

6. Is blower motor operating under starting blower speed control?

NO → Go to Blower Motor Circuit. (*6)

YES [Cause cannot be confirmed by self-diagnosis.]

7. Check ambient sensor circuit. (*8)

OK

8. Check in-vehicle sensor circuit. (*9)

OK

9. Check sunload sensor circuit. (*10)

OK

10. Check intake sensor circuit. (*2)

OK

If the symptom still exists, perform a complete operational check (*1) and check for other symptoms. [Refer to symptom table, (*7).] Does another symptom exist?

YES → Go to Trouble Diagnosis for related symptom.

NO

Replace unified meter and A/C amp.

INSPECTION END

Another symptom exists.

RJIA3261E

*1 [ATC-54. "Operational Check"](#)

*2 [ATC-105. "Intake Sensor Circuit"](#)

*3 [ATC-47. "FUNCTION CONFIRMATION PROCEDURE"](#), see No. 2.

*4 [ATC-47. "FUNCTION CONFIRMATION PROCEDURE"](#), see No. 6.

*5 [ATC-47. "FUNCTION CONFIRMATION PROCEDURE"](#), see No. 13.

*6 [ATC-74. "DIAGNOSIS PROCEDURE FOR BLOWER MOTOR"](#)

*7 [ATC-35. "SYMPTOM TABLE"](#)

*8 [ATC-96. "Ambient Sensor Circuit"](#)

*9 [ATC-99. "In-vehicle Sensor Circuit"](#)

*10 [ATC-102. "Sunload Sensor Circuit"](#)

*11 [EC-131. "DTC P0117, P0118 ECT SENSOR" \(QR engine\) or EC-474. "DTC P0117, P0118 ECT SENSOR" \(VQ engine\)](#)

TROUBLE DIAGNOSIS

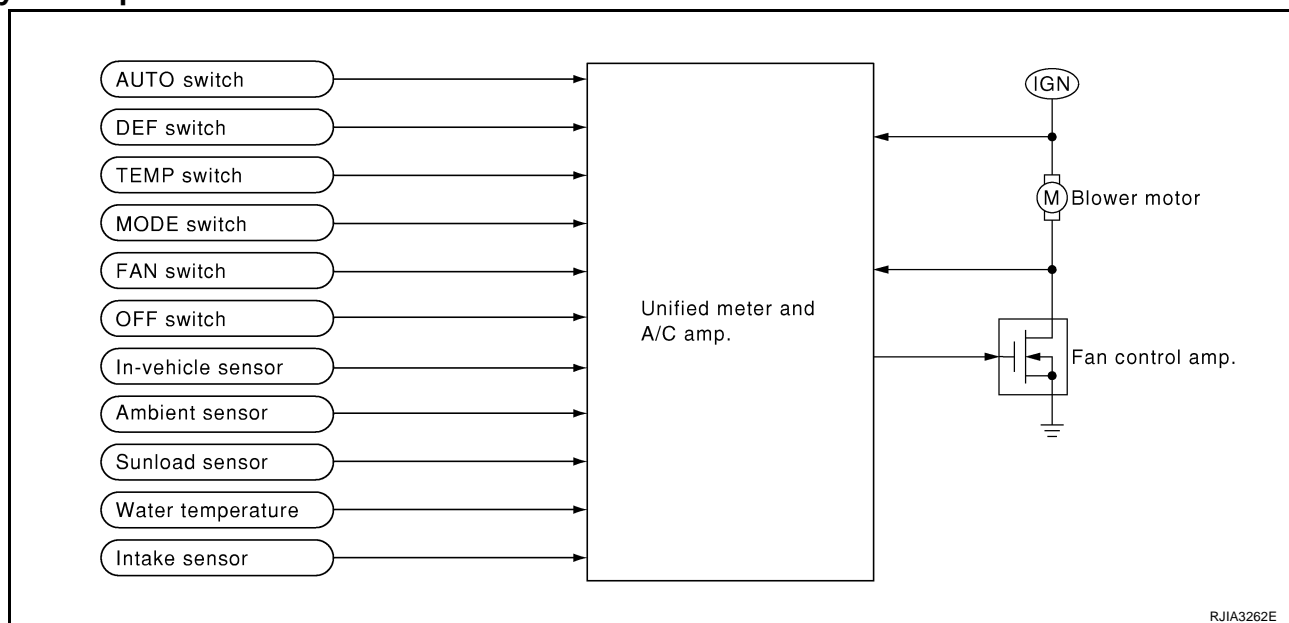
SYSTEM DESCRIPTION

Component Parts

Fan speed control system components are:

- Unified meter and A/C amp.
- A/C LAN system (PBR built-in mode door motor, air mix door motor and intake motor)
- Fan control amp.
- In-vehicle sensor
- Ambient sensor
- Sunload sensor
- Intake sensor

System Operation



Automatic Mode

In the automatic mode, the blower motor speed control signal is calculated by the unified meter and A/C amp. based on the input from the PBR, in-vehicle sensor, sunload sensor, intake sensor and ambient sensor. The blower motor applied voltage ranges from approximately 3.5 volts (lowest speed) to 12 volts (highest speed).

The control blower speed (in the range of 3.5 to 12 V), unified meter and A/C amp. supplies a gate voltage to the fan control amp. Based on this voltage, fan control amp. controls voltage supplied to the blower motor.

Starting Fan Speed Control

Start up from COLD SOAK Condition (Automatic mode)

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

In the most extreme case (very low ambient) the blower starting delay will be 150 seconds as described above. After this delay, the blower will operate at low speed until the engine coolant temperature rises above 56°C (133°F), and then the blower speed will increase 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 will gradually rise to the objective speed over a time period of 3 seconds or less (actual time depends on the objective blower speed).

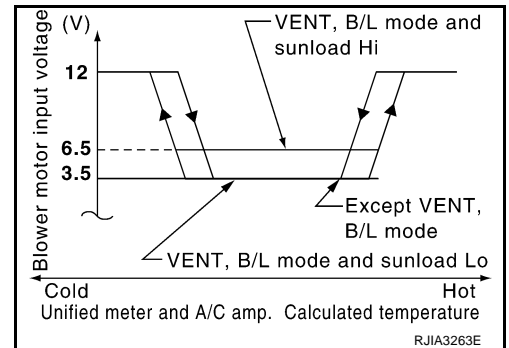
TROUBLE DIAGNOSIS

Blower Speed Compensation

Sunload

When the in-vehicle temperature and the set temperature are very close, the blower will be operating at low speed. The low speed will vary depending on the sunload. During conditions of low or no sunload, the blower speed is low (approx. 3.5 V). During high sunload conditions, unified meter and A/C amp. raise the blower speed (approx. 6.5 V).

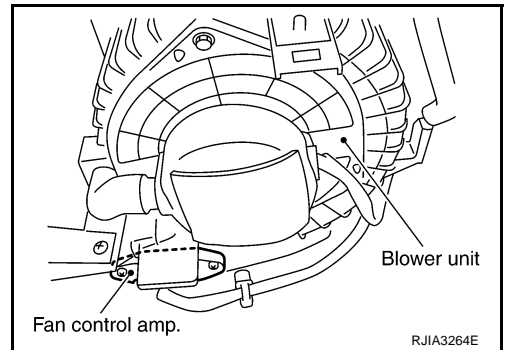
Fan Speed Control Specification



COMPONENT DESCRIPTION

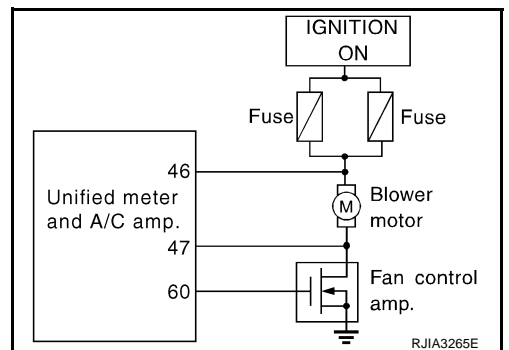
Fan Control Amp.

The fan control amp. is located on the blower unit. The fan control amp. receives a gate voltage from unified meter and A/C amp. to steplessly maintain the blower fan motor voltage in the 3.5 to 12 volt range.



DIAGNOSIS PROCEDURE FOR BLOWER MOTOR

SYMPTOM: Blower motor operation is malfunctioning.



TROUBLE DIAGNOSIS

1. CHECK POWER SUPPLY FOR BLOWER MOTOR

1. Disconnect blower motor connector.
2. Turn ignition switch ON.
3. Check voltage between blower motor harness connector M48 terminal 1 and ground.

1 – Ground

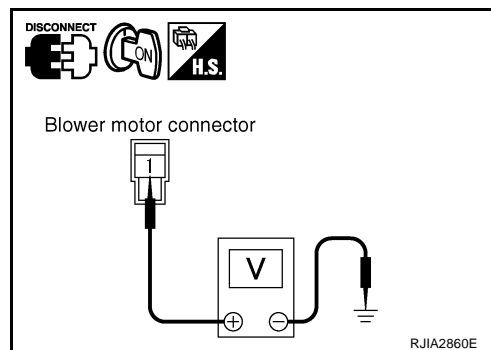
: Battery voltage

OK or NG

OK >> GO TO 2.

NG >> Check power supply circuit and 15A fuses [Nos. 10 and 11, located in the fuse block (J/B)]. Refer to [PG-79, "FUSE BLOCK - JUNCTION BOX \(J/B\)"](#).

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



2. CHECK FAN FEEDBACK CIRCUIT

1. Turn ignition switch OFF.
2. Reconnect blower motor connector.
3. Turn ignition switch ON.
4. Check voltage between unified meter and A/C amp. harness connector M45 terminal 47 and ground.

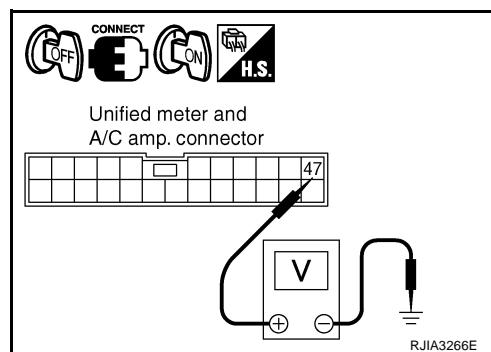
47 – Ground

: Battery voltage.

OK or NG

OK >> GO TO 3.

NG >> GO TO 9.



3. CHECK BLOWER MOTOR

Check blower motor. Refer to [ATC-77, "Blower Motor"](#).

OK or NG

OK >> GO TO 4.

NG >> Replace blower motor.

4. CHECK POWER SUPPLY FOR FAN CONTROL AMP.

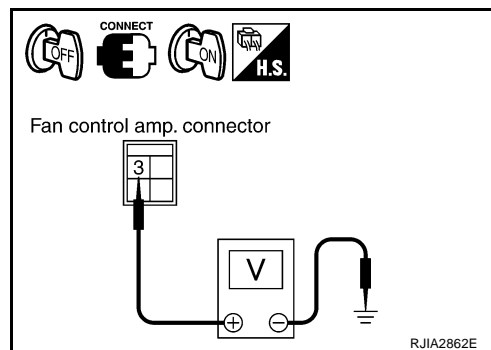
1. Turn ignition switch ON.
2. Check voltage between fan control amp. harness connector M86 terminal 3 and ground.

Terminals			Condition	Voltage
(+)		(-)		
Fan control amp. connector	Terminal No.			
M86	3	Ground	Fan speed: 1st speed	Approx. 8 V

OK or NG

OK >> GO TO 5.

NG >> Repair harness or connector.



TROUBLE DIAGNOSIS

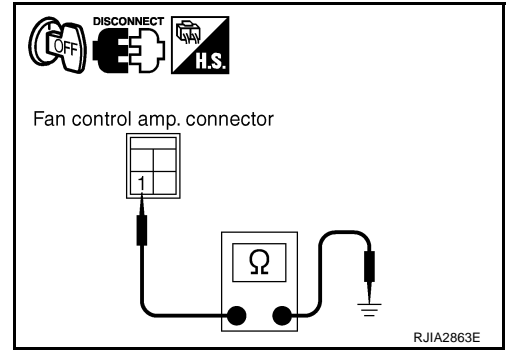
5. CHECK GROUND CIRCUIT FOR FAN CONTROL AMP.

1. Turn ignition switch OFF.
2. Disconnect fan control amp. connector.
3. Check continuity between fan control amp. harness connector M86 terminal 1 and ground.

1 – Ground : Continuity should exist.

OK or NG

- OK >> GO TO 6.
NG >> Repair harness or connector.



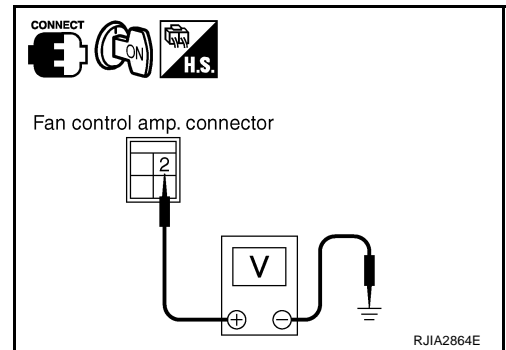
6. CHECK FOR UNIFIED METER AND A/C AMP. OUTPUT SIGNAL

1. Reconnect fan control amp. connector.
2. Turn ignition switch ON.
3. Check voltage between fan control amp. harness connector M86 terminal 2 and ground.

Terminals			Condition	Voltage
(+)		(-)		
Fan control amp. connector	Terminal No.			
M86	2	Ground	Fan speed: 1st - 4th speed	Approx. 2.5 - 3.5 V
			Fan speed: 5th speed	Approx. 9.5 - 10.5 V

OK or NG

- OK >> GO TO 9.
NG >> ● If the voltage is lower than 2.5 V: GO TO 7.
● If the voltage is higher than 10.5 V: GO TO 8.



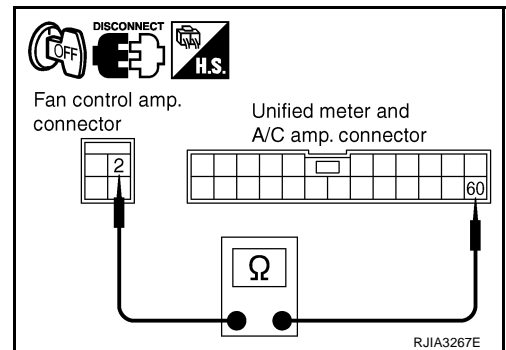
7. CHECK CIRCUIT CONTINUITY BETWEEN UNIFIED METER AND A/C AMP. AND FAN CONTROL AMP.

1. Turn ignition switch OFF.
2. Disconnect unified meter and A/C amp. connector and fan control amp. connector.
3. Check continuity between unified meter and A/C amp. harness connector M45 terminal 60 and fan control amp. harness connector M86 terminal 2.

60 – 2 : Continuity should exist.

OK or NG

- OK >> Replace fan control amp.
NG >> Repair harness or connector.



TROUBLE DIAGNOSIS

8. CHECK FAN CONTROL AMP.

1. Turn ignition switch OFF.
2. Disconnect fan control amp. connector.
3. Check continuity between fan control amp. connector M86 terminal 2 and 1.

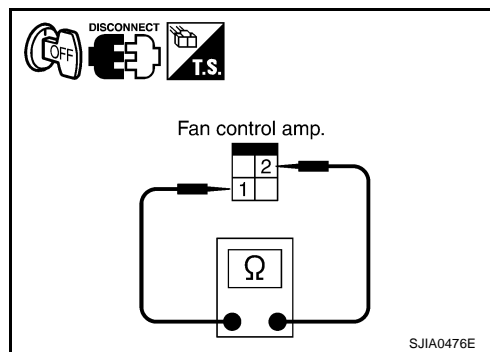
2 – 1

: Continuity should exist.

OK or NG

OK >> GO TO 9.

NG >> Replace fan control amp.



9. CHECK CIRCUIT CONTINUITY BETWEEN UNIFIED METER AND A/C AMP. AND FAN CONTROL AMP.

1. Turn ignition switch OFF.
2. Disconnect unified meter and A/C amp. connector.
3. Check continuity between unified meter and A/C amp. harness connector M45 terminal 47 and fan control amp. harness connector M86 terminal 3.

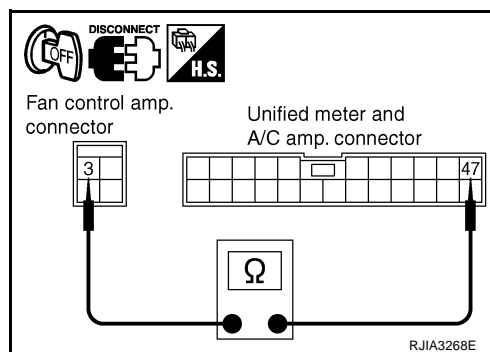
47 – 3

: Continuity should exist.

OK or NG

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

NG >> Repair harness or connector.

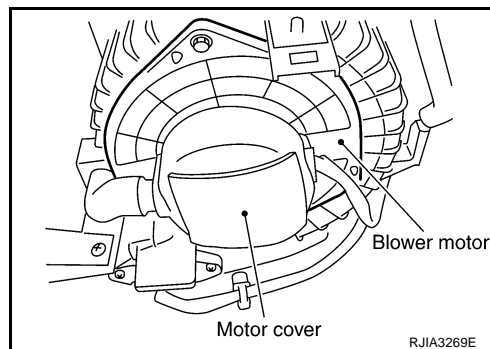


COMPONENT INSPECTION

Blower Motor

Confirm smooth rotation of the blower motor.

- Ensure that there are no foreign particles inside the blower unit.



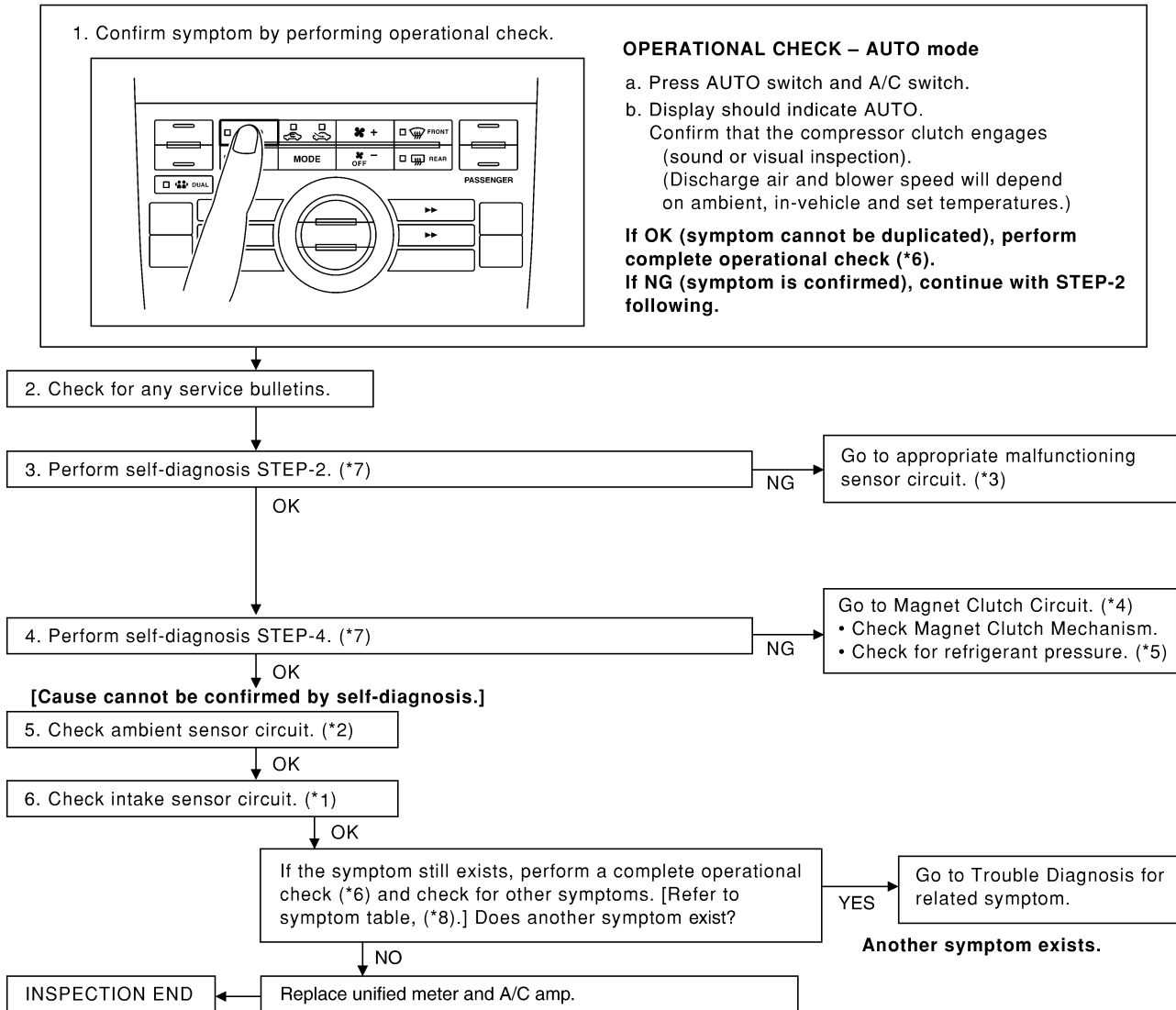
TROUBLE DIAGNOSIS

Magnet Clutch Circuit

BJS000G6

SYMPTOM: Magnet clutch does not engage.

INSPECTION FLOW



RJIA3270E

*1 [ATC-105. "Intake Sensor Circuit"](#)

*2 [ATC-96. "Ambient Sensor Circuit"](#)

*3 [ATC-47. "FUNCTION CONFIRMATION PROCEDURE"](#), see No. 13.

*4 [ATC-79. "DIAGNOSIS PROCEDURE FOR MAGNET CLUTCH"](#)

*5 [ATC-88. "TROUBLE DIAGNOSIS FOR UNUSUAL PRESSURE"](#)

*6 [ATC-54. "Operational Check"](#)

*7 [ATC-47. "FUNCTION CONFIRMATION PROCEDURE"](#), see No. 2 to 6.

*8 [ATC-35. "SYMPTOM TABLE"](#)

TROUBLE DIAGNOSIS

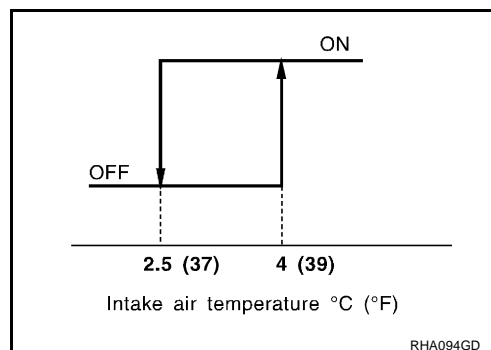
SYSTEM DESCRIPTION

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

Low Temperature Protection Control

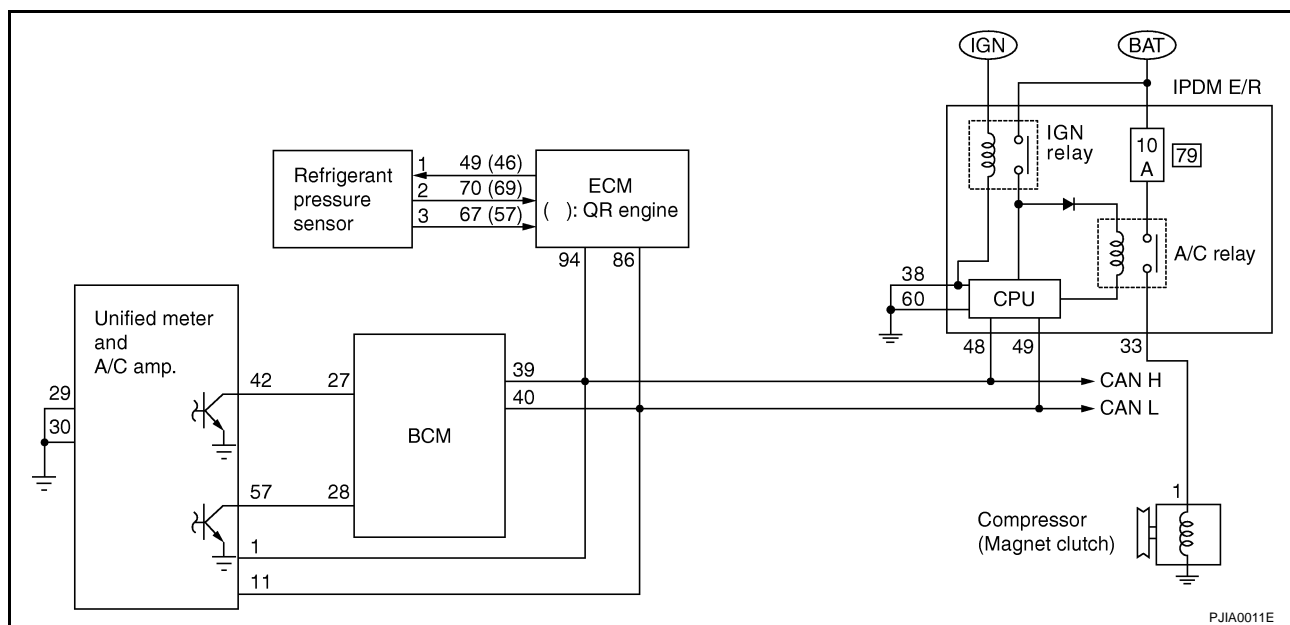
Unified meter and A/C amp. will turn the compressor ON or OFF as determined by a signal detected by intake sensor.

When intake air temperature is higher than 4°C (39°F), the compressor turns ON. The compressor turns OFF when intake air temperature is lower than 2.5°C (37°F).



DIAGNOSIS PROCEDURE FOR MAGNET CLUTCH

SYMPTOM: Magnet clutch does not engage when A/C switch is ON.



1. CHECK INTAKE SENSOR CIRCUIT

Check intake sensor. Refer to [ATC-47, "FUNCTION CONFIRMATION PROCEDURE"](#), see No. 11.

OK or NG

OK >> GO TO 2.

NG >> Malfunctioning intake sensor: Refer to [ATC-105, "Intake Sensor Circuit"](#).

2. PERFORM AUTO ACTIVE TEST

Refer to [PG-21, "Auto Active Test"](#).

Does the magnet clutch operate?

YES >> ● WITH CONSULT-II: GO TO 5.

● WITHOUT CONSULT-II: GO TO 6.

NO >> Check 10 A fuse (No. 79, located in IPDM E/R). Refer to [PG-25, "IPDM E/R Terminal Arrangement"](#), and GO TO 3.

TROUBLE DIAGNOSIS

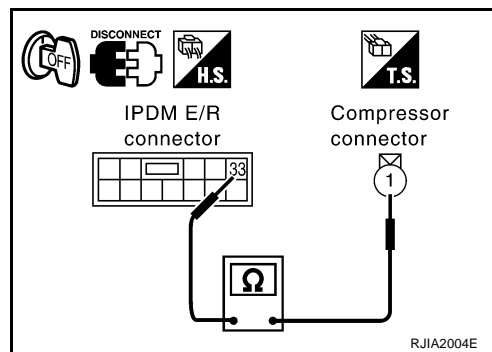
3. CHECK CIRCUIT CONTINUITY BETWEEN IPDM E/R AND COMPRESSOR

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector and compressor connector.
3. Check continuity between IPDM E/R harness connector E8 terminal 33 and compressor harness connector F2 terminal 1.

33 – 1 : Continuity should exist.

OK or NG

- OK >> GO TO 4.
NG >> Repair harness or connector.

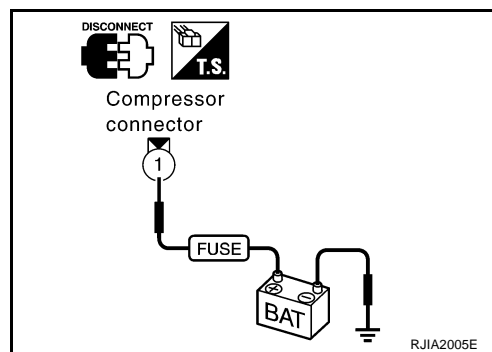


4. CHECK MAGNET CLUTCH CIRCUIT

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

OK or NG

- OK >> 1. Replace IPDM E/R.
2. Go to self-diagnosis procedure [ATC-47, "FUNCTION CONFIRMATION PROCEDURE"](#) and perform self-diagnosis STEP-4. Confirm that magnet clutch operation normal.
- NG >> 1. Replace compressor. Refer to [ATC-134, "Removal and Installation of Compressor"](#).
2. Go to self-diagnosis procedure [ATC-47, "FUNCTION CONFIRMATION PROCEDURE"](#) and perform self-diagnosis STEP-4. Confirm that magnet clutch operation normal.



5. CHECK BCM INPUT (COMPRESSOR ON) SIGNAL

Check compressor ON/OFF signal. Refer to [ATC-34, "CONSULT-II Function \(BCM\)"](#).

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

OK or NG

- OK >> GO TO 8.
NG >> GO TO 6.

DATA MONITOR			
MONITOR			
IGN ON SW	ON		
FAN ON SIG	ON		
AIR COND SW	ON		
		RECORD	
MODE	BACK	LIGHT	COPY

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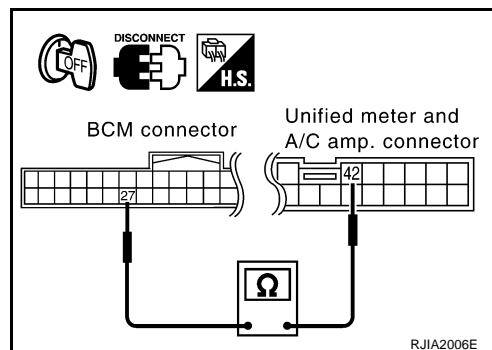
6. CHECK CIRCUIT CONTINUITY BETWEEN BCM AND UNIFIED METER AND A/C AMP.

1. Turn ignition switch OFF.
2. Disconnect BCM connector and unified meter and A/C amp. connector.
3. Check continuity between BCM harness connector M3 terminal 27 and unified meter and A/C amp. harness connector M45 terminal 42.

27 – 42 : Continuity should exist.

OK or NG

- OK >> GO TO 7.
NG >> Repair harness or connector.

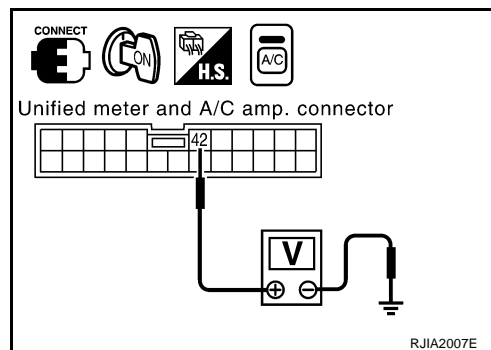


TROUBLE DIAGNOSIS

7. CHECK VOLTAGE FOR UNIFIED METER AND A/C AMP. (COMPRESSOR ON SIGNAL)

1. Reconnect BCM connector and unified meter and A/C amp. connector.
2. Turn ignition switch ON.
3. Check voltage between unified meter and A/C amp. harness connector M45 terminal 42 and ground.

Terminals			Condition	Voltage
(+)		(-)		
Unified meter and A/C amp. connector	Terminal No.			
M45	42	Ground	A/C switch: ON (Blower motor operates.)	Approx. 0 V
			OFF switch: ON (A/C System: OFF)	Approx. 5 V



OK or NG

OK >> GO TO 8.

NG-1 >> If the voltage is approx. 5 V when A/C switch is ON: Replace unified meter and A/C amp.

NG-2 >> If the voltage is approx. 0 V when A/C switch is OFF: Replace BCM.

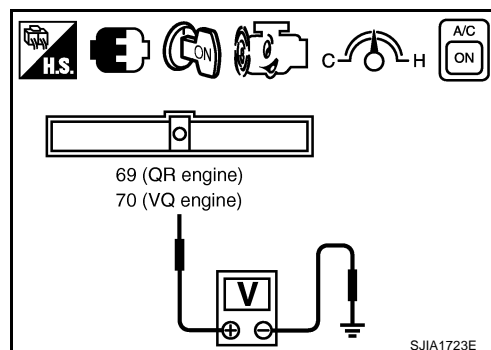
8. CHECK REFRIGERANT PRESSURE SENSOR

WITH CONSULT-II

1. Start the engine.
2. Check voltage of refrigerant pressure sensor. Refer to [EC-90, "CONSULT-II Reference Value in Data Monitor Mode"](#) (QR engine) or [EC-434, "CONSULT-II Reference Value in Data Monitor Mode"](#) (VQ engine).

WITHOUT CONSULT-II

1. Start the engine.
2. Check voltage between ECM harness connector F101 terminal 70 and ground.



Terminals		(-)	Condition	Voltage
(+)				
ECM con- nector	Terminal No.			
F101	69 (QR engine)	Ground	A/C switch: ON (Blower motor operates.)	Approx. 1.0 - 4.0 V
	70 (VQ engine)			

OK or NG

OK >> ● WITH CONSULT-II: GO TO 9.

● WITHOUT CONSULT-II: GO TO 10.

NG >> Refer to [EC-339, "REFRIGERANT PRESSURE SENSOR"](#) (QR engine) or [EC-748, "REFRIGERANT PRESSURE SENSOR"](#) (VQ engine).

TROUBLE DIAGNOSIS

9. CHECK BCM INPUT (FAN ON) SIGNAL

Check FAN ON/OFF signal. Refer to [ATC-34, "CONSULT-II Function \(BCM\)"](#).

FAN CONTROL SW ON : FAN ON SIG ON
FAN CONTROL SW OFF : FAN ON SIG OFF

OK or NG

OK >> GO TO 12.
NG >> GO TO 10.

DATA MONITOR			
MONITOR			
IGN ON SW		ON	
FAN ON SIG		ON	
AIR COND SW		ON	
		RECORD	
MODE	BACK	LIGHT	COPY

RJIA1111E

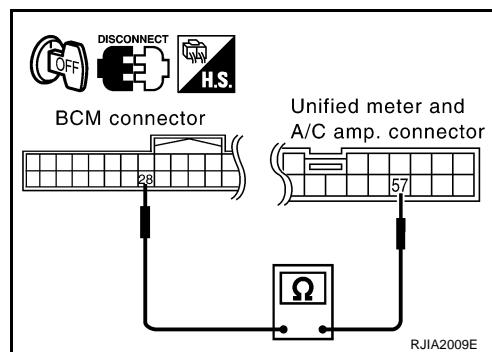
10. CHECK CIRCUIT CONTINUITY BETWEEN BCM AND UNIFIED METER AND A/C AMP.

- Turn ignition switch OFF.
- Disconnect BCM connector and unified meter and A/C amp. connector.
- Check continuity between BCM harness connector M3 terminal 28 and unified meter and A/C amp. harness connector M45 terminal 57.

28 – 57 : Continuity should exist.

OK or NG

OK >> GO TO 11.
NG >> Repair harness or connector.



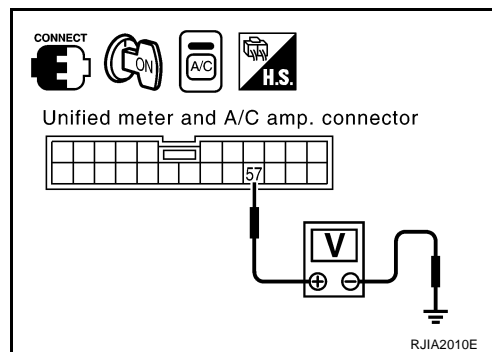
11. CHECK VOLTAGE FOR UNIFIED METER AND A/C AMP. (FAN ON SIGNAL)

- Reconnect BCM connector and unified meter and A/C amp. connector.
- Turn ignition switch ON.
- Check voltage between unified meter and A/C amp. harness connector M45 terminal 57 and ground.

Terminals			Condition	Voltage
(+)		(-)		
Unified meter and A/C amp. connector	Terminal No.			
M45	57	Ground	AUTO switch: ON (Blower motor operates.)	Approx. 0 V
			OFF switch: ON (A/C system: OFF)	Approx. 5 V

OK or NG

OK >> GO TO 12.
NG-1 >> If the voltage is approx. 5 V when blower motor is ON: Replace unified meter and A/C amp.
NG-2 >> If the voltage is approx. 0 V when blower motor is OFF: Replace BCM.



TROUBLE DIAGNOSIS

12. CHECK CAN COMMUNICATION

Check CAN communication. Refer to [BCS-14, "CAN Communication Inspection Using CONSULT-II \(Self-Diagnosis\)"](#) .

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

OK or NG

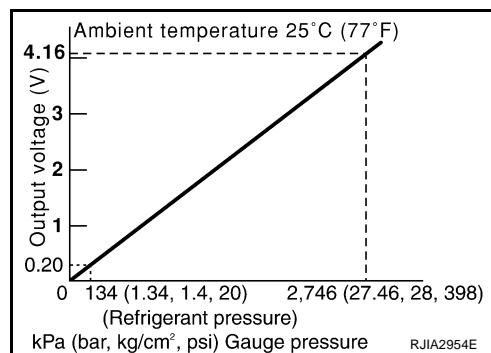
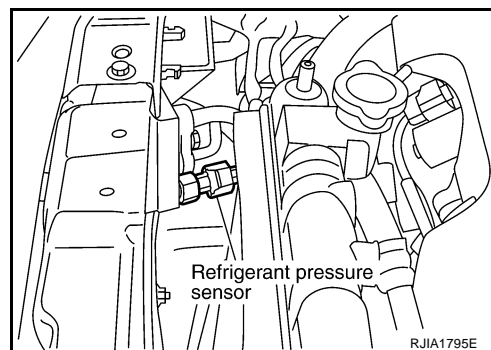
OK >> Replace ECM.

NG >> Repair or replace malfunctioning part(s).

COMPONENT INSPECTION

Refrigerant Pressure Sensor

The refrigerant pressure sensor is attached to the condenser. Make sure that the A/C refrigerant pressure and the sensor output voltage are as shown in the A/C operating condition figure. Refer to [EC-339, "REFRIGERANT PRESSURE SENSOR"](#) (QR engine) or [EC-748, "REFRIGERANT PRESSURE SENSOR"](#) (VQ engine).



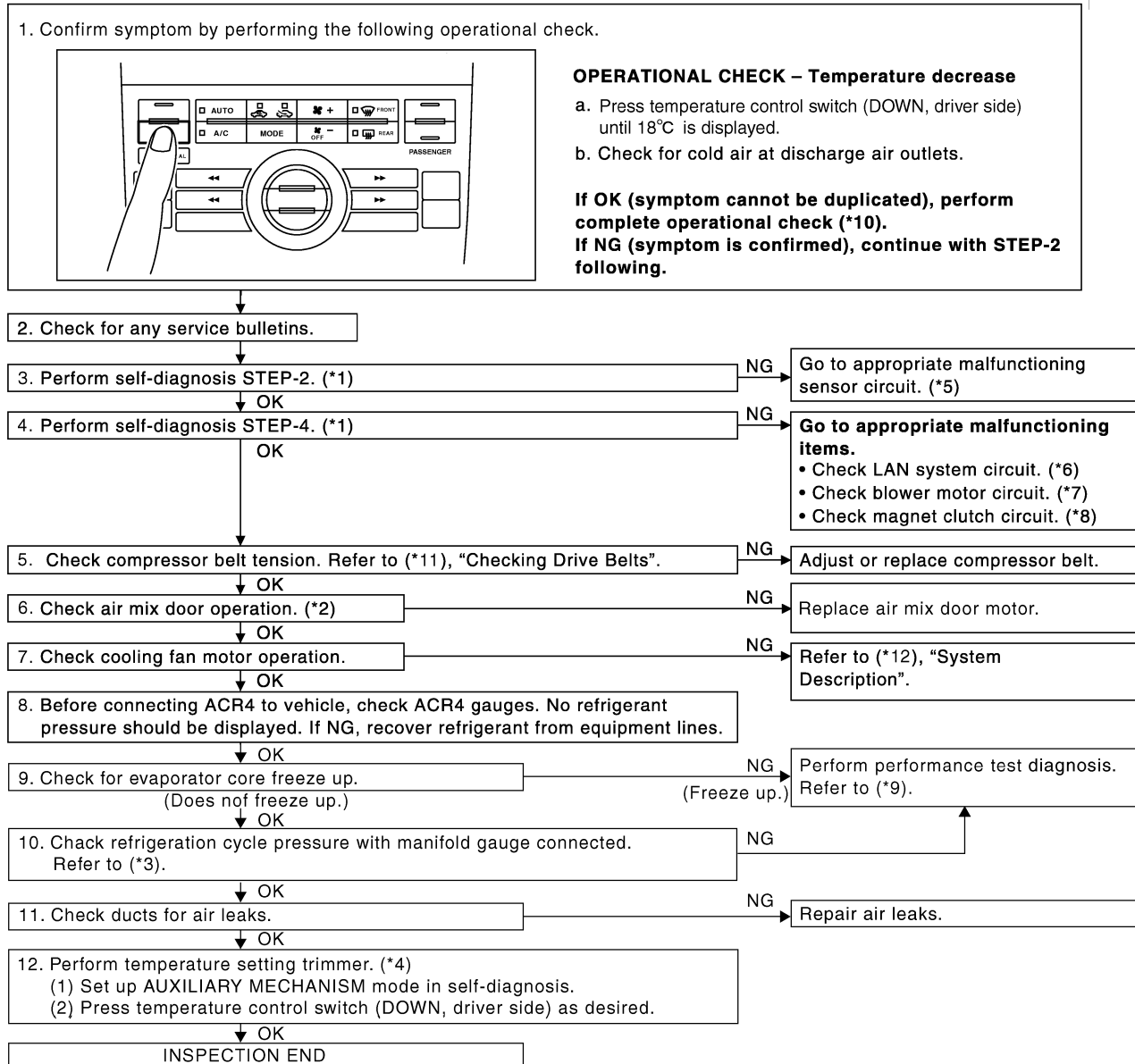
TROUBLE DIAGNOSIS

Insufficient Cooling

BJS000G7

SYMPTOM: Insufficient cooling

INSPECTION FLOW



SJIA1652E

*1 [ATC-47. "FUNCTION CONFIRMATION PROCEDURE"](#), see No. 2 to 6.

*2 [ATC-66. "Air Mix Door Motor Circuit"](#)

*3 [ATC-87. "Test Reading"](#)

*4 [ATC-52. "AUXILIARY MECHANISM: TEMPERATURE SETTING TRIMMER"](#)

*5 [ATC-47. "FUNCTION CONFIRMATION PROCEDURE"](#), see No. 13.

*6 [ATC-59. "LAN System Circuit"](#)

*7 [ATC-72. "Blower Motor Circuit"](#)

*8 [ATC-78. "Magnet Clutch Circuit"](#)

*9 [ATC-85. "PERFORMANCE TEST DIAGNOSIS"](#)

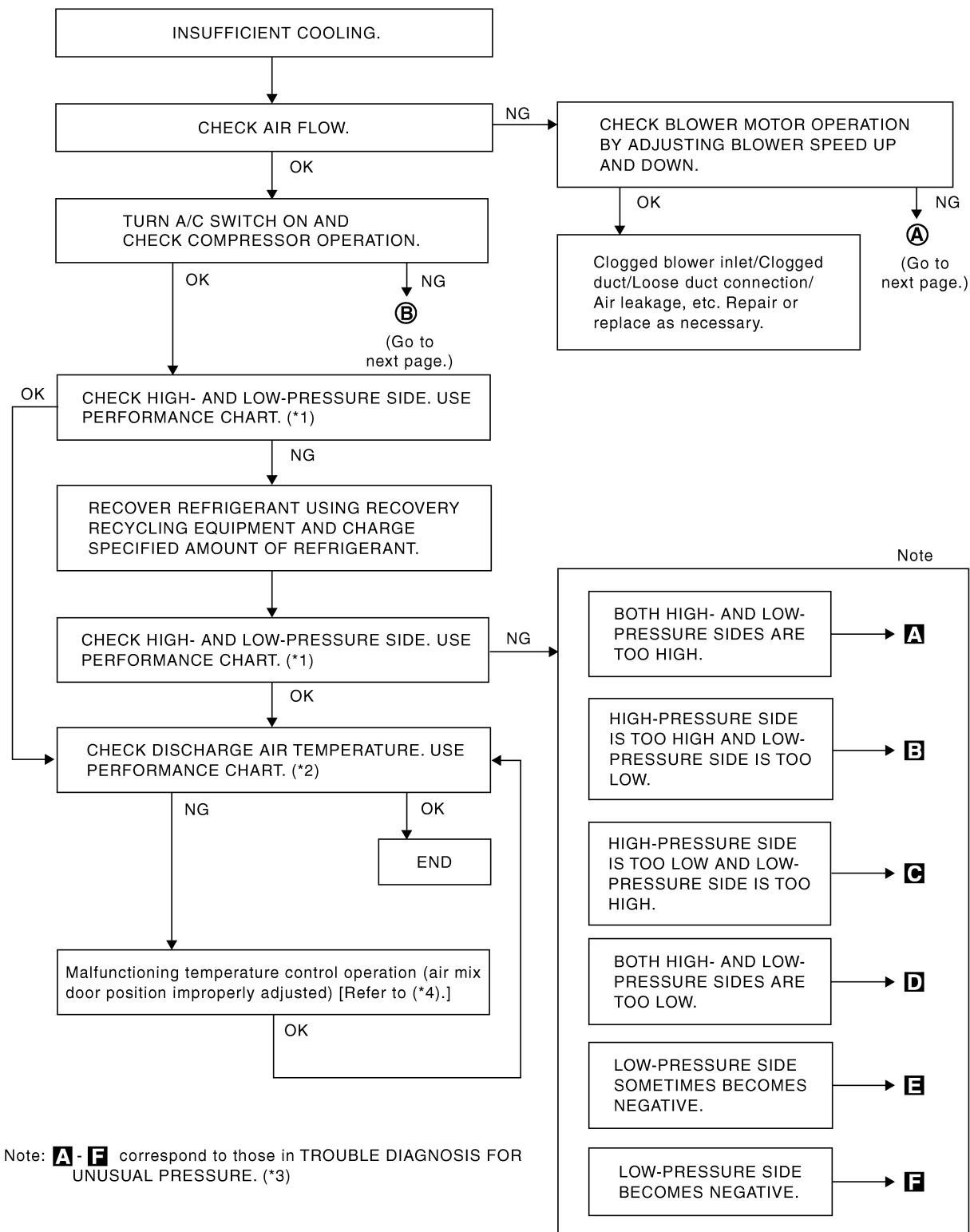
*10 [ATC-54. "Operational Check"](#)

*11 [EM-14. "Checking Drive Belts"](#) (QR engine) or [EM-128. "Checking Drive Belts"](#) (VQ engine)

*12 [EC-218. "System Description"](#) (QR engine) or [EC-575. "System Description"](#) (VQ engine)

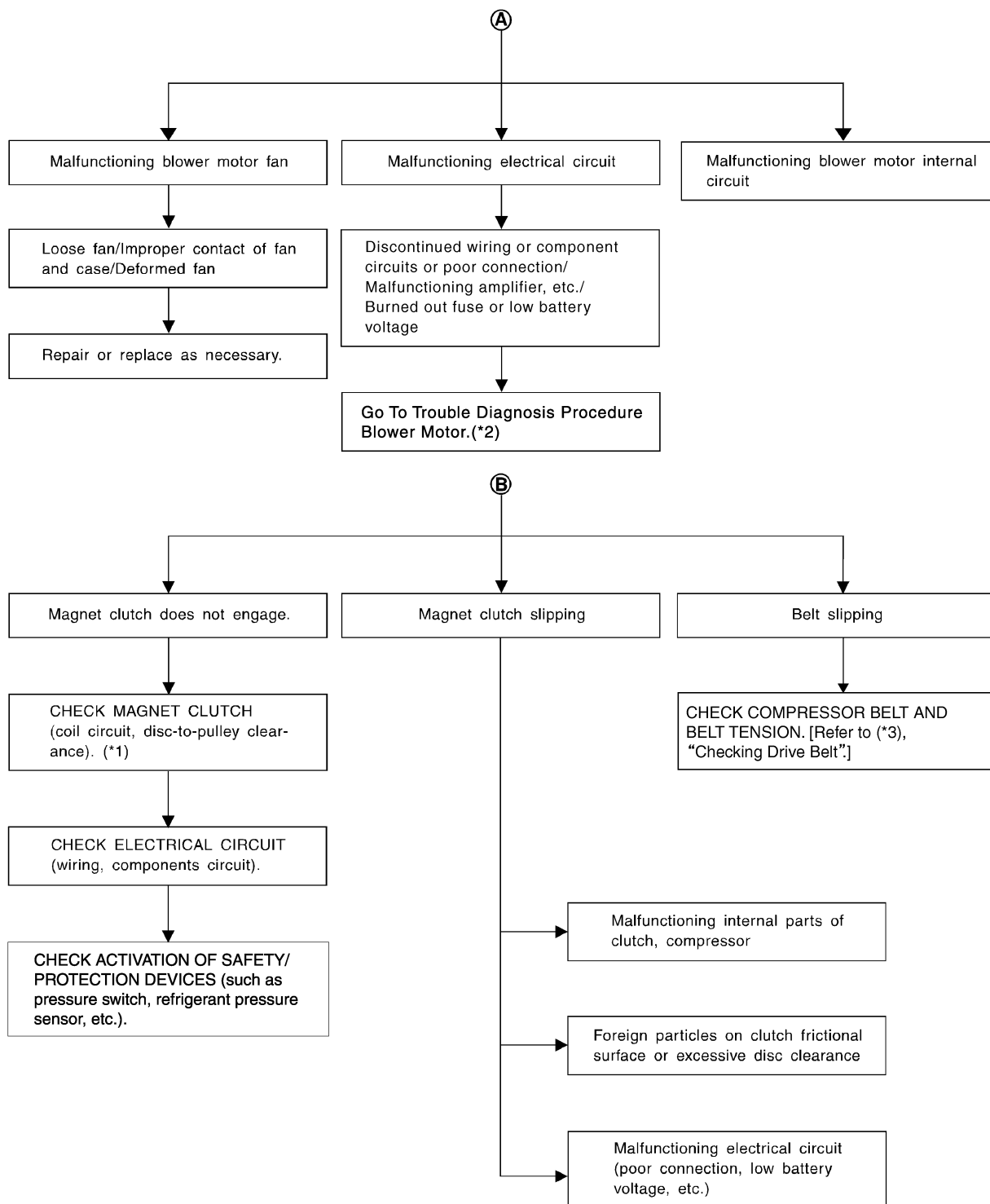
TROUBLE DIAGNOSIS

PERFORMANCE TEST DIAGNOSIS



*1 [ATC-87, "PERFORMANCE CHART"](#) *2 [ATC-87, "PERFORMANCE CHART"](#) *3 [ATC-88, "TROUBLE DIAGNOSIS FOR UNUSUAL PRESSURE"](#)
 *4 [ATC-66, "Air Mix Door Motor Circuit"](#)

TROUBLE DIAGNOSIS



SJIA1642E

*1 [ATC-136, "Check Disc to Pulley Clearance"](#)

*2 [ATC-72, "Blower Motor Circuit"](#)




*3 [EM-14, "Checking Drive Belts"](#) (QR engine) or [EM-128, "Checking Drive Belts"](#) (VQ engine)

TROUBLE DIAGNOSIS

PERFORMANCE CHART

Test Condition

Testing must be performed as follows:

Vehicle condition	Indoors or in the shade (in a well-ventilated place)
Doors	Closed
Door windows	Open
Hood	Open
TEMP.	Max. COLD
Mode switch	 (Ventilation) set
Intake switch	 (Recirculation) set
 Fan (blower) speed	Max. speed set
Engine speed	Idle speed

Operate the air conditioning system for 10 minutes before taking measurements.

Test Reading

Recirculating-to-discharge Air Temperature Table

Inside air (Recirculating air) at blower assembly inlet		Discharge air temperature at center ventilator °C (°F)
Relative humidity %	Air temperature °C (°F)	
50 - 60	20 (68)	8.9 - 10.6 (48 - 51)
	25 (77)	12.8 - 15.4 (55 - 60)
	30 (86)	16.8 - 20.1 (62 - 68)
60 - 70	20 (68)	10.6 - 12.2 (51 - 54)
	25 (77)	15.4 - 17.9 (60 - 64)
	30 (86)	20.1 - 23.4 (68 - 74)

Ambient Air Temperature-to-operating Pressure Table

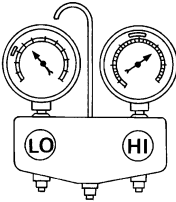
Ambient air		High-pressure (Discharge side) kPa (bar, kg/cm ² , psi)	Low-pressure (Suction side) kPa (bar, kg/cm ² , psi)
Relative humidity %	Air temperature °C (°F)		
50 - 70	20 (68)	780 - 970 (7.80 - 9.70, 7.96 - 9.89, 113.1 - 140.7)	150 - 180 (1.50 - 1.80, 1.53 - 1.84, 21.8 - 26.1)
	25 (77)	920 - 1,140 (9.20 - 11.40, 9.38 - 11.63, 133.4 - 165.3)	170 - 200 (1.70 - 2.00, 1.73 - 2.04, 24.7 - 29.1)
	30 (86)	950 - 1,190 (9.50 - 11.90, 9.69 - 12.14, 137.8 - 172.6)	185 - 235 (1.85 - 2.35, 1.89 - 2.40, 26.8 - 34.1)
	35 (95)	1,080 - 1,350 (10.80 - 13.50, 11.02 - 13.77, 156.6 - 195.8)	222 - 275 (2.22 - 2.75, 2.26 - 2.81, 32.2 - 39.9)
	40 (104)	1,250 - 1,550 (12.50 - 15.50, 12.75 - 15.81, 181.3 - 224.8)	253 - 325 (2.53 - 3.25, 2.58 - 3.32, 36.7 - 47.1)

TROUBLE DIAGNOSIS

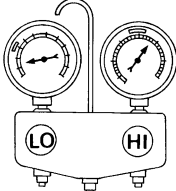
TROUBLE DIAGNOSIS FOR UNUSUAL PRESSURE

Whenever system's high and/or low side pressure(s) is/are unusual, diagnose using a manifold gauge. The marker above the gauge scale in the following tables indicates the standard (usual) pressure range. Since the standard (usual) pressure, however, differs from vehicle to vehicle, refer to above table (Ambient air temperature-to-operating pressure table).

Both High- and Low-pressure Sides are Too High

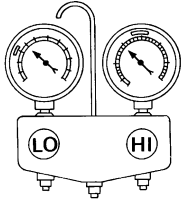
Gauge indication	Refrigerant cycle	Probable cause	Corrective action
<p>Both high- and low-pressure sides are too high.</p>  <p>AC359A</p>	The pressure returns to normal soon after water is splashed on the condenser.	Excessive refrigerant charge in refrigeration cycle.	Reduce refrigerant until specified pressure is obtained.
	Air suction by cooling fan is insufficient.	Insufficient condenser cooling performance. ↓ 1. Condenser fins are clogged. 2. Improper fan rotation of cooling fan.	<ul style="list-style-type: none"> ● Clean condenser. ● Check and repair cooling fan if necessary.
	<ul style="list-style-type: none"> ● Low-pressure pipe is not cold. ● When compressor is stopped high-pressure value quickly drops by approximately 196 kPa (1.96 bar, 2 kg/cm², 28 psi). It then decreases gradually thereafter. 	<p>Poor heat exchange in condenser. (After compressor operation stops, high-pressure decreases too slowly.) ↓ Air in refrigeration cycle.</p>	Evacuate repeatedly and recharge system.
	Engine tends to overheat.	Engine cooling systems malfunction.	Check and repair each engine cooling system.
	<ul style="list-style-type: none"> ● An area of the low-pressure pipe is colder than areas near the evaporator outlet. ● Low-pressure pipe is sometimes covered with frost. 	<ul style="list-style-type: none"> ● Excessive liquid refrigerant on low-pressure side. ● Excessive refrigerant discharge flow. ● Expansion valve is open a little compared with the specification. <p>↓ Improper expansion valve adjustment.</p>	Replace expansion valve.

High-pressure Side is Too High and Low-pressure Side is Too Low

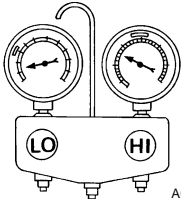
Gauge indication	Refrigerant cycle	Probable cause	Corrective action
<p>High-pressure side is too high and low-pressure side is too low.</p>  <p>AC360A</p>	Upper side of condenser and high-pressure side are hot, however, liquid tank is not so hot.	High-pressure tube or parts located between compressor and condenser are clogged or crushed.	<ul style="list-style-type: none"> ● Check and repair or replace malfunctioning parts. ● Check lubricant for contamination.

TROUBLE DIAGNOSIS

High-pressure Side is Too Low and Low-pressure Side is Too High

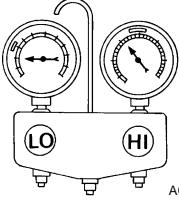
Gauge indication	Refrigerant cycle	Probable cause	Corrective action
<p>High-pressure side is too low and low-pressure side is too high.</p>  <p>AC356A</p>	High- and low-pressure sides become equal soon after compressor operation stops.	Compressor pressure operation is improper. ↓ Damaged inside compressor packings.	Replace compressor.
	No temperature difference between high- and low-pressure sides.	Compressor pressure operation is improper. ↓ Damaged inside compressor packings.	Replace compressor.

Both High- and Low-pressure Sides are Too Low

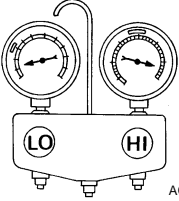
Gauge indication	Refrigerant cycle	Probable cause	Corrective action
<p>Both high- and low-pressure sides are too low.</p>  <p>AC353A</p>	<ul style="list-style-type: none"> There is a big temperature difference between liquid tank outlet and inlet. Outlet temperature is extremely low. Liquid tank inlet and expansion valve are frosted. 	Liquid tank inside is slightly clogged.	<ul style="list-style-type: none"> Replace liquid tank. Check lubricant for contamination.
	<ul style="list-style-type: none"> Temperature of expansion valve inlet is extremely low as compared with areas near liquid tank. Expansion valve inlet may be frosted. Temperature difference occurs somewhere in high-pressure side. 	High-pressure pipe located between liquid tank and expansion valve is clogged.	<ul style="list-style-type: none"> Check and repair malfunctioning parts. Check lubricant for contamination.
	Expansion valve and liquid tank are warm or slightly cool when touched.	Low refrigerant charge. ↓ Leaking fittings or components.	Check refrigerant for leaks. Refer to ATC-146, "Checking for Refrigerant Leaks" .
	There is a big temperature difference between expansion valve inlet and outlet while the valve itself is frosted.	Expansion valve closes a little compared with the specification. ↓ 1. Improper expansion valve adjustment 2. Malfunctioning expansion valve. 3. Outlet and inlet may be clogged.	<ul style="list-style-type: none"> Remove foreign particles by using compressed air. Replace expansion valve. Check lubricant for contamination.
	An area of the low-pressure pipe is colder than areas near the evaporator outlet.	Low-pressure pipe is clogged or crushed.	<ul style="list-style-type: none"> Check and repair malfunctioning parts. Check lubricant for contamination.
	Air flow volume is not enough or is too low.	Evaporator is frozen.	<ul style="list-style-type: none"> Check intake sensor circuit. Refer to ATC-105, "Intake Sensor Circuit". Replace compressor. Repair evaporator fins. Replace evaporator. Refer to ATC-72, "Blower Motor Circuit".

TROUBLE DIAGNOSIS

Low-pressure Side Sometimes Becomes Negative

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
<p>Low-pressure side sometimes becomes negative.</p>  <p>AC354A</p>	<ul style="list-style-type: none"> ● Air conditioning system does not function and does not cyclically cool the compartment air. ● The system constantly functions for a certain period of time after compressor is stopped and restarted. 	<p>Refrigerant does not discharge cyclically.</p> <p>↓</p> <p>Moisture is frozen at expansion valve outlet and inlet.</p> <p>↓</p> <p>Water is mixed with refrigerant.</p>	<ul style="list-style-type: none"> ● Drain water from refrigerant or replace refrigerant. ● Replace liquid tank.

Low-pressure Side Becomes Negative

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
<p>Low-pressure side becomes negative.</p>  <p>AC362A</p>	<p>Liquid tank or front/rear side of expansion valve's pipe is frosted or wet with dew.</p>	<p>High-pressure side is closed and refrigerant does not flow.</p> <p>↓</p> <p>Expansion valve or liquid tank is frosted.</p>	<p>Leave the system at rest until no frost is present. Start it again to check whether or not the malfunction is caused by water or foreign particles.</p> <ul style="list-style-type: none"> ● If water is the cause, initially cooling is okay. Then the water freezes causing a blockage. Drain water from refrigerant or replace refrigerant. ● If due to foreign particles, remove expansion valve and remove the particles with dry and compressed air (not shop air). ● If either of the above methods cannot correct the malfunction, replace expansion valve. ● Replace liquid tank. ● Check lubricant for contamination.

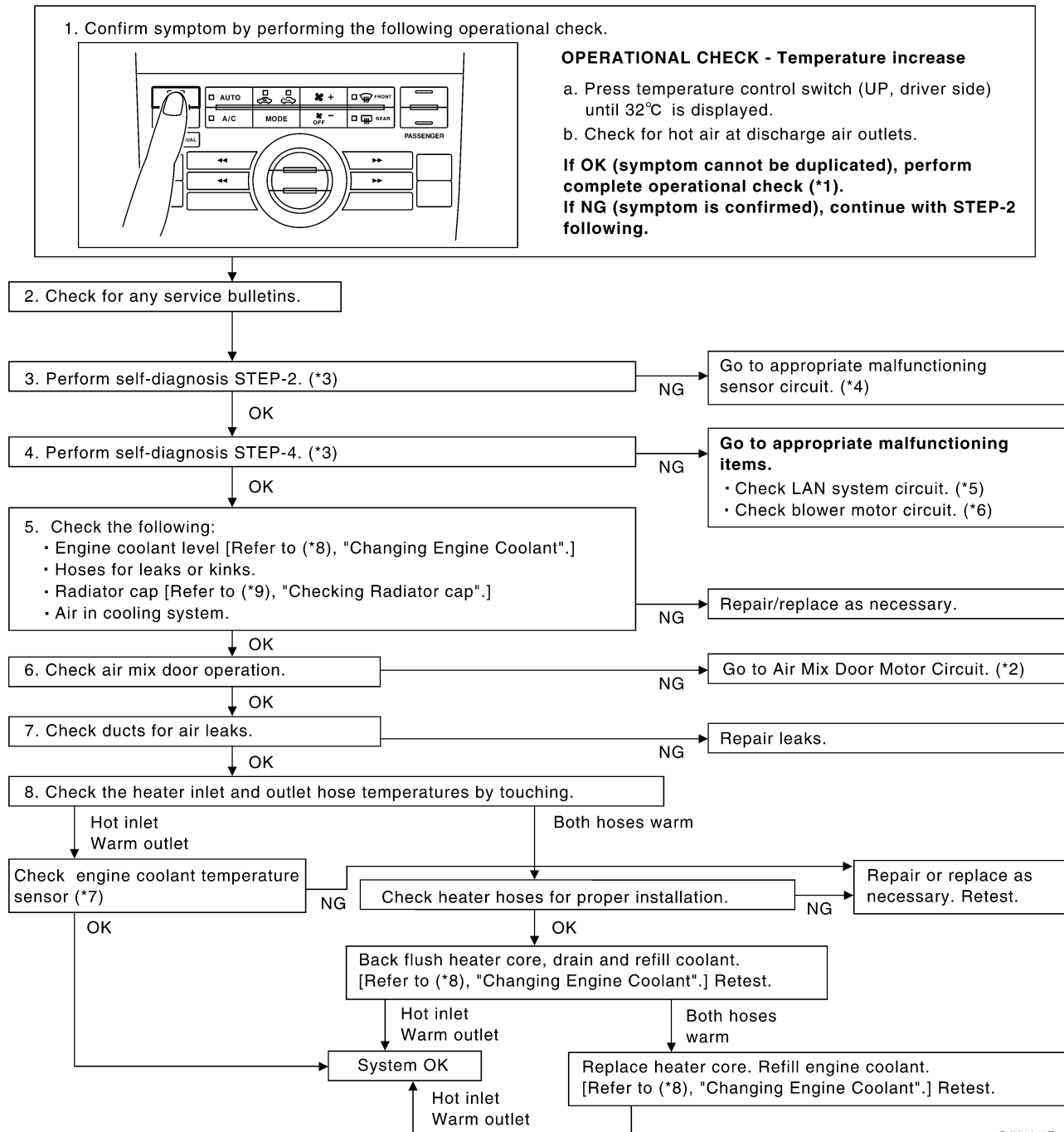
TROUBLE DIAGNOSIS

Insufficient Heating

BJS000GB

SYMPTOM: Insufficient heating

INSPECTION FLOW



*1 [ATC-54, "Operational Check"](#)

*2 [ATC-66, "Air Mix Door Motor Circuit"](#)

*3 [ATC-47, "FUNCTION CONFIRMATION PROCEDURE"](#), see No. 2 to 6.

*4 [ATC-47, "FUNCTION CONFIRMATION PROCEDURE"](#), see No. 13.

*5 [ATC-59, "LAN System Circuit"](#)

*6 [ATC-72, "Blower Motor Circuit"](#)

*7 [EC-131, "DTC P0117, P0118 ECT SENSOR"](#) (QR engine) or [EC-474, "DTC P0117, P0118 ECT SENSOR"](#) (VQ engine)

*8 [CO-10, "Changing Engine Coolant"](#) (QR engine) or [CO-34, "Changing Engine Coolant"](#) (VQ engine)

*9 [CO-14, "Checking Radiator Cap"](#) (QR engine) or [CO-38, "Checking Radiator Cap"](#) (VQ engine)

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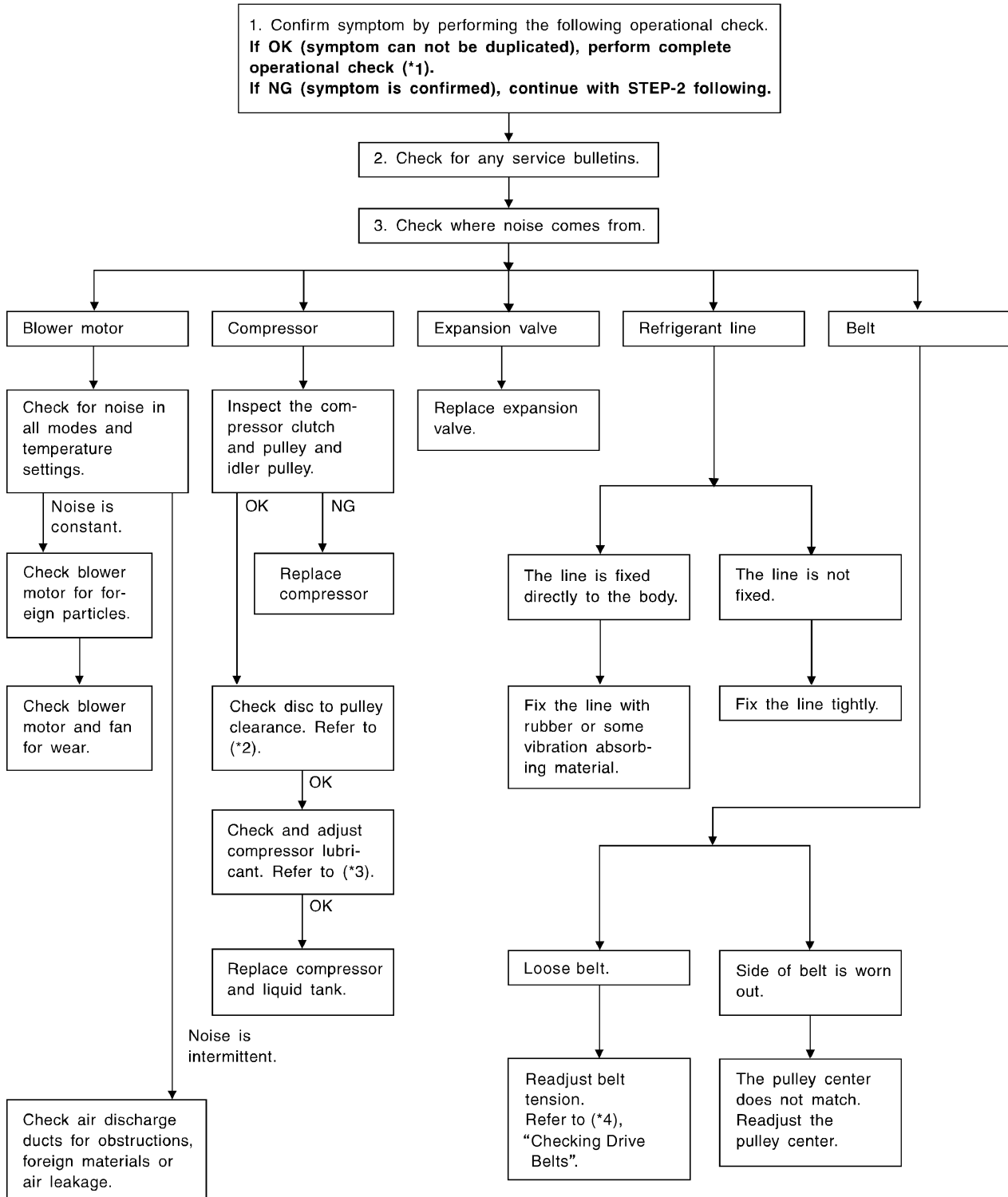
TROUBLE DIAGNOSIS

Noise

BJS000G9

SYMPTOM: Noise

INSPECTION FLOW



SJIA0843E

TROUBLE DIAGNOSIS

*1	ATC-54. "Operational Check"	*2	ATC-136. "Check Disc to Pulley Clearance"	*3	ATC-21. "Maintenance of Lubricant Quantity in Compressor"	A
*4	EM-14. "Checking Drive Belts" (QR engine) or EM-128. "Checking Drive Belts" (VQ engine)					B
						C
						D
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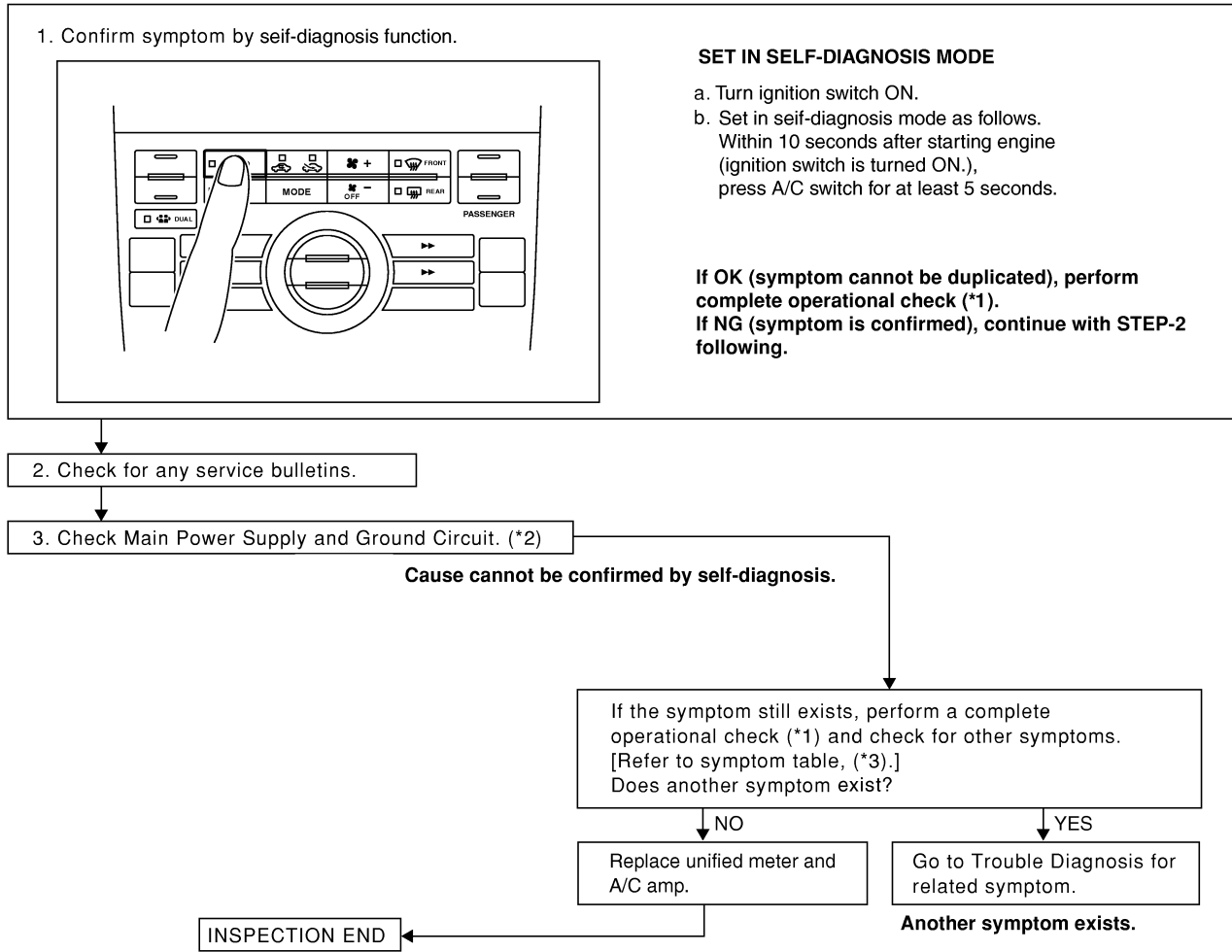
TROUBLE DIAGNOSIS

Self-diagnosis

BJS000GA

SYMPTOM: Self-diagnosis cannot be performed.

INSPECTION FLOW



*1 [ATC-54. "Operational Check"](#)

*2 [ATC-56. "Power Supply and Ground Circuit for Auto Amp."](#)

*3 [ATC-35. "SYMPTOM TABLE"](#)

PJIA0023E

TROUBLE DIAGNOSIS

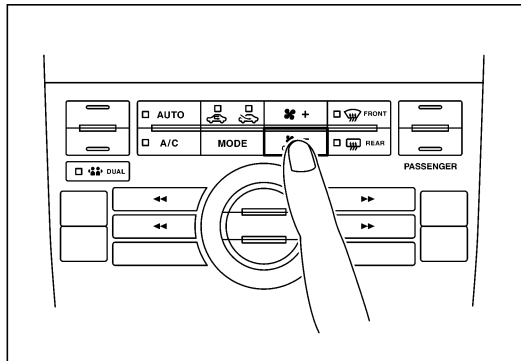
Memory Function

BJS000GB

SYMPTOM: Memory function does not operate.

INSPECTION FLOW

1. Confirm symptom by performing the following operational check.



OPERATIONAL CHECK – Memory function

- Press temperature control switch (UP, driver side) until 32°C is displayed.
 - Press fan control switch (DOWN) at least 2 seconds.
 - Turn the ignition off.
 - Turn the ignition on.
 - Press the AUTO switch.
 - Confirm that the set temperature remains at previous temperature.
 - Press fan control switch (DOWN) at least 2 seconds.
- If OK (symptom cannot be duplicated), perform complete operational check (*2).**
If NG (symptom is confirmed), continue with STEP-2 following.

2. Check for any service bulletins.

3. Check Main Power Supply and Ground Circuit. (*1)

OK

4. Replace Unfied meter and A/C amp.

5. FINAL CHECK

Go to self-diagnosis function confirmation procedure (*3) and perform self-diagnosis STEP-2.
Confirm that code No. 20 is displayed.

*1 [ATC-56, "Power Supply and Ground Circuit for Auto Amp."](#) *2 [ATC-54, "Operational Check"](#)

*3 [ATC-47, "FUNCTION CONFIRMATION PROCEDURE"](#)

RJIA3275E

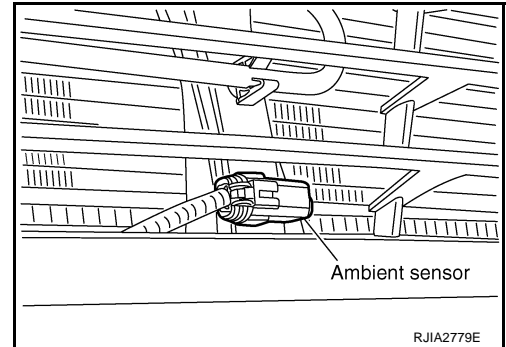
TROUBLE DIAGNOSIS

Ambient Sensor Circuit COMPONENT DESCRIPTION

BJS000GC

Ambient Sensor

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



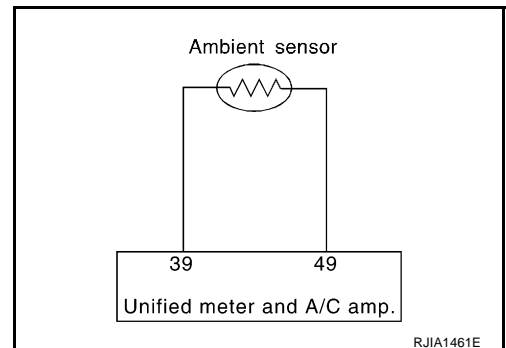
AMBIENT TEMPERATURE INPUT PROCESS

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

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

DIAGNOSIS PROCEDURE FOR AMBIENT SENSOR

SYMPTOM: Ambient sensor circuit is open or shorted. (21 or – 21 is indicated on unified meter and A/C amp. as a result of performing self-diagnosis STEP-2.)



1. CHECK VOLTAGE BETWEEN AMBIENT SENSOR AND GROUND

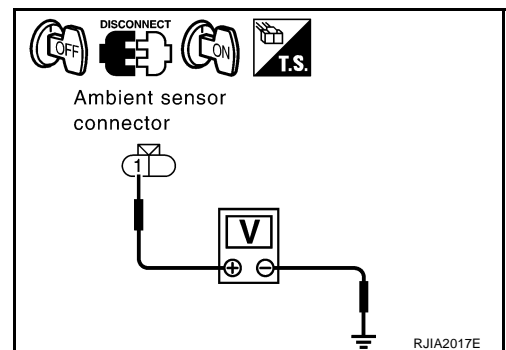
1. Disconnect ambient sensor connector.
2. Turn ignition switch ON.
3. Check voltage between ambient sensor harness connector E257 terminal 1 and ground.

1 – Ground

: Approx. 5 V

OK or NG

- OK >> GO TO 2.
NG >> GO TO 4.



TROUBLE DIAGNOSIS

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

1. Turn ignition switch OFF.
2. Disconnect unified meter and A/C amp. connector.
3. Check continuity between ambient sensor harness connector E257 terminal 2 and unified meter and A/C amp. harness connector M45 terminal 49.

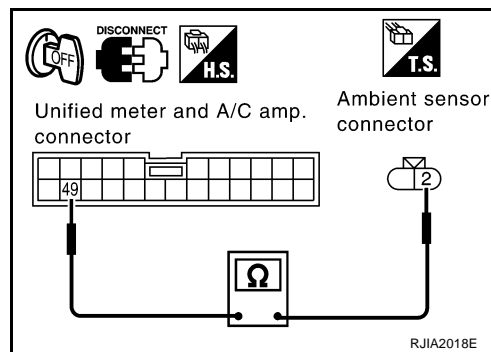
2 – 49

: Continuity should exist.

OK or NG

OK >> GO TO 3.

NG >> Repair harness or connector.



3. CHECK AMBIENT SENSOR

Refer to [ATC-98, "Ambient Sensor"](#) .

OK or NG

OK >> 1. Replace unified meter and A/C amp.

2. Go to self-diagnosis [ATC-47, "FUNCTION CONFIRMATION PROCEDURE"](#) and perform self-diagnosis STEP-2. Confirm that code No. 20 is displayed.

NG >> 1. Replace ambient sensor.

2. Go to self-diagnosis [ATC-47, "FUNCTION CONFIRMATION PROCEDURE"](#) and perform self-diagnosis STEP-2. Confirm that code No. 20 is displayed.

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

1. Turn ignition switch OFF.
2. Disconnect unified meter and A/C amp. connector.
3. Check continuity between ambient sensor harness connector E257 terminal 1 and unified meter and A/C amp. harness connector M45 terminal 39.

1 – 39

: Continuity should exist.

4. Check continuity between ambient sensor harness connector E257 terminal 1 and ground.

1 – Ground

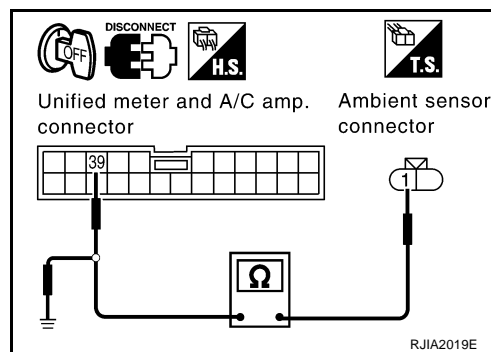
: Continuity should not exist.

OK or NG

OK >> 1. Replace unified meter and A/C amp.

2. Go to self-diagnosis [ATC-47, "FUNCTION CONFIRMATION PROCEDURE"](#) and perform self-diagnosis STEP-2. Confirm that code No. 20 is displayed.

NG >> Repair harness or connector.



TROUBLE DIAGNOSIS

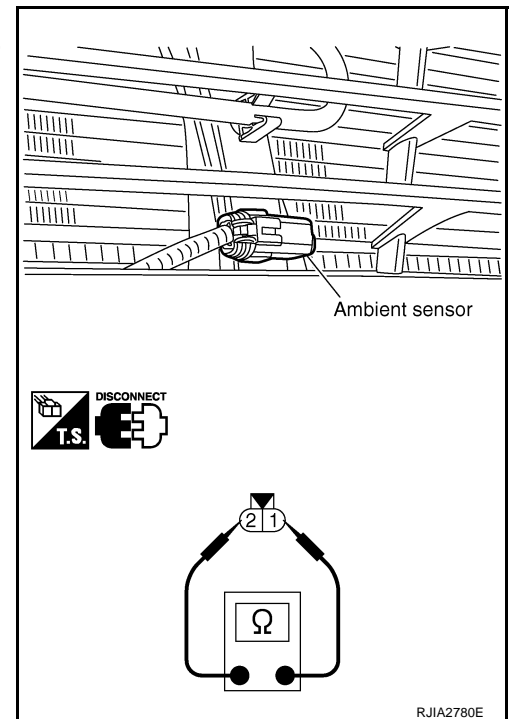
COMPONENT INSPECTION

Ambient Sensor

After disconnecting ambient sensor connector M257, measure resistance between terminals 1 and 2 at sensor side. Refer to the table below.

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

If NG, replace ambient sensor.



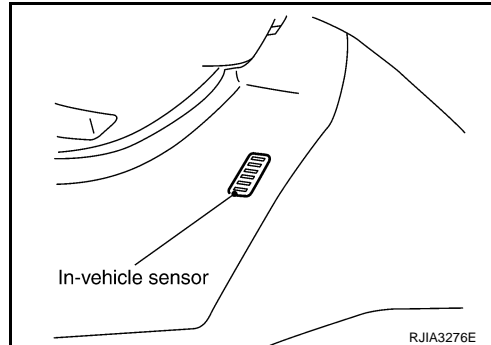
TROUBLE DIAGNOSIS

In-vehicle Sensor Circuit COMPONENT DESCRIPTION

BJS000GD

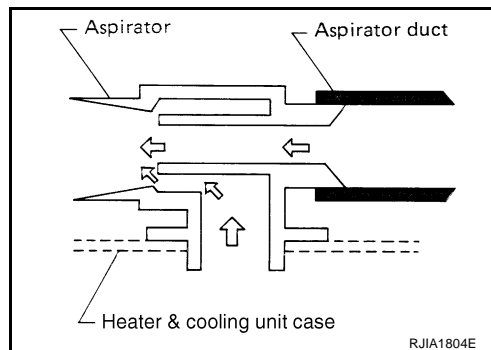
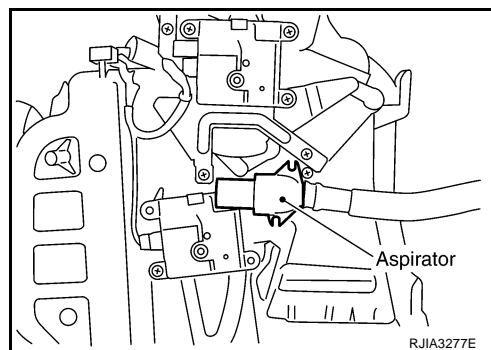
In-vehicle Sensor

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



Aspirator

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

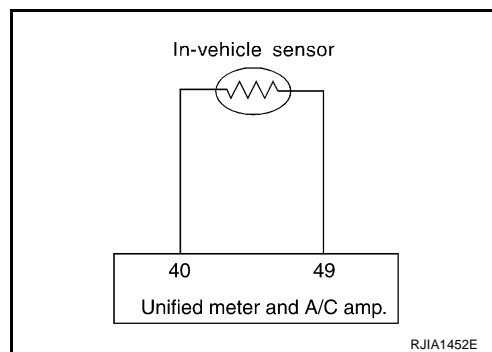


A
B
C
D
E
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M

TROUBLE DIAGNOSIS

DIAGNOSIS PROCEDURE FOR IN-VEHICLE SENSOR

SYMPTOM: In-vehicle sensor circuit is open or shorted. (22 or -22 is indicated on unified meter and A/C amp. as a result of performing self-diagnosis STEP-2.)



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 M29 terminal 1 and ground.

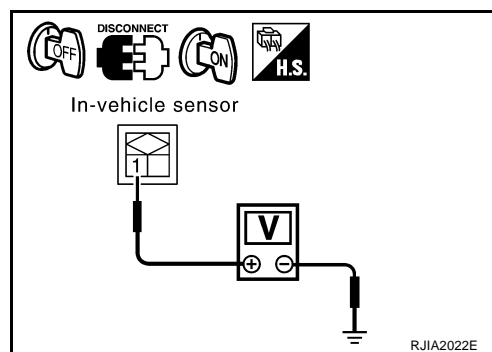
1 – Ground

: Approx. 5 V

OK or NG

OK >> GO TO 2.

NG >> GO TO 4.



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

1. Turn ignition switch OFF.
2. Disconnect unified meter and A/C amp. connector.
3. Check continuity between in-vehicle sensor harness connector M29 terminal 2 and unified meter and A/C amp. harness connector M45 terminal 49.

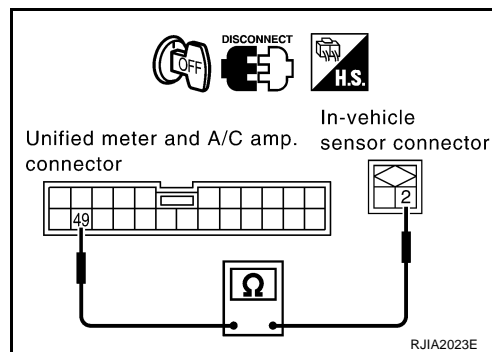
2 – 49

: Continuity should exist.

OK or NG

OK >> GO TO 3.

NG >> Repair harness or connector.



3. CHECK IN-VEHICLE SENSOR

Refer to [ATC-101, "In-vehicle Sensor"](#) .

OK or NG

OK >> 1. Replace unified meter and A/C amp.

2. Go to self-diagnosis [ATC-47, "FUNCTION CONFIRMATION PROCEDURE"](#) and perform self-diagnosis STEP-2. Confirm that code No. 20 is displayed.

NG >> 1. Replace in-vehicle sensor.

2. Go to self-diagnosis [ATC-47, "FUNCTION CONFIRMATION PROCEDURE"](#) and perform self-diagnosis STEP-2. Confirm that code No. 20 is displayed.

TROUBLE DIAGNOSIS

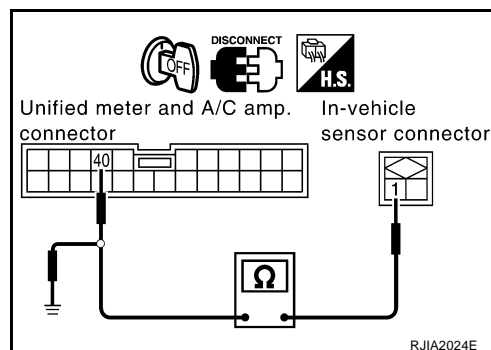
4. CHECK CIRCUIT CONTINUITY BETWEEN IN-VEHICLE SENSOR AND UNIFIED METER AND A/C AMP.

1. Turn ignition switch OFF.
2. Disconnect unified meter and A/C amp. connector.
3. Check continuity between in-vehicle sensor harness connector M29 terminal 1 and unified meter and A/C amp. harness connector M45 terminal 40.

1 – 40 : Continuity should exist.

4. Check continuity between in-vehicle sensor harness connector M29 terminal 1 and ground.

1 – Ground : Continuity should not exist.



OK or NG

OK >> 1. Replace unified meter and A/C amp.

2. Go to self-diagnosis [ATC-47, "FUNCTION CONFIRMATION PROCEDURE"](#) and perform self-diagnosis STEP-2. Confirm that code No. 20 is displayed.

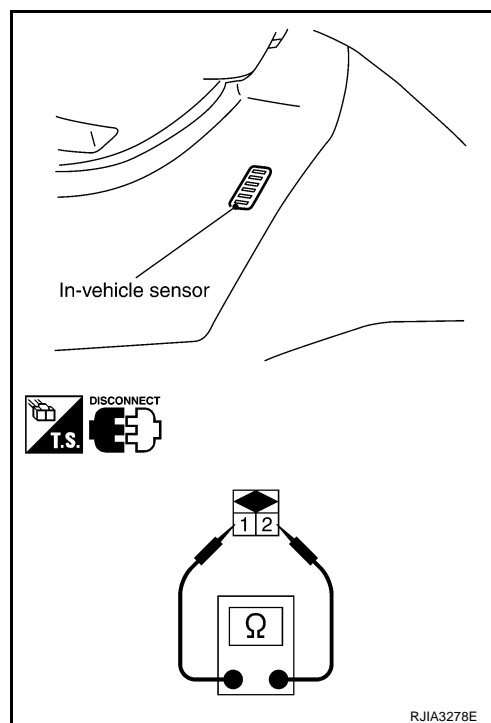
NG >> Repair harness or connector.

COMPONENT INSPECTION

In-vehicle Sensor

After disconnecting in-vehicle sensor connector M29, measure resistance between terminals 1 and 2 at sensor side. Refer to the table below.

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



If NG, replace in-vehicle sensor.

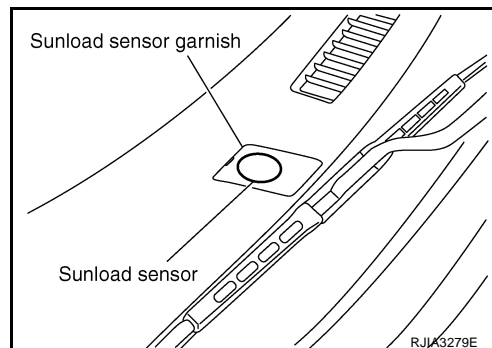
TROUBLE DIAGNOSIS

Sunload Sensor Circuit COMPONENT DESCRIPTION

BJS000GE

Sunload Sensor

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



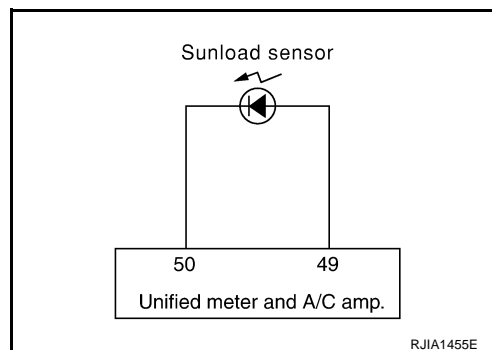
SUNLOAD INPUT PROCESS

The unified meter and A/C amp. also includes a processing circuit which averages the variations in detected sunload over a period of time. This prevents drastic swings in the ATC 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 will vary 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 ATC system operation. On the other hand, shortly after entering a long tunnel, the system will recognize the change in sunload, and the system will react accordingly.

DIAGNOSIS PROCEDURE FOR SUNLOAD SENSOR

SYMPTOM: Sunload sensor circuit is open or shorted. (25 or -25 is indicated on unified meter and A/C amp. as a result of performing self-diagnosis STEP-2.)



1. CHECK VOLTAGE BETWEEN SUNLOAD SENSOR AND GROUND

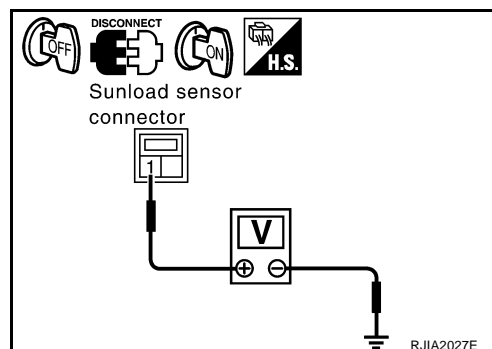
1. Disconnect sunload sensor connector.
2. Turn ignition switch ON.
3. Check voltage between sunload sensor harness connector M61 terminal 1 and ground.

1 – Ground

: Approx. 5 V

OK or NG

OK >> GO TO 2.
NG >> GO TO 4.



TROUBLE DIAGNOSIS

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

1. Turn ignition switch OFF.
2. Disconnect unified meter and A/C amp. connector.
3. Check continuity between sunload sensor harness connector M61 terminal 2 and unified meter and A/C amp. harness connector M45 terminal 49.

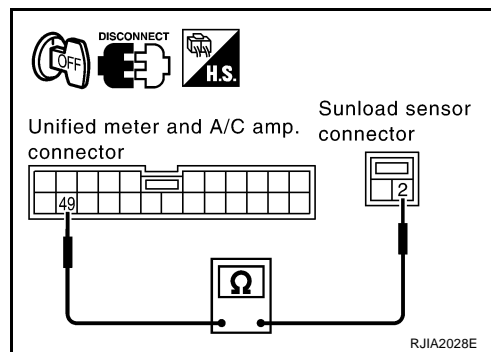
2 – 49

: Continuity should exist.

OK or NG

OK >> GO TO 3.

NG >> Repair harness or connector.



3. CHECK SUNLOAD SENSOR

1. Reconnect sunload sensor connector and unified meter and A/C amp. connector.
2. Refer to [ATC-104, "Sunload Sensor"](#).

OK or NG

OK >> 1. Replace unified meter and A/C amp.

2. Go to self-diagnosis [ATC-47, "FUNCTION CONFIRMATION PROCEDURE"](#) and perform self-diagnosis STEP-2. Confirm that code No. 20 is displayed.

NG >> 1. Replace sunload sensor.

2. Go to self-diagnosis [ATC-47, "FUNCTION CONFIRMATION PROCEDURE"](#) and perform self-diagnosis STEP-2. Confirm that code No. 20 is displayed.

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

1. Turn ignition switch OFF.
2. Disconnect unified meter and A/C amp. connector.
3. Check continuity between sunload sensor harness connector M61 terminal 1 and display and A/C auto amp. harness connector M45 terminal 50.

1 – 50

: Continuity should exist.

4. Check continuity between sunload sensor harness connector M61 terminal 1 and ground.

1 – Ground

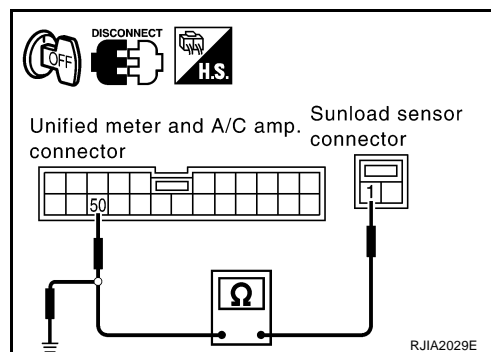
: Continuity should not exist.

OK or NG

OK >> 1. Replace unified meter and A/C amp.

2. Go to self-diagnosis [ATC-47, "FUNCTION CONFIRMATION PROCEDURE"](#) and perform self-diagnosis STEP-2. Confirm that code No. 20 is displayed.

NG >> Repair harness or connector.

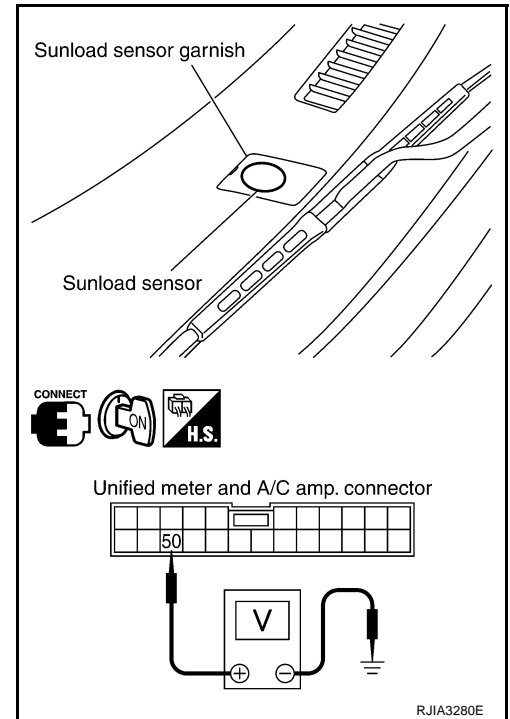


TROUBLE DIAGNOSIS

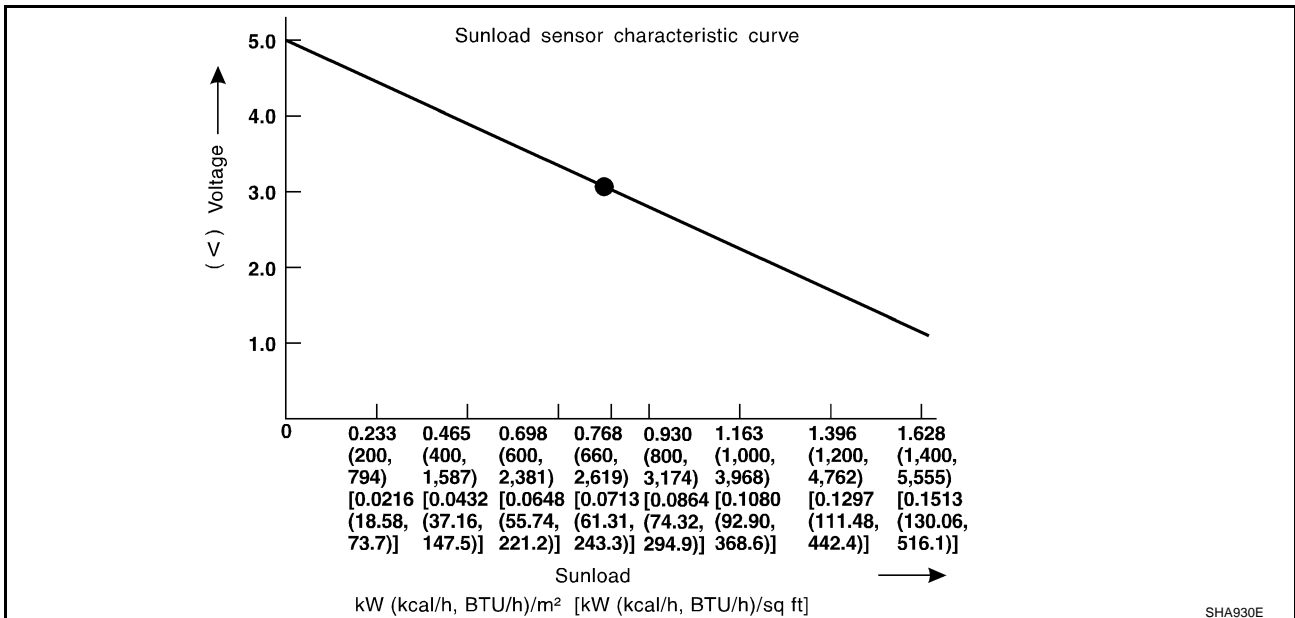
COMPONENT INSPECTION

Sunload Sensor

Measure voltage between unified meter and A/C amp. harness connector M45 terminal 50 and ground.



- When checking sunload sensor, select a place where sun shines directly on it.



If NG, replace sunload sensor.

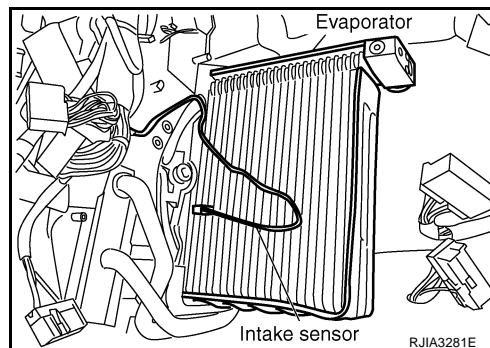
TROUBLE DIAGNOSIS

Intake Sensor Circuit COMPONENT DESCRIPTION

BJS000GF

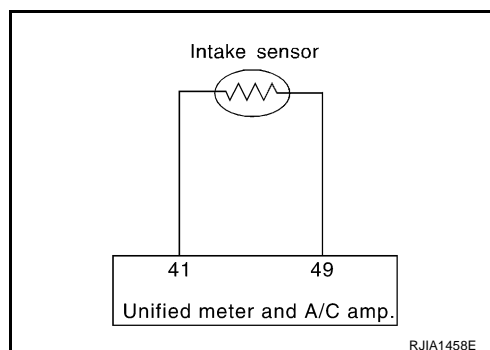
Intake Sensor

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



DIAGNOSIS PROCEDURE FOR INTAKE SENSOR

SYMPTOM: Intake sensor circuit is open or shorted. (24 or -24 is indicated on unified meter and A/C amp. as a result of performing self-diagnosis STEP-2.)



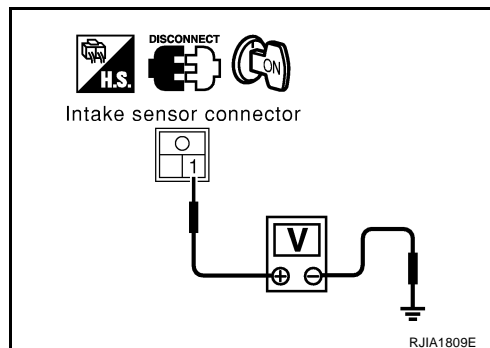
1. CHECK VOLTAGE BETWEEN INTAKE SENSOR AND GROUND

1. Disconnect intake sensor connector.
2. Turn ignition switch ON.
3. Check voltage between intake sensor harness connector M256 terminal 1 and ground.

1 – Ground : Approx. 5 V

OK or NG

- OK >> GO TO 2.
NG >> GO TO 4.



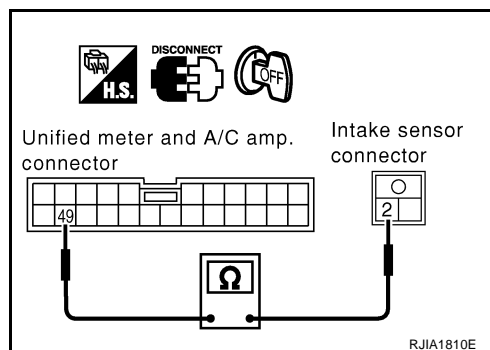
2. CHECK CIRCUIT CONTINUITY BETWEEN INTAKE SENSOR AND UNIFIED METER AND A/C AMP.

1. Turn ignition switch OFF.
2. Disconnect unified meter and A/C amp. connector.
3. Check continuity between intake sensor harness connector M256 terminal 2 and unified meter and A/C amp. harness connector M45 terminal 49.

2 – 49 : Continuity should exist.

OK or NG

- OK >> GO TO 3.
NG >> Repair harness or connector.



TROUBLE DIAGNOSIS

3. CHECK INTAKE SENSOR

Refer to [ATC-106, "Intake Sensor"](#) .

OK or NG

- OK >> 1. Replace unified meter and A/C amp.
2. Go to self-diagnosis [ATC-47, "FUNCTION CONFIRMATION PROCEDURE"](#) and perform self-diagnosis STEP-2. Confirm that code No. 20 is displayed.
- NG >> 1. Replace intake sensor.
2. Go to self-diagnosis [ATC-47, "FUNCTION CONFIRMATION PROCEDURE"](#) and perform self-diagnosis STEP-2. Confirm that code No. 20 is displayed.

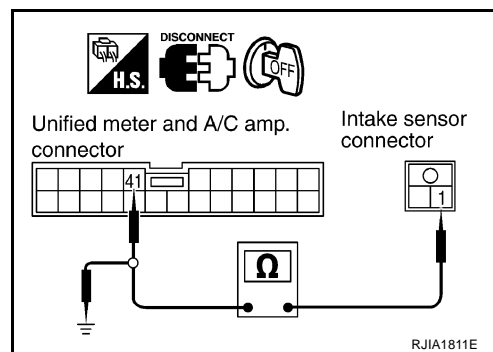
4. CHECK CIRCUIT CONTINUITY BETWEEN INTAKE SENSOR AND UNIFIED METER AND A/C AMP.

1. Turn ignition switch OFF.
2. Disconnect unified meter and A/C amp. connector.
3. Check continuity between intake sensor harness connector M256 terminal 1 and unified meter and A/C amp. harness connector M45 terminal 41.

1 – 41 : Continuity should exist.

4. Check continuity between intake sensor harness connector M256 terminal 1 and ground.

1 – Ground : Continuity should not exist.



OK or NG

- OK >> 1. Replace unified meter and A/C amp.
2. Go to self-diagnosis [ATC-47, "FUNCTION CONFIRMATION PROCEDURE"](#) and perform self-diagnosis STEP-2. Confirm that code No. 20 is displayed.
- NG >> Repair harness or connector.

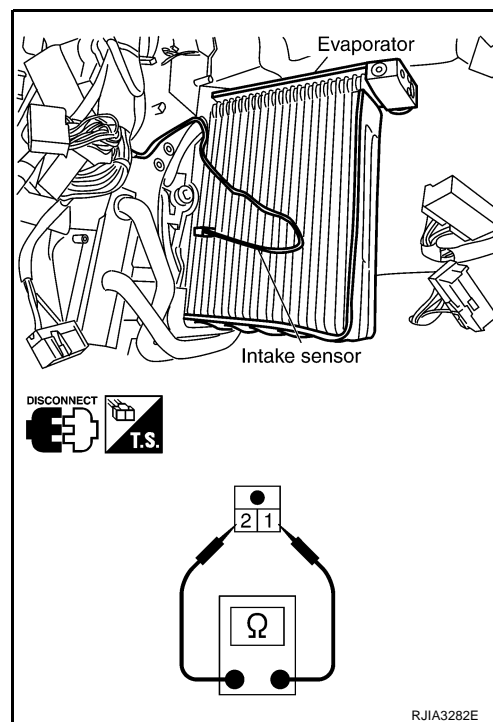
COMPONENT INSPECTION

Intake Sensor

After disconnecting intake sensor connector M256, measure resistance between terminals 1 and 2 at sensor side. Refer to the table below.

Temperature °C (°F)	Resistance kΩ
-15 (5)	18.63
-10 (14)	14.14
-5 (23)	10.85
0 (32)	8.40
5 (41)	6.57
10 (50)	5.18
15 (59)	4.12
20 (68)	3.30
25 (77)	2.66
30 (86)	2.16
35 (95)	1.77
40 (104)	1.46
45 (113)	1.21

If NG, replace intake sensor.



A/C CONTROLLER

PFP:27500

Removal and Installation of A/C and AV Switch

BJS000H4

REMOVAL

Refer to [AV-15, "Removal and Installation of Audio Unit"](#) (Integrated display system) or [AV-34, "Removal and Installation of Audio Unit"](#) (Integrated color display system).

INSTALLATION

Installation is basically the reverse order of removal.

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ATC

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L

M

AUTO AMP

PFP:27760

Removal and Installation of Unified Meter and A/C Amp.

BJS000H6

REMOVAL

Refer to [AV-15. "Removal and Installation of Audio Unit"](#) (Integrated display system) or [AV-34. "Removal and Installation of Audio Unit"](#) (Integrated color display system).

INSTALLATION

Installation is basically the reverse order of removal.

AMBIENT SENSOR

AMBIENT SENSOR

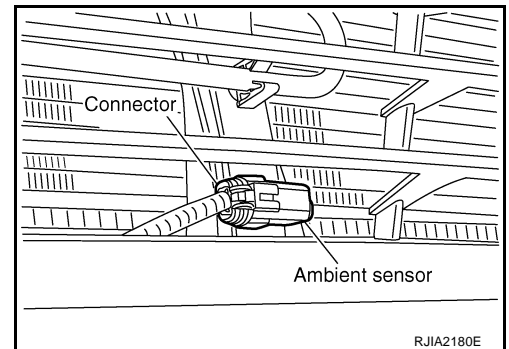
PFP:27722

Removal and Installation

BJS000H7

REMOVAL

1. Remove engine undercover.
2. Disconnect ambient sensor connector, and then remove ambient sensor.



INSTALLATION

Installation is basically the reverse order of removal.

A
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ATC

IN-VEHICLE SENSOR

IN-VEHICLE SENSOR

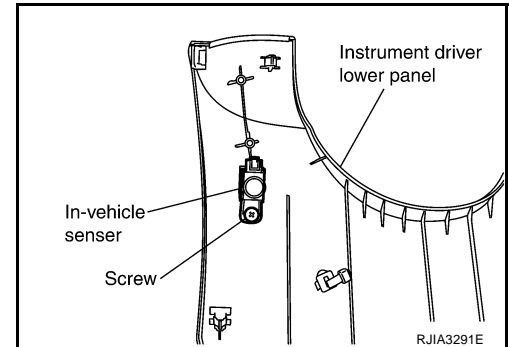
PFP:27720

Removal and Installation

BJS000HB

REMOVAL

1. Remove instrument driver lower panel. Refer to [IP-10, "INSTRUMENT PANEL ASSEMBLY"](#) .
2. Remove mounting screw, and then remove in-vehicle sensor.



INSTALLATION

Installation is basically the reverse order of removal.

SUNLOAD SENSOR

SUNLOAD SENSOR

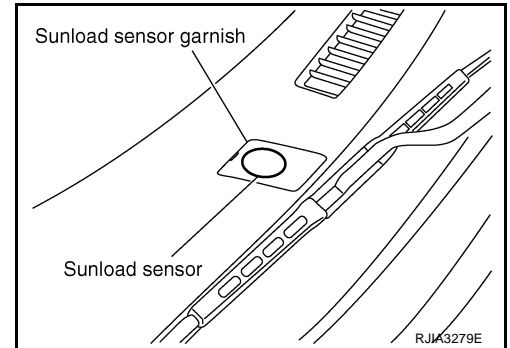
PFP:27721

Removal and Installation

BJ5000H9

REMOVAL

1. Remove sunload sensor garnish.
2. Disconnect sunload sensor connector, and then remove sunload sensor.



INSTALLATION

Installation is basically the reverse order of removal.

A

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D

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INTAKE SENSOR

INTAKE SENSOR

PFP:27723

Removal and Installation

BJS000HA

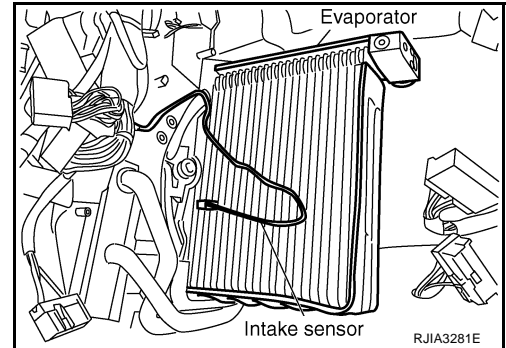
REMOVAL

1. Remove low-pressure pipe 2 and high-pressure pipe 2. Refer to [ATC-140, "Removal and Installation of Low-pressure Pipe 2 and High-pressure Pipe 2"](#).

CAUTION:

Cap or wrap the joint of the pipe with suitable material such as vinyl tape to avoid the entry of air.

2. Slide evaporator to passenger side, and then remove intake sensor.



INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

- Replace O-rings of A/C piping with new ones, and then apply compressor oil to it when installing it.
- Mark the mounting position of intake sensor bracket prior to removal so that the reinstalled sensor can be located in the same position.
- Female-side piping connection is thin and easy to deform. Slowly insert the male-side piping straight in axial direction.
- Insert piping securely until a click is heard.
- After piping connection is completed, pull male-side piping by hand to make sure that connection does not come loose.
- When recharging refrigerant, check for leaks.

BLOWER UNIT

BLOWER UNIT

PFP:27200

BJS000HB

Removal and Installation

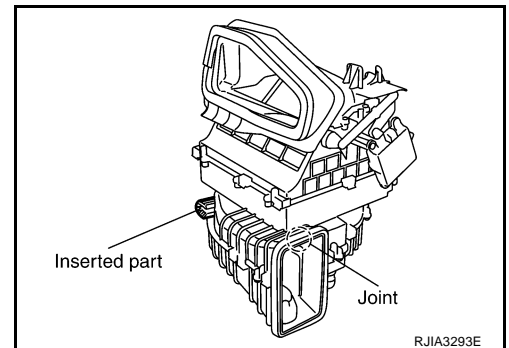
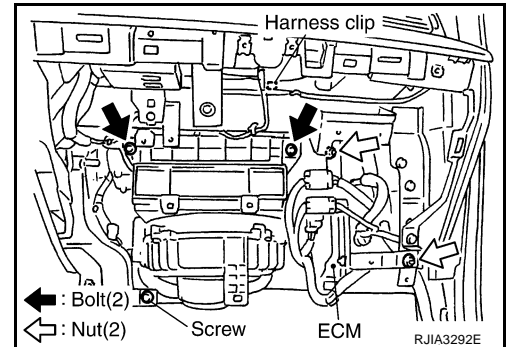
REMOVAL

1. Remove instrument passenger lower panel. Refer to [IP-10, "INSTRUMENT PANEL ASSEMBLY"](#) .
2. Remove mounting nuts, and then remove ECM with bracket attached.
3. Disconnect fan control amp. connector and blower fan motor connector.
4. Remove harness clip from blower unit.
5. Remove blower unit mounting bolts and screw, and then disconnect intake door motor connector.

CAUTION:

Move blower unit rightward, and remove locating pin (1 part) and joint. Then remove blower unit downward.

6. Remove blower unit.



INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

Make sure locating pin (1 part) and joint are securely inserted.

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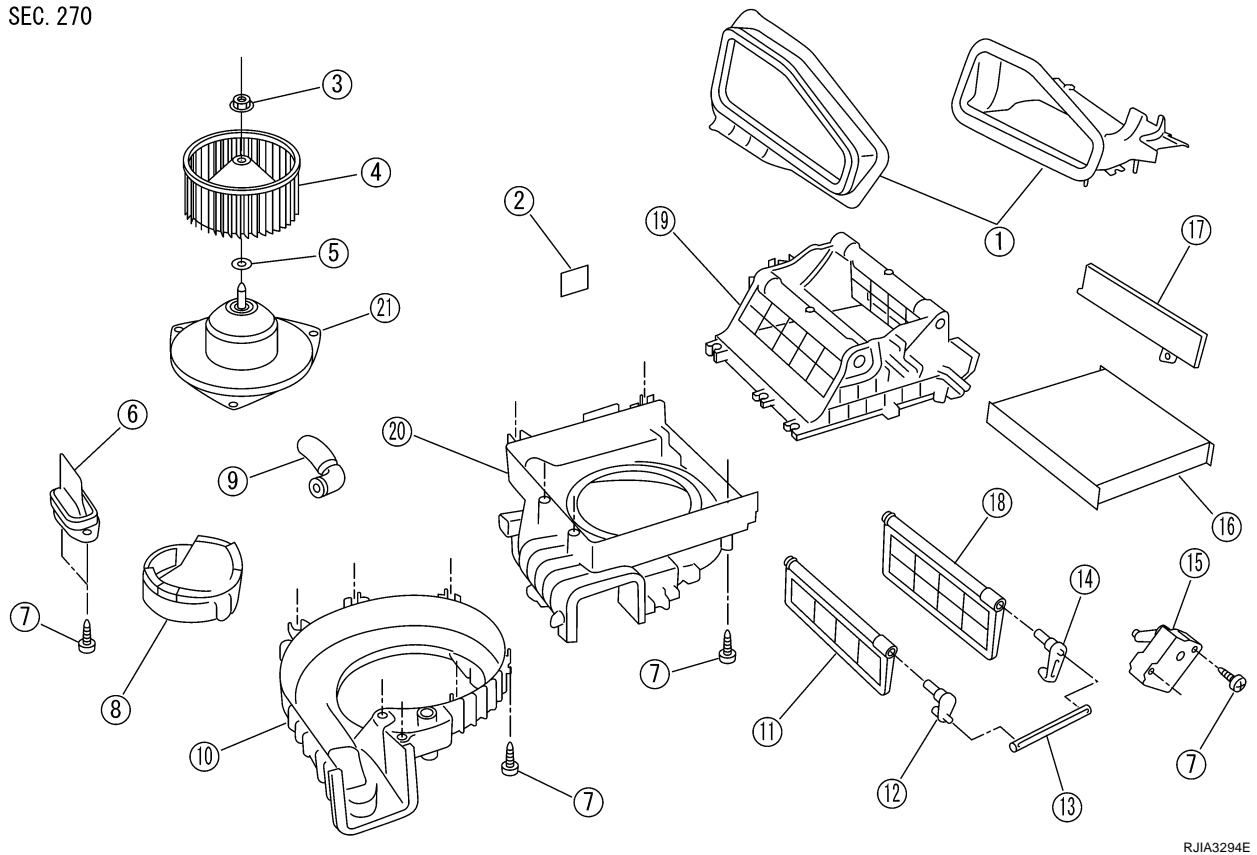
ATC

BLOWER UNIT

Disassembly and Assembly

BJS000HC

SEC. 270

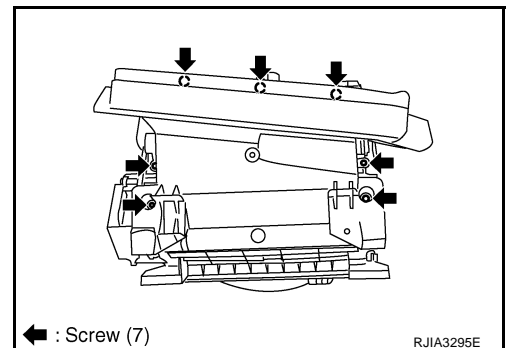


RJIA3294E

- | | | |
|----------------------------|-------------------------|-------------------------|
| 1. Intake adapter | 2. Plate clip | 3. Nut |
| 4. Blower fan | 5. Washer | 6. Fan control amp. |
| 7. Screw | 8. Motor cover | 9. Cooling hose |
| 10. Intake lower case | 11. Intake door 1 | 12. Intake door lever 1 |
| 13. Intake door link | 14. Intake door lever 2 | 15. Intake door motor |
| 16. Air conditioner filter | 17. Filter cover | 18. Intake door 2 |
| 19. Intake box | 20. Intake upper case | 21. Blower motor |

CAUTION:

If retaining tabs are damaged while disassembling blower unit, use 7 screws (27111-2Y000) to assemble blower unit.



RJIA3295E

BLOWER MOTOR

BLOWER MOTOR

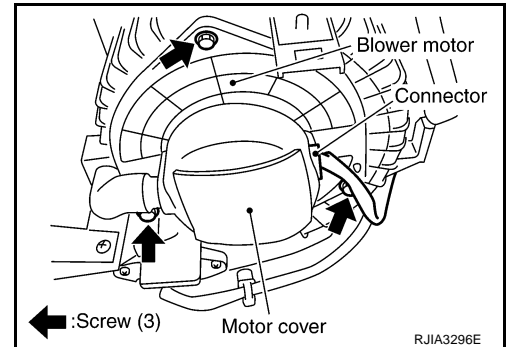
PFP:27226

Removal and Installation

BJS000HD

REMOVAL

1. Remove instrument passenger lower panel. Refer to [IP-10, "INSTRUMENT PANEL ASSEMBLY"](#) .
2. Disconnect blower motor connector.
3. Remove mounting screws, and then remove blower motor and motor cover.



INSTALLATION

Installation is basically the reverse order of removal.

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ATC

FAN CONTROL AMPLIFIER

FAN CONTROL AMPLIFIER

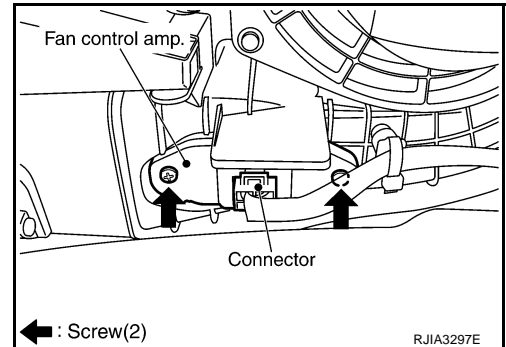
PFP:27761

Removal and Installation

BJS000HE

REMOVAL

1. Remove instrument passenger lower panel. Refer to [IP-10, "INSTRUMENT PANEL ASSEMBLY"](#) .
2. Remove harness clip.
3. Disconnect fan control amp. connector.
4. Remove mounting screws, and then remove fan control amp.



INSTALLATION

Installation is basically the reverse order of removal.

INTAKE DOOR MOTOR

INTAKE DOOR MOTOR

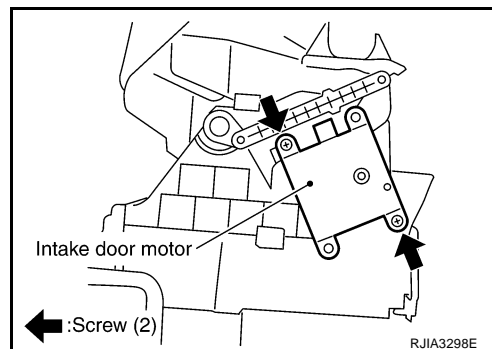
PFP:27730

Removal and Installation

BJS000HF

REMOVAL

1. Remove blower unit. Refer to [ATC-113, "BLOWER UNIT"](#) .
2. Remove mounting screws, and then remove intake door motor.



INSTALLATION

Installation is basically the reverse order of removal.

A
B
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ATC

AIR CONDITIONER FILTER

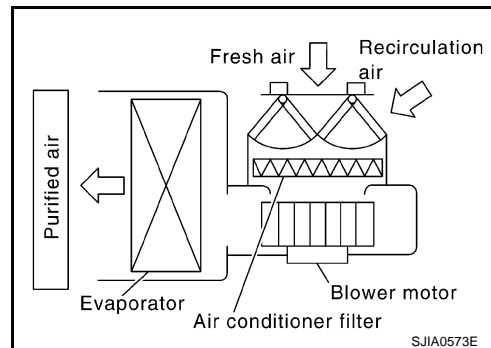
AIR CONDITIONER FILTER

PFP:27277

Removal and Installation FUNCTION

BJS000HG

Air inside passenger compartment is kept clean at either recirculation or fresh mode by installing air conditioner filter into blower unit.



REPLACEMENT TIMING

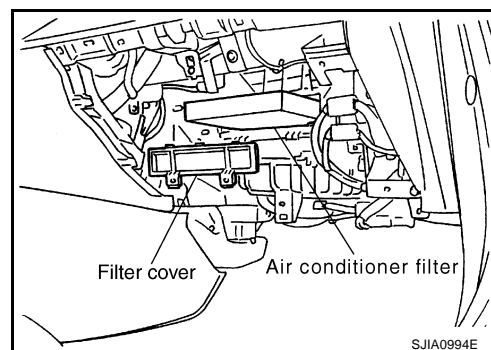
Replace air conditioner filter.

Refer to [MA-9, "CHASSIS AND BODY MAINTENANCE"](#).

When replacing filter, affix a caution label inside the glove box.

REPLACEMENT PROCEDURES

1. Remove instrument passenger lower panel. Refer to [IP-10, "INSTRUMENT PANEL ASSEMBLY"](#).
2. Remove filter cover, and then remove air conditioner filter.
3. Take out air conditioner filter from blower unit.
4. Replace with new one and reinstall on blower unit.
5. Reinstall instrument passenger lower panel.



HEATER & COOLING UNIT ASSEMBLY

HEATER & COOLING UNIT ASSEMBLY

PFP:27110

Removal and Installation

REMOVAL

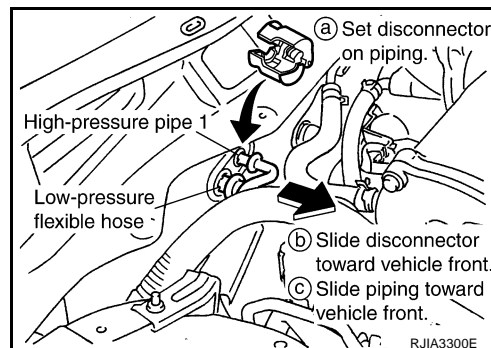
1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
2. Drain coolant from cooling system. Refer to [CO-10, "Changing Engine Coolant"](#) (QR engine) or [CO-34, "Changing Engine Coolant"](#) (VQ engine).
3. Remove extension cowl top lower panel. Refer to [EI-21, "COWL TOP"](#) .

4. Disconnect low-pressure pipe 1 and high-pressure pipe 1 from evaporator.

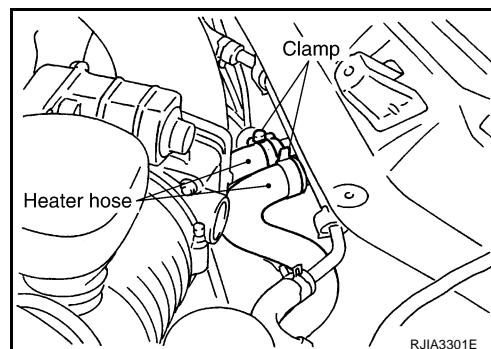
- a. Set a disconnecter [high-pressure side (SST: 9253089908), low-pressure side (SST: 9253089916)] on A/C piping.
- b. Slide a disconnecter toward vehicle front until it clicks.
- c. Slide A/C piping toward vehicle front and disconnect it.

CAUTION:

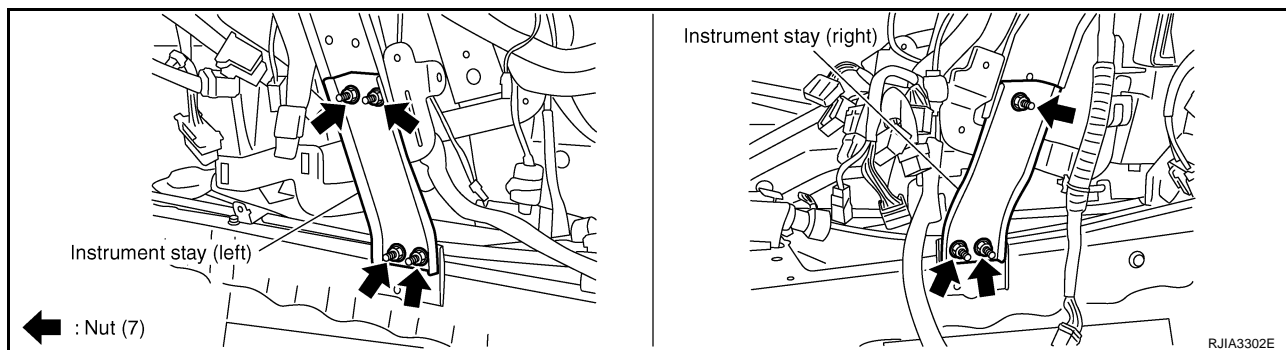
Cap or wrap the joint of the pipe with suitable material such as vinyl tape to avoid the entry of air.



5. Disconnect two heater hoses from heater core.

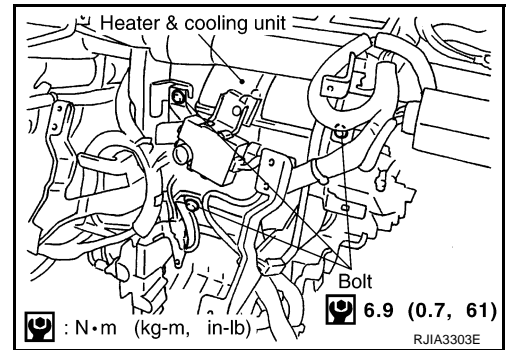


6. Remove instrument panel assembly. Refer to [IP-10, "INSTRUMENT PANEL ASSEMBLY"](#) .
7. Remove blower unit. Refer to [ATC-113, "BLOWER UNIT"](#) .
8. Remove drain hose.
9. Remove mounting nuts, and then remove instrument stays.



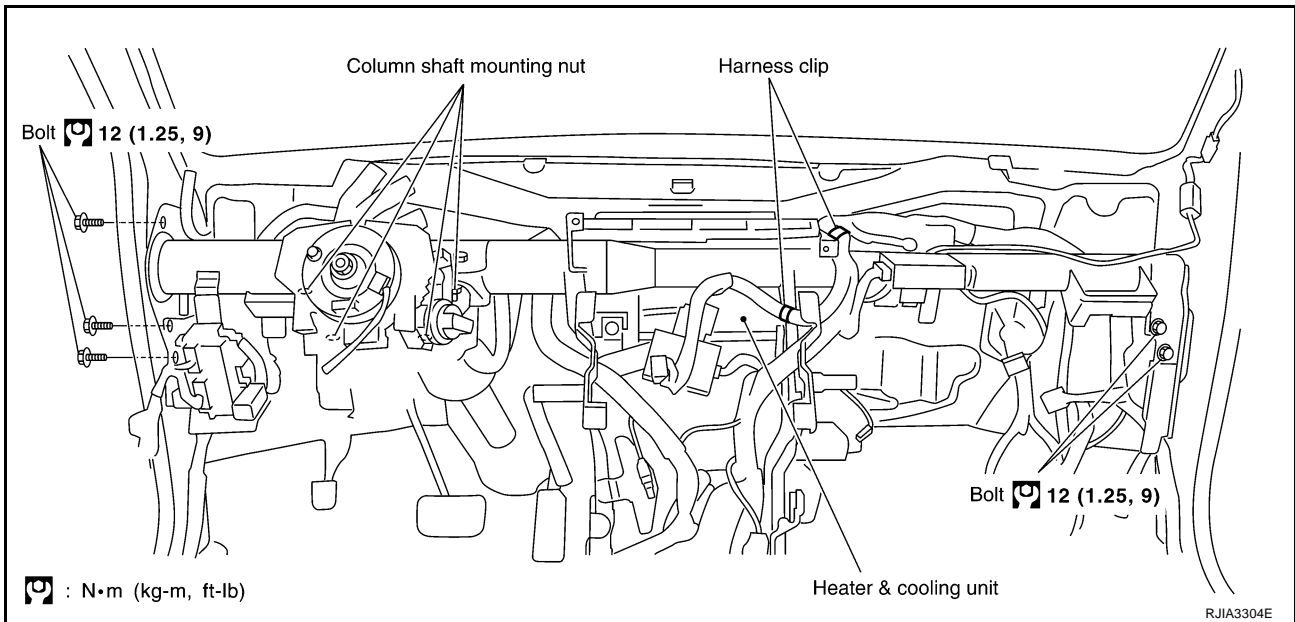
HEATER & COOLING UNIT ASSEMBLY

10. Remove mounting bolts from heater & cooling unit.



11. Remove steering column mounting nuts.

12. Remove steering member mounting bolts.



13. Remove steering member, and then remove heater & cooling unit.

INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

- Replace O-rings of A/C piping with new ones, and then apply compressor oil to it when installing it.
- Female-side piping connection is thin and easy to deform. Slowly insert the male-side piping straight in axial direction.
- Insert piping securely until a click is heard.
- After piping connection is completed, pull male-side piping by hand to make sure that connection does not come loose.
- When recharging refrigerant, check for leaks.

NOTE:

- When filling radiator with coolant, refer to [CO-10, "Changing Engine Coolant"](#) (QR engine) or [CO-34, "Changing Engine Coolant"](#) (VQ engine).
- Recharge the refrigerant.

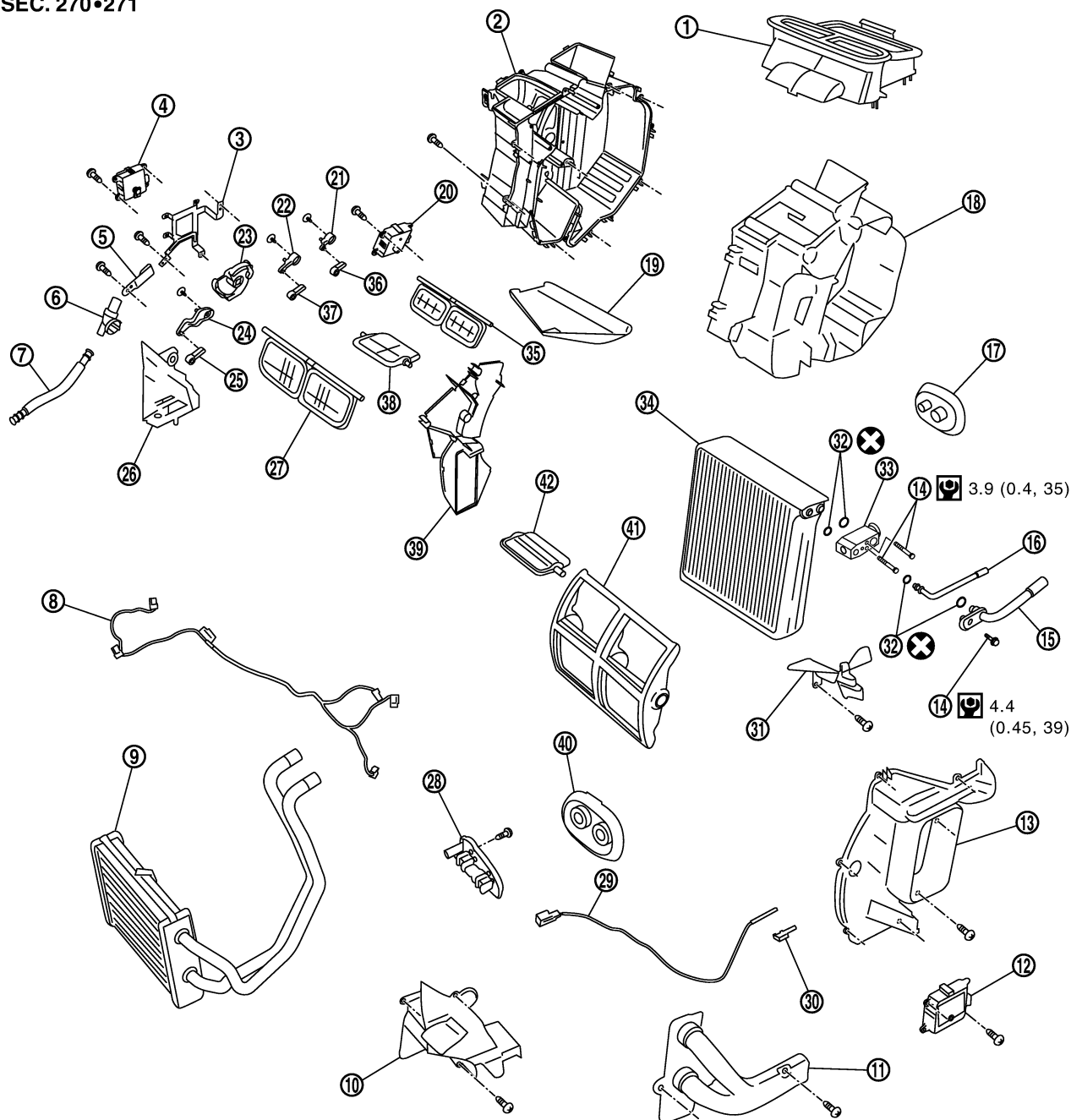
HEATER & COOLING UNIT ASSEMBLY

Disassembly and Assembly

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SJIA1657E

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|--------------------------|--------------------------------------|-----------------------------------------|
| 1. Adaptor duct | 2. Heater & cooling case (left) | 3. Mode door motor bracket |
| 4. Mode door motor | 5. Instrument lower cover bracket | 6. Aspirator |
| 7. Aspirator duct | 8. Sub harness | 9. Heater core |
| 10. Foot duct (right) | 11. Heater core cover | 12. Air mix door motor (passenger side) |
| 13. Evaporator cover | 14. Bolt | 15. Low-pressure pipe 2 |
| 16. High-pressure pipe 2 | 17. Cooler pipe grommet | 18. Heater & cooling case (right) |
| 19. Insulator | 20. Air mix door motor (driver side) | 21. Defroster door lever |
| 22. Max. cool door lever | 23. Main link | 24. Ventilator door lever |
| 25. Ventilator door link | 26. Foot duct (left) | 27. Ventilator door |
| 28. Heater pipe support | 29. Intake sensor | 30. Intake sensor bracket |
| 31. Adaptor cover | 32. O-ring | 33. Expansion valve |
| 34. Evaporator | 35. Defroster door | 36. Defroster door link |

HEATER & COOLING UNIT ASSEMBLY

37. Max. cool door link

38. Max. cool door (left)

39. Center case

40. Heater pipe grommet

41. Air mix door

42. Max. cool door (right)



: N·m (kg-m, in-lb)



: Always replace after every disassembly

MODE DOOR MOTOR

MODE DOOR MOTOR

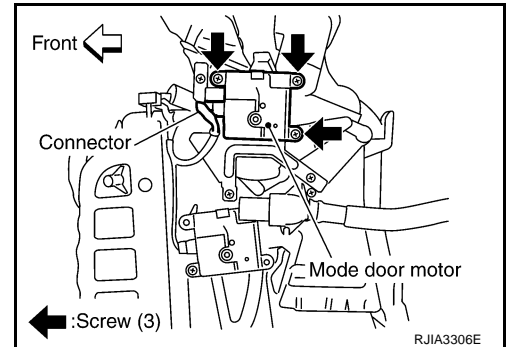
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Removal and Installation

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REMOVAL

1. Remove instrument driver lower panel. Refer to [IP-10, "INSTRUMENT PANEL ASSEMBLY"](#).
2. Disconnect mode door motor connector.
3. Remove mounting screws, and then remove mode door motor.



INSTALLATION

Installation is basically the reverse order of removal.

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AIR MIX DOOR MOTOR

AIR MIX DOOR MOTOR

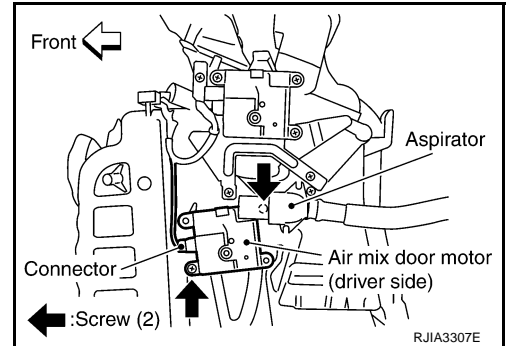
PFP:27732

Removal and Installation

BJS000HK

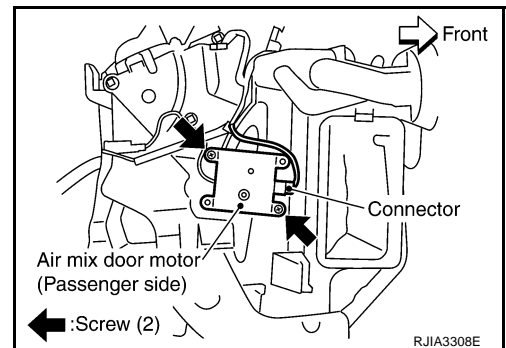
Driver Side

1. Set the temperature (driver side) at 18°C, and then disconnect the battery cable from the negative terminal.
2. Remove instrument driver lower panel. Refer to [IP-10, "INSTRUMENT PANEL ASSEMBLY"](#).
3. Remove aspirator.
4. Remove mounting screws, and then remove air mix door motor.
5. Disconnect air mix door motor connector.



Passenger Side

1. Set the temperature (passenger side) at 18°C, and then disconnect the battery cable from the negative terminal.
2. Remove blower unit. Refer to [ATC-113, "BLOWER UNIT"](#).
3. Remove mounting screws, and then remove air mix door motor.
4. Disconnect air mix door motor connector.



INSTALLATION

Installation is basically the reverse order of removal.

HEATER CORE

HEATER CORE

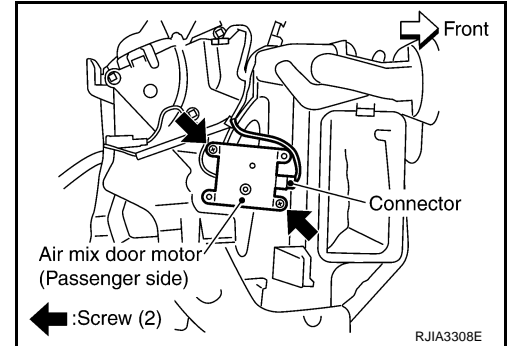
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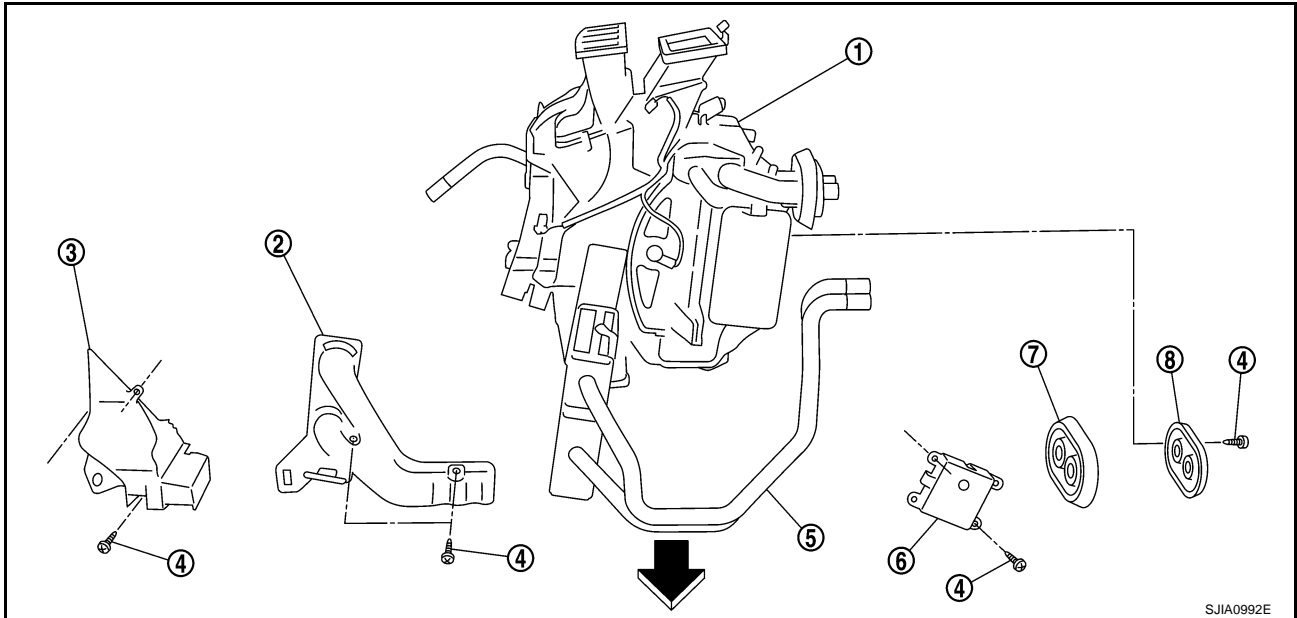
Removal and Installation

REMOVAL

1. Set the temperature (passenger side) at 18°C, and then disconnect the battery cable from the negative terminal.
2. Remove heater & cooling unit assembly. Refer to [ATC-119, "HEATER & COOLING UNIT ASSEMBLY"](#).
3. Remove mounting screws, and then remove air mix door motor (passenger side).
4. Disconnect air mix door motor connector.



5. Remove mounting screws, and then remove foot duct (right).



- | | | |
|--------------------------|------------------------|----------------------------------------|
| 1. Heater & cooling unit | 2. Heater core cover | 3. Foot duct (right) |
| 4. Screw | 5. Heater core | 6. Air mix door motor (passenger side) |
| 7. Heater pipe grommet | 8. Heater pipe support | |

6. Remove mounting screws, and then remove heater core cover.
7. Remove heater pipe support and heater pipe grommet.
8. Slide heater core (shown in the figure) to rightward.

INSTALLATION

Installation is basically the reverse order of removal.

DUCTS AND GRILLES

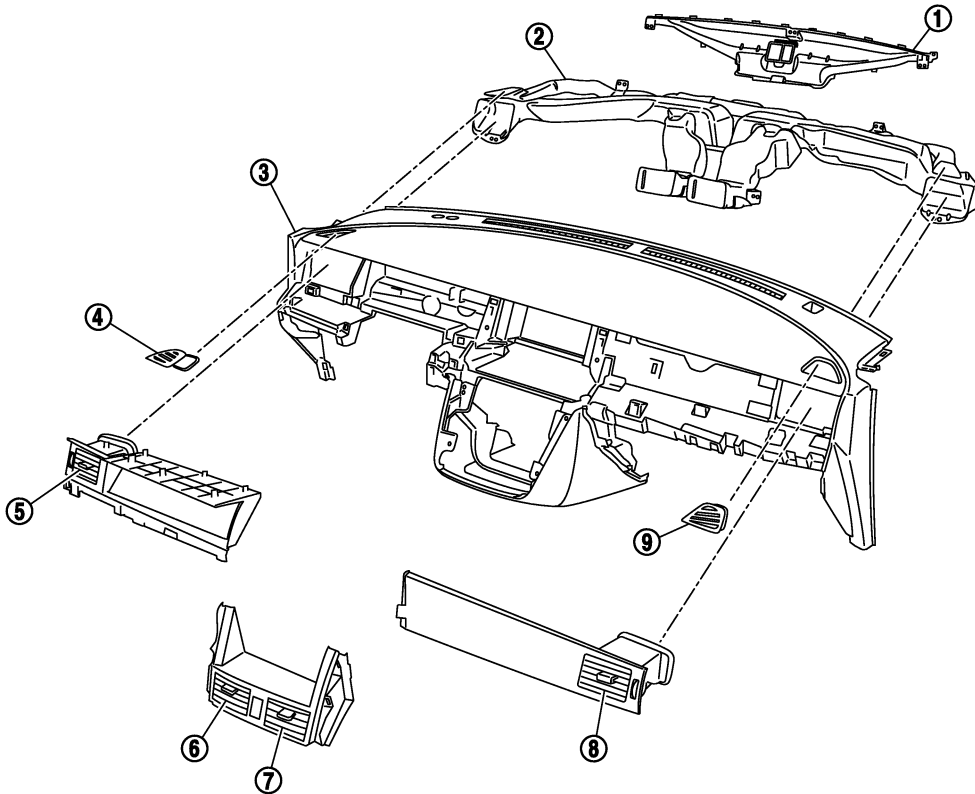
DUCTS AND GRILLES

PFP:27860

Removal and Installation REMOVAL

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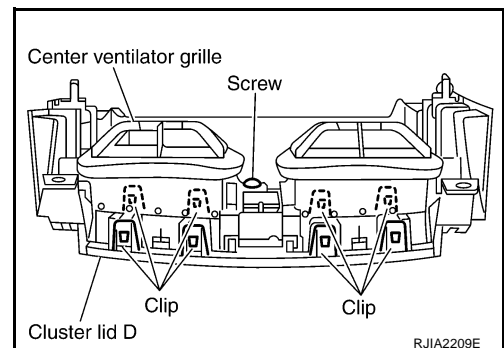


SJIA1653E

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|-------------------------------------|-----------------------------------|------------------------------------|
| 1. Defroster nozzle | 2. Duct assembly | 3. Instrument panel |
| 4. Side defroster grille (left) | 5. Side ventilator grille (left) | 6. Center ventilator grille (left) |
| 7. Center ventilator grille (right) | 8. Side ventilator grille (right) | 9. Side defroster grille (right) |

Removal of Center Ventilator Grilles

1. Remove cluster lid D. Refer to [IP-10, "INSTRUMENT PANEL ASSEMBLY"](#).
2. Remove mounting clips, and then remove center ventilator grilles.

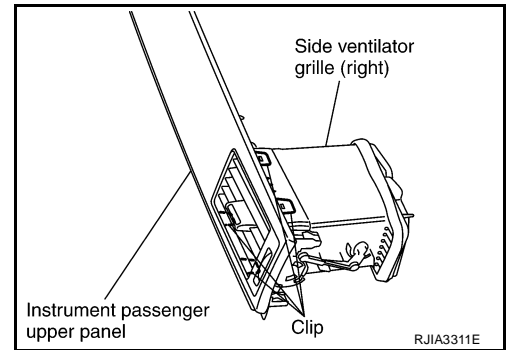


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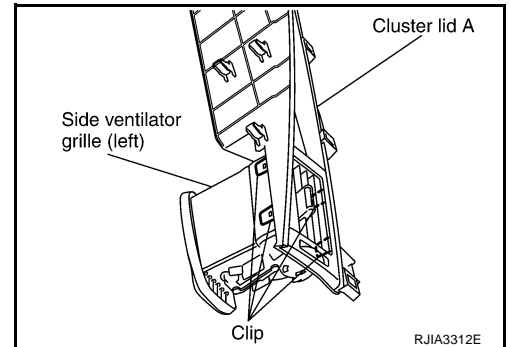
DUCTS AND GRILLES

Removal of Side Ventilator Grilles

1. Remove instrument passenger upper panel. Refer to [IP-10, "INSTRUMENT PANEL ASSEMBLY"](#) .
2. Remove mounting clips, and then remove side ventilator grille (right).

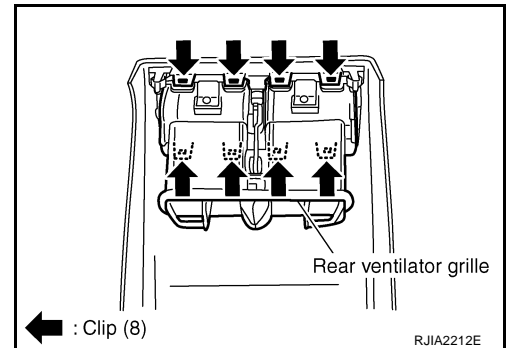


3. Remove cluster lid A. Refer to [IP-10, "INSTRUMENT PANEL ASSEMBLY"](#) .
4. Remove mounting clips, and then remove side ventilator grille (left).



Removal of Rear Ventilator Grille

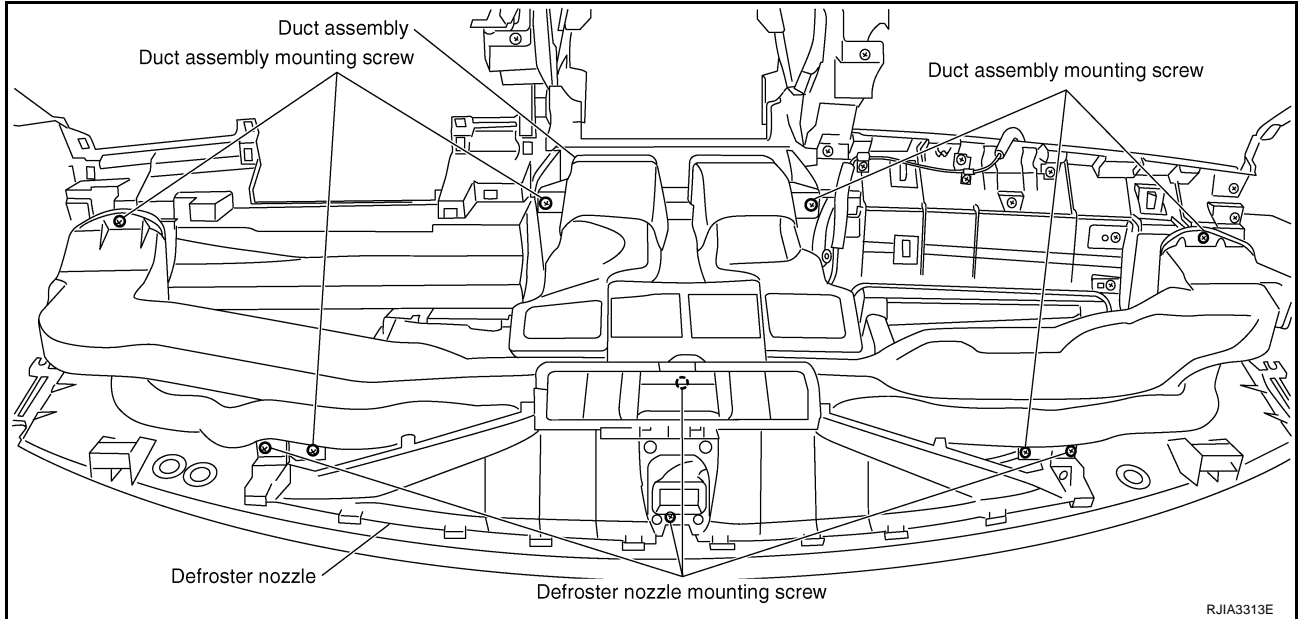
1. Remove console rear cover. Refer to [IP-10, "INSTRUMENT PANEL ASSEMBLY"](#) .
2. Remove mounting clips, and then remove rear ventilator grille.



DUCTS AND GRILLES

Removal of Defroster Nozzle and Duct Assembly

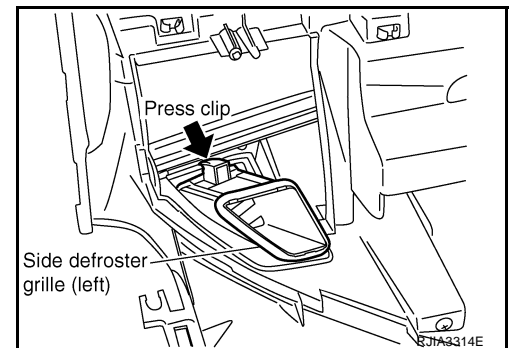
1. Remove instrument panel assembly. Refer to [IP-10, "INSTRUMENT PANEL ASSEMBLY"](#).
2. Remove mounting screws, and then remove defroster nozzle.



3. Remove mounting screws, and then remove duct assembly.

Removal of Side Defroster Grilles

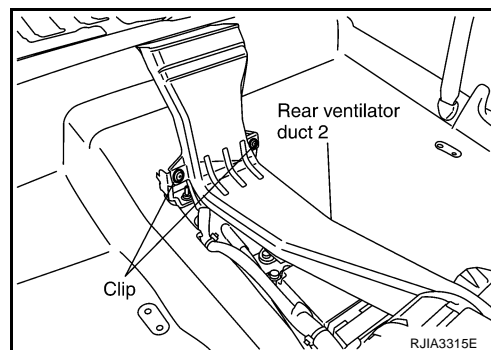
1. Remove duct assembly.
2. Remove side defroster grilles.



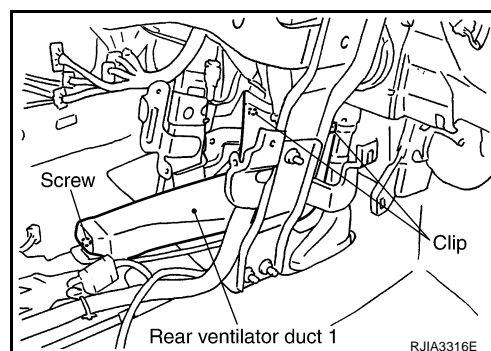
DUCTS AND GRILLES

Removal of Rear Ventilator Ducts

1. Remove center console. Refer to [IP-10, "INSTRUMENT PANEL ASSEMBLY"](#).
2. Remove mounting clips, and then remove rear ventilator duct 2.

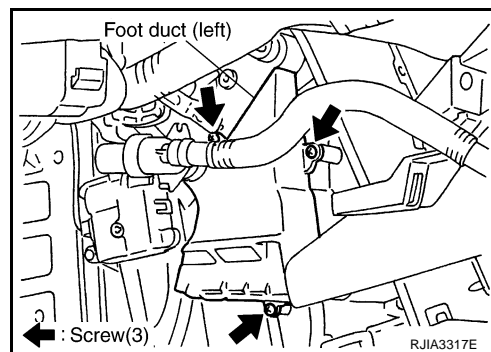


3. Remove mounting clips and screw, and then remove rear ventilator duct 1.

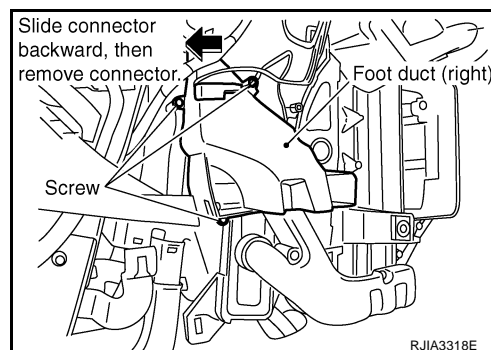


Removal of Foot Ducts

1. Remove instrument driver lower panel. Refer to [IP-10, "INSTRUMENT PANEL ASSEMBLY"](#).
2. Remove instrument lower cover (driver side)
3. Remove mounting screws, and then remove foot duct (left).



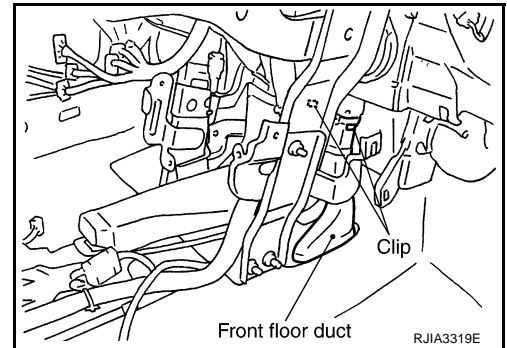
4. Remove blower unit. Refer to [ATC-113, "BLOWER UNIT"](#).
5. Remove intake sensor connector from foot duct.
6. Remove mounting screws, and then remove foot duct (right).



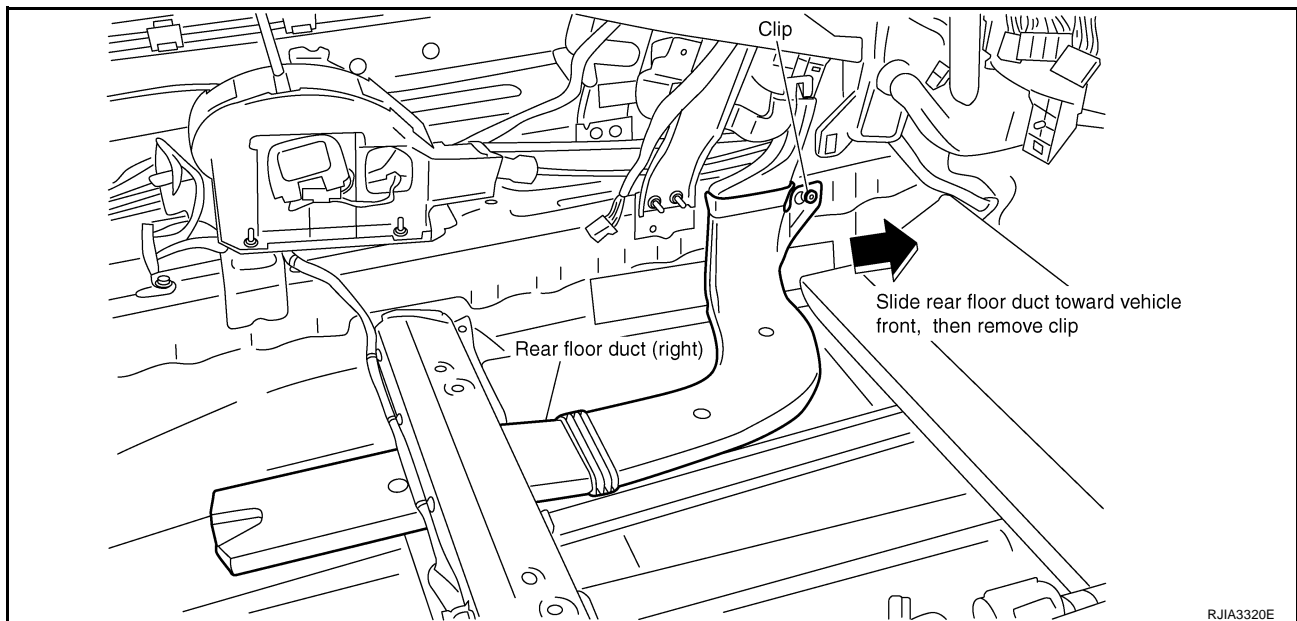
DUCTS AND GRILLES

Removal of Floor Ducts

1. Remove front seats and center console. Refer to [SE-97, "FRONT SEAT"](#) and [IP-10, "INSTRUMENT PANEL ASSEMBLY"](#).
2. Slide front floor duct downward, and then remove it.
3. Remove floor carpet. Refer to [EI-52, "FLOOR TRIM"](#).



4. Remove mounting clips, and then remove floor ducts.



INSTALLATION

Installation is basically the reverse order of removal.

REFRIGERANT LINES

REFRIGERANT LINES

PFP:92600

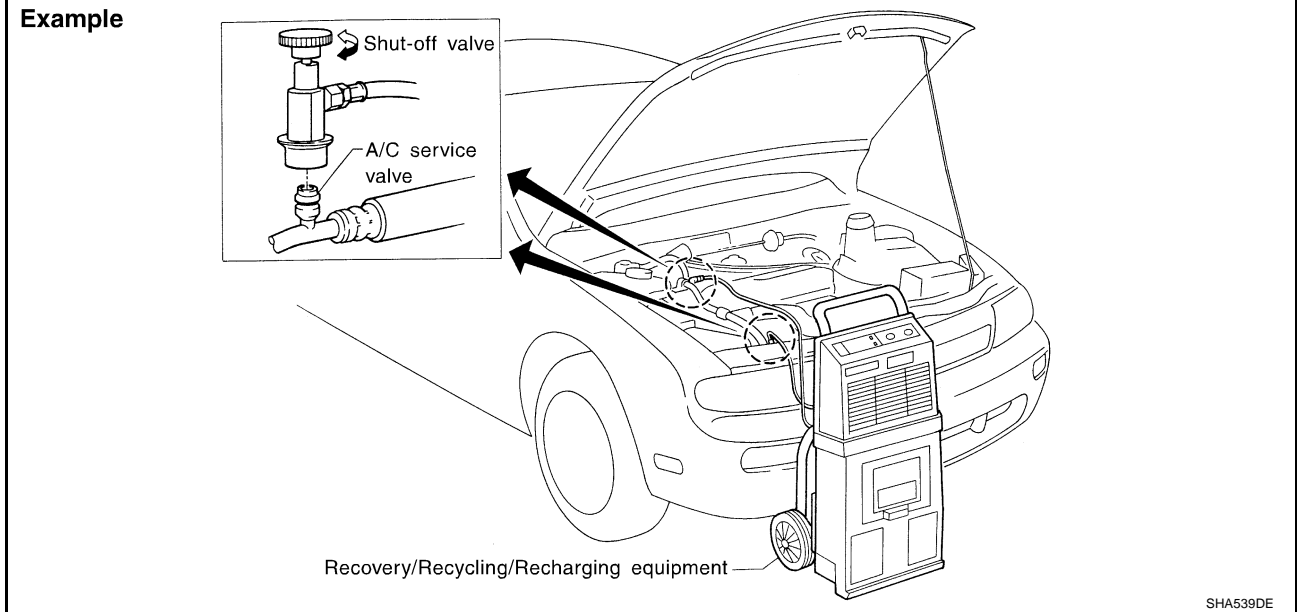
HFC-134a (R-134a) Service Procedure SETTING OF SERVICE TOOLS AND EQUIPMENT

BJS000HN

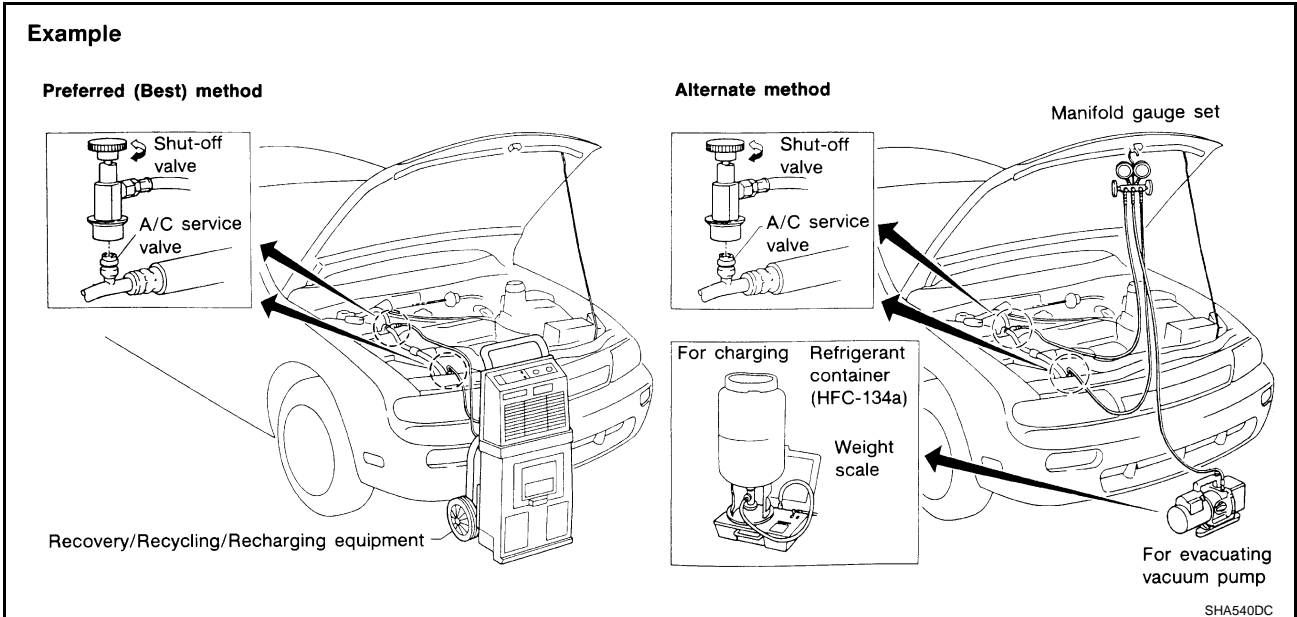
Discharging Refrigerant

WARNING:

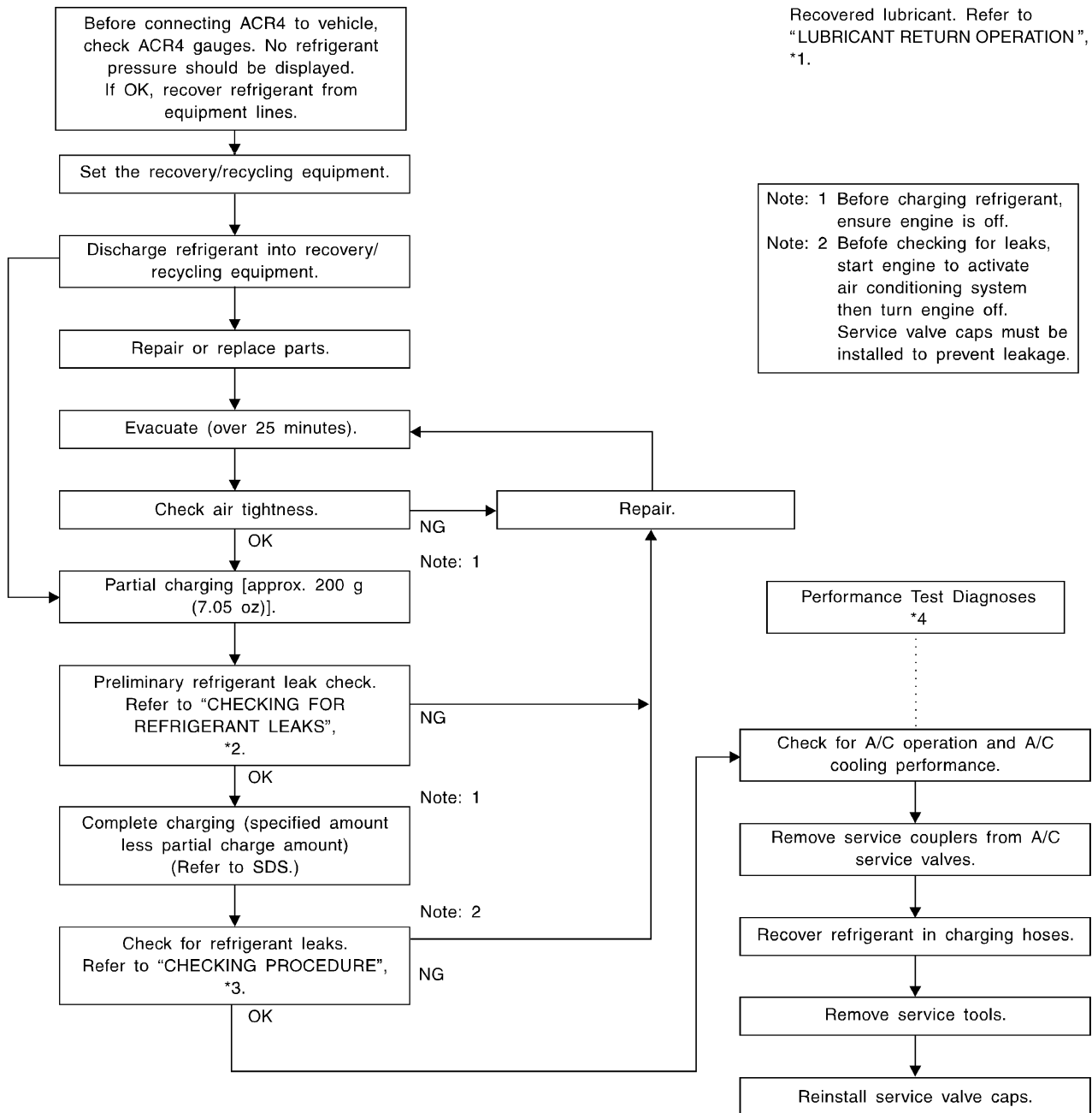
Avoid breathing A/C refrigerant and lubricant vapor or mist. Exposure may irritate eyes, nose and throat. Use only approved recovery/recycling equipment to discharge HFC-134a (R-134a) refrigerant. If accidental system discharge occurs, ventilate work area before resuming service. Additional health and safety information may be obtained from refrigerant and lubricant manufacturers.



Evacuating System and Charging Refrigerant



REFRIGERANT LINES



*1 [ATC-21, "LUBRICANT RETURN OPERATION"](#)

*4 [ATC-85, "PERFORMANCE TEST DIAGNOSIS"](#)

*2 [ATC-146, "Checking for Refrigerant Leaks"](#)

*3 [ATC-148, "CHECKING PROCEDURE"](#)

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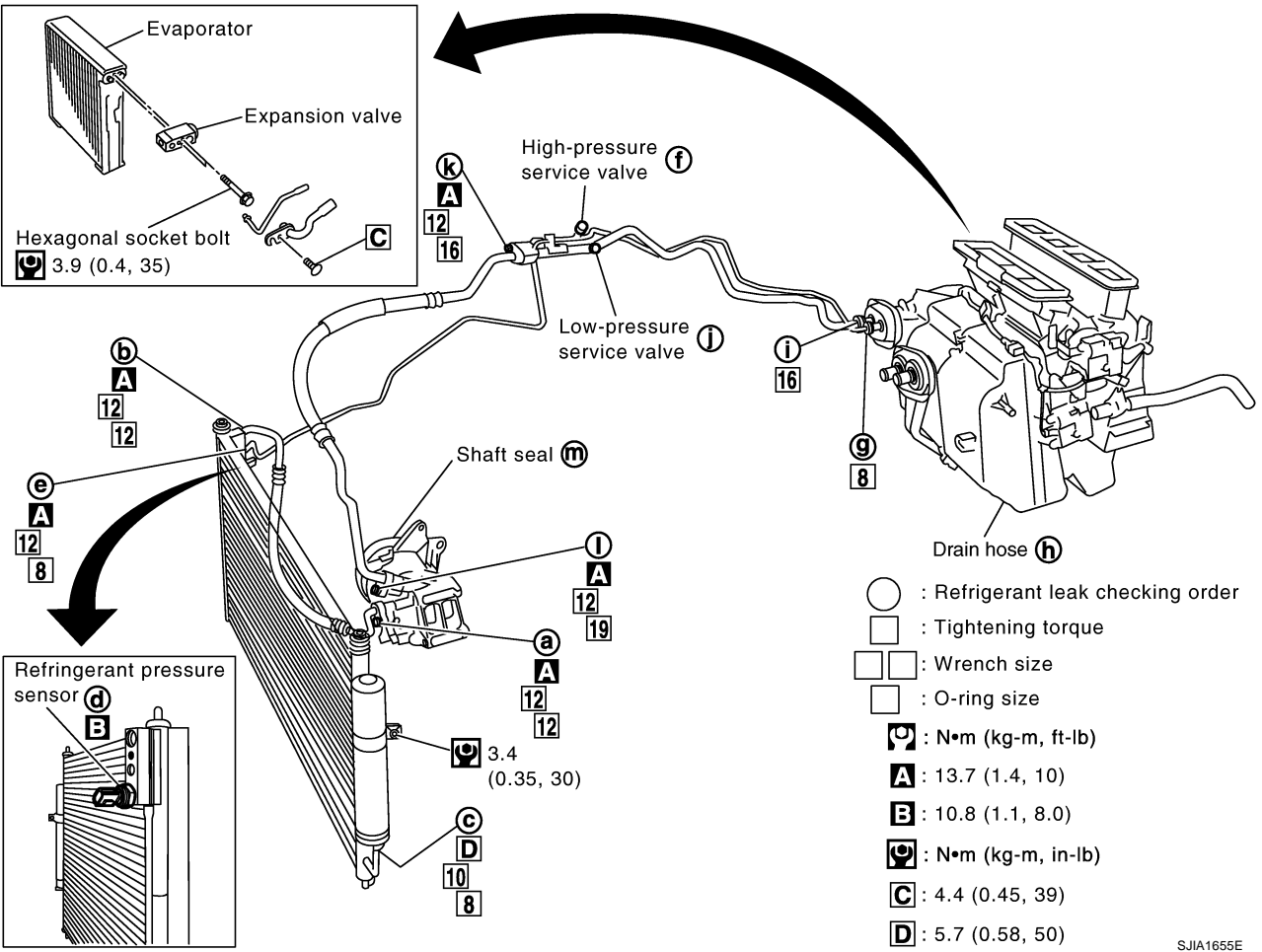
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REFRIGERANT LINES

VQ ENGINE

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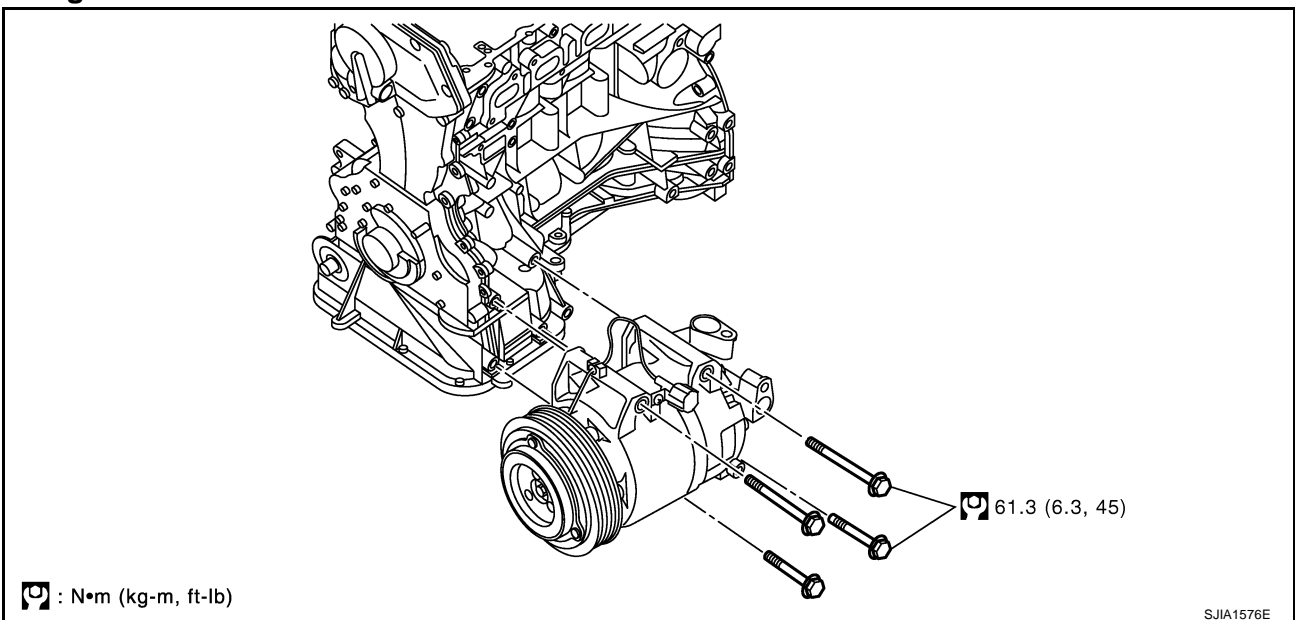
SJIA1655E

Removal and Installation of Compressor

REMOVAL

QR Engine

BJS000HP

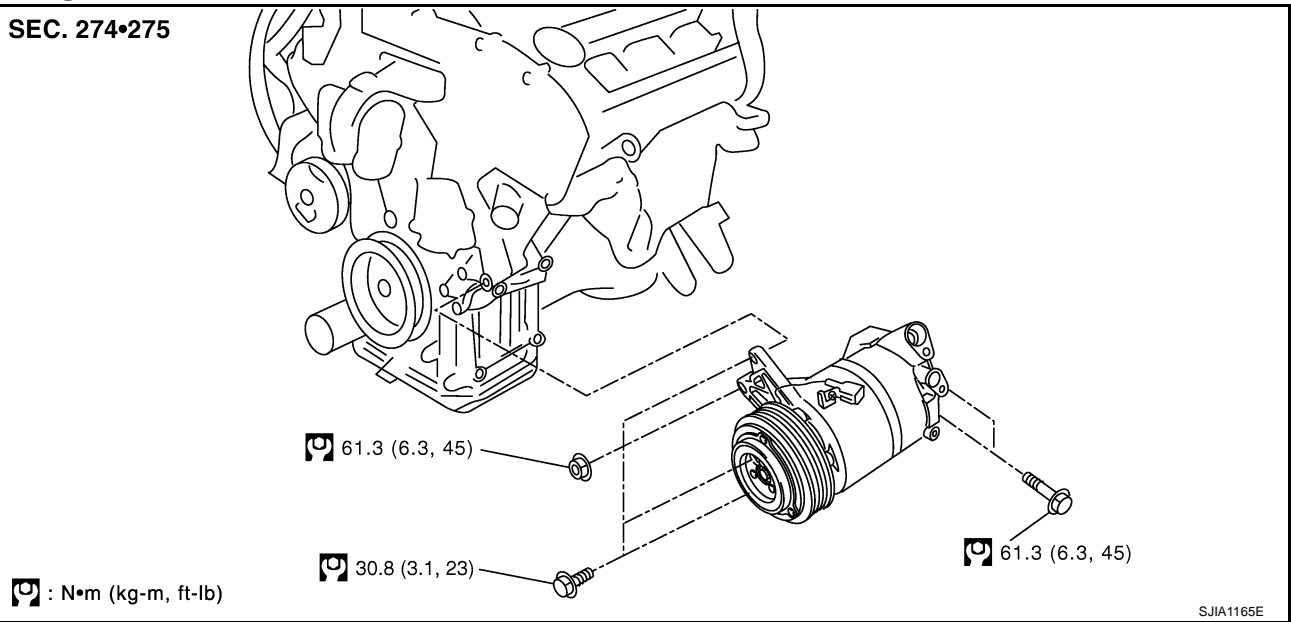


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REFRIGERANT LINES

VQ Engine

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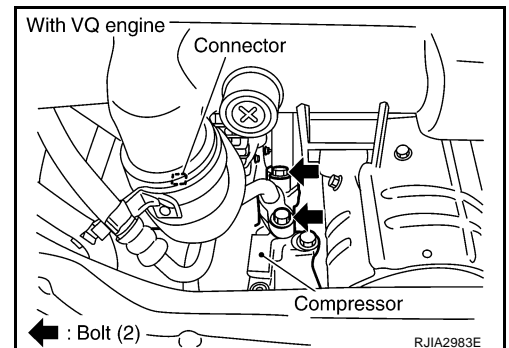


1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
2. Remove engine undercover, using power tools.
3. Remove fender protector (right). Refer to [EI-23, "FENDER PROTECTOR"](#) .
4. Remove A/C compressor belt. Refer to [EM-14, "DRIVE BELTS"](#) (QR engine) or [EM-128, "DRIVE BELTS"](#) (VQ engine).
5. Remove mounting bolts from low-pressure flexible hose and high-pressure flexible hose.

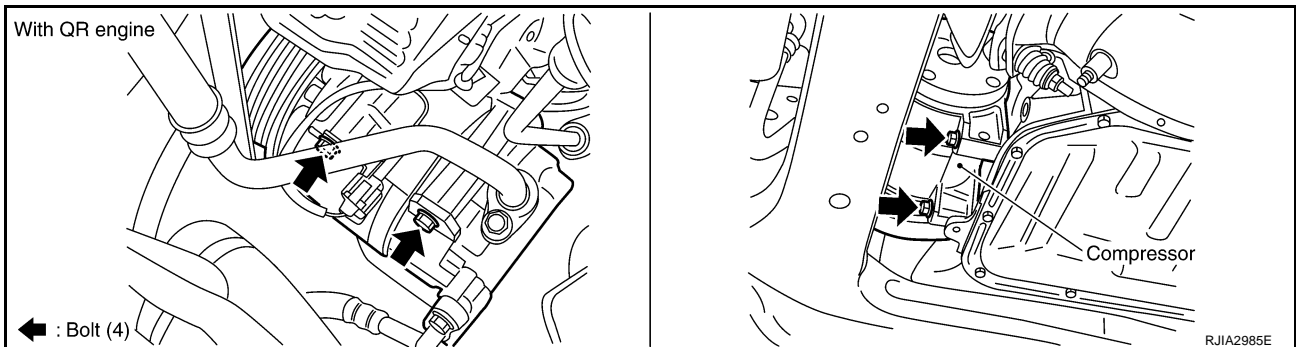
CAUTION:

Cap or wrap the joint of the pipe with suitable material such as vinyl tape to avoid the entry of air.

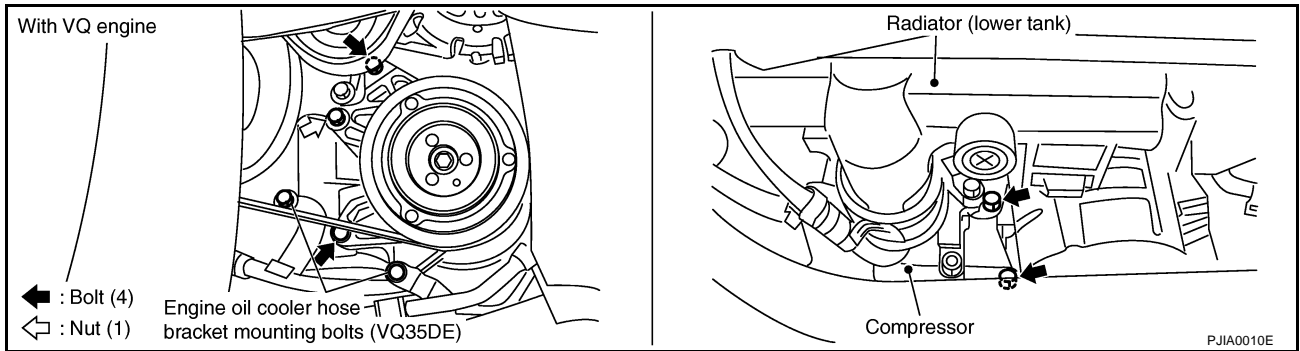
6. Disconnect compressor connector.
7. Remove idler pulley bracket (VQ engine). Refer to [EM-129, "Removal and Installation"](#) .



8. Remove engine oil cooler hose bracket mounting bolts (VQ engine).



REFRIGERANT LINES



9. Remove mounting bolts and nut from compressor, using power tools.

10. Remove compressor from right side of the vehicle.

INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

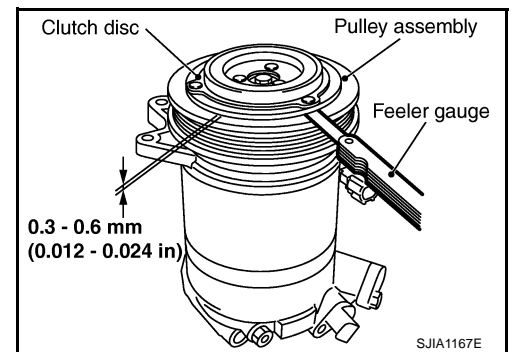
- Replace O-rings of low-pressure flexible hose and high-pressure flexible hose with new ones, and then apply compressor oil to it when installing it.
- When recharging refrigerant, check for leaks.

Check Disc to Pulley Clearance

Check clearance around the entire periphery of clutch disc.

Disc to pulley clearance : 0.3 - 0.6 mm (0.012 - 0.024 in)

If specified clearance is not obtained, replace compressor.



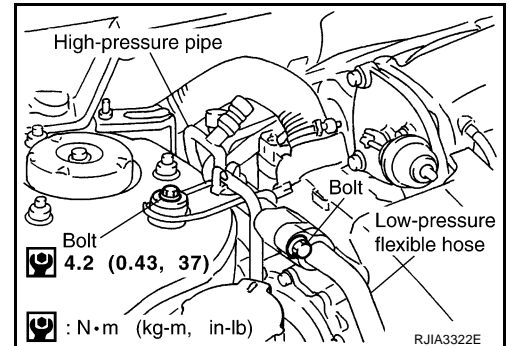
REFRIGERANT LINES

Removal and Installation of Low-pressure Flexible Hose and Low-pressure Pipe

BJS000HR

1 REMOVAL

1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
2. Remove extension cowl top lower panel. Refer to [EI-21, "COWL TOP"](#).
3. Remove mounting bolts and clips.

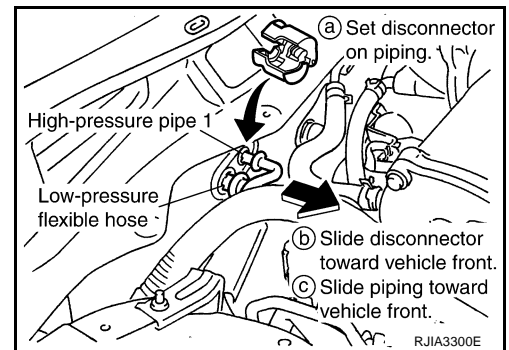


4. Disconnect one-touch joints of low-pressure flexible hose and low-pressure pipe 1.
- a. Set a disconnecter [high-pressure side (SST: 9253089908), low-pressure side (SST: 9253089916)] on A/C piping.
- b. Slide a disconnecter toward vehicle front until it clicks.
- c. Slide A/C piping toward vehicle front and disconnect it.

CAUTION:

Cap or wrap the joint of the pipe with suitable material such as vinyl tape to avoid the entry of air.

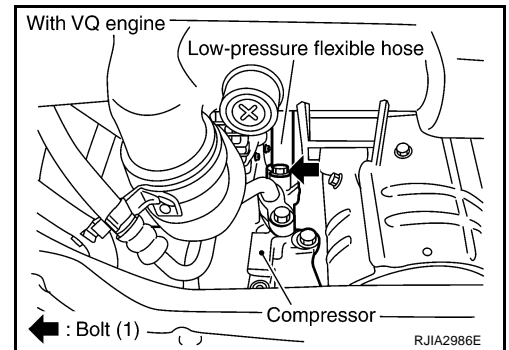
5. Remove low-pressure pipe 1 (VQ engine).



6. Remove mounting bolt from low-pressure flexible hose.
7. Remove low-pressure flexible hose.

CAUTION:

Cap or wrap the joint of the pipe with suitable material such as vinyl tape to avoid the entry of air.



INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

- Replace O-rings of A/C piping with new ones, and then apply compressor oil to it when installing it.
- Female-side piping connection is thin and easy to deform. Slowly insert the male-side piping straight in axial direction.
- Insert piping securely until a click is heard.
- After piping connection is completed, pull male-side piping by hand to make sure that connection does not come loose.
- When recharging refrigerant, check for leaks.

REFRIGERANT LINES

Removal and Installation of High-pressure Flexible Hose

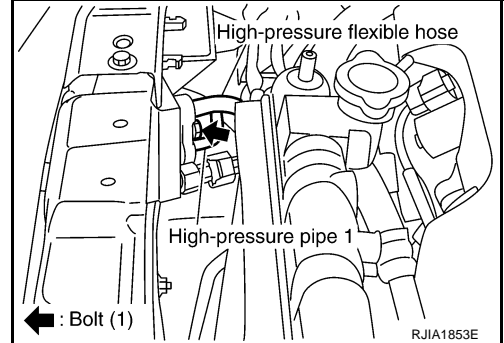
BJS000HS

REMOVAL

1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
2. Remove mounting bolt from high-pressure flexible hose (condenser side).

CAUTION:

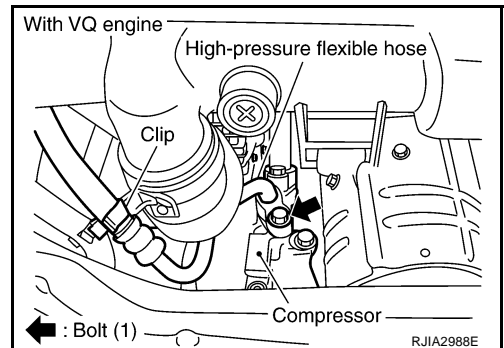
Cap or wrap the joint of the pipe with suitable material such as vinyl tape to avoid the entry of air.



3. Remove mounting bolt from high-pressure flexible hose (compressor side), and then remove high-pressure flexible hose.

CAUTION:

Cap or wrap the joint of the pipe with suitable material such as vinyl tape to avoid the entry of air.



INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

- Replace O-rings of A/C piping with new ones, and then apply compressor oil to it when installing it.
- When recharging refrigerant, check for leaks.

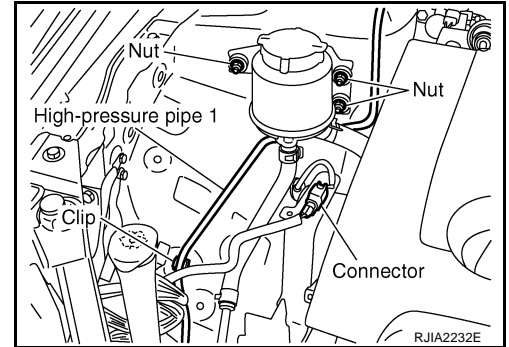
REFRIGERANT LINES

Removal and Installation of High-pressure Pipe 1 (Engine Compartment)

BJS000HT

REMOVAL

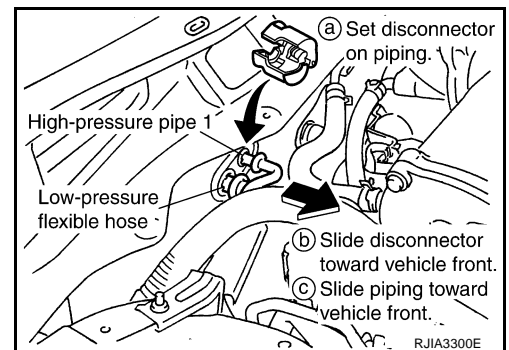
1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
2. Remove extension cowl top lower panel. Refer to [EI-21, "COWL TOP"](#).
3. Remove low-pressure flexible hose and low-pressure pipe 1 (VQ engine). Refer to [ATC-137, "Removal and Installation of Low-pressure Flexible Hose and Low-pressure Pipe 1"](#).
4. Remove radiator reservoir tank. Refer to [CO-13, "RADIATOR"](#) (QR engine) or [CO-37, "RADIATOR"](#) (VQ engine).
5. Remove IPDM E/R. Refer to [PG-28, "Removal and Installation of IPDM E/R"](#).
6. Remove power steering oil reservoir tank mounting nuts.
7. Remove vehicle harness connector from bracket.
8. Remove high-pressure pipe 1 from clips.
9. Remove high-pressure flexible hose from vehicle clips.



10. Disconnect one-touch joints of high-pressure pipe 1.
 - a. Set a disconnecter (SST: 9253089908) on A/C piping.
 - b. Slide a disconnecter toward vehicle front until it clicks.
 - c. Slide A/C piping toward vehicle front and disconnect it.

CAUTION:

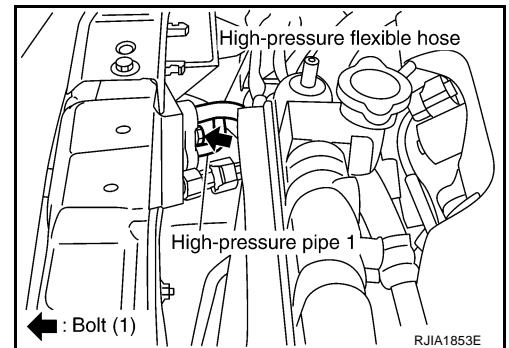
Cap or wrap the joint of the pipe with suitable material such as vinyl tape to avoid the entry of air.



11. Remove mounting bolt, and then remove high-pressure pipe 1.

CAUTION:

Cap or wrap the joint of the pipe with suitable material such as vinyl tape to avoid the entry of air.



INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

- Replace O-rings of A/C piping with new ones, and then apply compressor oil to it when installing it.
- Female-side piping connection is thin and easy to deform. Slowly insert the male-side piping straight in axial direction.
- Insert piping securely until a click is heard.
- After piping connection is completed, pull male-side piping by hand to make sure that connection does not come loose.
- When recharging refrigerant, check for leaks.

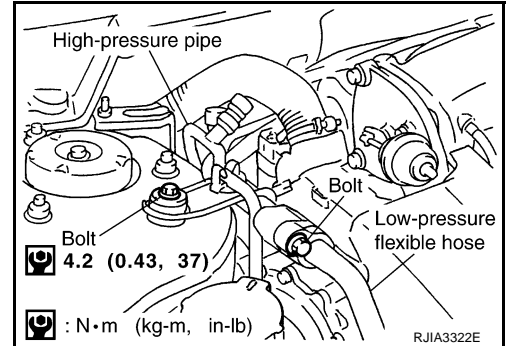
REFRIGERANT LINES

Removal and Installation of Low-pressure Pipe 2 and High-pressure Pipe 2

BJS000HU

REMOVAL

1. Set the temperature (passenger side) at 18°C, and then disconnect the battery cable from the negative terminal.
2. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
3. Remove extension cowl top lower panel. Refer to [EI-21, "COWL TOP"](#).
4. Remove mounting bolt from low-pressure pipe 1 bracket.
5. Remove high-pressure pipe 1 from vehicle clips.

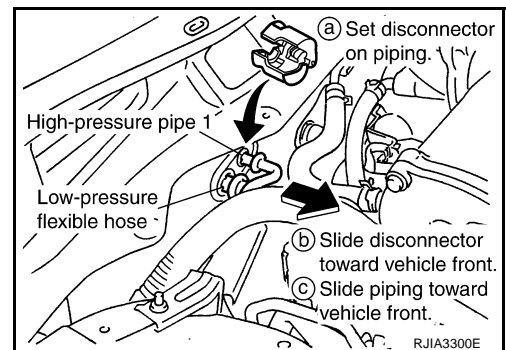


6. Disconnect one-touch joints of low-pressure pipe 1, and high-pressure pipe 1.
 - a. Set a disconnecter [high-pressure side (SST: 9253089908), low-pressure side (SST: 9253089916)] on A/C piping.
 - b. Slide a disconnecter toward vehicle front until it clicks.
 - c. Slide A/C piping toward vehicle front and disconnect it.

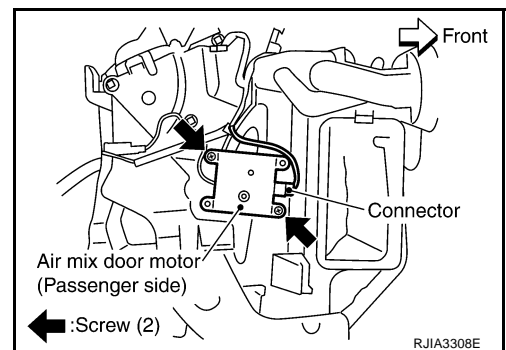
CAUTION:

Cap or wrap the joint of the pipe with suitable material such as vinyl tape to avoid the entry of air.

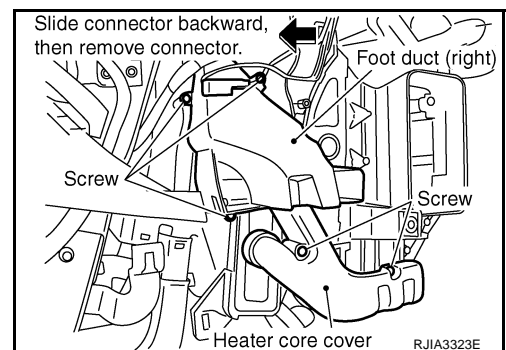
7. Remove blower unit. Refer to [ATC-113, "BLOWER UNIT"](#).



8. Remove mounting screws, and then remove air mix door motor (passenger side).
9. Disconnect air mix door motor connector.

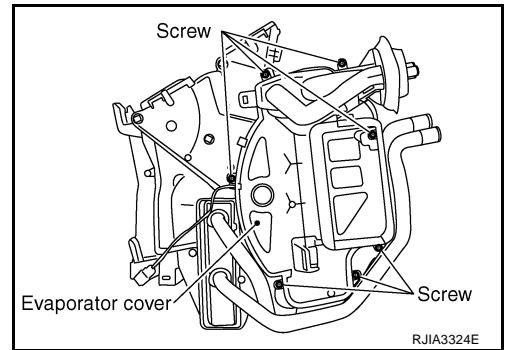


10. Remove intake sensor connector from foot duct (right).
11. Remove mounting screws, and then remove foot duct (right).
12. Remove mounting screws, and then remove heater core cover.



REFRIGERANT LINES

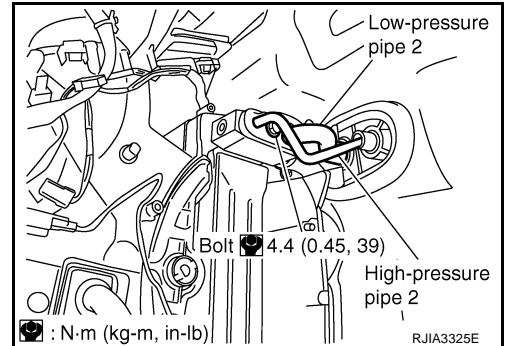
13. Remove mounting screws, and then remove evaporator cover.



14. Remove mounting bolt, and then remove low-pressure pipe 2 and high-pressure pipe 2.

CAUTION:

Cap or wrap the joint of the pipe with suitable material such as vinyl tape to avoid the entry of air.



INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

- Replace O-rings of A/C piping with new ones, and then apply compressor oil to it when installing it.
- Female-side piping connection is thin and easy to deform. Slowly insert the male-side piping straight in axial direction.
- Insert piping securely until a click is heard.
- After piping connection is completed, pull male-side piping by hand to make sure that connection does not come loose.
- When recharging refrigerant, check for leaks.

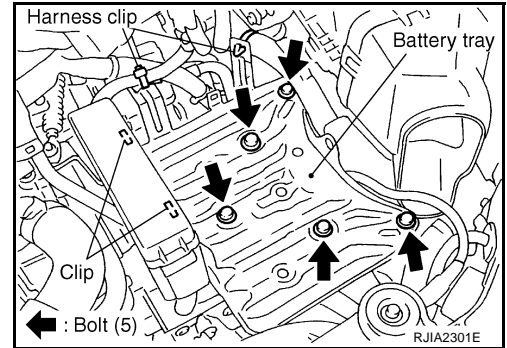
REFRIGERANT LINES

BJS000HV

Removal and Installation of Condenser

REMOVAL

1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
2. Remove air duct (inlet). Refer to [EM-17, "AIR CLEANER AND AIR DUCT"](#) (QR engine) or [EM-131, "AIR CLEANER AND AIR DUCT"](#) (VQ engine).
3. Remove front grille. Refer to [EI-20, "FRONT GRILLE"](#) .
4. Remove battery. Refer to [SC-4, "BATTERY"](#) .
5. Remove mounting bolts, and then remove battery tray.

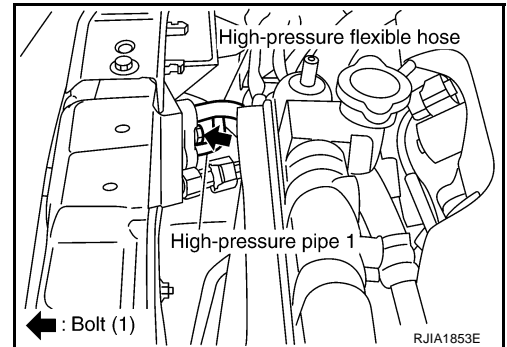


6. Remove mounting bolt from high-pressure flexible hose and high-pressure pipe1.
7. Disconnect high-pressure flexible hose and high-pressure pipe 1 from condenser.

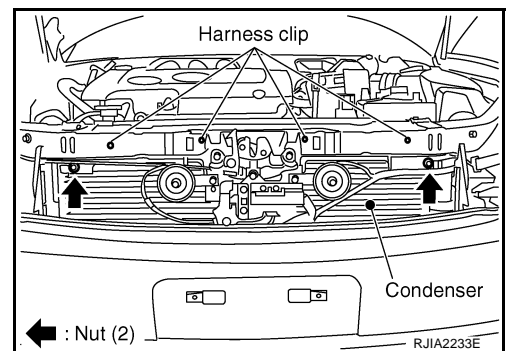
CAUTION:

Cap or wrap the joint of the pipe with suitable material such as vinyl tape to avoid the entry of air.

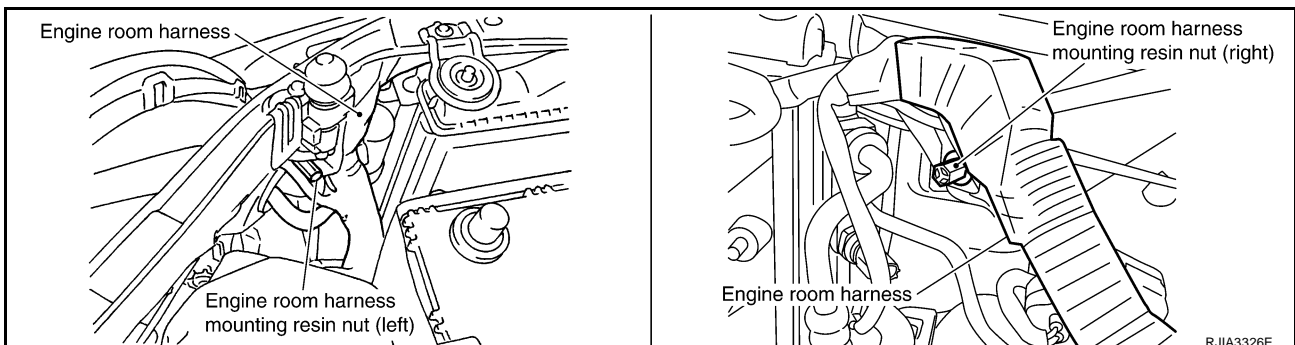
8. Disconnect refrigerant pressure sensor connector.



9. Remove mounting bolts from condenser.
10. Remove condenser bracket.
11. Remove engine room harness clips from radiator core upper support.



12. Remove engine room harness mounting resin nuts.



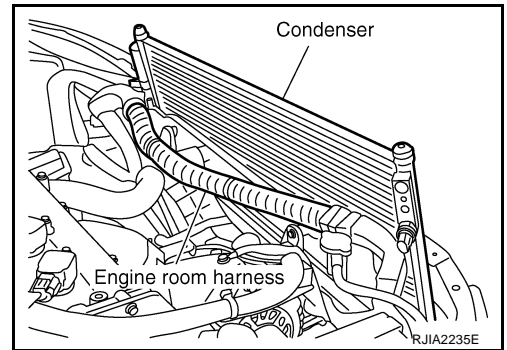
13. Remove radiator upper mount.

REFRIGERANT LINES

14. Move engine room harness backward.
15. Remove condenser between radiator and radiator core support.

CAUTION:

Be careful not to damage core surface of condenser and the radiator.



INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

- Replace O-rings of A/C piping with new ones, and then apply compressor oil to it when installing it.
- When recharging refrigerant, check for leaks.

Condenser mounting nut

 : 6.1 N·m (0.62 kg-m, 54 in-lb)

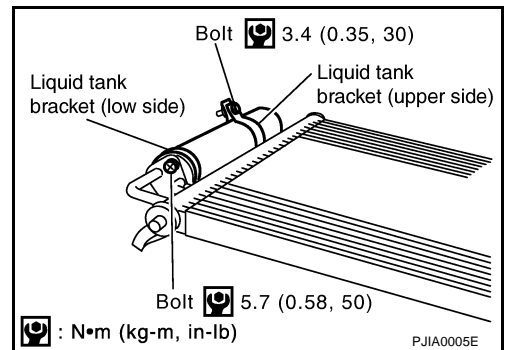
Removal and Installation of Liquid Tank REMOVAL

1. Remove condenser. Refer to [ATC-142, "Removal and Installation of Condenser"](#).
2. Clean liquid tank and its surrounding area, and remove dirt and rust from liquid tank.

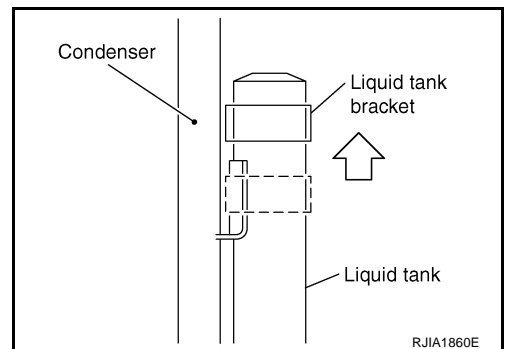
CAUTION:

Be sure to clean carefully.

3. Remove mounting bolt from liquid tank.



4. Lift liquid tank bracket upward. Remove liquid tank bracket from protruding part of condenser.
5. Slide liquid tank upward, and then remove liquid tank.



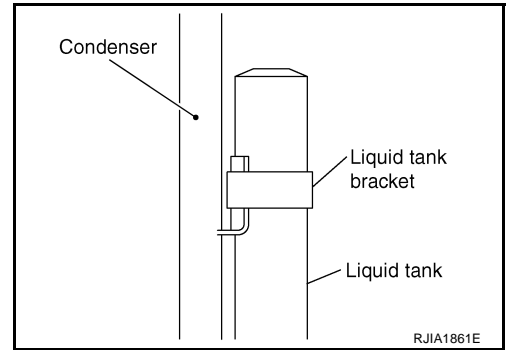
REFRIGERANT LINES

INSTALLATION

Install liquid tank, and then install liquid tank bracket on condenser.

CAUTION:

- Make sure liquid tank bracket is securely installed at protrusion of condenser. (Make sure liquid tank bracket does not move to a position below center of liquid tank.)
- Replace O-rings of A/C piping with new ones, and then apply compressor oil to it when installing it.
- When recharging refrigerant, check for leaks.



Removal and Installation of Refrigerant Pressure Sensor

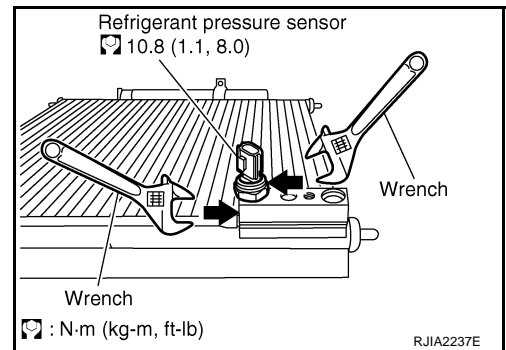
BJS000HX

REMOVAL

1. Remove condenser. Refer to [ATC-142, "Removal and Installation of Condenser"](#).
2. Remove refrigerant pressure sensor from condenser.

CAUTION:

When working, be careful not to damage the condenser fins.



INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

Apply compressor oil to O-ring of refrigerant pressure sensor when installing it.

Removal and Installation of Evaporator

BJS000HY

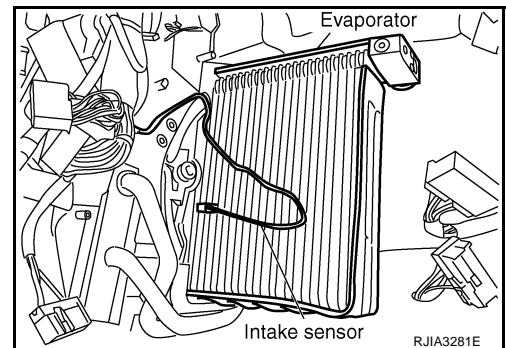
REMOVAL

1. Remove low-pressure pipe 2 and high-pressure pipe 2. Refer to [ATC-140, "Removal and Installation of Low-pressure Pipe 2 and High-pressure Pipe 2"](#).

CAUTION:

Cap or wrap the joint of the pipe with suitable material such as vinyl tape to avoid the entry of air.

2. Slide evaporator, and then remove it from heater & cooling unit assembly.
3. Remove intake sensor from evaporator, and then remove evaporator.



REFRIGERANT LINES

INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

- Replace O-rings of A/C piping with new ones, and then apply compressor oil to it when installing it.
- Female-side piping connection is thin and easy to deform. Slowly insert the male-side piping straight in axial direction.
- Insert piping securely until a click is heard.
- After piping connection is completed, pull male-side piping by hand to make sure that connection does not come loose.
- O-rings are different from low-pressure pipe 1 (high-pressure pipe 2) and low-pressure pipe 2 (high-pressure pipe 3).
- Mark the mounting position of intake sensor bracket prior to removal so that the reinstalled sensor can be located in the same position.
- When recharging refrigerant, check for leaks.

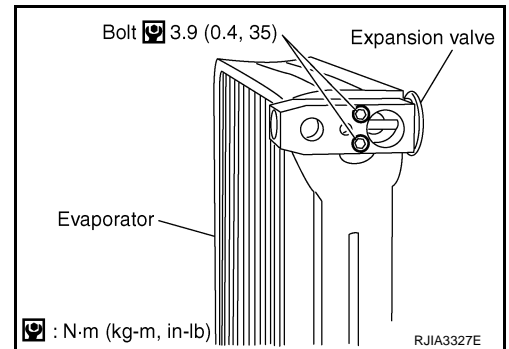
Removal and Installation of Expansion Valve

REMOVAL

1. Remove evaporator. Refer to [ATC-144, "Removal and Installation of Evaporator"](#) .
2. Remove mounting bolts, and then remove expansion valve.

CAUTION:

Cap or wrap the joint of the pipe with suitable material such as vinyl tape to avoid the entry of air.



INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

- Replace O-rings of evaporator with new ones, and then apply compressor oil to it when installing it.
- O-rings are different from low-pressure pipe 1 (high-pressure pipe 1) and low-pressure pipe 2 (high-pressure pipe 2).
- When recharging refrigerant, check for leaks.

REFRIGERANT LINES

Checking for Refrigerant Leaks

BJS000JF

Perform a visual inspection of all refrigeration parts, fittings, hoses and components for signs of A/C lubricant leakage, damage and corrosion. A/C lubricant leakage may indicate an area of refrigerant leakage. Allow extra inspection time in these areas when using either an electrical leak detector or fluorescent dye leak detector (SST: J-42220).

If dye is observed, confirm the leak with an electrical leak detector. It is possible a prior leak was repaired and not properly cleaned.

When searching for leaks, do not stop when one leak is found but continue to check for additional leaks at all system components and connections.

When searching for refrigerant leaks using an electrical leak detector, move the probe along the suspected leak area at 1 to 2 inches per second and no further than 1/4 inch from the component.

CAUTION:

Moving the electrical leak detector probe slower and closer to the suspected leak area will improve the chances of finding a leak.

Checking System for Leaks Using the Fluorescent Leak Detector

BJS000JG

1. Check A/C system for leaks using the UV lamp and safety goggles (SST: J-42220) in a low sunlight area (area without windows preferable). Illuminate all components, fittings and lines. The dye will appear as a bright green/yellow area at the point of leakage. Fluorescent dye observed at the evaporator drain opening indicates an evaporator core assembly (tubes, core or expansion valve) leak.
2. If the suspected area is difficult to see, use an adjustable mirror or wipe the area with a clean shop rag or cloth, with the UV lamp for dye residue.
3. After the leak is repaired, remove any residual dye using dye cleaner (SST: J-43872) to prevent future misdiagnosis.
4. Perform a system performance check and verify the leak repair with an approved electrical leak detector.

NOTE:

Other gases in the work area or substances on the A/C components, for example, anti-freeze, windshield washer fluid, solvents and lubricants, may falsely trigger the leak detector. Make sure the surfaces to be checked are clean.

Clean with a dry cloth or blow off with shop air.

Do not allow the sensor tip of the detector to contact with any substance. This can also cause false readings and may damage the detector.

Dye Injection

BJS000JH

(This procedure is only necessary when recharging the system or when the compressor has seized and was replaced.)

1. Check A/C system static (at rest) pressure. Pressure must be at least 345 kPa (3.45 bar, 3.52 kg/cm², 50 psi).
2. Pour one bottle (1/4 ounce / 7.4 cc) of the A/C refrigerant dye into the injector tool (SST: J-41459).
3. Connect the injector tool to the A/C low-pressure side service valve.
4. Start engine and switch A/C ON.
5. When the A/C operating (compressor running), inject one bottle (1/4 ounce / 7.4 cc) of fluorescent dye through the low-pressure service valve using dye injector tool (SST: J-41459) (refer to the manufacture's operating instructions).
6. With the engine still running, disconnect the injector tool from the service valve.

CAUTION:

Be careful the A/C system or replacing a component, pour the dye directly into the open system connection and proceed with the service procedures.

7. Operate the A/C system for a minimum of 20 minutes to mix the dye with the system oil. Depending on the leak size, operating conditions and location of the leak, it may take from minutes to days for the dye to penetrate a leak and become visible.
8. Attach a blue label as necessary.

REFRIGERANT LINES

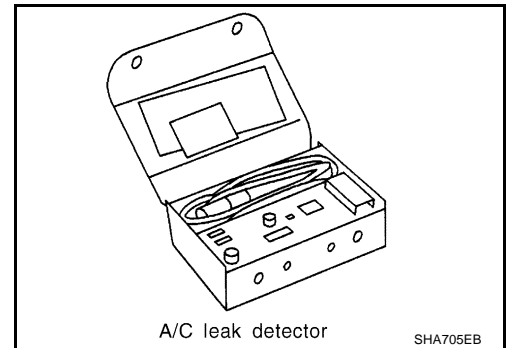
Electrical Leak Detector

PRECAUTIONS FOR HANDLING LEAK DETECTOR

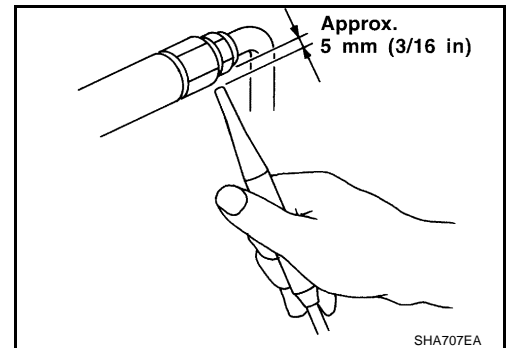
When performing a refrigerant leak check, use an A/C electrical leak detector (SST) or equivalent. Ensure that the instrument is calibrated and set properly per the operating instructions.

The leak detector is a delicate device. In order to use the leak detector properly, read the operating instructions and perform any specified maintenance.

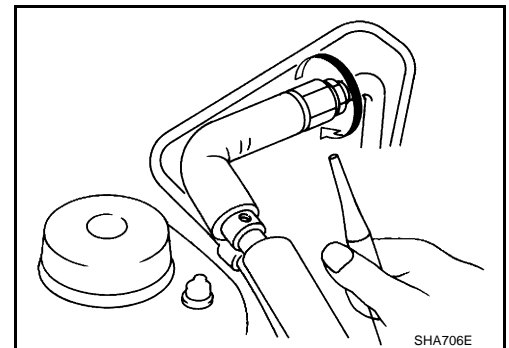
BJ/S000JI



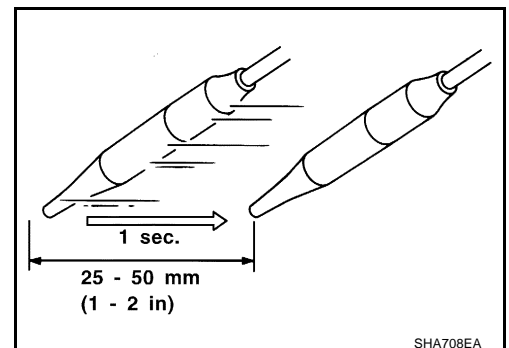
1. Position probe approximately 5 mm (3/16 in) away from point to be checked.



2. When testing, circle each fitting completely with probe.



3. Move probe along component approximately 25 to 50 mm (1 to 2 in)/sec.



REFRIGERANT LINES

CHECKING PROCEDURE

To prevent inaccurate or false readings, make sure there is no refrigerant vapor, shop chemicals, or cigarette smoke in the vicinity of the vehicle. Perform the leak test in calm area (low air/wind movement) so that the leaking refrigerant is not dispersed.

1. Stop the engine.
2. Connect a suitable A/C manifold gauge set (SST) to the A/C service valves.
3. Check if the A/C refrigerant pressure is at least 345 kPa (3.45 bar, 3.52 kg/cm² , 50 psi) above 16°C (61°F). If less than specification, recover/evacuate and recharge the system with the specified amount of refrigerant.

NOTE:

At temperatures below 16°C (61°F), leaks may not be detected since the system may not reach 345 kPa (3.45 bar, 3.52 kg/cm² , 50 psi).

4. Perform the leak test from the high-pressure side (compressor discharge a to evaporator inlet g) to the low-pressure side [evaporator drain hose h to shaft seal l (QR engine) or m (VQ engine)]. Refer to [ATC-133, "Components"](#) . Perform a leak check for the following areas carefully. Clean the component to be checked and move the leak detected probe completely around the connection/component.

Compressor

Check the fitting of high- and low-pressure flexible hoses, relief valve and shaft seal.

Condenser

Check the fitting of high-pressure flexible hose and pipe, refrigerant pressure sensor.

Liquid tank

Check the fitting of refrigerant connection.

Service valves

Check all around the service valves. Ensure service valve caps are secured on the service valves (to prevent leaks).

NOTE:

After removing A/C manifold gauge set from service valves, wipe any residue from valves to prevent any false readings by leak detector.

Cooling unit (Evaporator)

With engine OFF, turn blower fan on "High" for at least 15 seconds to dissipate any refrigerant trace in the cooling unit. Wait a minimum of 10 minutes accumulation time (refer to the manufacturer's recommended procedure for actual wait time) before inserting the leak detector probe into the drain hose.

Keep the probe inserted for at least 10 seconds. Use caution not to contaminate the probe tip with water or dirt that may be in the drain hose.

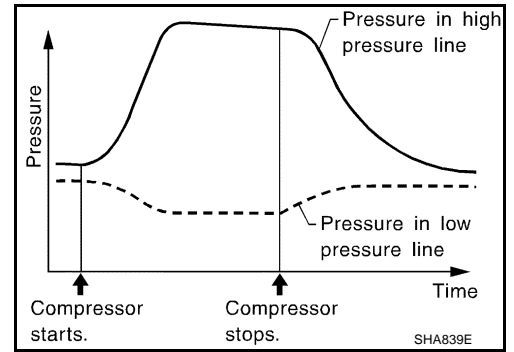
5. If a leak detector detects a leak, verify at least once by blowing compressed air into area of suspected leak, then repeat check as outlined above.
6. Do not stop when one leak is found. Continue to check for additional leaks at all system components. If no leaks are found, perform steps 7 - 10.
7. Start the engine.
8. Set the A/C control as follows;
 - a. A/C switch: ON
 - b. Mode door position: VENT (Ventilation)
 - c. Intake door position: Recirculation
 - d. Temperature setting: Max. cold
 - e. Fan speed: High
9. Run engine at 1,500 rpm for at least 2 minutes.

REFRIGERANT LINES

10. Stop the engine and perform leak check again following steps 4 through 6 above.

Refrigerant leaks should be checked immediately after stopping the engine. Begin with the leak detector at the compressor. The pressure on the high-pressure side will gradually drop after refrigerant circulation stops and pressure on the low-pressure side will gradually rise, as shown in the graph. Some leaks are more easily detected when pressure is high.

11. Before connecting ACR4 to vehicle, check ACR4 gauges. No refrigerant pressure should be displayed. If pressure is displayed, recover refrigerant from equipment lines.
12. Discharge A/C system using approved refrigerant recovery equipment. Repair the leaking fitting or component if necessary.
13. Evacuate and recharge A/C system and perform the leak test to confirm no refrigerant leaks.
14. Perform A/C performance test to ensure system works properly.



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ATC

SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

Compressor

BJS00014

Model	ZEXEL VALEO CLIMATE CONTROL make DKS-17D
Type	Swash plate
Displacement cm ³ (cu in)/rev	175 (10.7)
Cylinder bore × stroke mm (in)	30.5 (1.20) × 24.0 (0.94)
Direction of rotation	Clockwise (viewed from drive end)
Drive belt	Poly V

Lubricant

BJS00015

Model	ZEXEL VALEO CLIMATE CONTROL make DKS-17D
Name	Nissan A/C System Oil Type S (DH-PS)
Capacity mℓ (Imp fl oz)	Total in system 150 (5.3)
	Compressor (Service part) charging amount 150 (5.3)

Refrigerant

BJS00016

Type	HFC-134a (R-134a)
Capacity kg (lb)	0.5 (1.1)

Engine Idling Speed

BJS00017

Refer to [EC-45, "Idle Speed and Ignition Timing Check"](#) (QR engine) or [EC-387, "Idle Speed and Ignition Timing Check"](#) (VQ engine).

Belt Tension

BJS00018

Refer to [EM-14, "DRIVE BELTS"](#) (QR engine) or [EM-128, "DRIVE BELTS"](#) (VQ engine).