SECTION ATC
AUTOMATIC AIR CONDITIONER

CONTENTS

PRECAUTIONS

PFP:00001

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

NJS000D2

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

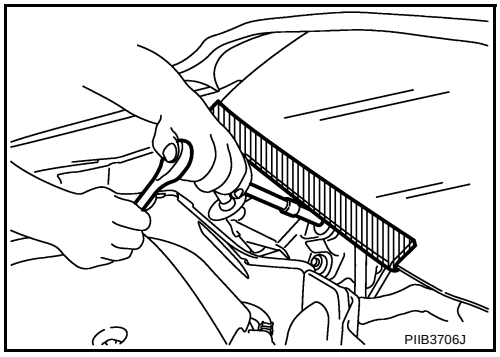
NJS000D3

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

Precautions for Procedures without Cowl Top Cover

NJS000CP

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



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

NJS00003

CAUTION:

- **CFC-12 (R-12) refrigerant and HFC-134a (R-134a) refrigerant are not compatible. If the refrigerants are mixed and compressor malfunction is likely to occur, refer to "CONTAMINATED REFRIGERANT" below. To determine the purity of HFC-134a (R-134a) in the vehicle and recovery tank, use Refrigerant Recovery/Recycling Recharging equipment and Refrigerant Identifier.**
- **Use only specified lubricant for the HFC-134a (R-134a) A/C system and HFC-134a (R-134a) components. 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:**
  - **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.**
  - **Avoid breathing A/C refrigerant and lubricant vapor or mist. Exposure may irritate eyes, nose and throat. Remove HFC-134a (R-134a) from the A/C system, using certified service equipment meeting requirements of SAE J-2210 [HFC-134a (R-134a) recycling equipment], or J-2209 [HFC-134a (R-134a) recovery equipment]. 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 allow lubricant (Nissan A/C System Oil Type S) to come in contact with styrofoam parts. Damage may result.**

CONTAMINATED REFRIGERANT

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

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

General Refrigerant Precautions

NJS00004

WARNING:

- **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 (125°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

NJS00006

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

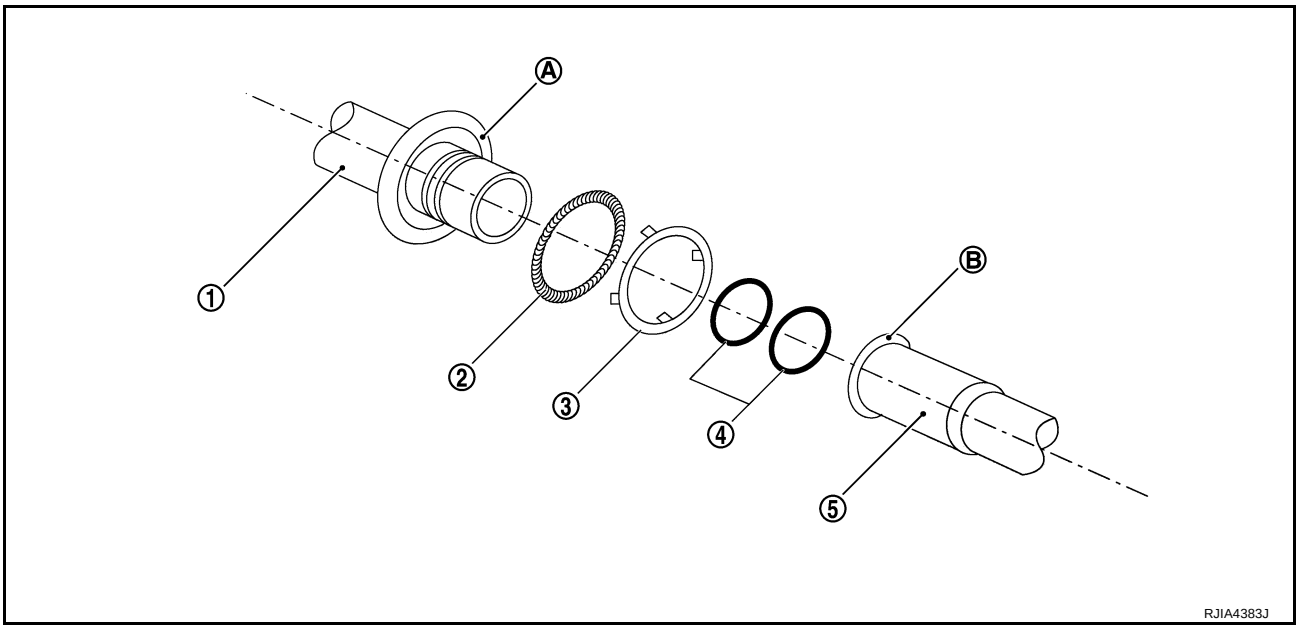
- Expansion valve to evaporator
- Refrigerant pressure sensor to liquid tank

ABOUT ONE-TOUCH JOINT

Description

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

COMPONENT PARTS



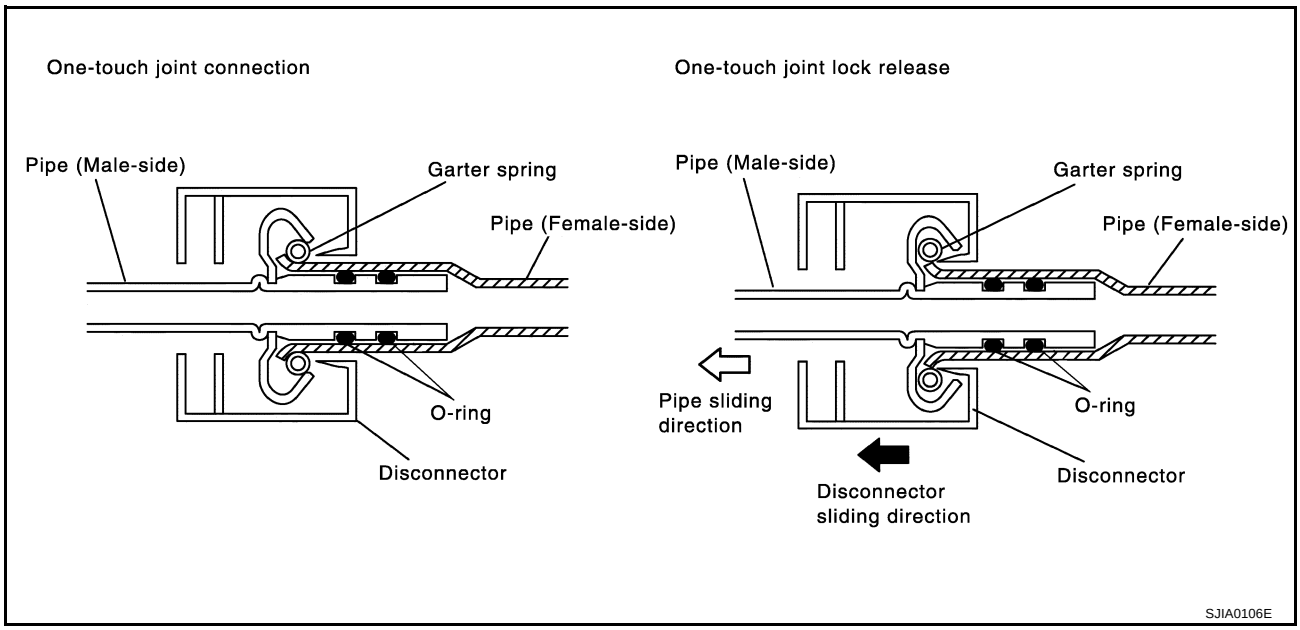
FUNCTIONS OF COMPONENT PARTS

1	Pipe (Male side)	● 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)	● Seals connection by compressing O-rings (4). ● Anchors piping connection using flare (B) and garter spring (2).

NOTE:

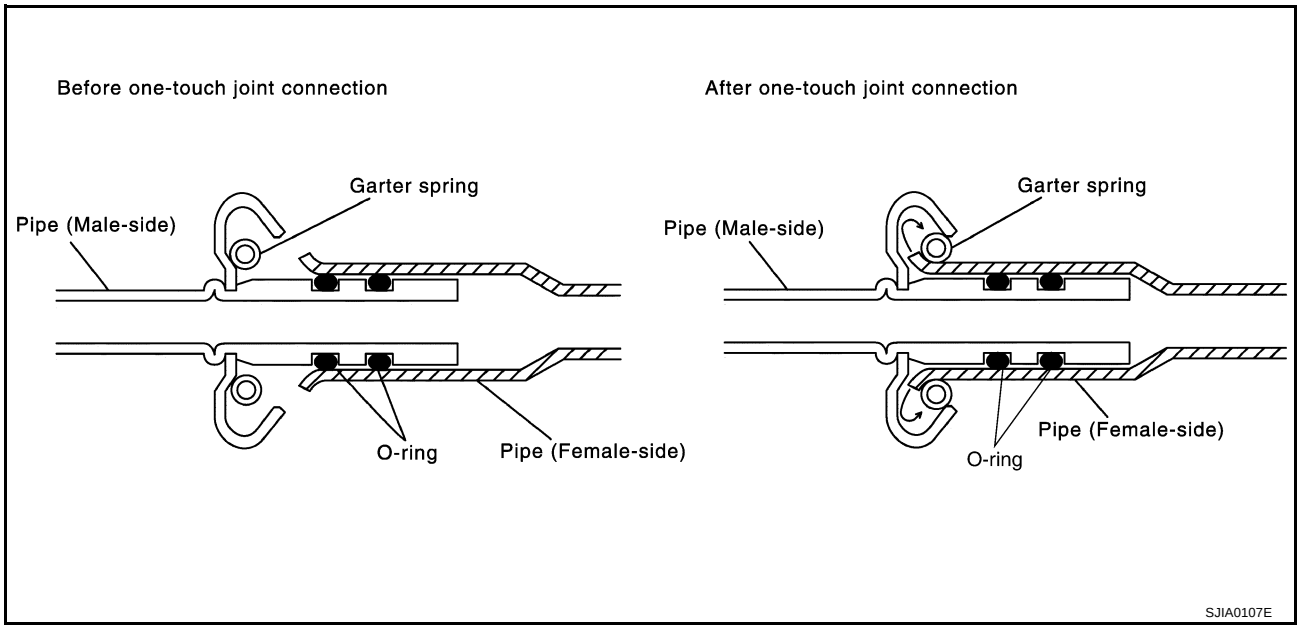
- Garter spring (2) cannot be removed from cage (A) of male-side piping.
- Indicator ring (3) remains near piping connection point, however, this is not a malfunction. (This is to check piping connection during factory assembly.)

REMOVAL



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

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 point is thin. So, when inserting male-side piping, take care not to deform female-side piping. Slowly insert it in axial direction.**
   - **Insert piping securely until a click is heard.**

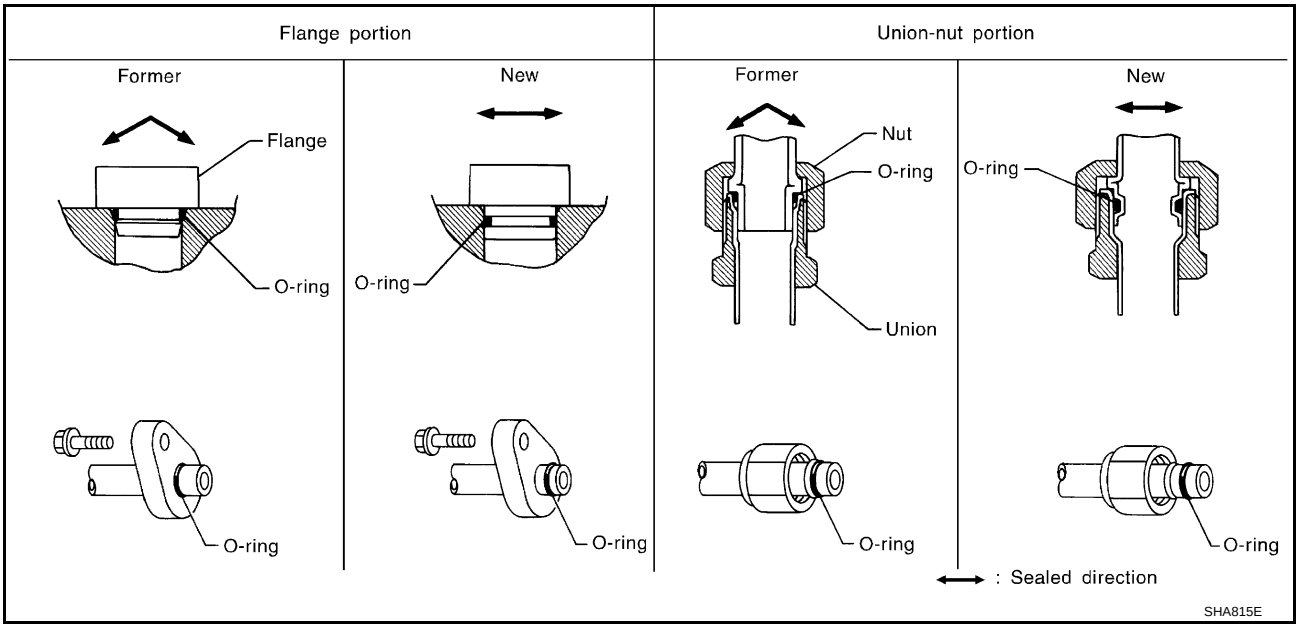
- **After piping connection is completed, pull male-side piping by hand to make sure that connection does not come loose.**

NOTE:
One-touch joint connection is used in points below.

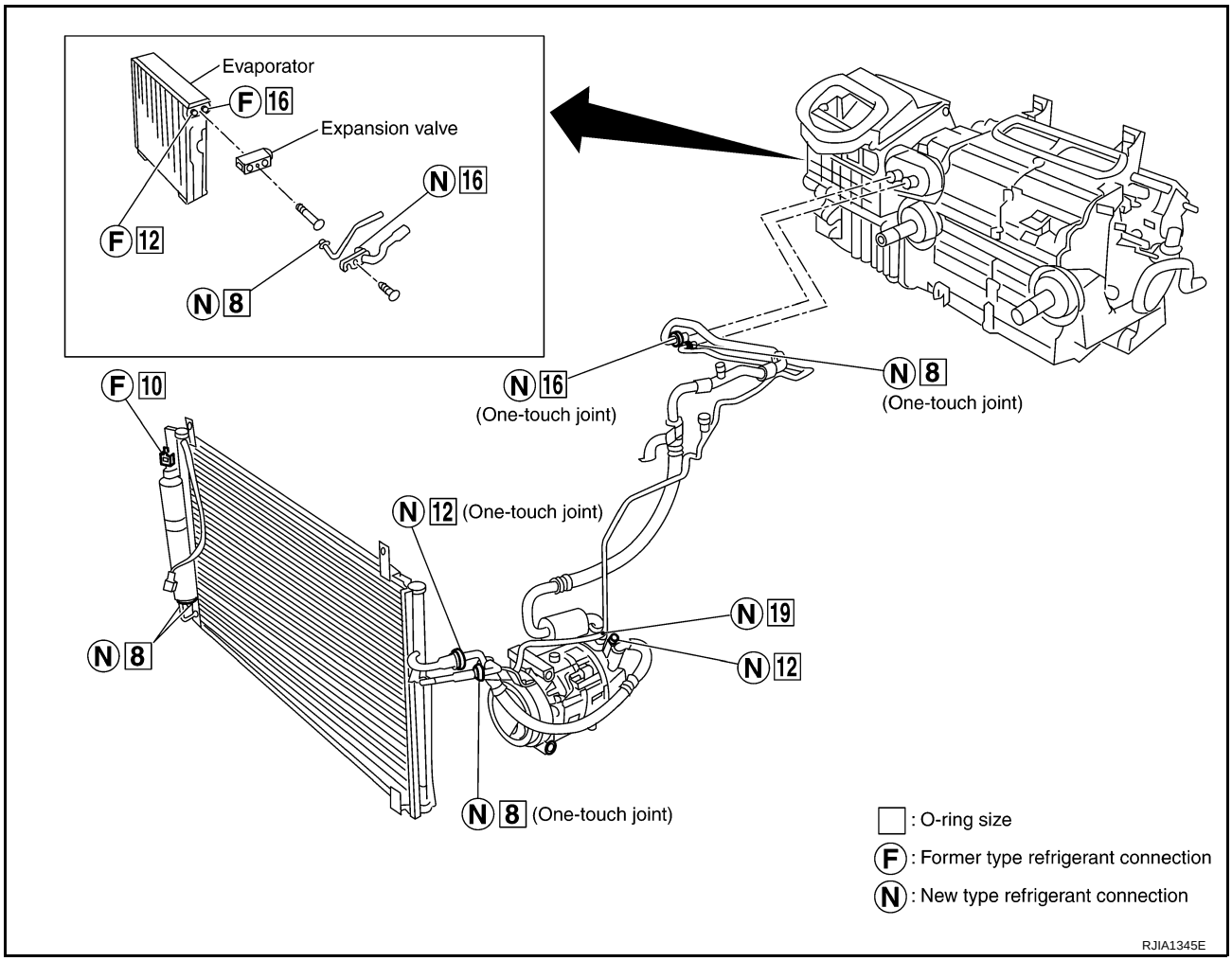
- Low-pressure flexible hose to evaporator (O-ring size: 16)
- High-pressure flexible hose to condenser (O-ring size: 12)
- High-pressure pipe 1 to evaporator (O-ring size: 8)
- High-pressure pipe 1 to condenser (O-ring size: 8)

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 chance 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.
- 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



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 will leak at, or around, the connection.

O-Ring Part Numbers and Specifications

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

WARNING:

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.

CAUTION:

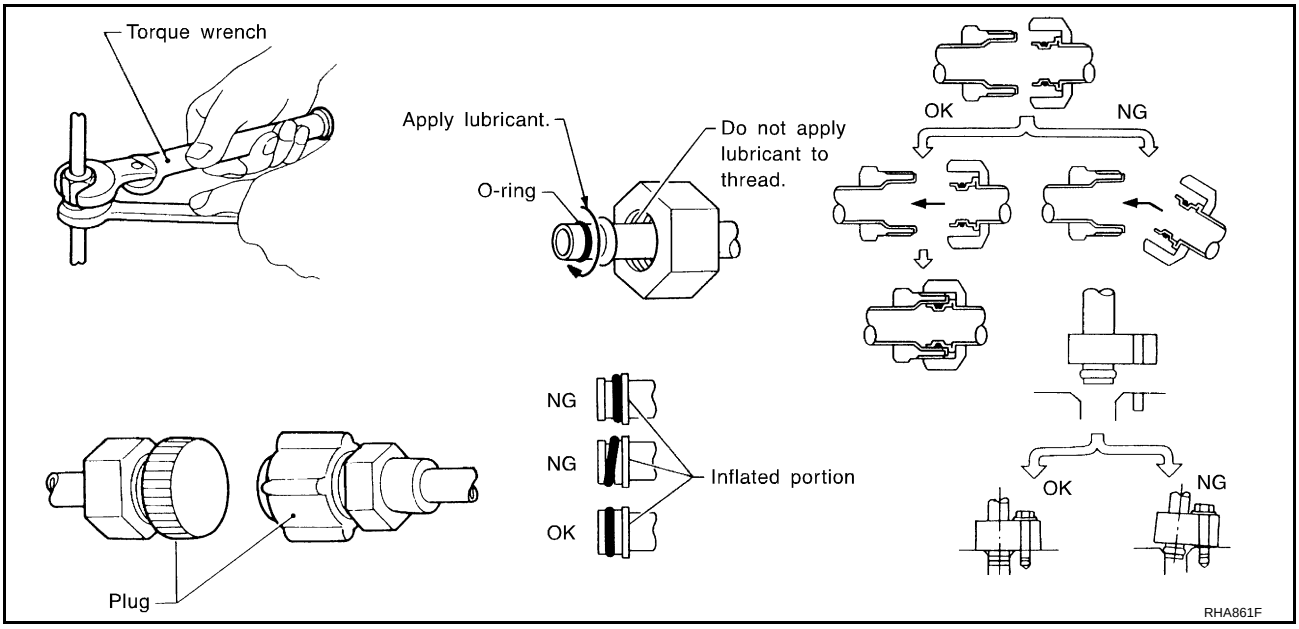
When replacing or cleaning refrigerant cycle components, observe the following.

- **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 tube, 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

Part number : KLH00-PAGS0

- **O-ring must be closely attached to dented portion 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

NJS00007

- **Plug all openings to prevent moisture and foreign matter from entering.**
- **When the compressor is removed, store it in the same way as it is when mounted on the car.**
- **When replacing or repairing compressor, follow “Maintenance of Lubricant Quantity in Compressor” exactly. Refer to ATC-24, "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.**
- **After replacing the compressor magnet clutch, apply voltage to the new one and check for normal operation.**

Precautions for Service Equipment

NJS00008

RECOVERY/RECYCLING EQUIPMENT

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

ELECTRONIC LEAK DETECTOR

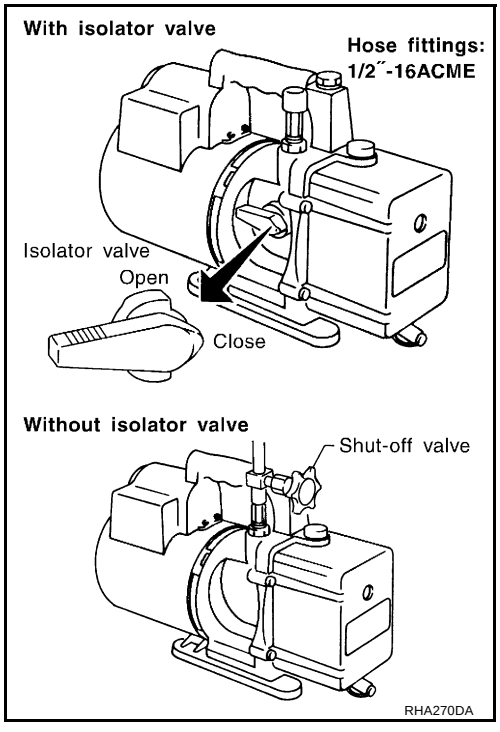
Be certain to follow the manufacturer’s instructions for tester operation and tester maintenance.

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.

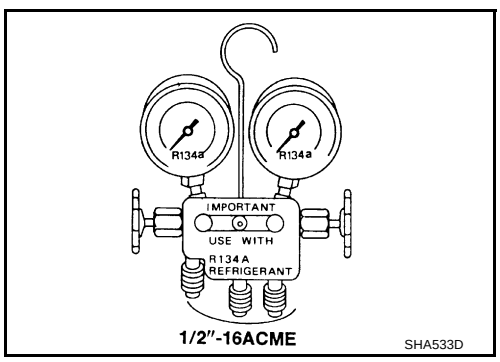
- Usually vacuum pumps have a manual isolator valve as part of the pump. Close this valve to isolate the service hose from the pump.
- For pumps without an isolator, use a hose equipped with a manual shut-off valve near the pump end. Close the valve to isolate the hose from the pump.
- If the hose has 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.



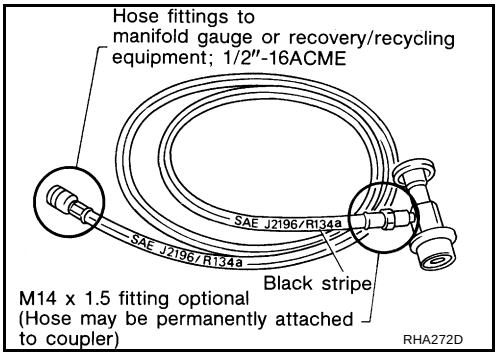
MANIFOLD GAUGE SET

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.



SERVICE HOSES

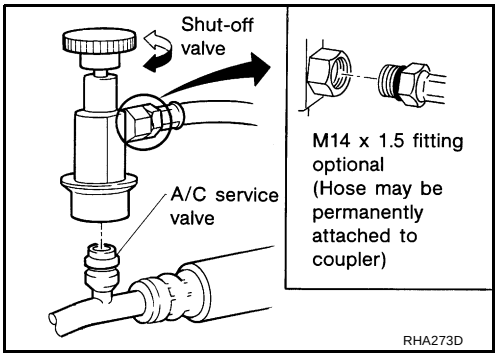
Be certain that the service hoses display the markings described (colored hose with black stripe). All hoses must include positive shut -off devices (either manual or automatic) near the end of the hoses opposite to the manifold gauge.



SERVICE COUPLERS

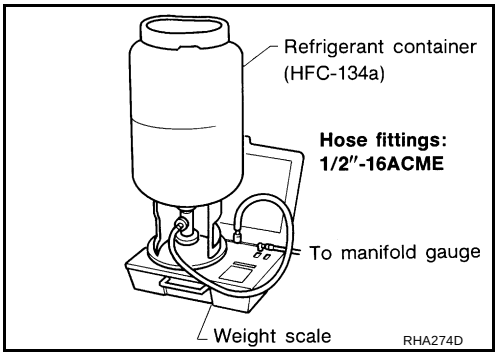
Never attempt to connect HFC-134a (R-134a) service couplers to a CFC-12 (R-12) A/C system. The HFC-134a (R-134a) couplers will not properly connect to the CFC-12 (R-12) system. However, if an improper connection is attempted, discharging and contamination may occur.

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.



CHARGING CYLINDER

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

Precautions for Leak Detection Dye

NJS00009

- 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 electronic refrigerant leak detector. The fluorescent dye leak detector should be used in conjunction with an electronic refrigerant leak detector (SST: J-41995) to pin-point refrigerant leaks.
- For your safety and your customer's satisfaction, read and follow all manufacture's operating instructions and precautions prior to performing the work.
- A compressor shaft seal should not be repaired because of dye seepage. The compressor shaft seal should only be repaired after confirming the leak with an electronic refrigerant 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.

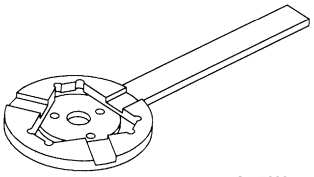
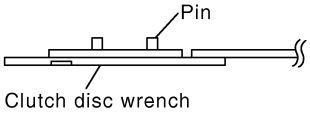
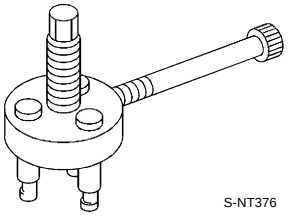
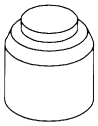
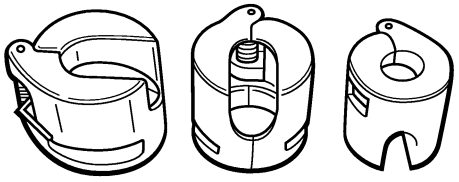
PREPARATION

PFP:00002

Special Service Tools

NJS0000B

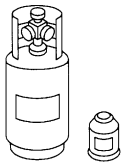
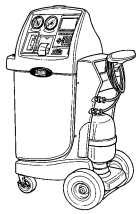
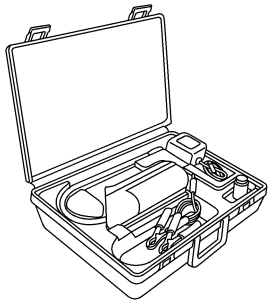
The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

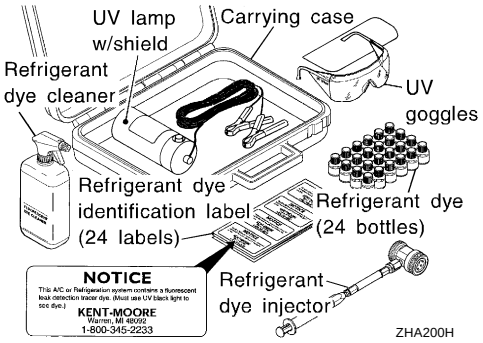
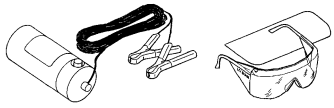
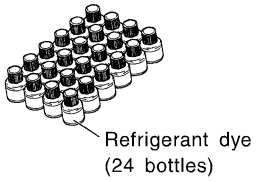
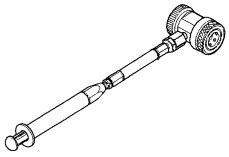
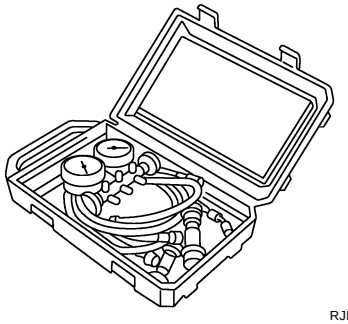
Tool number (Kent-Moore No.) Tool name		Description
KV99106100 (J-41260) Clutch disc wrench	 S-NT232  SJIA1168E	Removing shaft nut and clutch disc
KV99232340 (J-38874) Clutch disc puller	 S-NT376	Removing clutch disc
KV99106200 (J-41261) Pulley installer	 S-NT235	Installing pulley
9253089908 (for high-pressure pipe 1) (-) 9253089912 (for high-pressure flexible hose) (-) 9253089916 (for low-pressure pipe 1 and low-pressure flexible hose) (-) Disconnector tool set (J-45815)	 SJIA1274E	Disconnect one-touch joint connection

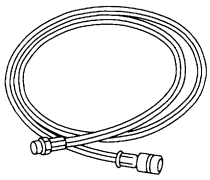
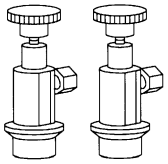
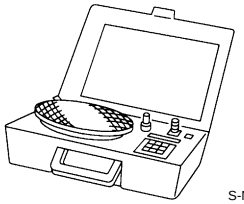
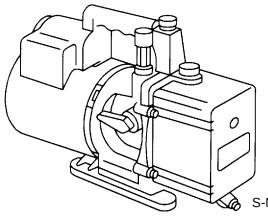
HFC-134a (R-134a) Service Tools and Equipment

NJS0000C

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 will occur and compressor malfunction will result.

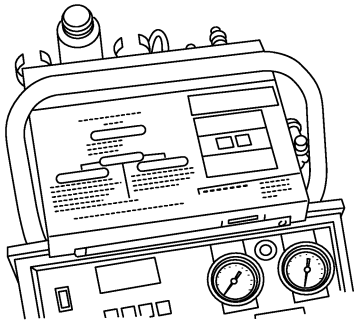
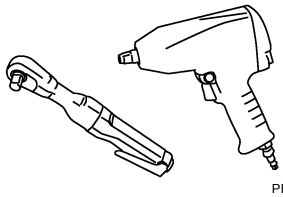
Tool number (Kent-Moore No.) Tool name		Description
HFC-134a (R-134a) refrigerant	 S-NT196	Container color: Light blue Container marking: HFC-134a (R-134a) Fitting size: Thread size ● Large container 1/2″-16 ACME
KLH00-PAGS0 (-) Nissan A/C System Oil Type S (DH-PS)	 S-NT197	Type: Poly alkylene glycol oil (PAG), type S (DH-PS) Application: HFC-134a (R-134a) wobble (swash) plate compressors (Nissan only) Capacity: 40 m ℓ (1.4 US fl oz, 1.4 Imp fl oz)
(ACR2005-NI) ACR5 A/C Service Center	 WJIA0293E	Function: Refrigerant recovery, recycling and recharging
(J-41995) Electrical leak detector	 AHA281A	Power supply: DC 12 V (Battery terminal)

Tool number (Kent-Moore No.) Tool name		Description
(J-43926) Refrigerant dye leak detection kit Kit includes: (J-42220) UV lamp and UV safety goggles (J-41459) HFC-134a (R-134a) dye injector Use with J-41447, 1/4 ounce bottle (J-41447) HFC-134a (R-134a) fluorescent leak detection dye (Box of 24, 1/4 ounce bottles) (J-43872) Refrigerant dye cleaner	 ZHA200H	Power supply: DC 12 V (Battery terminal)
(J-42220) UV lamp and UV safety goggles	 SHA438F	Power supply: DC 12 V (Battery terminal) For checking refrigerant leak when fluorescent dye is installed in A/C system Includes: UV lamp and UV safety goggles
(J-41447) HFC-134a (R-134a) fluorescent leak detection dye (Box of 24, 1/4 ounce bottles)	 SHA439F	Application: For HFC-134a (R-134a) PAG oil Container: 1/4 ounce (7.4 cc) bottle (Includes self-adhesive dye identification labels for affixing to vehicle after charging system with dye.)
(J-41459) HFC-134a (R-134a) dye injector Use with J-41447, 1/4 ounce bottle	 SHA440F	For injecting 1/4 ounce of fluorescent leak detection dye into A/C system
(J-43872) Refrigerant dye cleaner	 SHA441F	For cleaning dye spills
(J-39183) Manifold gauge set (with hoses and couplers)	 RJIA0196E	Identification: ● The gauge face indicates HFC-134a (R-134a). Fitting size: Thread size ● 1/2″-16 ACME

Tool number (Kent-Moore No.) Tool name	Description
Service hoses ● High-pressure side hose (J-39501-72) ● Low-pressure side hose (J-39502-72) ● Utility hose (J-39476-72)  S-NT201	Hose color: ● 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: ● 1/2″-16 ACME
Service couplers ● High-pressure side coupler (J-39500-20) ● Low-pressure side coupler (J-39500-24)  S-NT202	Hose fitting to service hose: ● M14 x 1.5 fitting is optional or permanently attached.
(J-39650) Refrigerant weight scale  S-NT200	For measuring of refrigerant Fitting size: Thread size ● 1/2″-16 ACME
(J-39649) Vacuum pump (Including the isolator valve)  S-NT203	Capacity: ● Air displacement: 4 CFM ● Micron rating: 20 microns ● Oil capacity: 482 g (17 oz) Fitting size: Thread size ● 1/2″-16 ACME

Commercial Service Tools

NJS0000D

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

REFRIGERATION SYSTEM

PFP:KA990

Refrigerant Cycle

NJS0000E

REFRIGERANT FLOW

The refrigerant flows in the standard pattern, that is, through the compressor, the condenser with liquid tank, through the evaporator, and back to the compressor. The refrigerant evaporation through 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

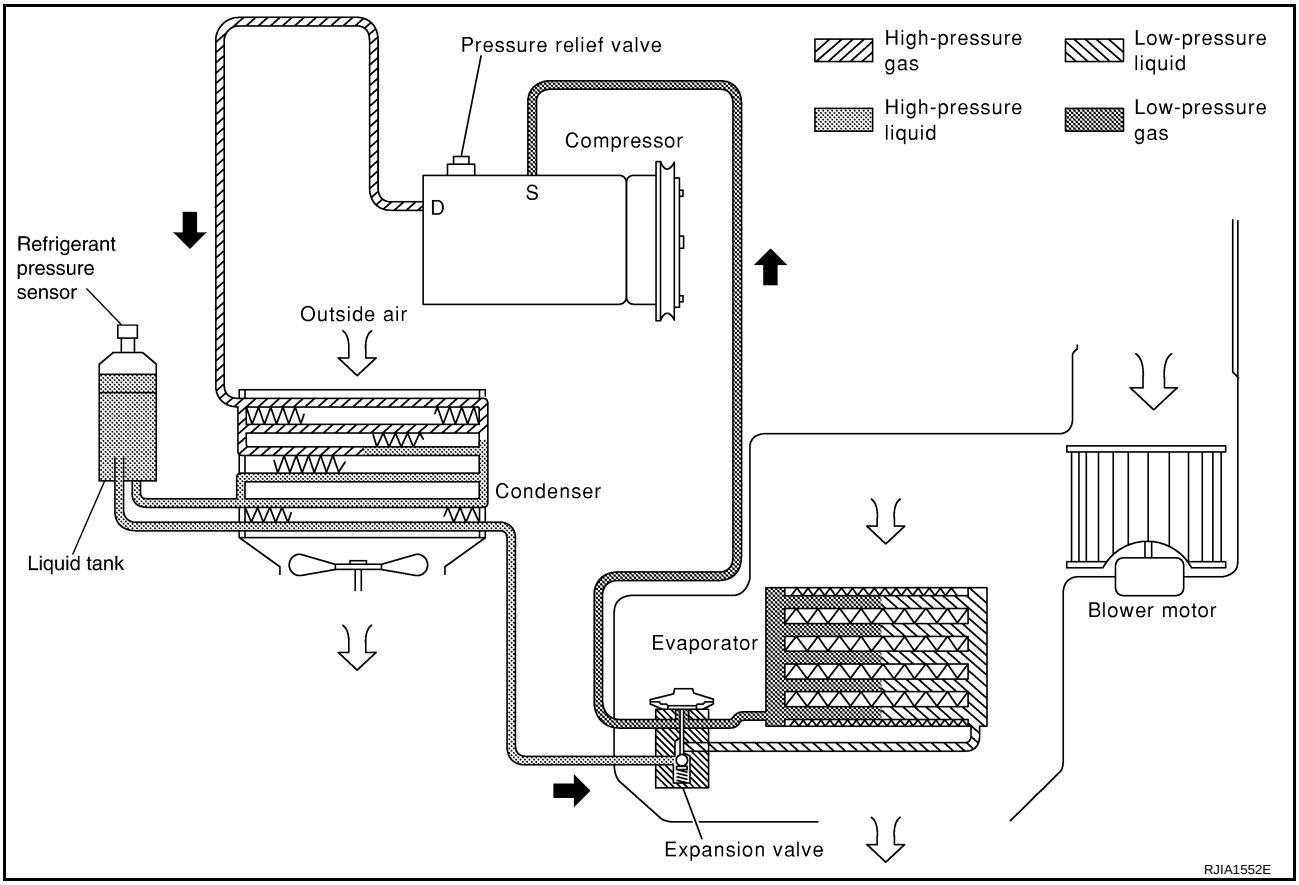
NJS0000F

REFRIGERANT PRESSURE SENSOR

The refrigerant system is protected against excessively high- or low-pressures by the refrigerant pressure sensor, located on the liquid tank. 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 (28 kg/cm^2 , 398 psi), or below about 134 kPa (1.4 kg/cm^2 , 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 (38 kg/cm^2 , 540 psi)], the release port on the pressure relief valve automatically opens and releases refrigerant into the atmosphere.



V-6 Variable Displacement Compressor

NJS0000G

GENERAL INFORMATION

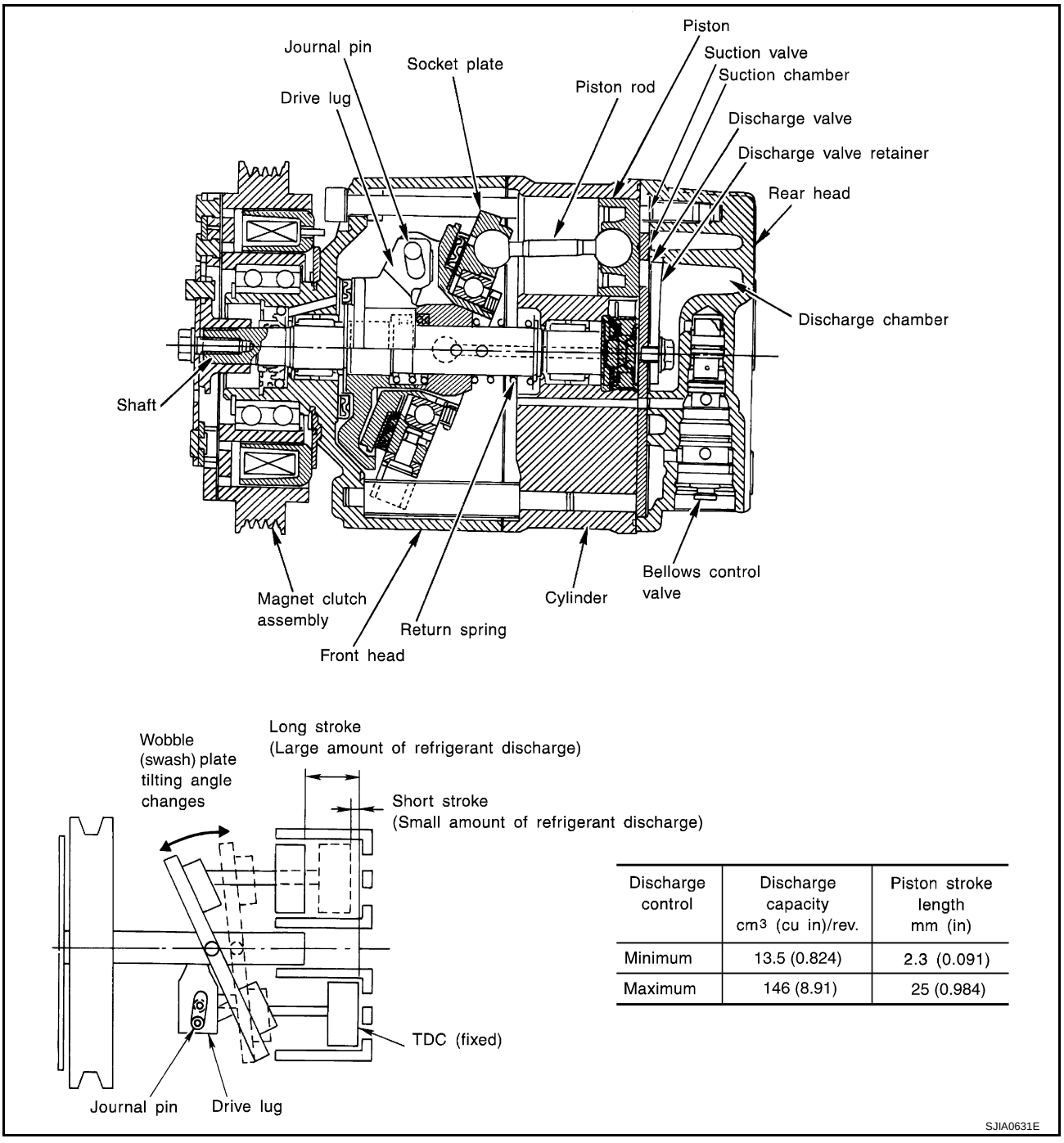
1. The V-6 variable compressor differs from previous units. The vent temperatures of the V-6 variable compressor do not drop too far below 5°C (41°F) when:
   Evaporator intake air temperature is less than 20°C (68°F).
   Engine is running at speeds less than 1,500 rpm.
   This is because the V-6 compressor provides a means of “capacity” control.
2. The V-6 variable compressor provides refrigerant control under varying conditions. During cold winters, it may not produce high refrigerant pressure discharge (compared to previous units) when used with air conditioning systems.
3. A “clanking” sound may occasionally be heard during refrigerant charge. The sound indicates that the tilt angle of the wobble (swash) plate has changed and is not a malfunction.
4. For air conditioning systems with the V-6 compressor, the clutch remains engaged unless: the system main switch, fan switch or ignition switch is turned OFF. When ambient (outside) temperatures are low or when the amount of refrigerant is insufficient, the clutch is disengaged to protect the compressor.
5. A constant range of suction pressure is maintained when engine speed is greater than a certain value. It normally ranges from 147 to 177 kPa (1.5 to 1.8 kg/cm^2 , 21 to 26 psi) under varying conditions. In previous compressors, however, suction pressure was reduced with increases in engine speed.

DESCRIPTION

General

The variable compressor is basically a swash plate type that changes piston stroke in response to the required cooling capacity.

The tilt of the wobble (swash) plate allows the piston's stroke to change so that refrigerant discharge can be continuously changed from 13.5 to 146 cm^3 (0.824 to 8.91 cu in).

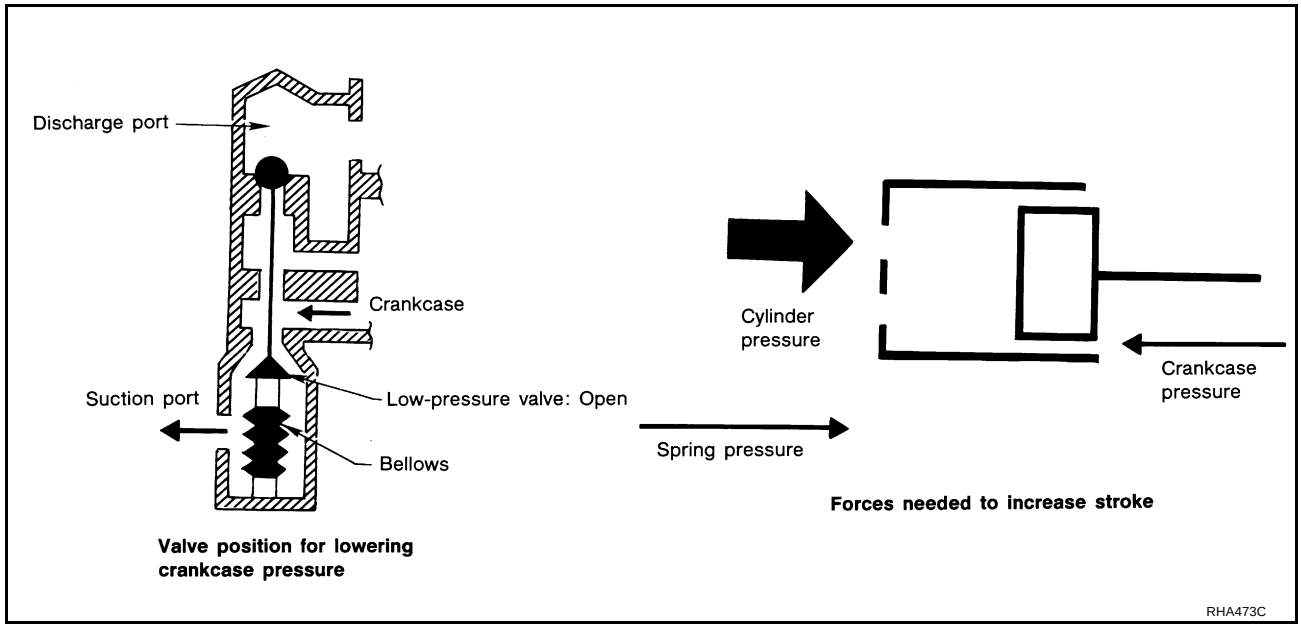


Discharge control	Discharge capacity cm^3 (cu in)/rev.	Piston stroke length mm (in)
Minimum	13.5 (0.824)	2.3 (0.091)
Maximum	146 (8.91)	25 (0.984)

Operation

1. Operation Control Valve
   Operation control valve is located in the suction port (low-pressure) side, and opens or closes in response to changes in refrigerant suction pressure.
   Operation of the valve controls the internal pressure of the crankcase.
   The angle of the wobble (swash) plate is controlled by the pressure difference between the crankcase's internal pressure and the piston cylinder pressure.
2. Maximum Cooling
   Refrigerant pressure on the low-pressure side increases with an increases in heat loads.
   When this occurs, the control valve's bellows compress to open the low-pressure side valve and close the high-pressure side valve.
   This cases the following pressure changes:
   - The crankcase's internal pressure to equal the pressure on the low-pressure side.
   - The cylinder's internal pressure to be greater than the crankcase's internal pressure.

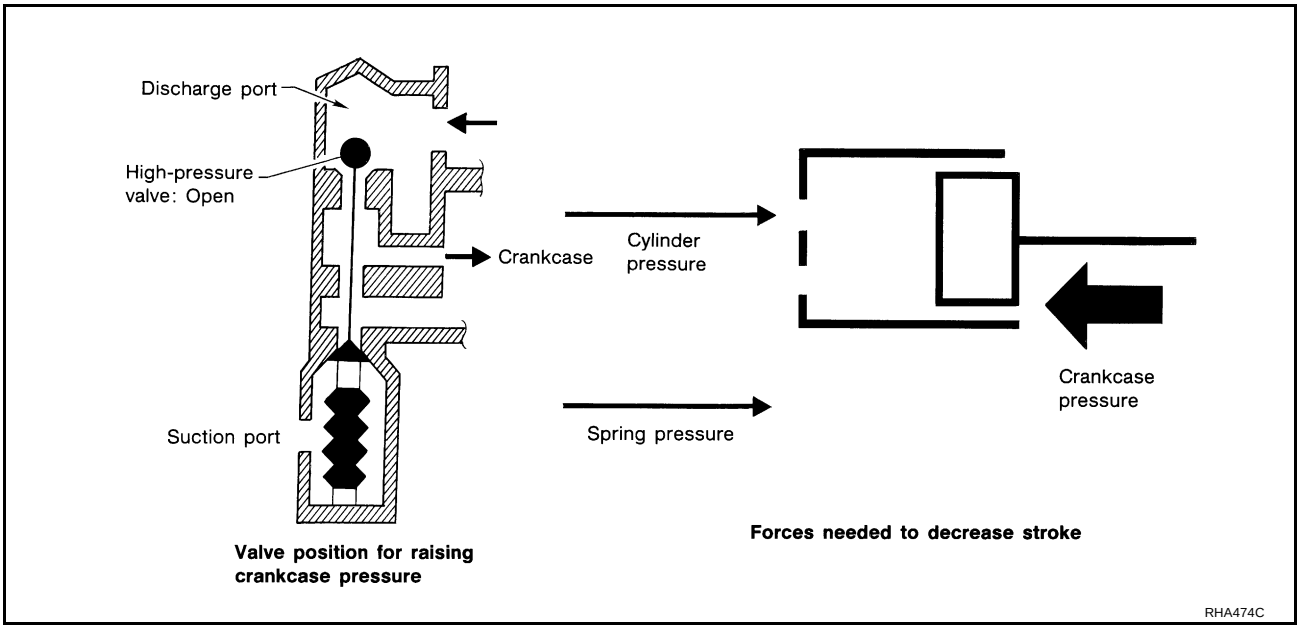
   Under this condition, the wobble (swash) plate is set to the maximum stroke position.



3. Capacity Control
   - Refrigerant pressure on suction side is low during high speed driving or when ambient or interior temperature is low.
   - The bellows expands when refrigerant pressure on the suction pressure side drops below approxi mately 177 kPa (1.8 kg/cm^2 , 26 psi).

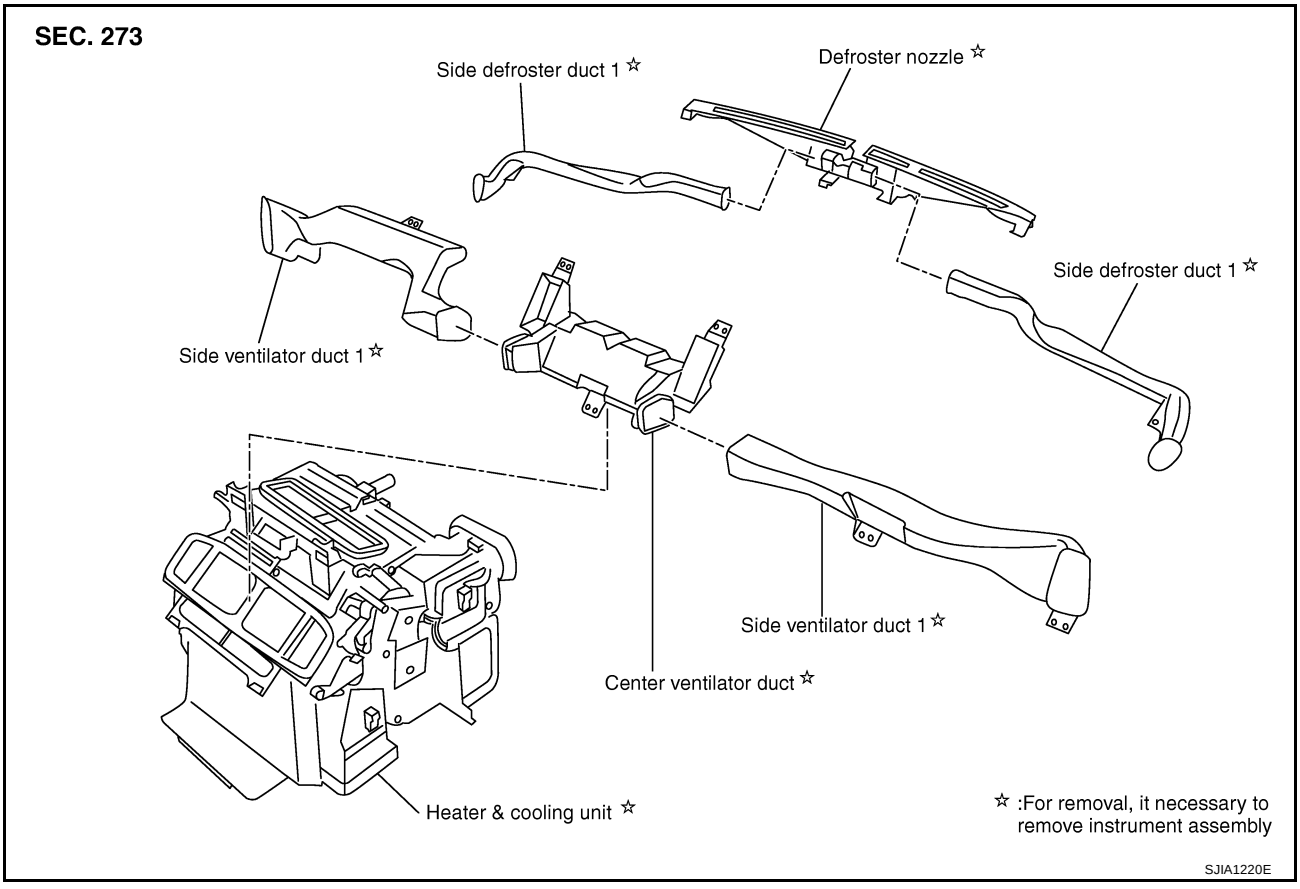
   Since suction pressure is low, it makes the suction port close and the discharge port open. Thus, crankcase pressure becomes high as high-pressure enters the crankcase.
   - The force acts around the journal pin near the wobble (swash) plate, and is generated by the pressure difference between before and behind the piston.

   The drive lug and journal pin are located where the piston generates the highest pressure. Piston pressure is between suction pressure Ps and discharge pressure Pd, which is close to suction pressure Ps. If crankcase pressure Pc rises due to capacity control, the force around the journal pin makes the wobble (swash) plate angle decrease and also the piston stroke decrease. In other words, crankcase pressure increase triggers pressure difference between the piston and the crankcase. The pressure difference changes the angle of the wobble (swash) plate.



Component Layout

NJS0000H



LUBRICANT

PFP:KLG00

Maintenance of Lubricant Quantity in Compressor

NJS0000I

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**
Part number	**: KLH00-PAGS0**

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 engine, and set 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 engine.

>> GO TO 3.

3. CHECK REPLACEMENT PART

Should the compressor be replaced?

YES >> GO TO ATC-25, "LUBRICANT ADJUSTING PROCEDURE FOR COMPRESSOR REPLACEMENT" .
NO >> GO TO ATC-25, "LUBRICANT ADJUSTING PROCEDURE FOR COMPONENTS REPLACEMENT EXCEPT COMPRESSOR" .

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

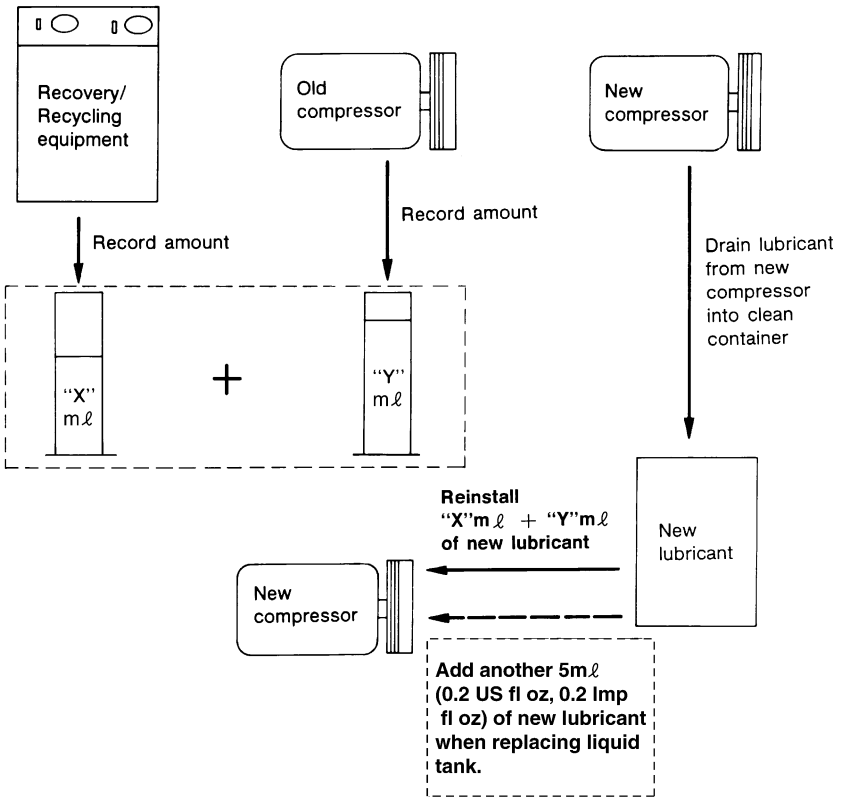
Part replaced	Lubricant to be added to system	Remarks
	Amount of lubricant m ℓ (US fl oz, Imp fl oz)	
Evaporator	75 (2.5, 2.6)	—
Condenser	35 (1.2, 1.2)	—
Liquid tank	10 (0.3, 0.4)	—
In case of refrigerant leak	30 (1.0, 1.1)	Large leak
	—	Small leak *1

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

LUBRICANT ADJUSTING PROCEDURE FOR COMPRESSOR REPLACEMENT

1. Before connecting recovery/recycling recharging equipment to vehicle, check recovery/recycling recharging equipment gauges. No refrigerant pressure should be displayed. If NG, recover refrigerant from equipment lines.
2. Connect recovery/recycling recharging equipment to vehicle. Confirm refrigerant purity in supply tank using recovery/recycling recharging equipment and refrigerant identifier. If NG, refer to ATC-5, "CONTAMINATED REFRIGERANT" .
3. Confirm refrigerant purity in vehicle A/C system using recovery/recycling recharging equipment and refrigerant identifier. If NG, refer to ATC-5, "CONTAMINATED REFRIGERANT" .
4. Discharge refrigerant into the refrigerant recovery/recycling equipment. Measure lubricant discharged into the recovery/recycling equipment.
5. Drain the lubricant from the old (removed) compressor into a graduated container and recover the amount of lubricant drained.
6. Drain the lubricant from the new compressor into a separate, clean container.
7. 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.
8. Measure an amount of new lubricant equal to the amount recovered during discharging. Add this lubricant to new compressor through the suction port opening.
9. If the liquid tank also needs to be replaced, add another 5 m ℓ (0.2 US fl oz, 0.2 Imp fl oz) of lubricant at this time.
   Do not add this 5 m ℓ (0.2 US fl oz, 0.2 Imp fl oz) of lubricant only when replaces the compressor.

Lubricant adjusting procedure for compressor replacement



RJIA3578E

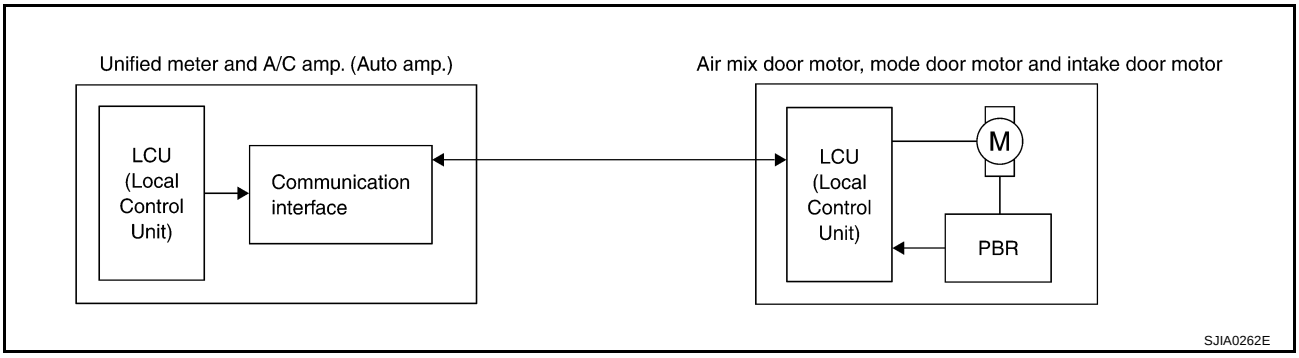
AIR CONDITIONER CONTROL

PFP:27500

Description of Air Conditioner LAN Control System

NJS0000J

The LAN (Local Area Network) system consists of unified meter and A/C amp., mode door motor, air mix door motor and intake door motor.
A configuration of these components is shown in the figure below.

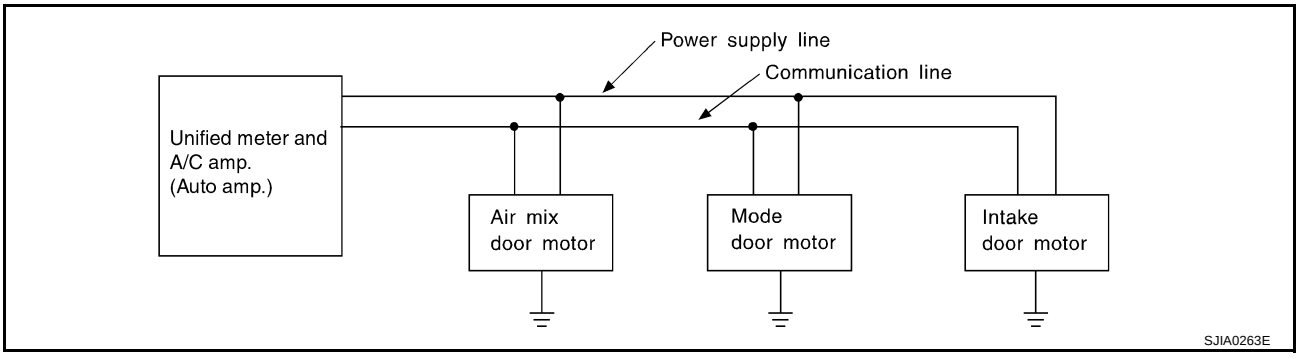


System Construction

NJS0000K

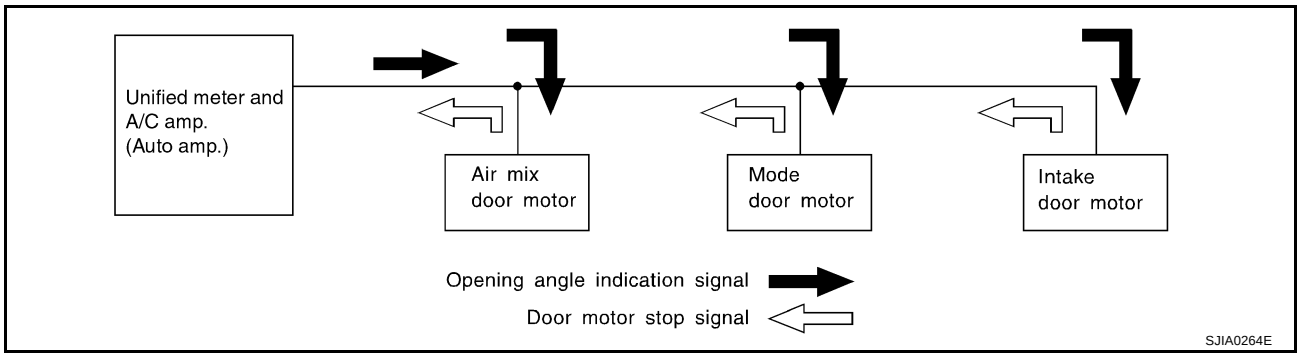
A small network is constructed between unified meter and A/C amp., air mix door motor, mode door motor and intake door motor. The unified meter and A/C amp. and motors are connected by data transmission lines and motor power supply lines. The LAN network is built through the ground circuits of each door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

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



OPERATION

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



TRANSMISSION DATA AND TRANSMISSION ORDER

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

Start:

Initial compulsory signal 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 errors, 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.

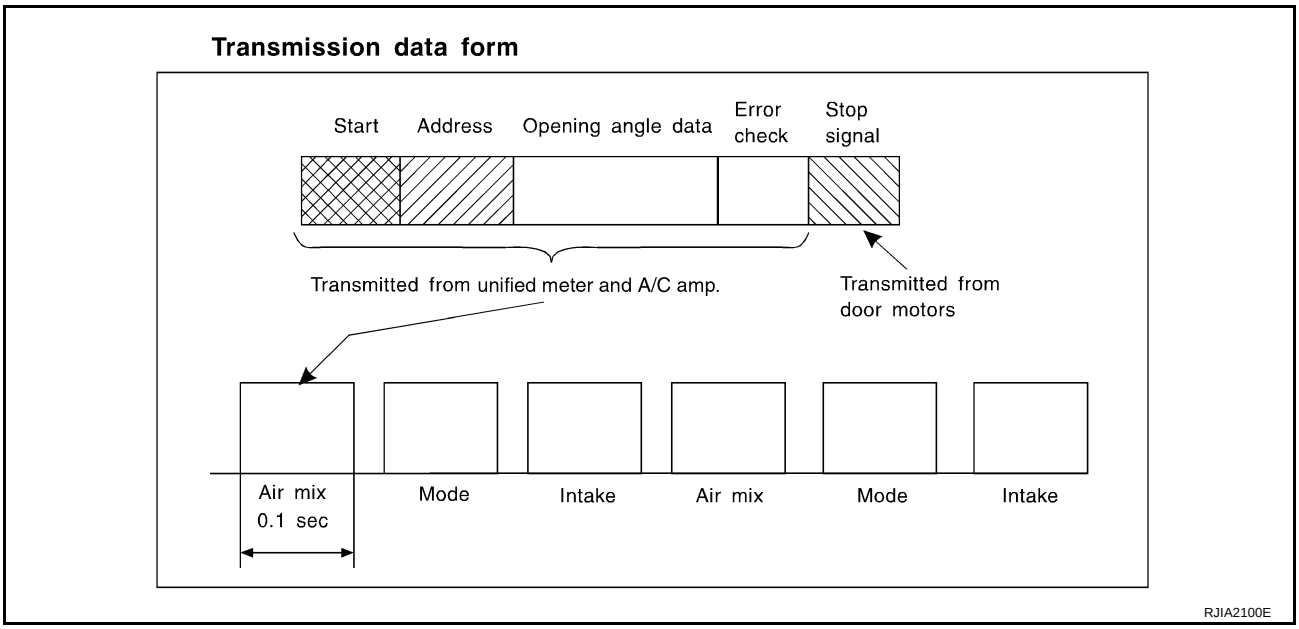
Error Check:

Procedure by which sent 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 electrical frequency
- Poor electrical connections
- Signal leakage from transmission lines
- Signal level fluctuation

Stop Signal:

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



AIR MIX DOOR CONTROL (AUTOMATIC TEMPERATURE CONTROL)

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

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 FAN control dial set to AUTO, 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.

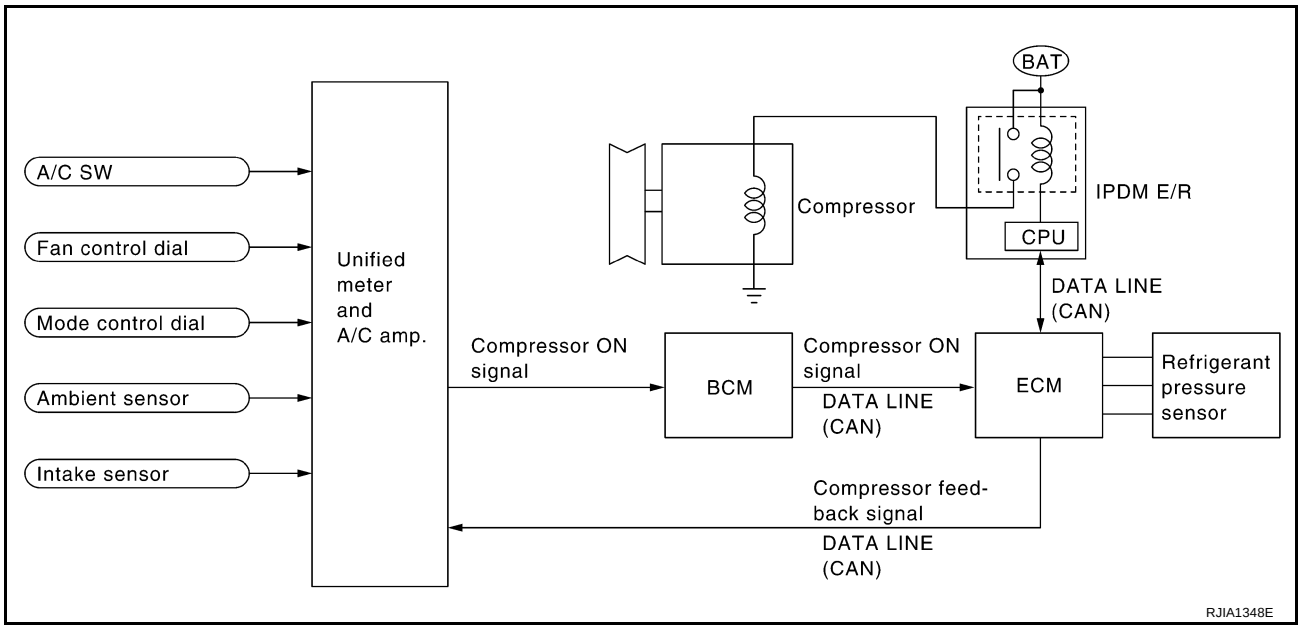
INTAKE DOOR CONTROL

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.

MAGNET CLUTCH CONTROL



When A/C switch is pressed, turn fan control dial to ON or set mode control dial to D/F, D/F2 or DEF position, unified meter and A/C amp. inputs compressor ON signal to BCM.
BCM sends compressor ON signal to ECM, via CAN communication line.
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 line.
Upon receipt of compressor ON signal from ECM, IPDM E/R turns air conditioner relay ON to operate compressor.
When sending compressor ON signal to IPDM E/R via CAN communication line, ECM simultaneously sends compressor feedback signal to unified meter and A/C amp. via CAN communication line.
Unified meter and A/C amp., then, uses input compressor feedback signal to control air inlet.

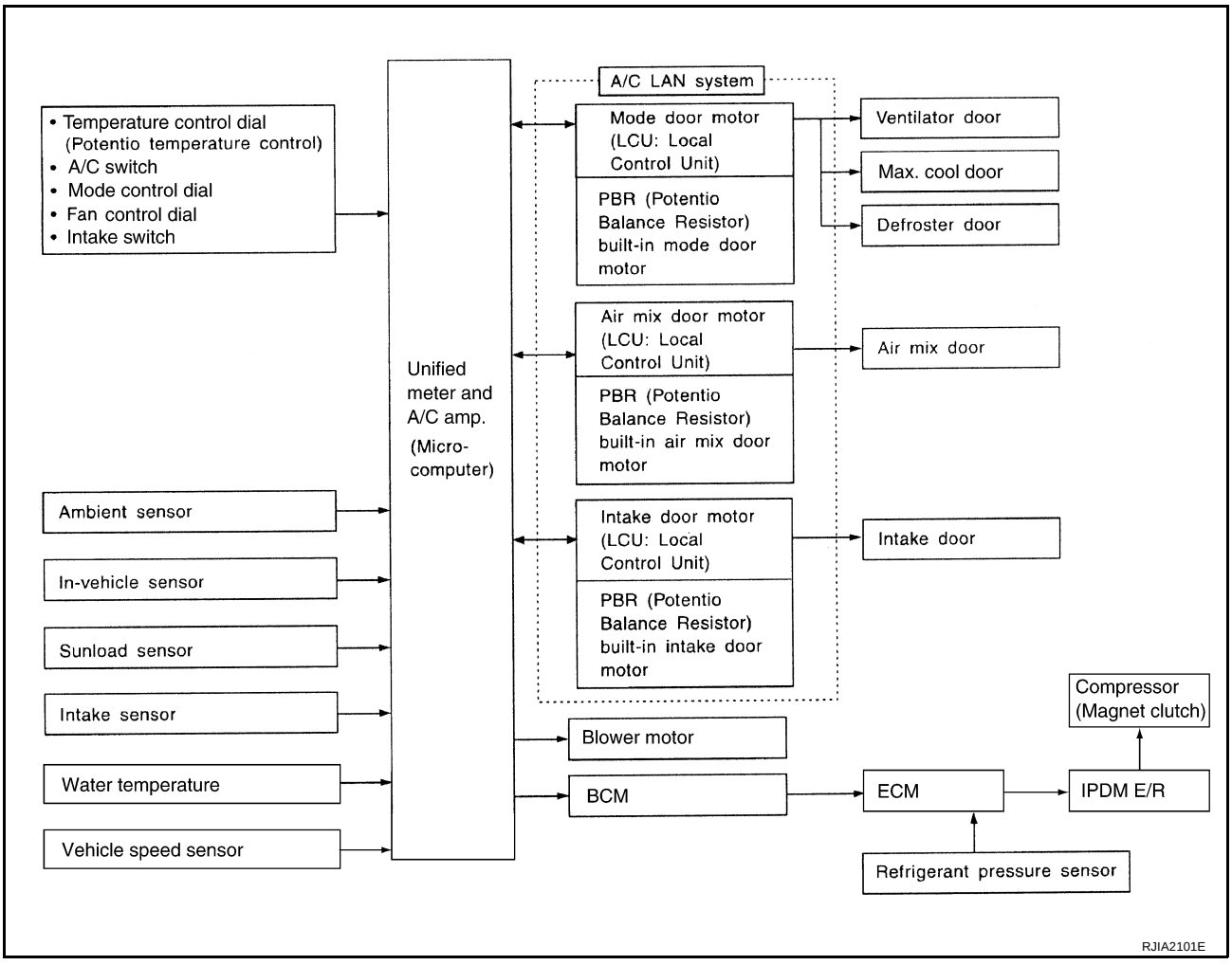
SELF-DIAGNOSIS SYSTEM

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

Description of Control System

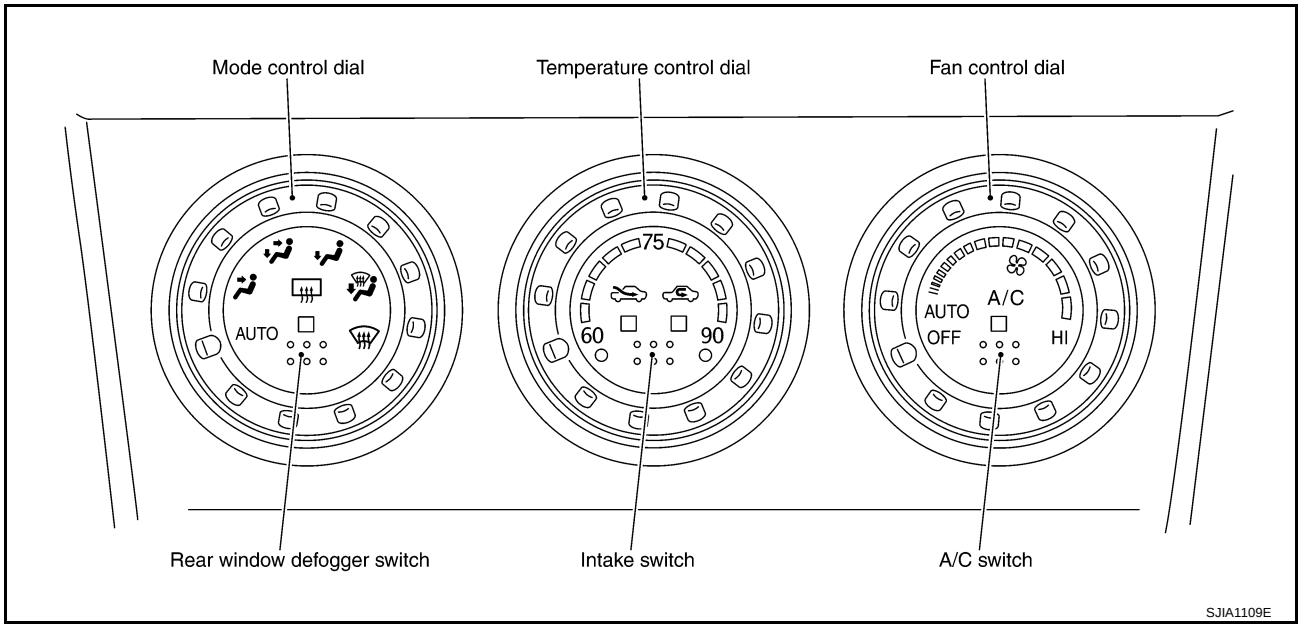
NJS0000L

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



Control Operation

NJS0000M



MODE CONTROL DIAL

The air discharge outlets are controlled with this dial.
Mode doors are set to the defrost position with this dial. Also, intake doors are set to the outside air position.
When shifting mode control dial to D/F, D/F2 or DEF position under the following conditions, compressor is turned ON. (A/C LED ON)

- FAN: ON
- A/C: OFF

TEMPERATURE CONTROL DIAL (POTENTIO TEMPERATURE CONTROL)

The set temperature is increased or decreased with this dial.

FAN CONTROL DIAL

The blower speed is automatically or manually controlled with this dial. Twenty-five speeds are available for manual control.
Shifting fan control dial to AUTO, compressor is turned ON automatically.

REAR WINDOW DEFOGGER SWITCH

When illumination is ON, rear window is defogged.

INTAKE SWITCH

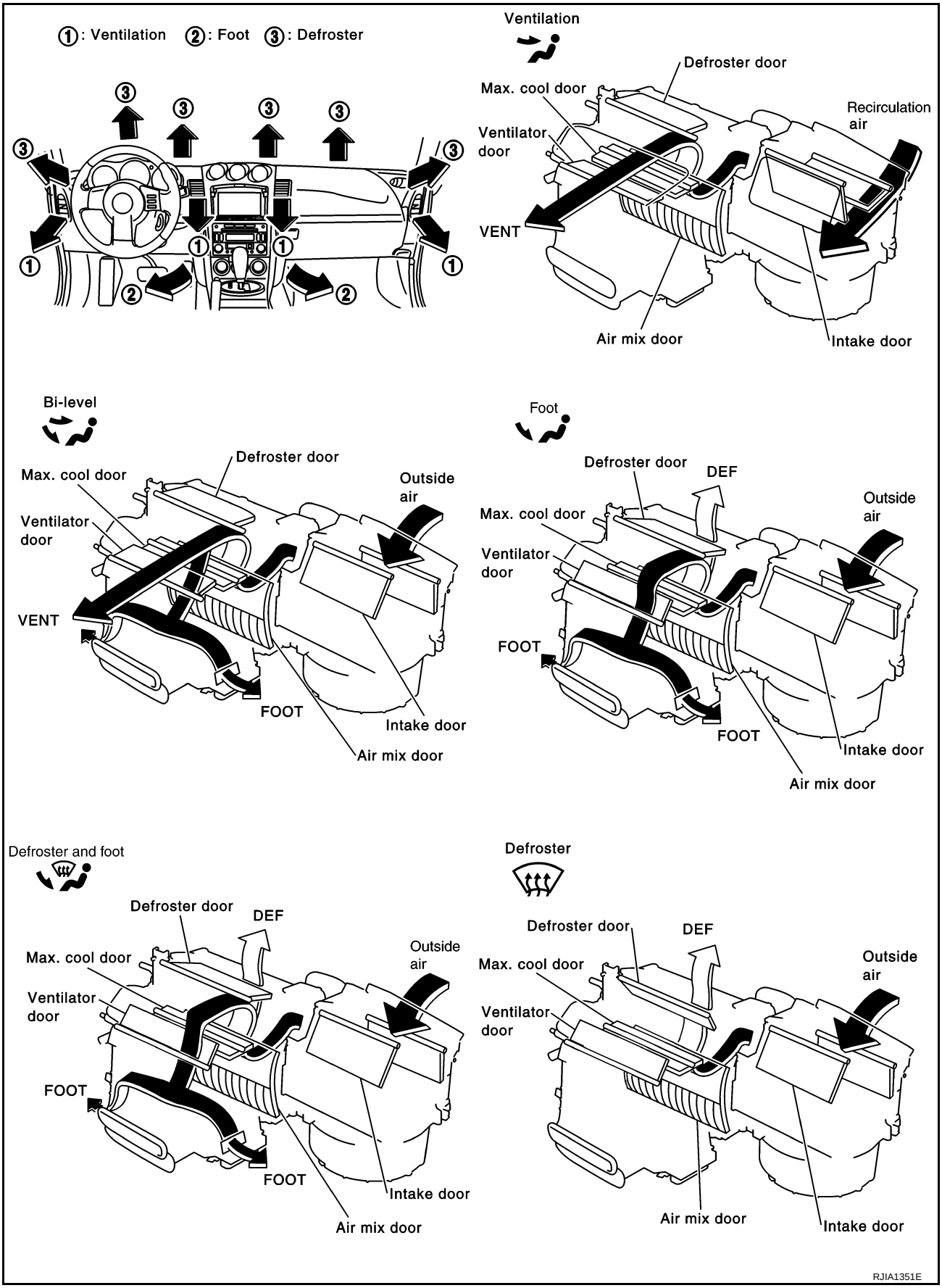
- When intake switch is ON, REC LED turns ON, and air inlet is fixed to REC.
- When press intake switch again, FRE LED turns ON, and air inlet is fixed to FRE.
- When intake switch is pressed for approximately 1.5 seconds or longer, REC and FRE indicators blink twice. Then, the system enters into automatic control mode. Inlet status is displayed even during automatic control.
- When FRE LED is turned ON, shifting mode control dial to D/F, D/F2 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, D/F2 or DEF position)

A/C SWITCH

The compressor is ON or OFF.
(Pressing the A/C switch when the fan control dial is ON will turn off the A/C switch and compressor.)

Discharge Air Flow

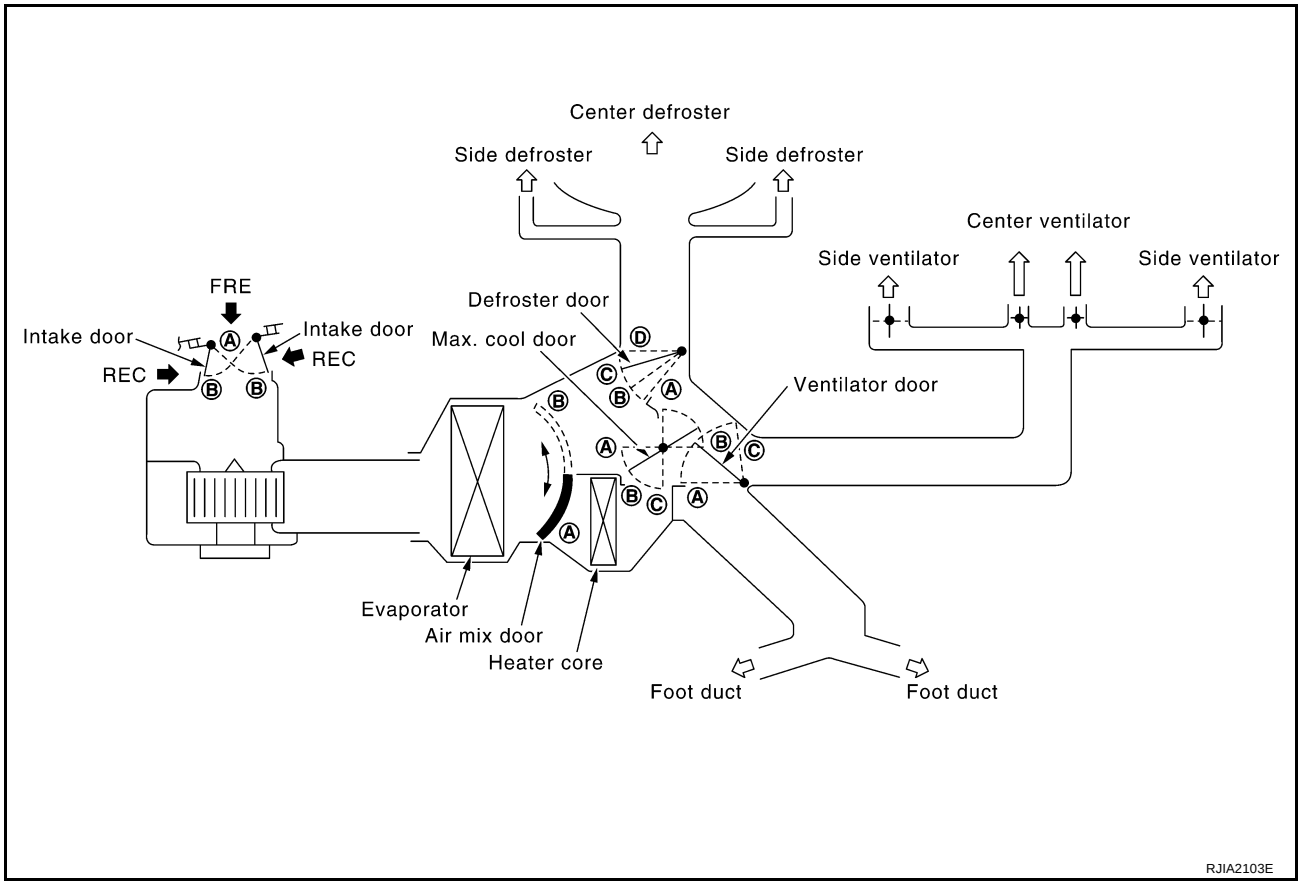
NJS0000N



System Description

NJS0000O

SWITCHES AND THEIR CONTROL FUNCTION



Door \ Position or switch	MODE control dial						Intake SW		Temperature control dial		
	VENT	B/L	FOOT	D/F	DEF	AUTO					
						—			18°C (60°F)	~	32°C (90°F)
Ventilator door	Ⓐ	Ⓑ	Ⓒ	Ⓒ	Ⓒ	AUTO	—		—		
Max. cool door	Ⓐ	Ⓑ	Ⓑ	Ⓑ	Ⓒ		—		—		
Defroster door	Ⓓ	Ⓓ	Ⓓ or Ⓒ *1	Ⓑ	Ⓐ		—		—		
Intake door	—			Ⓑ	Ⓑ	—	Ⓐ *2	Ⓑ *2	—		
Air mix door	—			—	—	—	—		Ⓐ	AUTO	Ⓑ

*1: This position is selected only when the mode door is automatically controlled.
*2: Inlet status is displayed during automatic control.

SJIA1110E

CAN Communication System Description

NJS0000P

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-24, "CAN Communication Unit" .

TROUBLE DIAGNOSIS

PFP:00004

CONSULT-II Function (BCM)

NJS0000Q

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

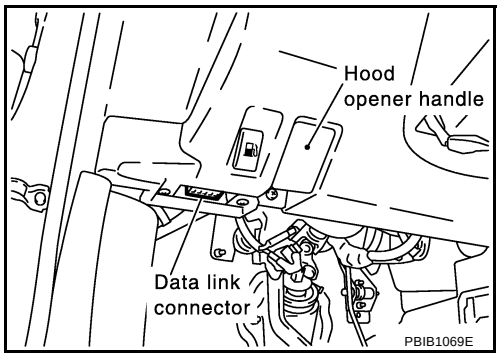
System part	Check item, diagnosis mode	Description
BCM	Data monitor	Displays BCM input data in real time.

CONSULT-II BASIC OPERATION

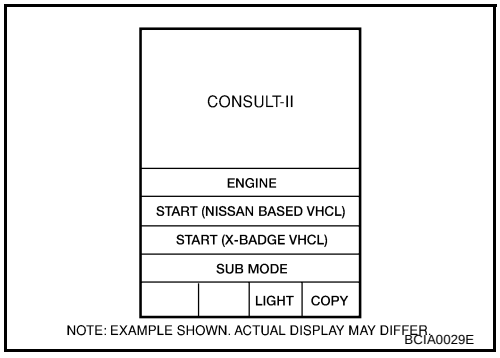
CAUTION:

If CONSULT-II is used with no connection of CONSULT-II CONVERTER, malfunctions might be detected in self-diagnosis depending on control unit which carry out CAN communication.

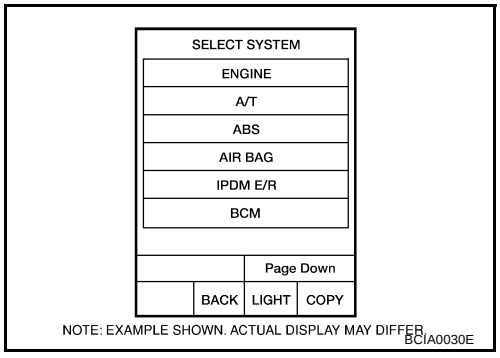
1. With the ignition switch OFF, connect CONSULT-II and CONSULT-II CONVERTER to the data link connector, and then turn the ignition switch ON.



2. Touch “START (NISSAN BASED VHCL)”.



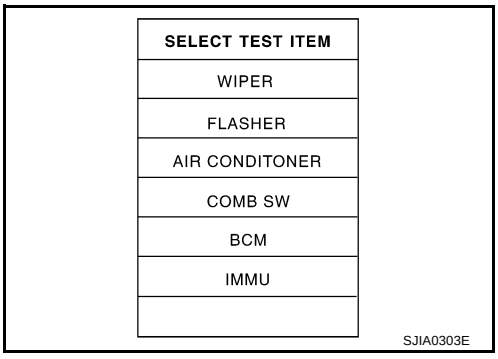
3. Touch “BCM” on “SELECT SYSTEM” screen. If “BCM” is not indicated, refer to GI-39, "CONSULT-II Data Link Connector (DLC) Circuit" .



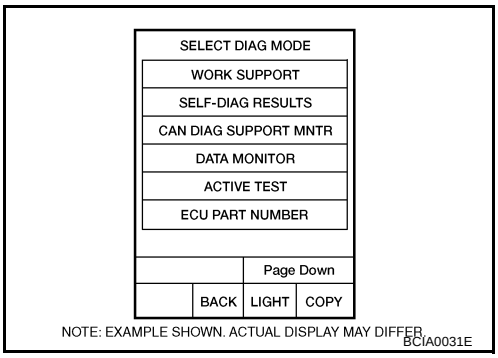
DATA MONITOR

Operation Procedure

1. Touch “AIR CONDITIONER” on “SELECT TEST ITEM” screen.



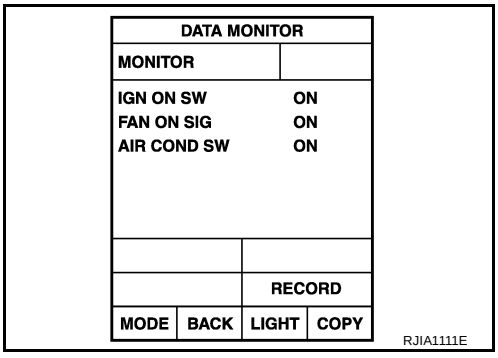
2. Touch “DATA MONITOR” on “SELECT DIAG MODE” screen.



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”.



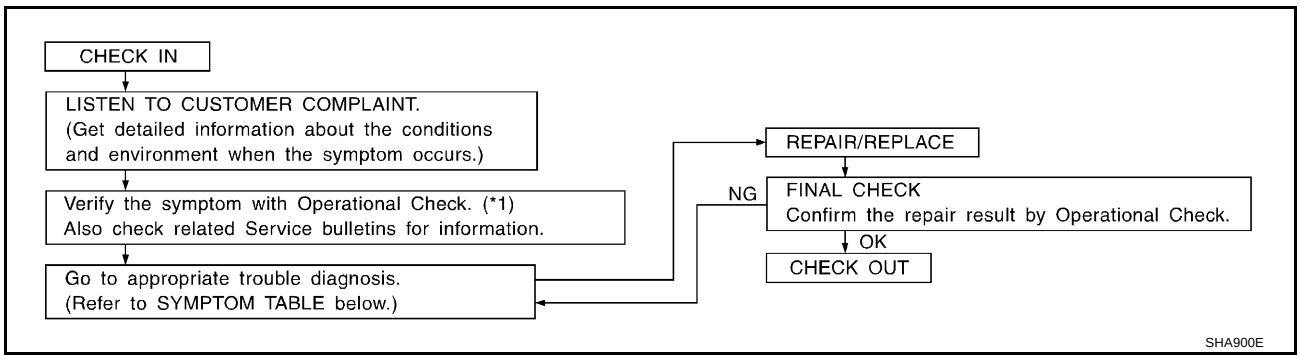
Display Item List

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.

How to Perform Trouble Diagnosis for Quick and Accurate Repair

NJS0000R

WORK FLOW



*1 ATC-56, "Operational Check"

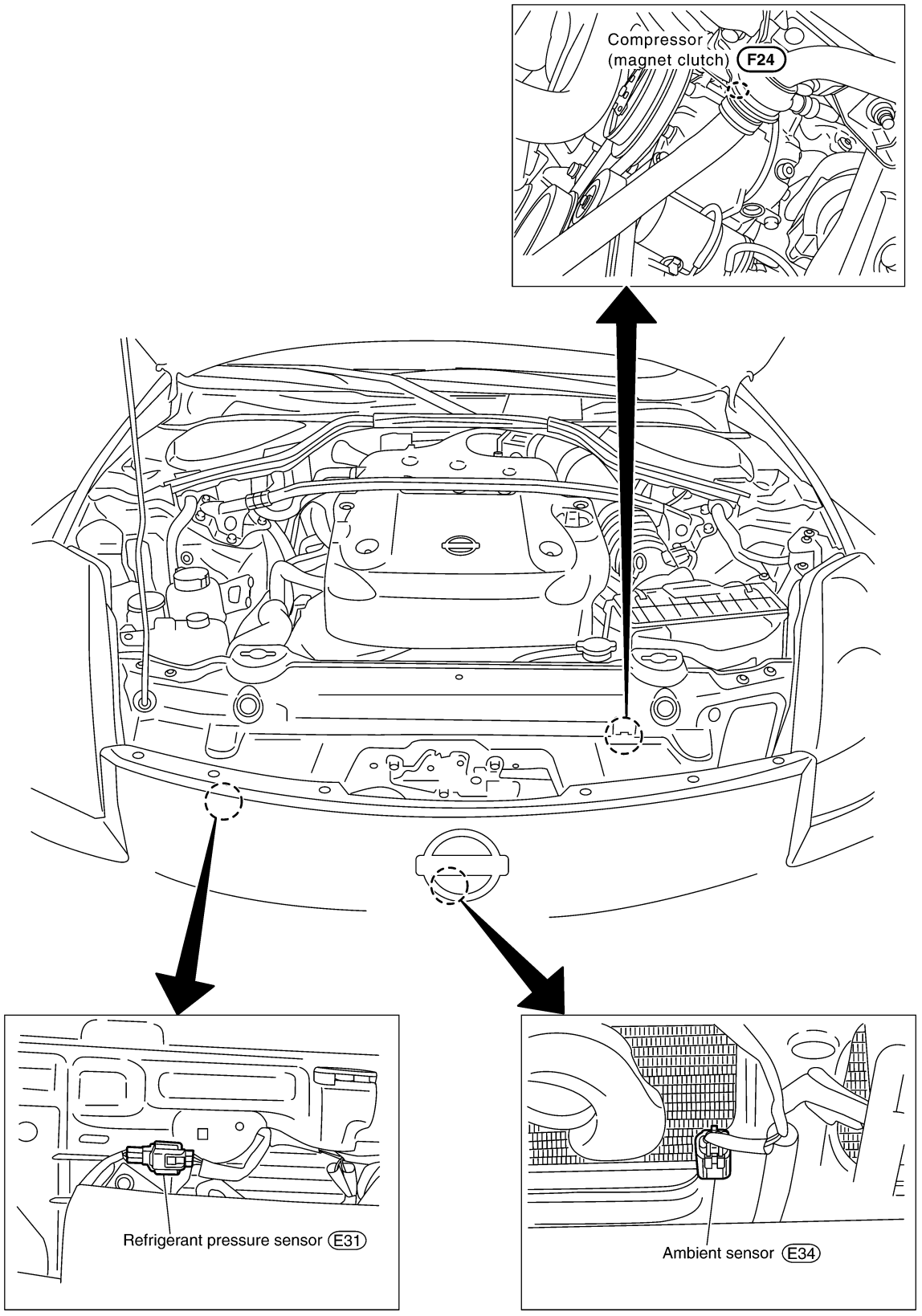
SYMPTOM TABLE

Symptom	Reference Page	
A/C system does not come on.	Go to Trouble Diagnosis Procedure for A/C system.	ATC-57, "Power Supply and Ground Circuit for Auto Amp."
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-77, "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-92, "Insufficient Heating"
Noise	Go to Trouble Diagnosis Procedure for Noise.	ATC-93, "Noise"
Self-diagnosis cannot be performed.	Go to Trouble Diagnosis Procedure for Self-diagnosis.	ATC-94, "Self-diagnosis"

Component Parts and Harness Connector Location

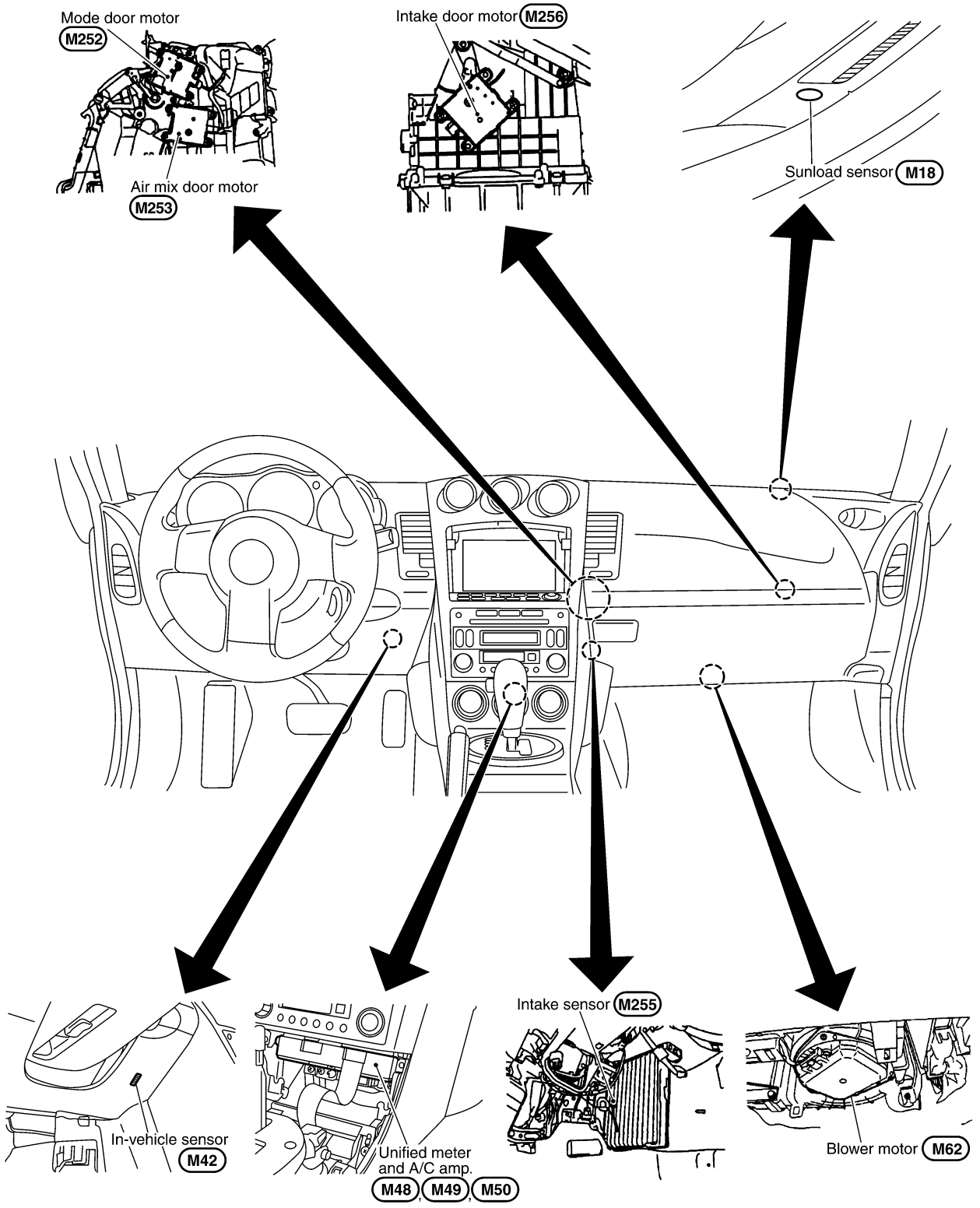
NJS0000S

ENGINE COMPARTMENT



RJIA1354E

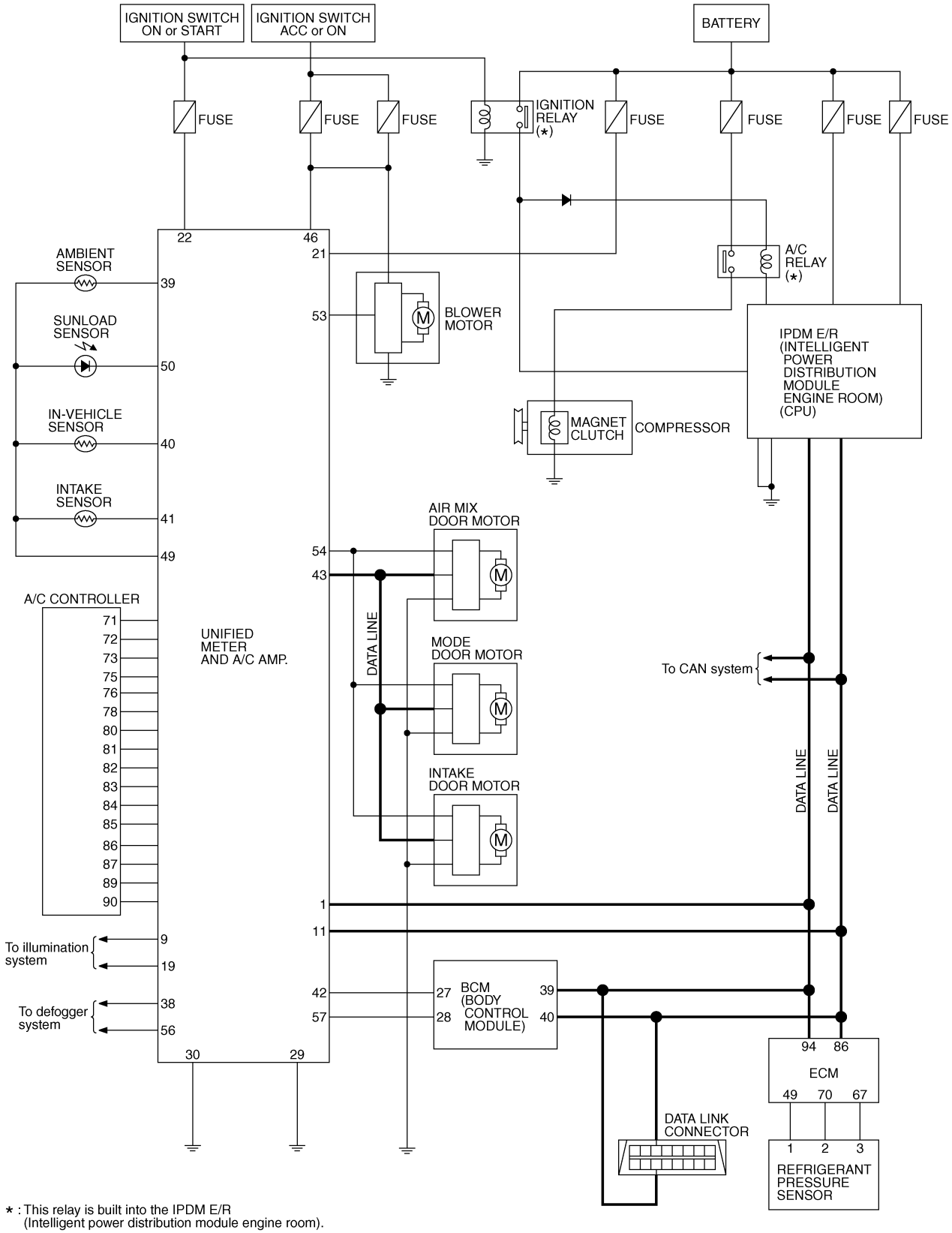
PASSENGER COMPARTMENT



RJIA1355E

Schematic

NJS0000T

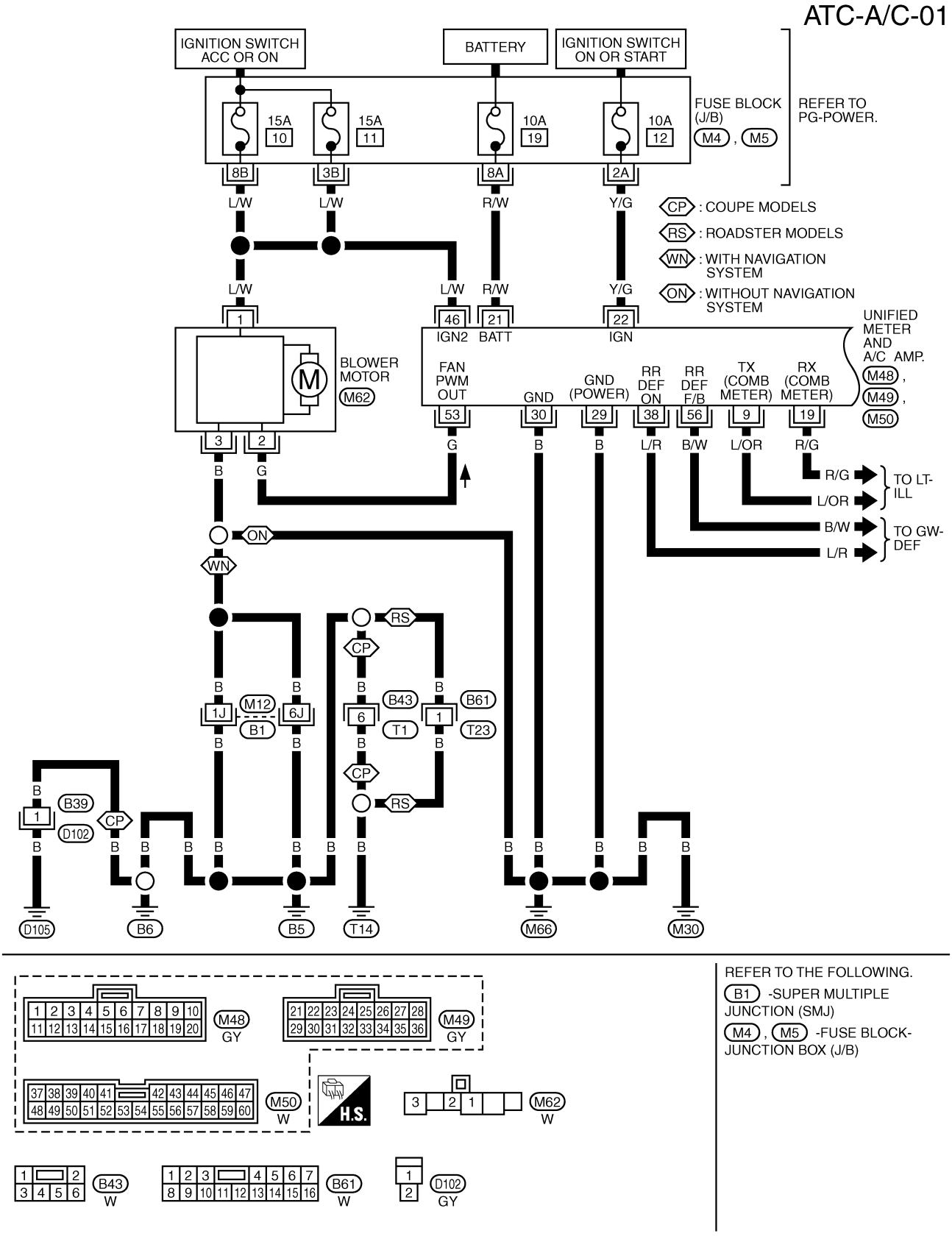


* : This relay is built into the IPDM E/R (Intelligent power distribution module engine room).

TJWT0106E

Wiring Diagram —A/C—

NJS0000U



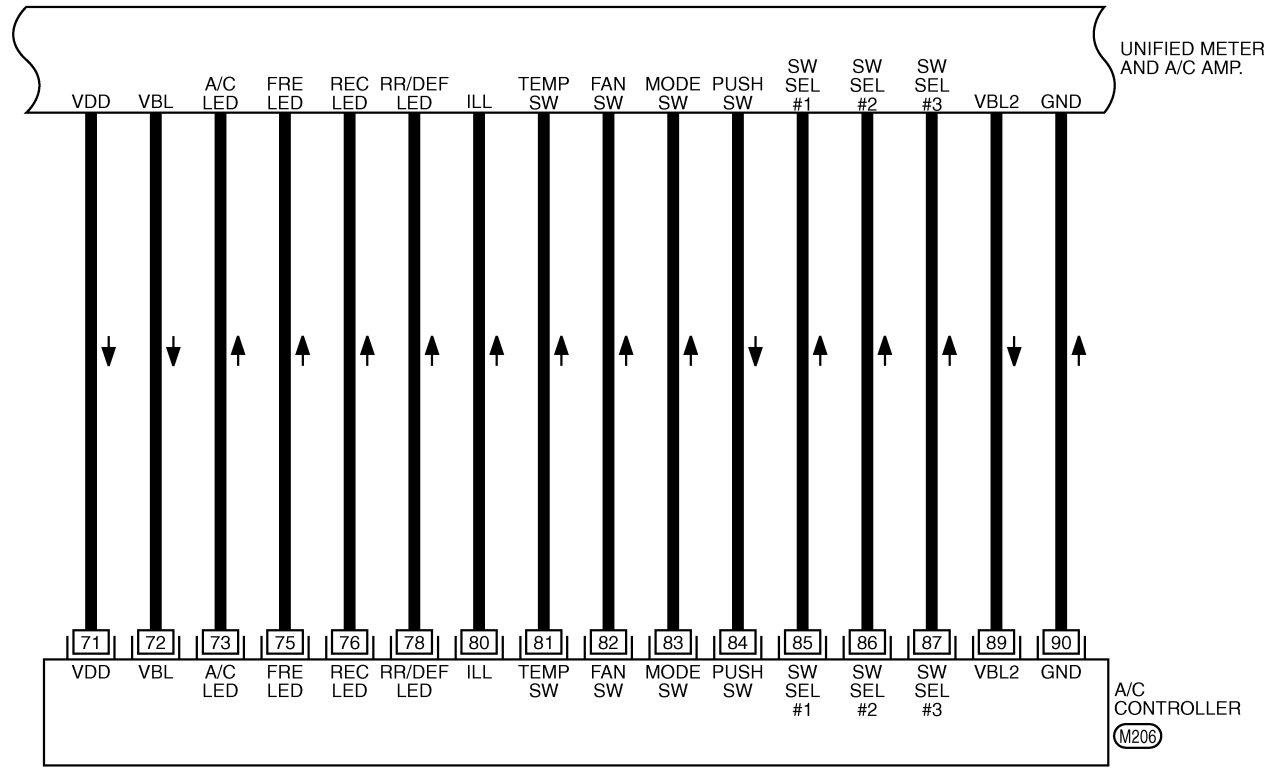
REFER TO THE FOLLOWING.

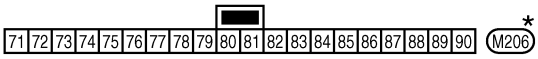
B1 -SUPER MULTIPLE JUNCTION (SMJ)

M4 , M5 -FUSE BLOCK-JUNCTION BOX (J/B)

TJWT0092E

ATC-A/C-02

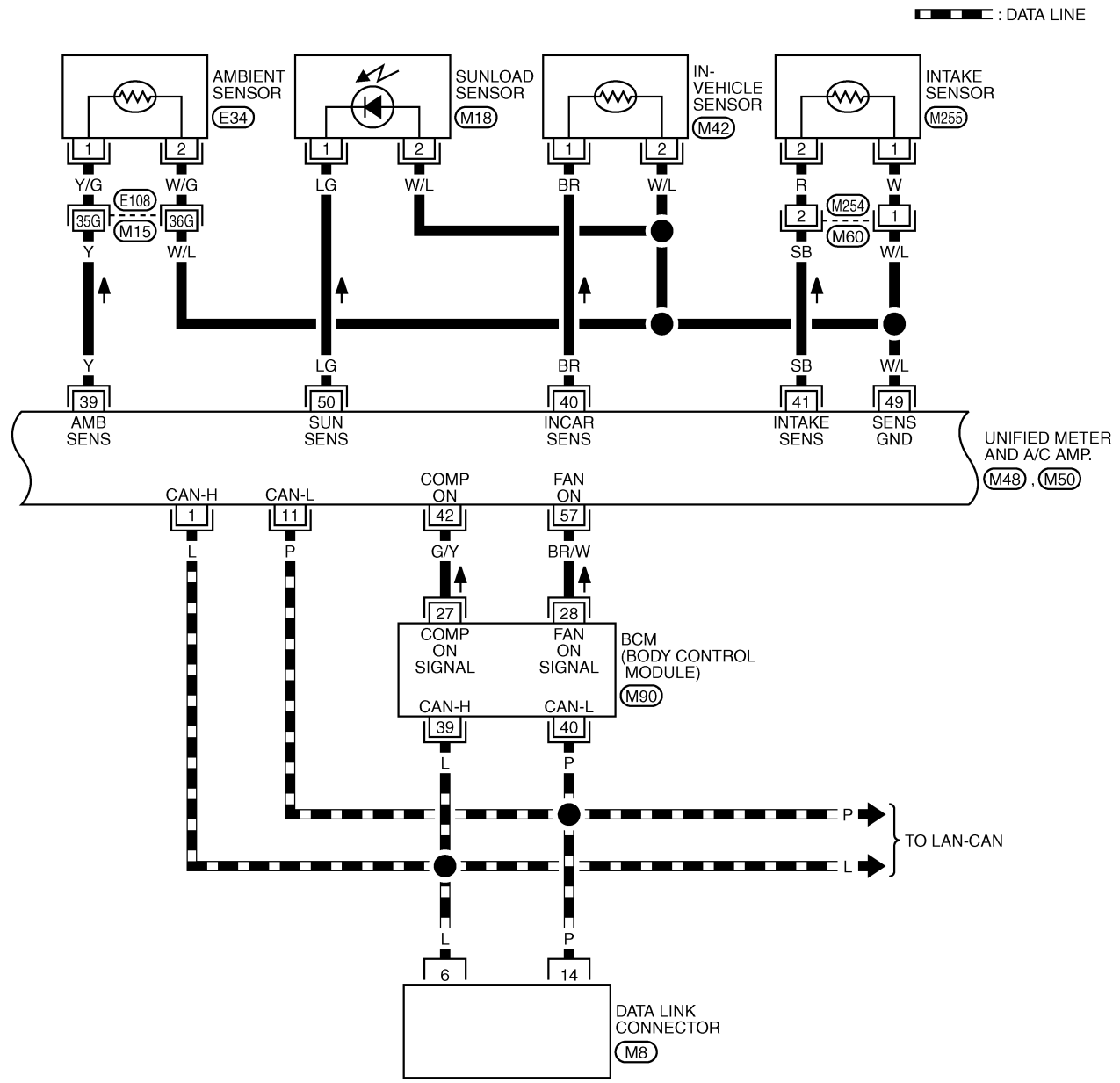


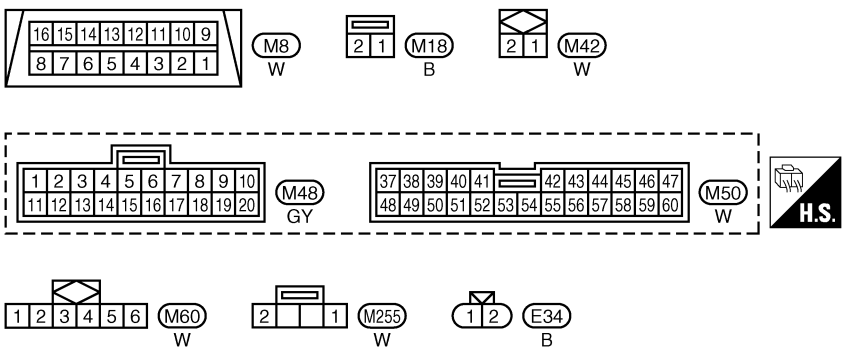


*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TJWT0169E

ATC-A/C-03

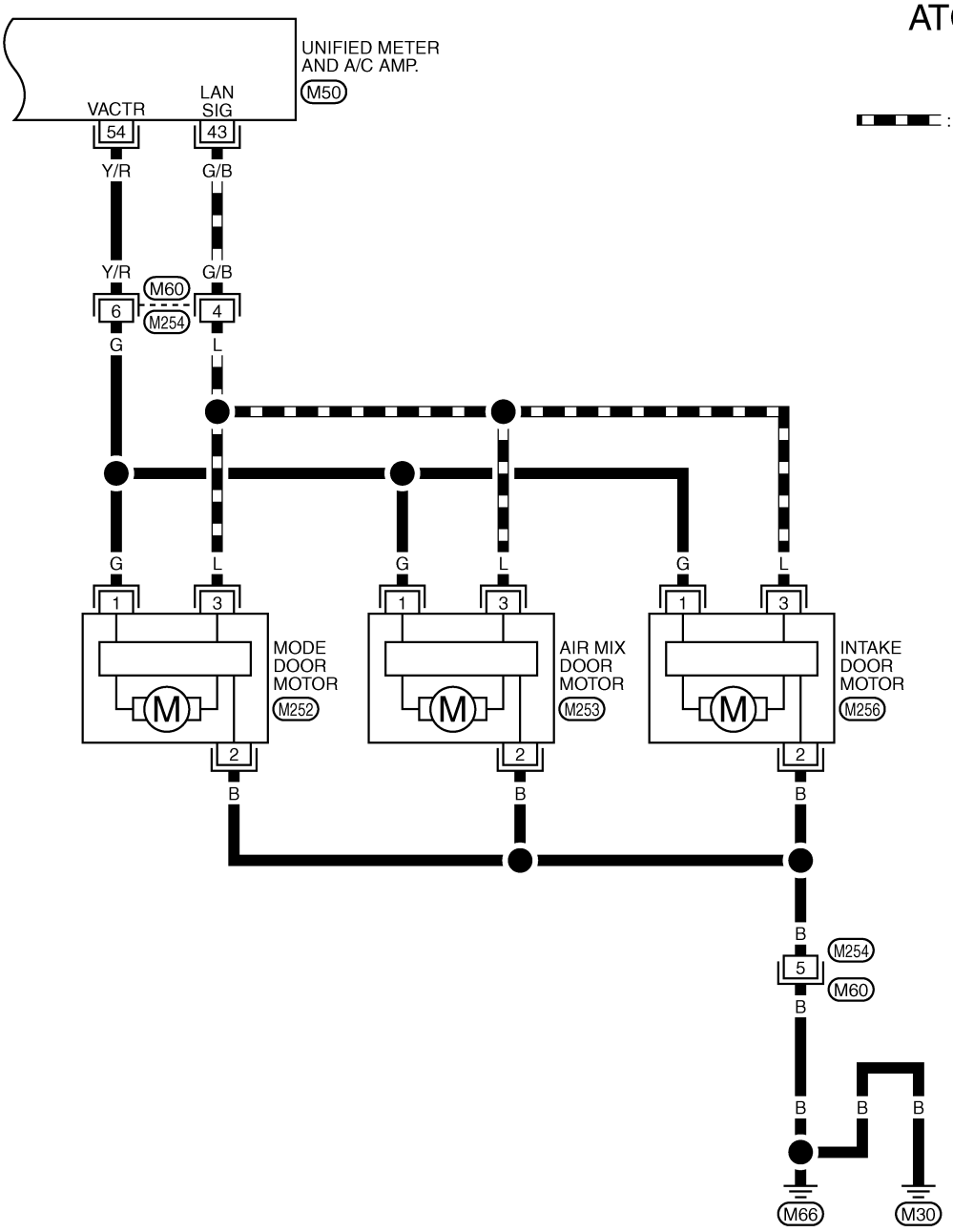




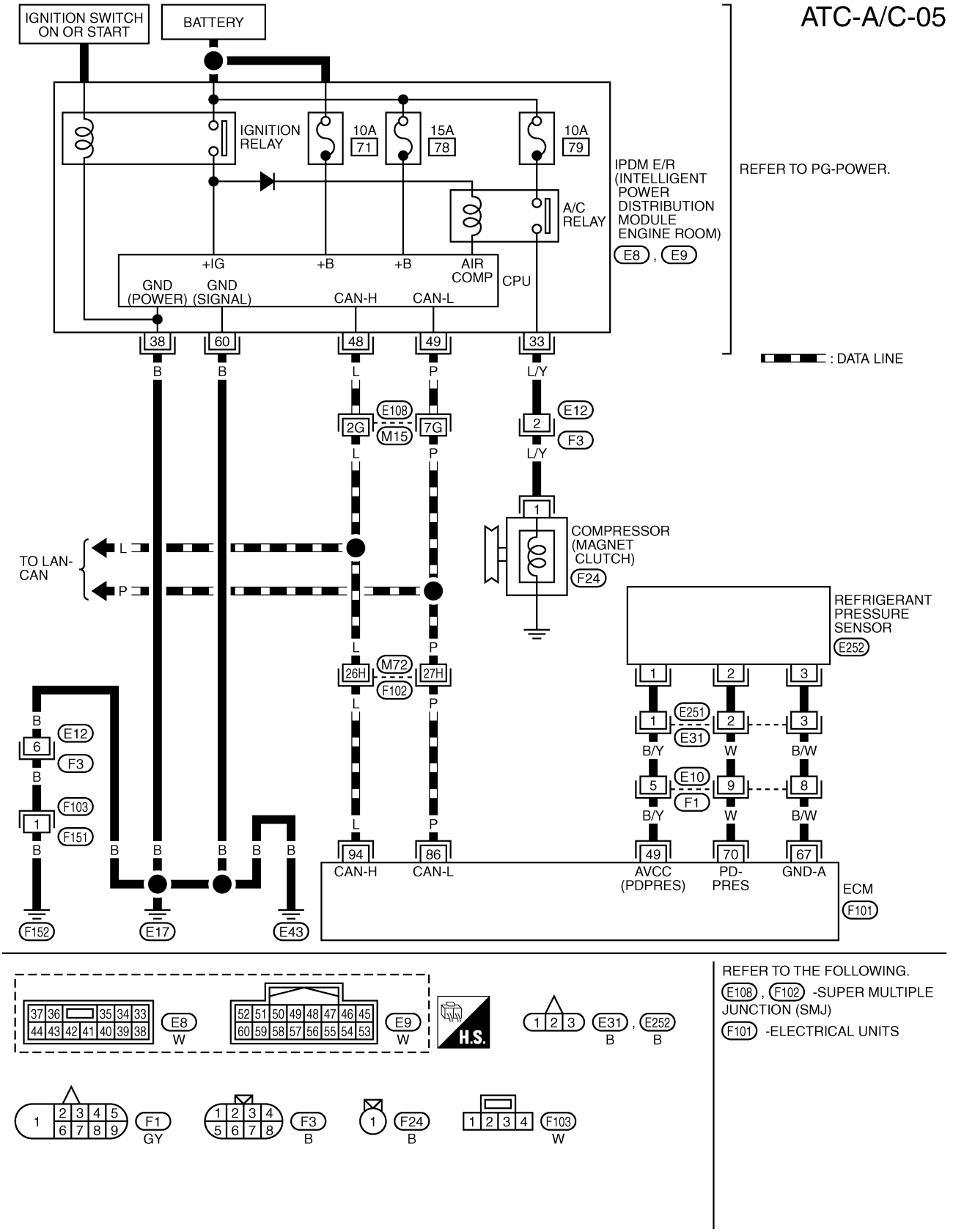
REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)
M90 -ELECTRICAL UNITS

TJWT0170E

ATC-A/C-04



TJWT0171E

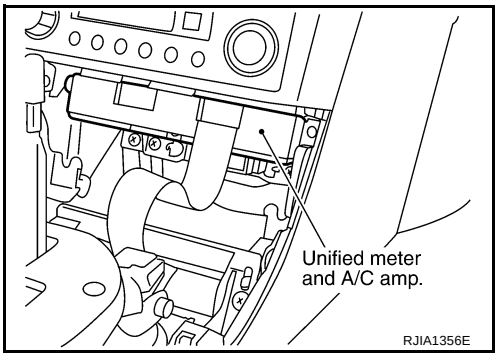

ATC-A/C-05
IGNITION SWITCH ON OR START
BATTERY
IGNITION RELAY
10A 71
15A 78
10A 79
A/C RELAY
IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
E8 , E9
REFER TO PG-POWER.
+IG
+B
+B
AIR COMP
CPU
GND (POWER)
GND (SIGNAL)
CAN-H
CAN-L
38
60
48
49
33
: DATA LINE
E108
2G
M15
7G
E12
2
F3
COMPRESSOR (MAGNET CLUTCH)
1
F24
TO LAN-CAN
M72
26H
F102
27H
REFRIGERANT PRESSURE SENSOR
E252
E251
E31
E10
F1
B/Y
W
B/W
E12
F3
F103
F151
F152
E17
E43
94
86
CAN-H
CAN-L
49
70
67
AVCC (PDPRES)
PD-PRES
GND-A
ECM
F101
E8
E9
H.S.
E31 , E252
F1
GY
F3
B
F24
F103
W
REFER TO THE FOLLOWING.
E108 , F102 -SUPER MULTIPLE JUNCTION (SMJ)
F101 -ELECTRICAL UNITS

TJWT0172E

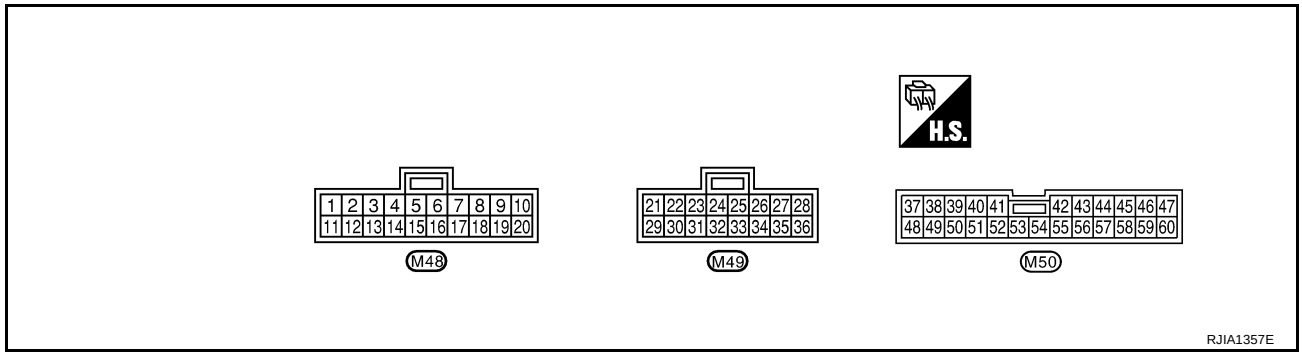
Auto Amp. Terminals and Reference Value

NJS0000V

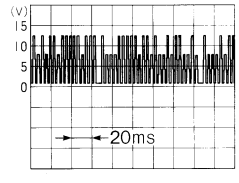
Measure voltage between each terminal and ground by referring terminals and reference value for unified meter and A/C amp.



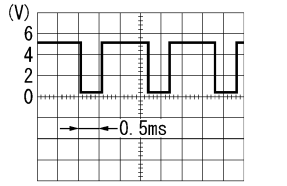
PIN CONNECTOR TERMINAL LAYOUT



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	—	—	—
9	L/OR	Multiplex communication signal (Tx)	—	—	—
11	P	CAN-L	—	—	—
19	R/G	Multiplex communication signal (Rx)	—	—	—
21	R/W	Power supply for BATT	OFF	—	Battery voltage
22	Y/G	Power supply for IGN	ON	—	Battery voltage
29	B	Ground (Power)	ON	—	Approx. 0
30	B	Ground	ON	—	Approx. 0
38	L/R	Rear window defogger ON signal	ON	Rear window defogger switch: ON	Approx. 0
				Rear window defogger switch: OFF	Approx. 12
39	Y	Ambient sensor	—	—	—
40	BR	In-vehicle sensor	—	—	—
41	SB	Intake sensor	—	—	—
42	G/Y	Compressor ON signal	ON	Compressor: ON	Approx. 0
				Compressor: OFF	Approx. 5
43	G/B	A/C LAN signal	ON	—	

HAK0652D

Terminal No.	Wire color	Item	Ignition switch	Condition	Voltage (V)
46	L/W	Power supply for IGN2	ACC or ON	—	Battery voltage
49	W/L	Sensor ground	ON	—	Approx. 0
50	LG	Sunload sensor	—	—	—
53	G	Blower motor control signal	ON	Blower speed: 1st step	 SJIA0116J
54	Y/R	Power supply for each door motor	ON	—	Battery voltage
56	B/W	Rear window defogger feedback signal	ON	Rear window defogger switch: ON	Approx. 12
				Rear window defogger switch: OFF	Approx. 0
57	BR/W	Blower motor ON signal	ON	Fan control dial: ON (A/C system operates)	Approx. 0
				Fan control dial: OFF	Approx. 5

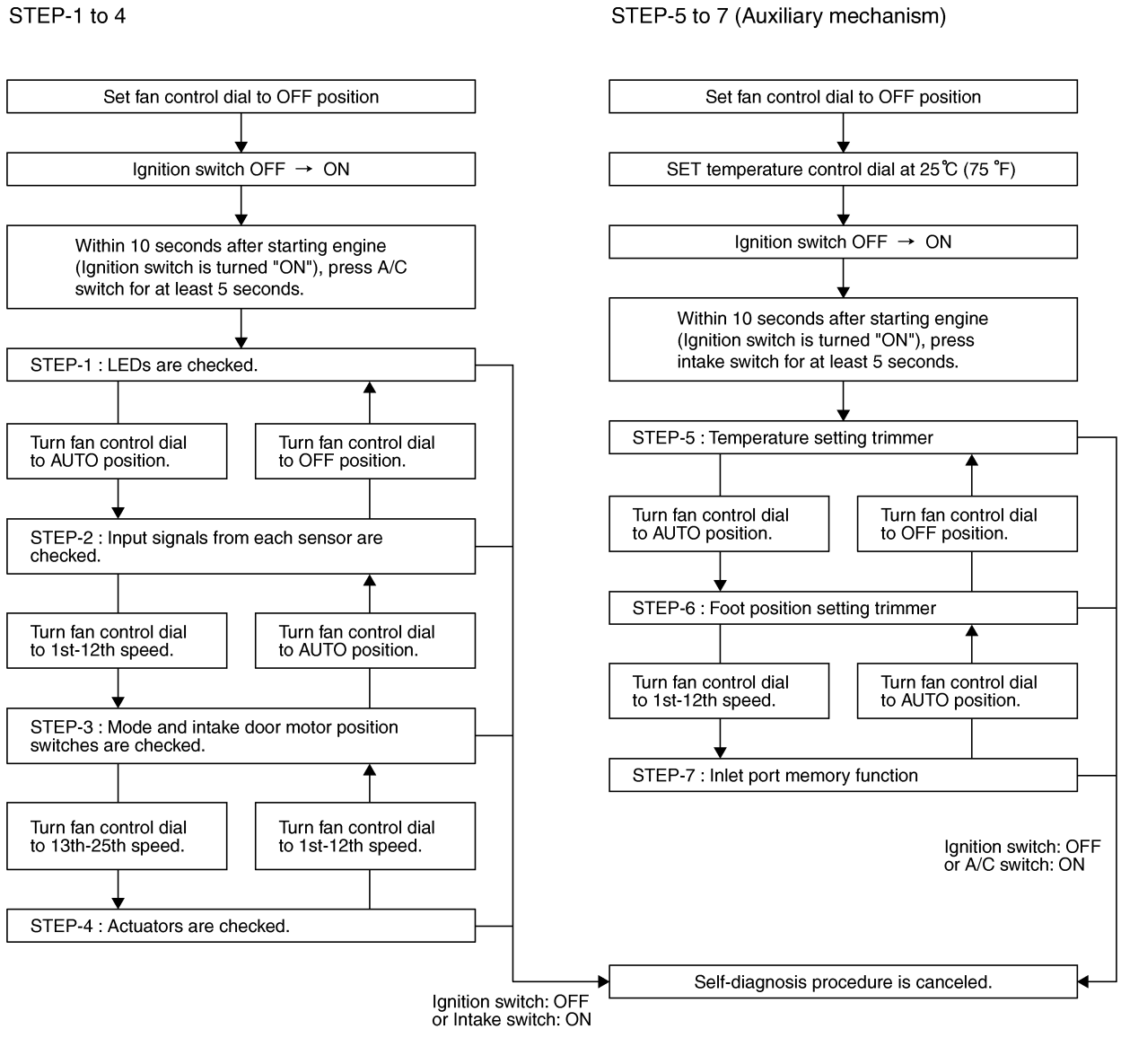
Self-diagnosis Function

NJS0000W

DESCRIPTION

The self-diagnosis system diagnoses sensors, door motors, blower motor, etc. by system line.
Self-diagnosis is STEP-1 to 7. There are two ways of changing method during self-diagnosis.

- Switching to self-diagnosis STEP-1 to 4.
  Shifting from usual control to the self-diagnosis system is accomplished by starting the engine (turning the ignition switch from OFF to 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 intake switch or turning the ignition switch OFF. Shifting from one step to another is accomplished be means of turning fan control dial, as required.
- Switching to self-diagnosis STEP-5 to 7 (Auxiliary mechanism).
  Shifting from usual control to the self-diagnosis system is accomplished by starting the engine (turning the ignition switch from OFF to ON) and pressing intake switch for at least 5 seconds. The intake switch must be pressed within 10 seconds after starting the engine (ignition switch is turned ON). This system will be canceled by either pressing A/C switch or turning the ignition switch OFF. Shifting from one step to another is accomplished by means of turning fan control dial, as required.



SJIA1139E

FUNCTION CONFIRMATION PROCEDURE

1. SET IN SELF-DIAGNOSIS MODE (STEP-1 TO 4)

1. Set the fan control dial to OFF position.
2. Turn ignition switch ON.
3. 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.

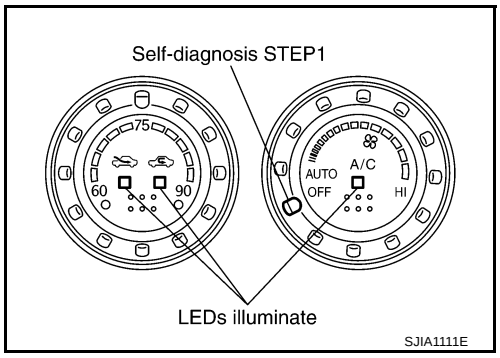
CAUTION:
If battery voltage drops below 12 V during diagnosis STEP-3, door motor speed becomes slower and as a result, the system may generate an error even when operation is normal. To avoid this, start engine before performing this diagnosis.

>> GO TO 2.

2. STEP-1: LEDS ARE CHECKED

Check intake and A/C switch LEDs illumination.

OK >> GO TO 3.
NG >> Refer to ATC-94, "Self-diagnosis" .



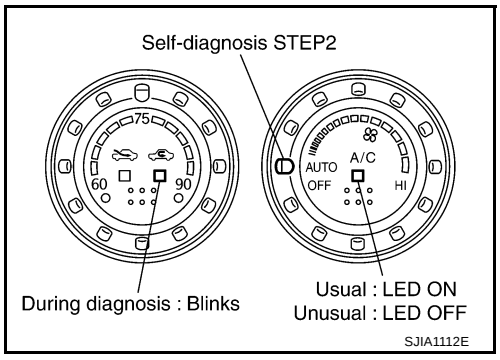
3. CHECK TO ADVANCE SELF-DIAGNOSIS STEP-2

1. Turn fan control dial to AUTO position.

   CAUTION:
   When switched to STEP-2, LED of REC position blinks for approximately 25 seconds.
2. Check A/C switch LED illumination.

Advance to self-diagnosis STEP-2?

YES >> GO TO 4.
NO >> Replace A/C controller. (Fan control dial is malfunctioning.)



4. CHECK TO RETURN SELF-DIAGNOSIS STEP-1

Turn fan control dial to OFF position.

Return to self-diagnosis STEP-1?

YES >> GO TO 5.
NO >> Replace A/C controller. (Fan control dial is malfunctioning.)

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

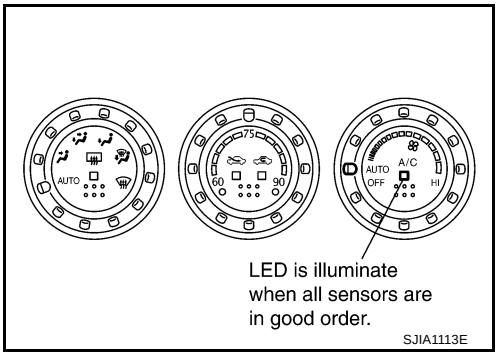
1. Turn fan control dial to AUTO position.
2. Turn mode control dial to AUTO position.

CAUTION:
When switched to STEP-2, LED of REC position blinks for approximately 25 seconds.

3. Check A/C switch LED is illuminate.

OK or NG

OK >> GO TO 6.
NG >> GO TO 9.



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

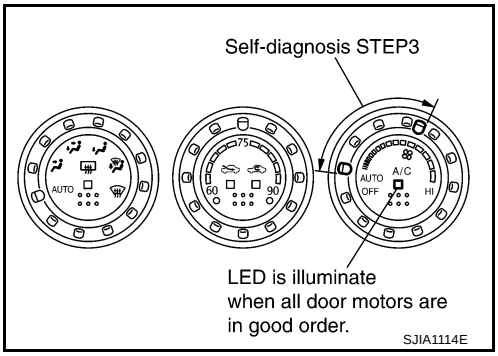
1. Turn fan control dial to 1st-12th speed.

CAUTION:
When switched to STEP-3, LED of REC position blinks for approximately 50 seconds.

2. Check A/C switch LED is illuminate.

OK or NG

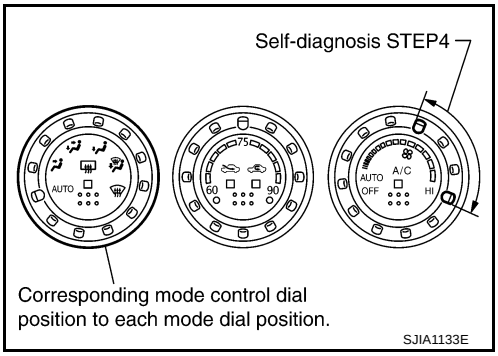
OK >> GO TO 7.
NG >> GO TO 10.



7. STEP-4: OPERATION OF EACH ACTUATOR IS CHECKED

1. Turn fan control dial to 13th-25th speed.
2. Change operation status of air conditioner by changing mode control dial position.

>> GO TO 8.



8. CHECK ACTUATORS

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

Discharge air flow

Mode door position	Air outlet/distribution		
	Vent	Foot	Defroster
	100%	–	–
	54%	46%	–
	–	76% (100%)	24% (–)
	–	57%	43%
	–	–	100%

( ): Manually control

RJIA2110E

STEP-No. *1	STEP-41	STEP-42	STEP-43	STEP-44	STEP-45	STEP-46
Mode control dial position	AUTO	VENT	B/L	FOOT or FOOT2	D/F or D/F2	DEF
Mode door position	VENT	VENT2	B/L	FOOT *2	D/F	DEF
Intake door position	REC	REC	REC	FRE	FRE	FRE
Air mix door position	FULL COLD	FULL COLD	FULL COLD	FULL HOT	FULL HOT	FULL HOT
Blower motor duty ratio	25%	25%	41%	57%	75%	91%
Compressor	ON	ON	OFF	OFF	ON	ON

Checks must be made visually, by listening to any noise, or by touching air outlets with hand, etc. for improper operation.
*1: STEP-No. 41 to 46 are for differentiation and will not be displayed.
*2: FOOT position during automatic control. Refer to ATC-55, "AUXILIARY MECHANISM: FOOT POSITION SETTING TRIMMER" .

OK or NG

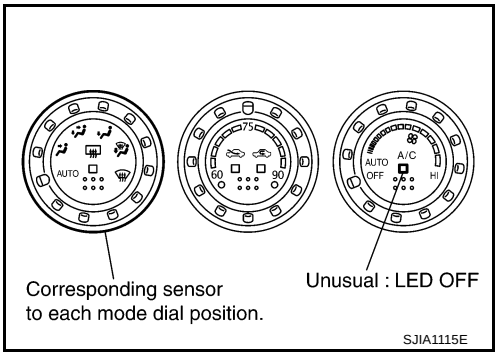
OK >> 1. Turn ignition switch OFF or intake switch ON.
2. INSPECTION END

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" .
- 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-77, "Magnet Clutch Circuit" .
- Discharge air temperature does not change.
  Go to Air Mix Door Motor Circuit. Refer to ATC-66, "Air Mix Door Motor Circuit" .

9. CHECK MALFUNCTIONING SENSOR

Refer to the following chart.
*1: Perform self-diagnosis STEP-2 under sunshine.
When performing indoors, aim a light (more than 60 W) at sunload sensor, otherwise LED of A/C switch will not indicate despite that sunload sensor is functioning properly.

CAUTION:
When switched to STEP-2, LED of REC position blinks for approximately 25 seconds.



Mode control dial position	Unusual	Malfunctioning sensor (Including circuits)	Reference page
VENT	A/C LED: OFF	Ambient sensor	*2
B/L		In-vehicle sensor	*3
FOOT or FOOT2		Sunload sensor *1	*4
D/F or D/F2		Intake sensor	*5
DEF		Air mix door motor (LCU) PBR	*6

*2: ATC-95, "DIAGNOSIS PROCEDURE FOR AMBIENT SENSOR" .
*3: ATC-98, "DIAGNOSIS PROCEDURE FOR IN-VEHICLE SENSOR" .
*4: ATC-100, "DIAGNOSIS PROCEDURE FOR SUNLOAD SENSOR" .
*5: ATC-103, "DIAGNOSIS PROCEDURE FOR INTAKE SENSOR" .
*6: ATC-68, "DIAGNOSIS PROCEDURE FOR AIR MIX DOOR MOTOR PBR" .

>> INSPECTION END

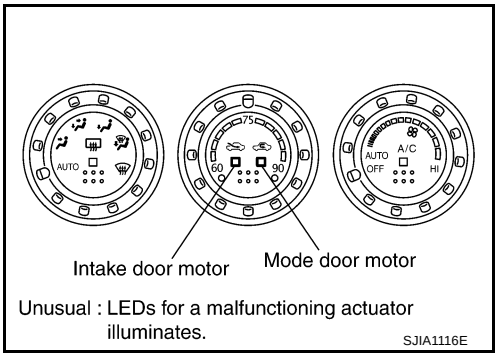
10. CHECK MALFUNCTIONING DOOR MOTOR POSITION SWITCH

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

CAUTION:
When switched to STEP-3, LED of REC position blinks for approximately 50 seconds.

Unusual	Mode or intake door position	Reference page
REC LED: ON	Mode door motor	*1
FRE LED: ON	Intake door motor	*2

*1: ATC-65, "DIAGNOSIS PROCEDURE FOR MODE DOOR MOTOR" .
*2: ATC-71, "DIAGNOSIS PROCEDURE FOR INTAKE DOOR MOTOR" .



>> INSPECTION END

AUXILIARY MECHANISM: TEMPERATURE SETTING TRIMMER

The trimmer compensates for differences in range of ±3°C (±6°F) between temperature setting (temperature control dial position) and temperature felt by customer.

Operating procedures for this trimmer are as follows:

1. Set temperature control dial at 25°C (75°F).
2. Set fan control dial to OFF.
3. Turn ignition switch ON.
4. Set in self-diagnosis mode as follows. Within 10 seconds after starting engine (ignition switch is turned ON.), press intake switch for at least 5 seconds.
5. When intake switch is pressed, temperature shifts in following order: 0°C (0°F)→ 1°C (2°F)→ 2°C (4°F)→ 3°C (6°F)→ –3°C (–6°F)→ –2°C (–4°F)→ –1°C (–2°F)→ return to 0°C (0°F).

Setting temperature	LED status of each switch		
	FRE	REC	A/C
–3°C (–6°F)	ON	ON	ON
–2°C (–4°F)	ON	ON	OFF
–1°C (–2°F)	ON	OFF	ON
0°C (0°F) (Initial setting)	OFF	OFF	OFF
1°C (2°F)	OFF	OFF	ON
2°C (4°F)	OFF	ON	OFF
3°C (6°F)	OFF	ON	ON

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

AUXILIARY MECHANISM: FOOT POSITION SETTING TRIMMER

Wind distribution ratio in FOOT mode can be set.

Operating procedures for this trimmer are as follows:

1. Set temperature control dial at 25°C (75°F).
2. Set fan control dial to AUTO.
3. Turn ignition switch ON.
4. Set in self-diagnosis mode as follows. Within 10 seconds after starting engine (ignition switch is turned ON.), press intake switch for at least 5 seconds.
5. Press intake switch as desired.

Type	Discharge air flow			
	Automatically controls the mode door		Manually controls the mode door	
	FOOT	DEF	FOOT	DEF
Type-A (initial setting)	76%	24%	100%	—
Type-B	76%	24%	100%	—
Type-C	100%	—	100%	—
Type-D	100%	—	100%	—

RJIA1365E

Type	LED status of each switch		
	FRE	REC	A/C
Type-A (Initial setting)	OFF	OFF	ON
Type-B	OFF	ON	OFF
Type-C	OFF	ON	ON
Type-D	ON	OFF	OFF

AUXILIARY MECHANISM: INLET PORT MEMORY FUNCTION

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

Operating procedures for this trimmer are as follows:

1. Set fan control dial to 1st-12th speed.
2. Turn ignition switch ON.
3. Set in self-diagnosis mode as follows. Within 10 seconds after starting engine (ignition switch is turned ON.), press intake switch for at least 5 seconds.
4. Press intake switch as desired.

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

Operational Check

NJS0000X

The purpose of the operational check is to check if the individual system operates properly.

Conditions : Engine running at normal operating temperature

CHECKING BLOWER

1. Turn fan control dial to 1st speed. Blower should operate on low speed.
2. Turn fan control dial to 2nd speed, and continue checking blower speed 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. Turn mode control dial to each position.
2. Confirm that discharge air comes out according to the air distribution table. Refer to ATC-33, "Discharge Air Flow" .

Discharge air flow

Mode door position	Air outlet/distribution		
	Vent	Foot	Defroster
	100%	–	–
	54%	46%	–
	–	76% (100%)	24% (–)
	–	57%	43%
	–	–	100%

( ): Manually control

RJIA2110E

Intake door position is checked in the next step.
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 D/F, D/F2 or DEF position are selected.

CHECKING INTAKE DOOR

1. Press intake switch. Recirculation LED should illuminate.
2. Press intake switch again. Fresh LED 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.

CHECKING TEMPERATURE DECREASE

1. Turn temperature control dial until 18°C (60°F).
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.

CHECKING TEMPERATURE INCREASE

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

If NG, go to trouble diagnosis procedure for ATC-92, "Insufficient Heating" .
If OK, continue the check.

CHECKING A/C SWITCH

Turn fan control dial to AUTO position. (Compressor is turned ON automatically.)

- Confirm that the compressor clutch engages (sound or visual inspection). (Discharge air and blower speed will depend on ambient, in-vehicle, and set temperatures.)

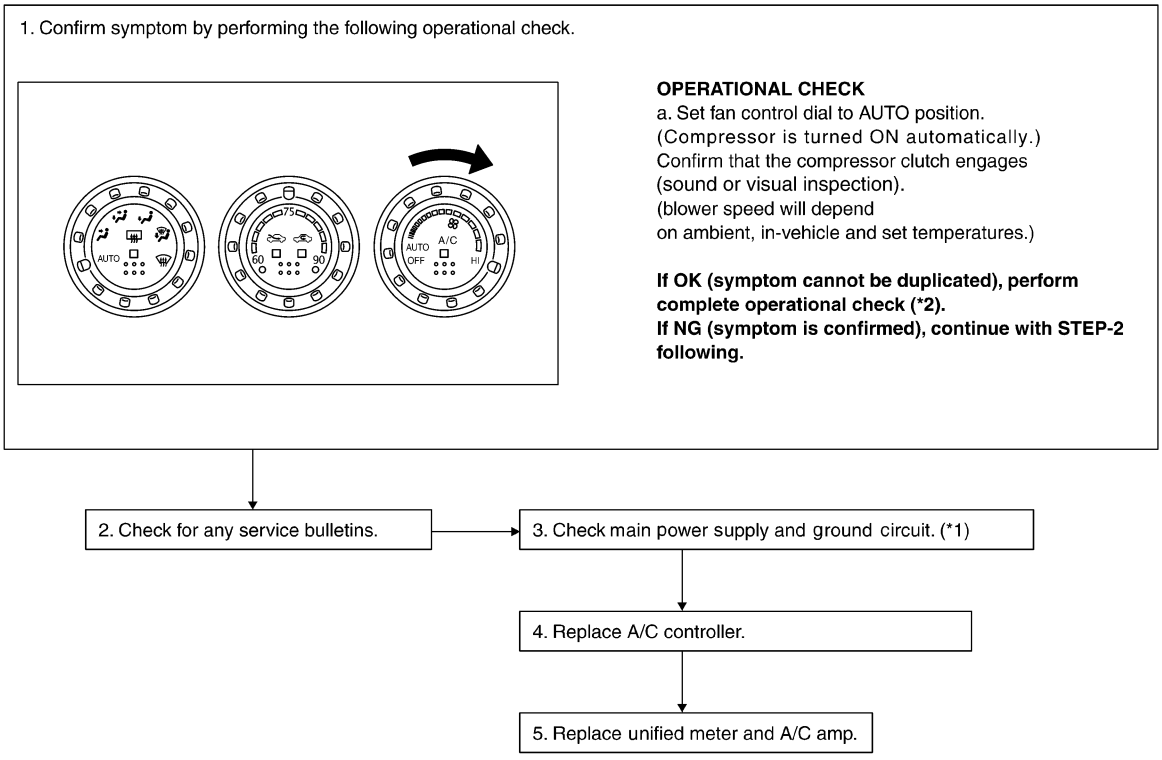
If NG, go to trouble diagnosis procedure for ATC-57, "Power Supply and Ground Circuit for Auto Amp." , then if necessary, trouble diagnosis procedure for ATC-77, "Magnet Clutch Circuit" .
If all operational checks are OK (symptom cannot be duplicated), go to Incident Simulation Tests in GI-27, "How to Perform Efficient Diagnosis for an Electrical Incident" and perform tests as outlined to simulate driving conditions environment. If symptom appears, refer to ATC-38, "SYMPTOM TABLE" and perform applicable trouble diagnosis procedures.

Power Supply and Ground Circuit for Auto Amp.

NJS0000Y

SYMPTOM: A/C system does not come on.

INSPECTION FLOW



SJIA1123E

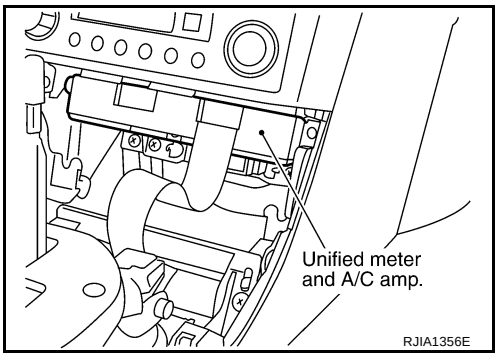
*1 ATC-58, "DIAGNOSIS PROCEDURE FOR A/C SYSTEM"

*2 ATC-56, "Operational Check"

COMPONENT DESCRIPTION

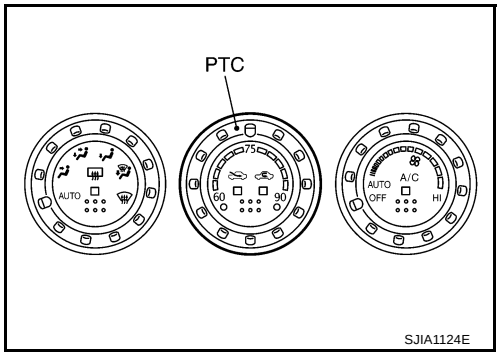
Unified Meter and A/C amp. (Automatic Amplifier)

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 dial are operated, data is input to the uified meter and A/C amp. from the A/C controller using multiplex 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.



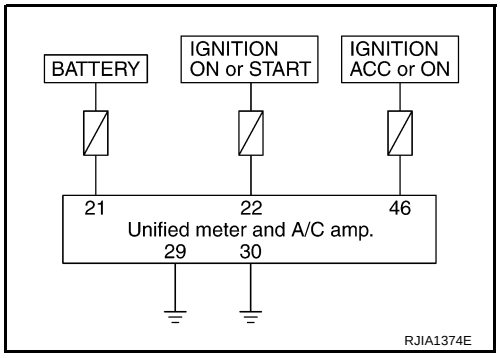
Potentio Temperature Control (PTC)

The PTC is built into the A/C controller. It can be set at an interval of 1°C (2.0°F) in the 18°C (60°F) to 32°C (90°F) temperature range by turning the temperature control dial.



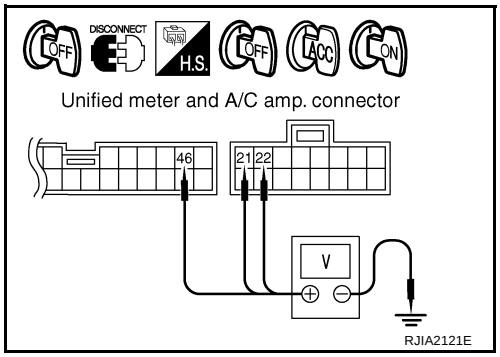
DIAGNOSIS PROCEDURE FOR A/C SYSTEM

SYMPTOM: A/C system does not come on.



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

1. Disconnect unified meter connector and A/C amp. connector.
2. Check voltage between unified meter and A/C amp. harness connector M49 terminal 21 and 22, unified meter and A/C amp. harness connector M50 terminal 46 and ground.



Terminals			Ignition switch position		
(+)		(–)	OFF	ACC	ON
Unified meter and A/C amp. connector	Terminal No.				
M49	21	Ground	Battery voltage	Battery voltage	Battery voltage
M49	22		Approx. 0 V	Approx. 0 V	Battery voltage
M50	46		Approx. 0 V	Battery voltage	Battery voltage

OK or NG

OK >> GO TO 2.

NG >> Check 10 A and 15 A fuses [Nos. 10, 11, 12 and 19, located in the fuse block (J/B)]. Refer to PG-87, "FUSE BLOCK - JUNCTION BOX (J/B)" .

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

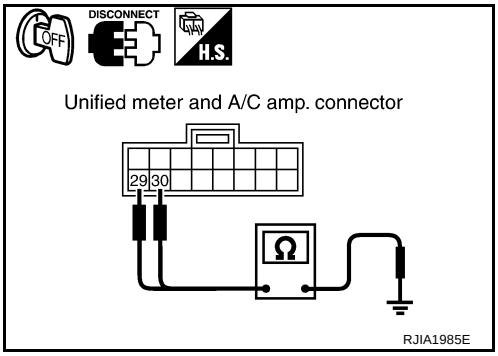
2. CHECK GROUND CIRCUIT FOR UNIFIED METER AND A/C AMP.

1. Turn ignition switch OFF.
2. Check continuity between unified meter and A/C amp. harness connector M49 terminal 29, 30 and ground.

29, 30 – Ground : Continuity should exist.

OK or NG

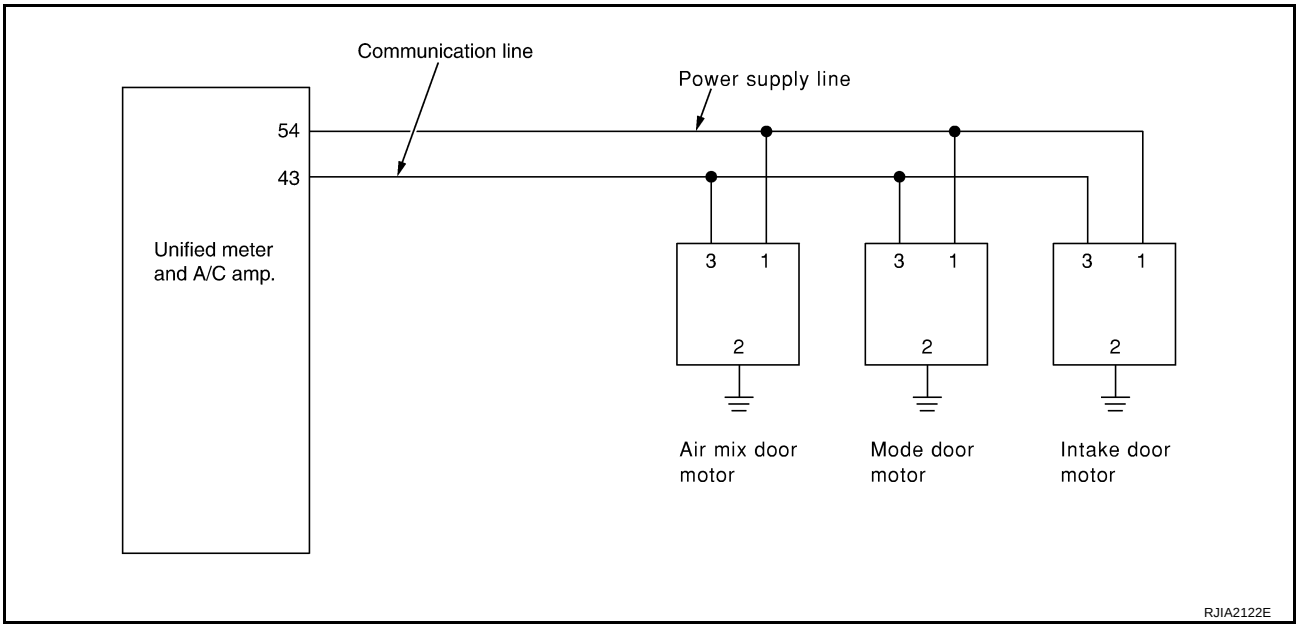
OK >> Replace unified meter and A/C amp.
NG >> Repair harness or connector.



LAN System Circuit

NJS0000Z

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



DIAGNOSIS PROCEDURE FOR LAN CIRCUIT

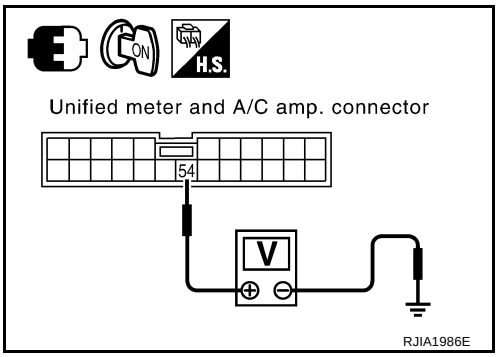
1. CHECK POWER SUPPLY FOR UNIFIED METER AND A/C AMP.

1. Turn ignition switch ON.
2. Check voltage between unified meter and A/C amp. harness connector M50 terminal 54 and ground.

54 – Ground : Battery voltage

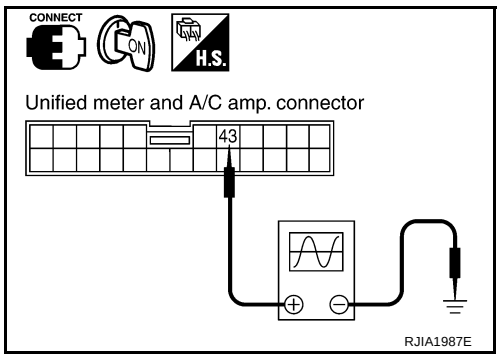
OK or NG

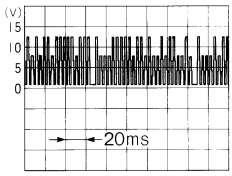
OK >> GO TO 2.
NG >> Replace unified meter and A/C amp.



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

Confirm A/C LAN signal between unified meter and A/C amp. harness connector M50 terminal 43 and ground using an oscilloscope.



Terminals			Voltage
(+)		(–)	
Unified meter and A/C amp. connector	Terminal No.		
M50	43	Ground	

HAK0652D

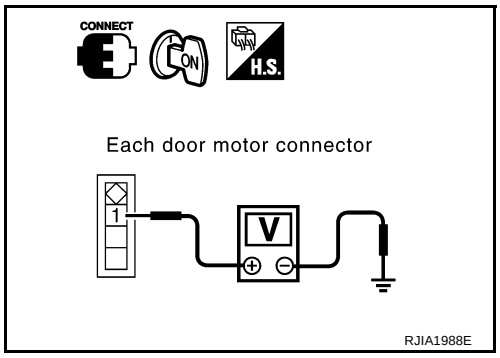
OK or NG

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

3. CHECK POWER SUPPLY FOR EACH DOOR MOTOR

Check voltage between each door motor harness connector M252, M253, M256 terminal 1 and ground.

1 – Ground : Battery voltage

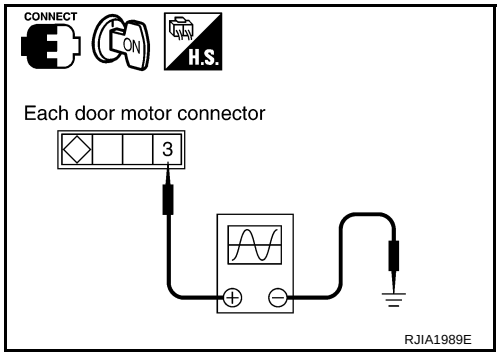


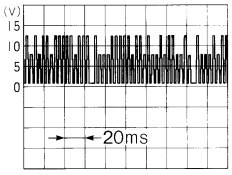
OK or NG

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
	(+)		(–)	
	Connector	Terminal No.		
Mode	M252	3	Ground	
Air mix	M253	3		
Intake	M256	3		

HAK0652D

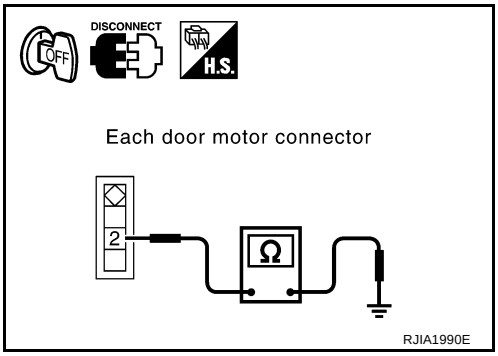
OK or NG

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, M256 terminal 2 and ground.

2 – Ground : Continuity should exist.



OK or NG

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

6. CHECK MOTOR OPERATION

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

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 door motor, air mix door motor and intake door motor connector.
3. Reconnect air mix door motor and intake door motor connector.
4. Turn ignition switch ON.
5. Confirm air mix door motor and intake door motor operation.

OK or NG

OK >> (Air mix door motor and intake door motor operate normally.)
- Replace mode door motor.

NG >> (Air mix door motor and intake door motor 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 connector.
3. Reconnect mode door motor connector.
4. Turn ignition switch ON.
5. Confirm mode door motor and intake door motor operation.

OK or NG

OK >> (Mode door motor and intake door motor operate normally.)
- Replace air mix door motor.

NG >> (Mode door motor and intake door motor 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 connector.
4. Turn ignition switch ON.
5. Confirm mode door motor and air mix door motor operation.

OK or NG

OK >> (Mode door motor and air mix door motor operate normally.)
- Replace intake door motor.

NG >> (Mode door motor and air mix door motor does not operate normally.)
- Replace unified meter and A/C amp.

Mode Door Motor Circuit

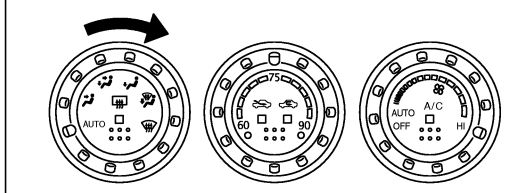
NJS00010

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

a. Turn mode control dial to each position.

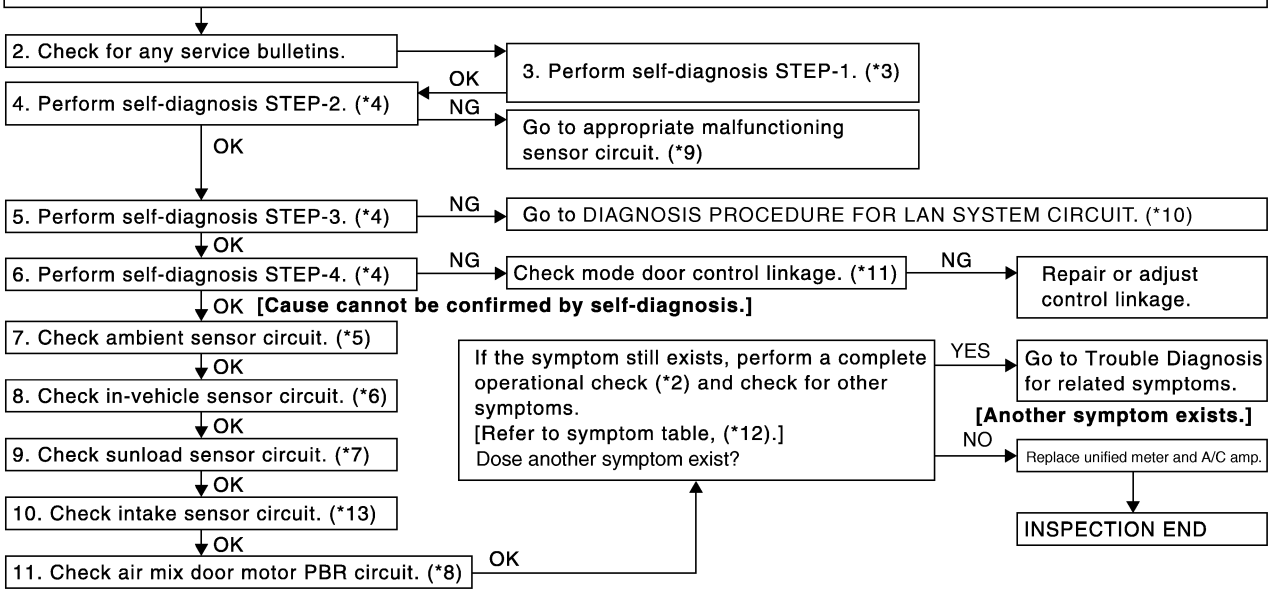
Discharge air flow

Mode door position	Air outlet/distribution		
	Vent	Foot	Defroster
	100%	–	–
	54%	46%	–
	–	76% (100%)	24% (–)
	–	57%	43%
	–	–	100%

( ): Manually control

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

- **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 D/F, D/F2 or DEF is selected.**
  Intake door position is checked in the next step.



SJIA1125E

*1 ATC-33, "Discharge Air Flow"
*2 ATC-56, "Operational Check"
*3 ATC-50, "FUNCTION CONFIRMATION PROCEDURE", see No. 1.
*4 ATC-50, "FUNCTION CONFIRMATION PROCEDURE", see No. 5 to 7.
*5 ATC-95, "Ambient Sensor Circuit"
*6 ATC-97, "In-vehicle Sensor Circuit"
*7 ATC-100, "Sunload Sensor Circuit"
*8 ATC-68, "Air Mix Door Motor PBR Circuit"
*9 ATC-50, "FUNCTION CONFIRMATION PROCEDURE", see No. 9.

*10 ATC-59, "DIAGNOSIS PROCEDURE FOR LAN CIRCUIT" *11 ATC-119, "MODE DOOR MOTOR" *12 ATC-38, "SYMPTOM TABLE"

*13 ATC-103, "Intake Sensor Circuit"

SYSTEM DESCRIPTION

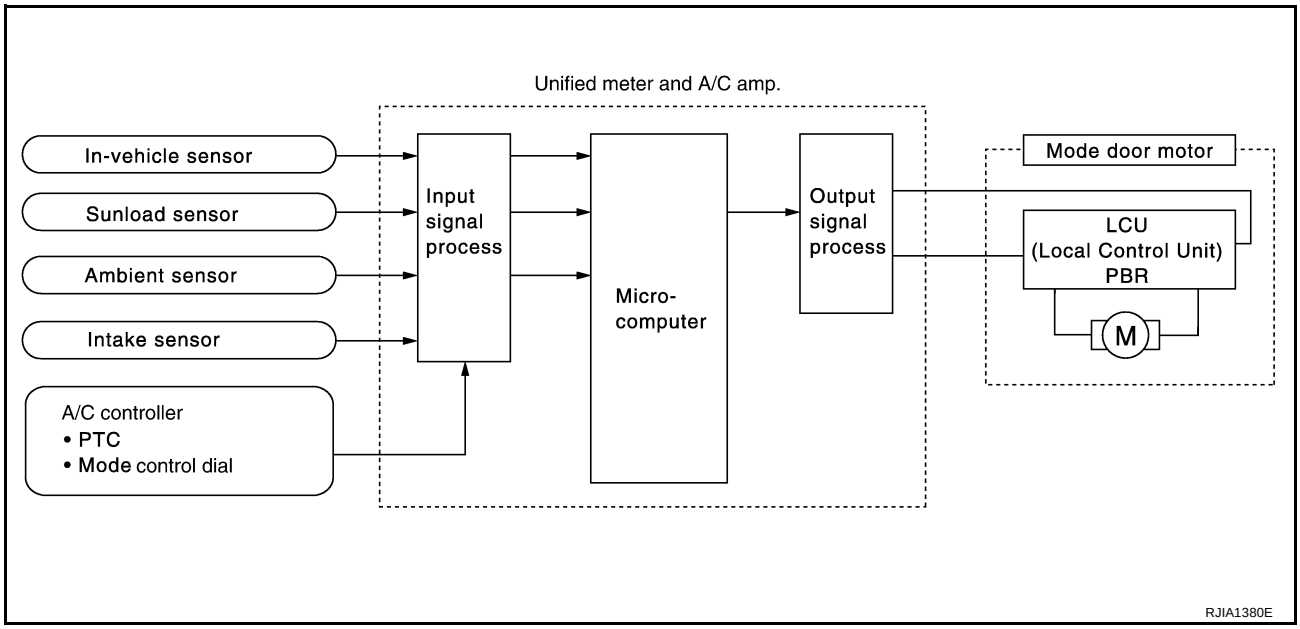
Component Parts

Mode door control system components are:

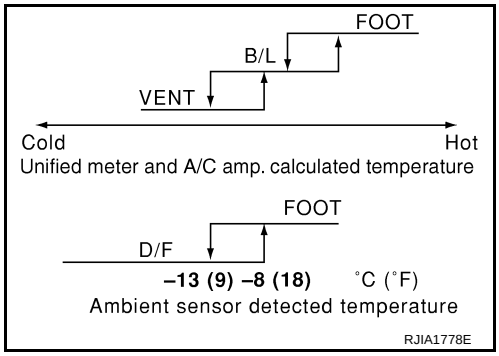
- Unified meter and A/C amp.
- Mode door motor (LCU)
- A/C LAN system (PBR built-in mode door motor, air mix door motor and intake door motor)
- In-vehicle sensor
- Ambient sensor
- Sunload sensor
- Intake sensor

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 FRESH/RECIRCULATION operation is selected. The new selection data are returned to the unified meter and A/C amp.



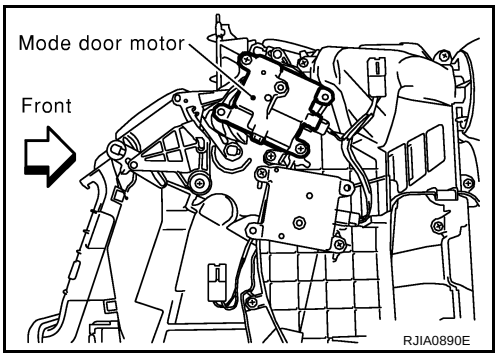
Mode Door Control Specification



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" .

Air Mix Door Motor Circuit

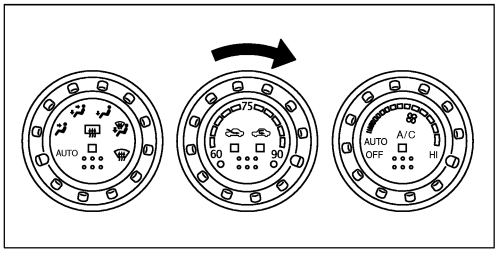
NJS00011

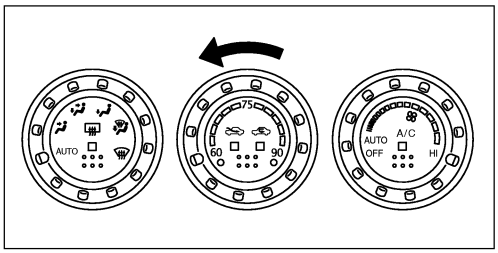
SYMPTOM:

- 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

a. Turn temperature control dial clockwise until 32°C (90°F).
b. Check for hot air at discharge air outlets.

Temperature decrease

a. Turn temperature control dial counterclockwise until 18°C (60°F).
b. 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.

2. Check for any service bulletins.
3. Perform self-diagnosis STEP-1. (*1)
OK
4. Perform self-diagnosis STEP-2. (*12)
NG → Go to appropriate malfunctioning sensor circuit. (*6)
OK
5. Perform self-diagnosis STEP-4. (*12)
OK **[Cause cannot be confirmed by self-diagnosis.]**
6. Check ambient sensor circuit. (*2)
OK
7. Check in-vehicle sensor circuit. (*3)
OK
8. Check sunload sensor circuit. (*4)
OK
9. Check intake sensor circuit. (*11)
OK
10. Check air mix door motor PBR circuit. (*5)
OK
NG → Go to LAN system circuit. (*7)
OK
Check air mix door motor. (*8)
NG → Replace air mix door motor.
If the symptom still exists, perform a complete operational check (*9) and check for other symptoms. [Refer to symptom table, (*10).] Does another symptom exist?
YES → Go to Trouble Diagnosis for related symptom.
Another symptom exists.
NO
Replace unified meter and A/C amp. → INSPECTION END

SJIA1126E

*1 ATC-50, "FUNCTION CONFIRMATION PROCEDURE", see No. 1.
*2 ATC-95, "Ambient Sensor Circuit"
*3 ATC-97, "In-vehicle Sensor Circuit"
*4 ATC-100, "Sunload Sensor Circuit"
*5 ATC-68, "Air Mix Door Motor PBR Circuit"
*6 ATC-50, "FUNCTION CONFIRMATION PROCEDURE", see No. 9.
*7 ATC-59, "LAN System Circuit"
*8 ATC-68, "Air Mix Door Motor"
*9 ATC-56, "Operational Check"
*10 ATC-38, "SYMPTOM TABLE"
*11 ATC-103, "Intake Sensor Circuit"
*12 ATC-50, "FUNCTION CONFIRMATION PROCEDURE", see No. 5 to 7.

SYSTEM DESCRIPTION

Component Parts

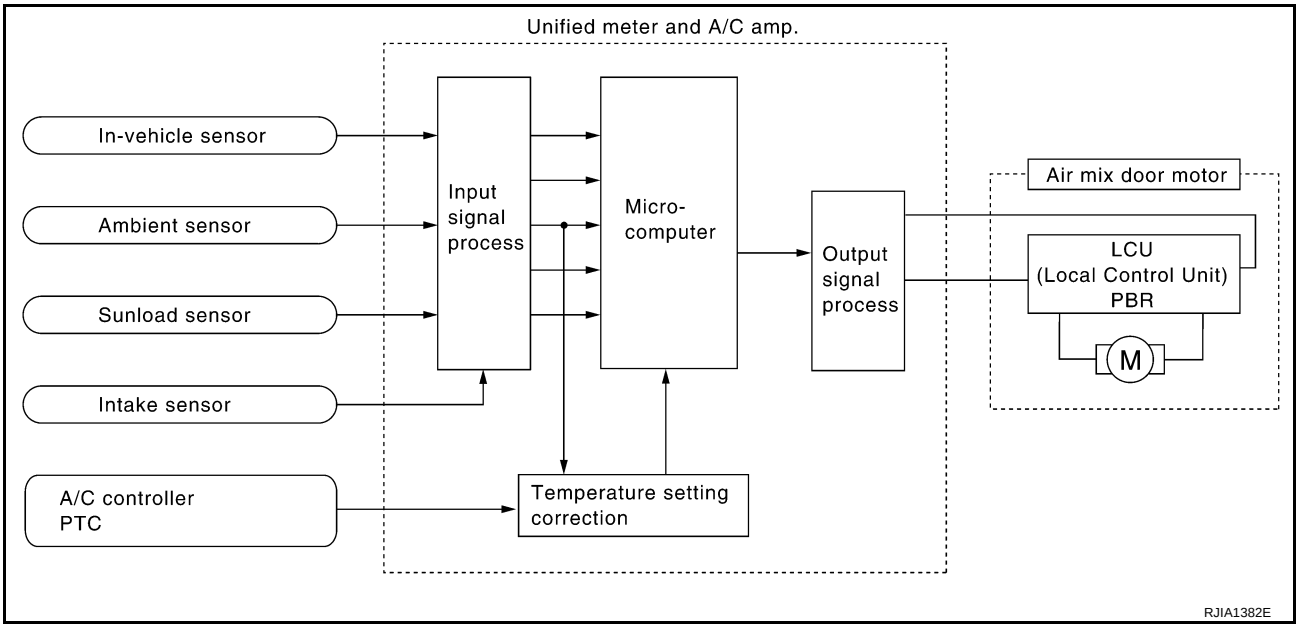
Air mix door control system components are:

- 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

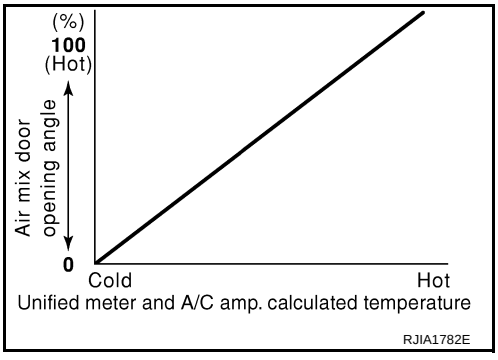
System Operation

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 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 FRESH/RECIRCULATION operation is selected. The new selection data are returned to the unified meter and A/C amp.



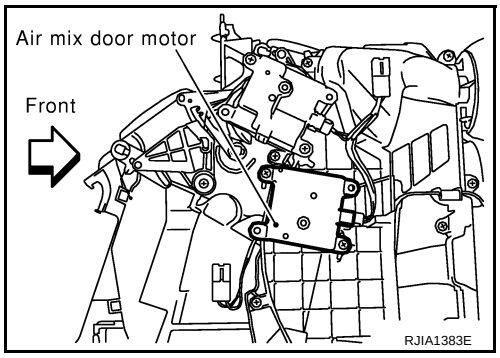
Air Mix Door Control Specification



COMPONENT DESCRIPTION

Air Mix Door Motor

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



DIAGNOSIS PROCEDURE FOR AIR MIX DOOR

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

NJS00012

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" .

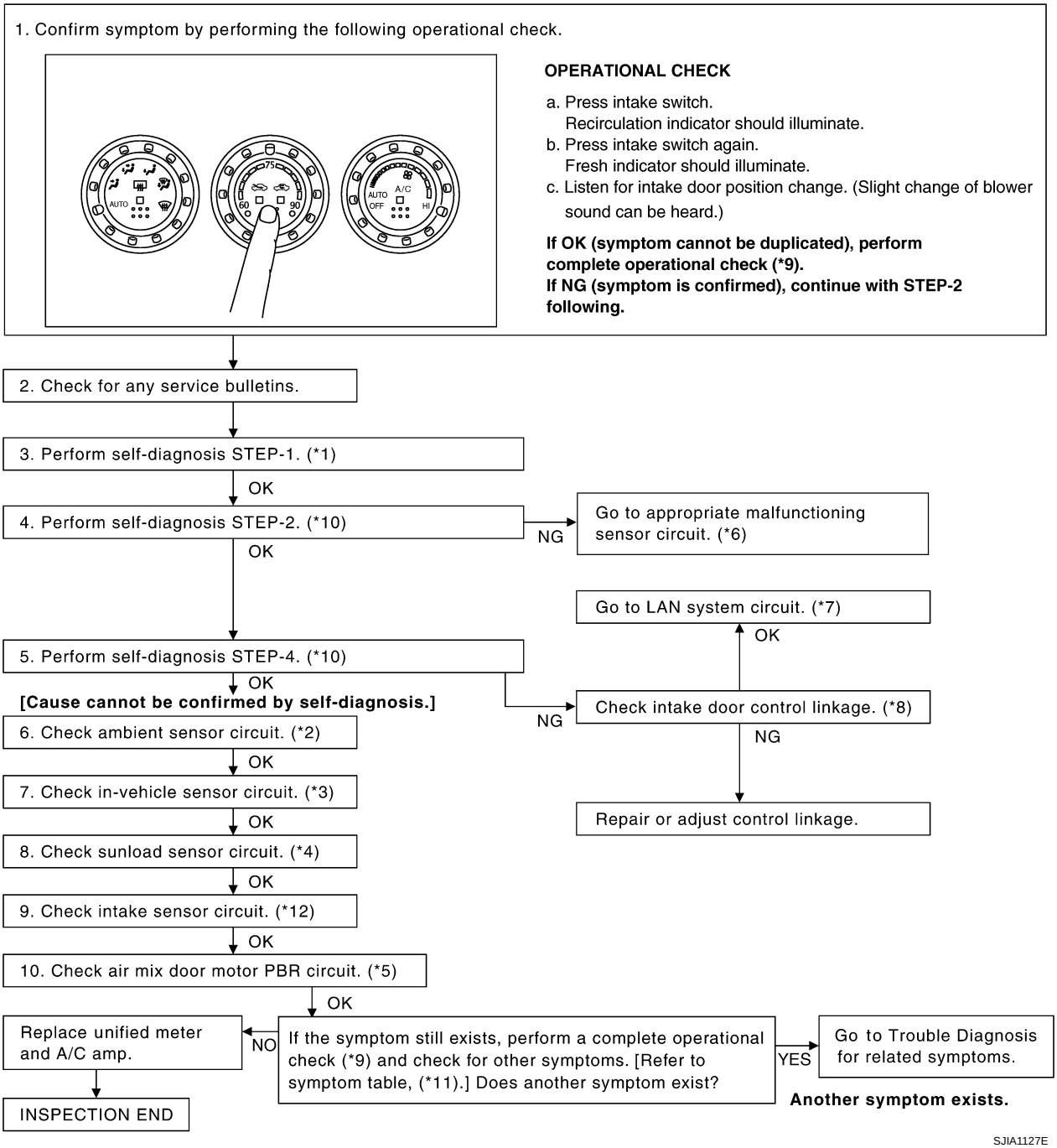
Intake Door Motor Circuit

NJS00013

SYMPTOM:

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

INSPECTION FLOW



SJIA1127E

*1	ATC-50, "FUNCTION CONFIRMATION PROCEDURE", see No. 1.	*2	ATC-95, "Ambient Sensor Circuit"	*3	ATC-97, "In-vehicle Sensor Circuit"
*4	ATC-100, "Sunload Sensor Circuit"	*5	ATC-68, "Air Mix Door Motor PBR Circuit"	*6	ATC-50, "FUNCTION CONFIRMATION PROCEDURE", see No. 9.
*7	ATC-59, "LAN System Circuit"	*8	ATC-114, "INTAKE DOOR MOTOR"	*9	ATC-56, "Operational Check"
*10	ATC-50, "FUNCTION CONFIRMATION PROCEDURE", see No. 5 to 7.	*11	ATC-38, "SYMPTOM TABLE"	*12	ATC-103, "Intake Sensor Circuit"

SYSTEM DESCRIPTION

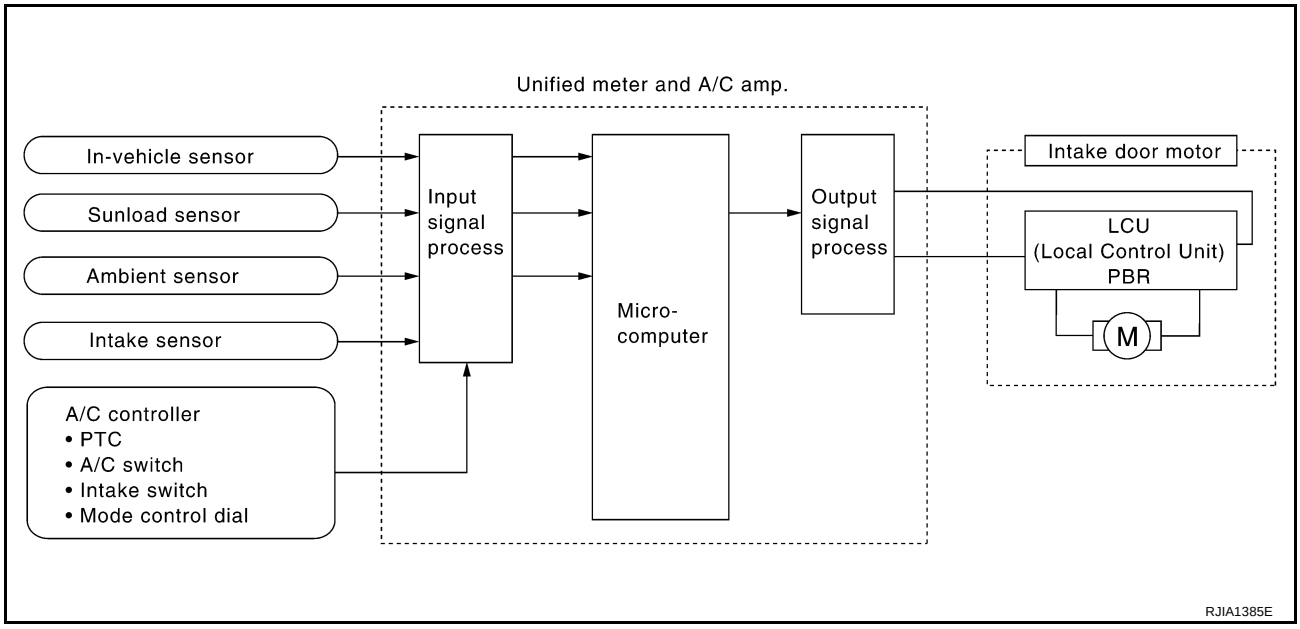
Component Parts

Intake door control system components are:

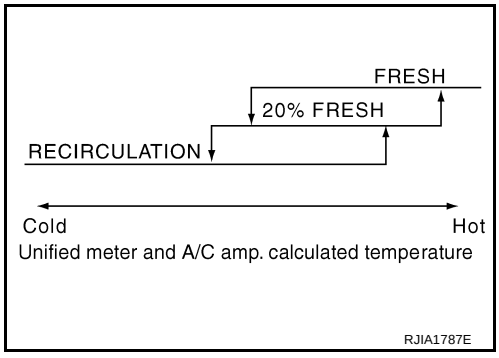
- Unified meter and A/C amp.
- Intake door motor (LCU)
- A/C LAN system (PBR built-in mode door motor, air mix door motor and intake door motor)
- In-vehicle sensor
- Ambient sensor
- Sunload sensor
- Intake sensor

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 setting mode control dial to D/F, D/F2 or DEF position, fan control dial OFF position, the unified meter and A/C amp. sets the intake door at the FRESH position.



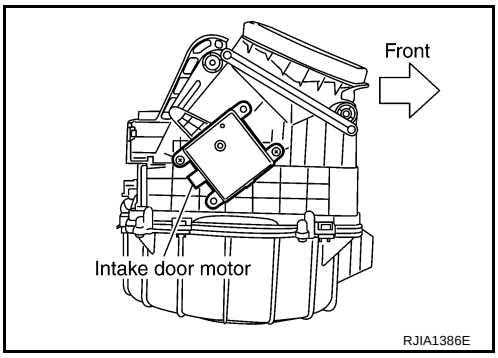
Intake Door Control Specification



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

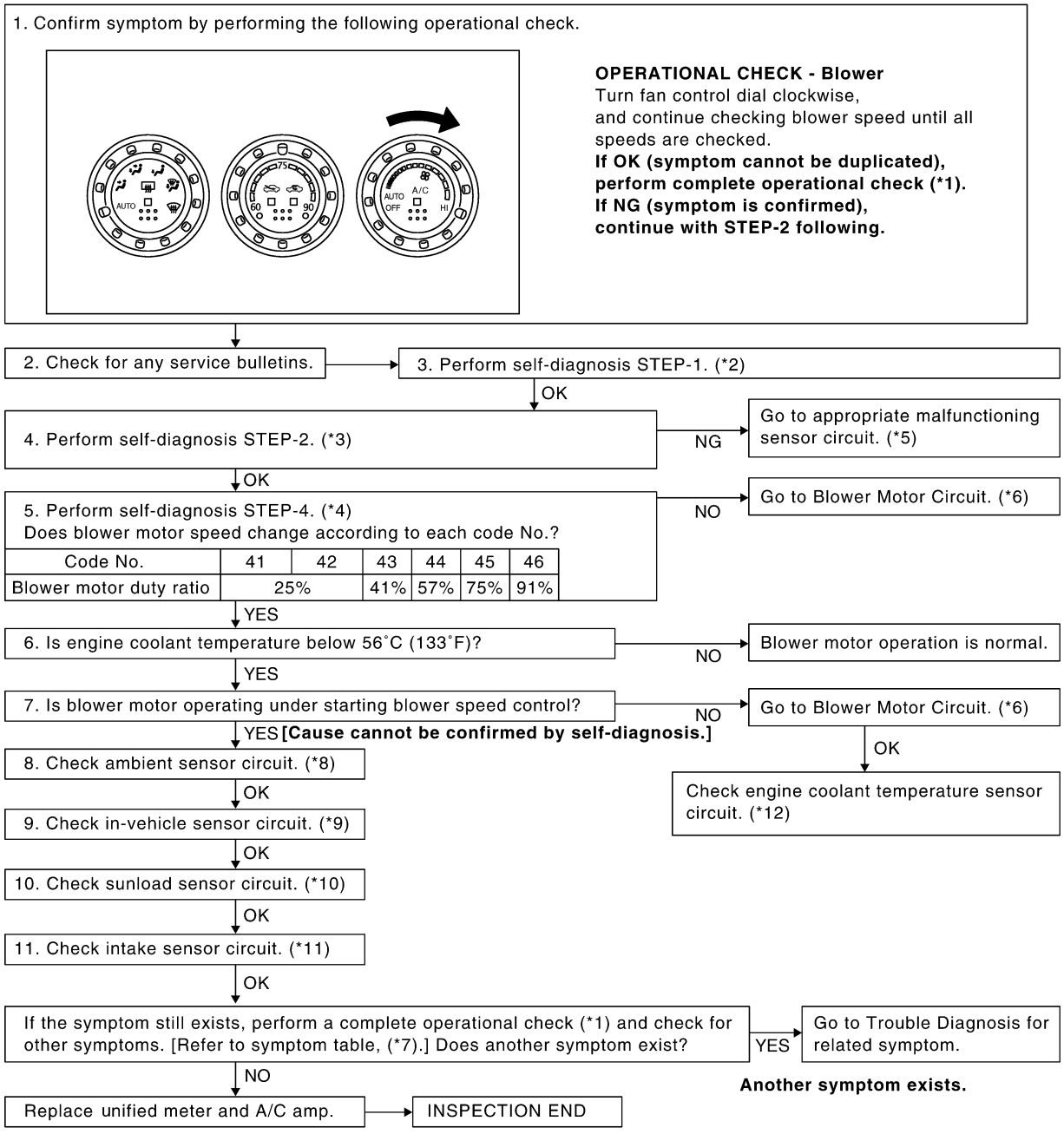
SYMPTOM: Intake door motor does not operate normally.
Perform diagnosis procedure. Refer to ATC-59, "DIAGNOSIS PROCEDURE FOR LAN CIRCUIT" .

Blower Motor Circuit

NJS00014

SYMPTOM: Blower motor operation is malfunctioning.

INSPECTION FLOW



SJIA1128E

*1	ATC-56, "Operational Check"	*2	ATC-50, "FUNCTION CONFIRMATION PROCEDURE", see No. 1.	*3	ATC-50, "FUNCTION CONFIRMATION PROCEDURE", see No. 5.
*4	ATC-50, "FUNCTION CONFIRMATION PROCEDURE", see No. 7.	*5	ATC-50, "FUNCTION CONFIRMATION PROCEDURE", see No. 9.	*6	ATC-74, "DIAGNOSIS PROCEDURE FOR BLOWER MOTOR"
*7	ATC-38, "SYMPTOM TABLE"	*8	ATC-95, "Ambient Sensor Circuit"	*9	ATC-97, "In-vehicle Sensor Circuit"
*10	ATC-100, "Sunload Sensor Circuit"	*11	ATC-103, "Intake Sensor Circuit"	*12	EC-234, "DTC P0117, P0118 ECT SENSOR"

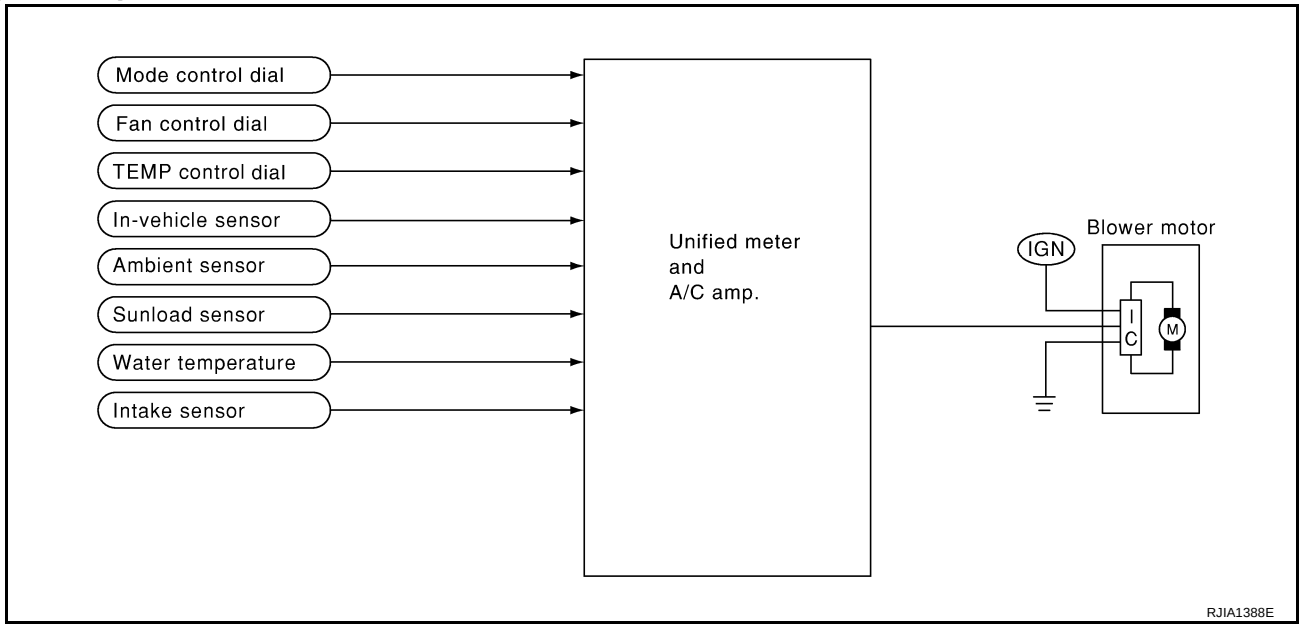
SYSTEM DESCRIPTION

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 door motor)
- In-vehicle sensor
- Ambient sensor
- Sunload sensor
- Intake sensor

System Operation



Automatic Mode

In the automatic mode, the blower motor speed is calculated by the unified meter and A/C amp. based on the input from the PBR, in-vehicle sensor, sunload sensor, intake sensor and ambient sensor.
When the air flow is increased, the duty ratio of the blower motor's drive signal is changed at 8%/sec. to prevent a sudden increase in air flow.
In addition to manual air flow control and the usual automatic air flow control, starting air flow control, low water temperature starting control and high passenger compartment temperature starting control are available.

Starting Fan Speed Control

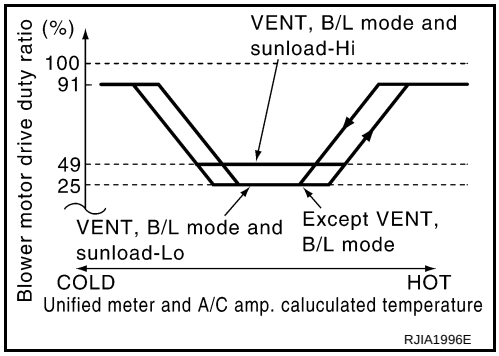
Start up from COLD SOAK Condition (Automatic mode)
In a cold start up condition where the engine coolant temperature is below 56°C (133°F), the blower will not operate for a short period of time (up to 150 seconds). The exact start delay time varies depending on the ambient and engine coolant temperature.
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 A/C switch is pushed. 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).

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 at duty ratio 25%. During high sunload conditions, the unified meter and A/C amp. raise the blower fan speed.(duty ratio 49%).

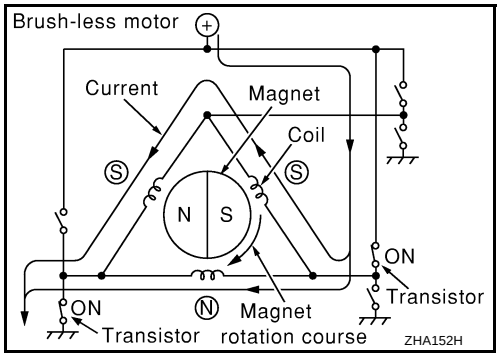
Fan Speed Control Specification



COMPONENT DESCRIPTION

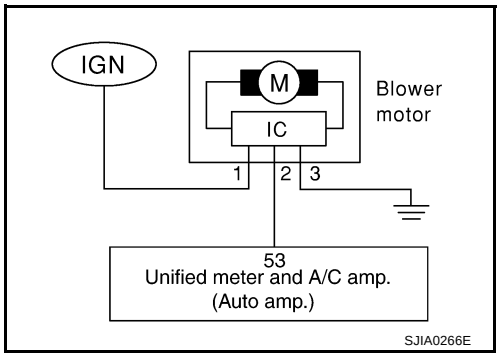
Brush-less Motor

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



DIAGNOSIS PROCEDURE FOR BLOWER MOTOR

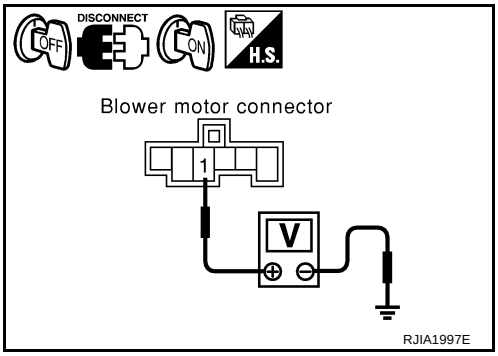
SYMPTOM: Blower motor operation is malfunctioning.



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 M62 terminal 1 and ground.

1 – Ground : Battery voltage



OK or NG

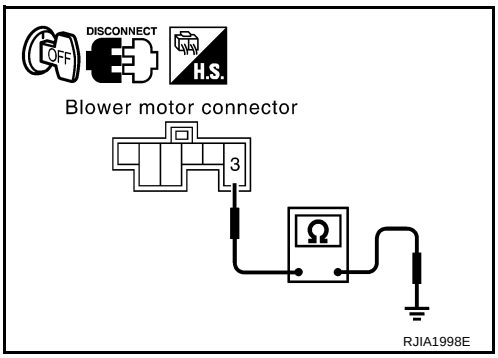
OK >> GO TO 2.
NG >> Check power supply circuit and 15 A fuses [Nos. 10 and 11, located in the fuse block (J/B)]. Refer to PG-87, "FUSE BLOCK - JUNCTION BOX (J/B)" .

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

2. CHECK GROUND CIRCUIT FOR BLOWER MOTOR

1. Turn ignition switch OFF.
2. Check continuity between blower motor harness connector M62 terminal 3 and ground.

3 – Ground : Continuity should exist.



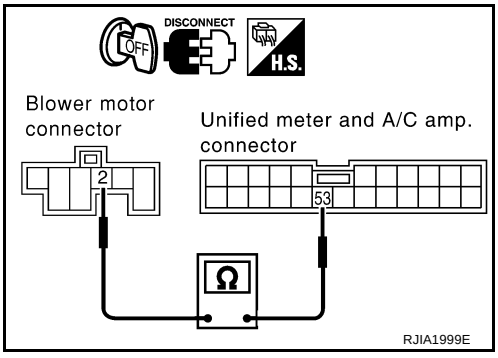
OK or NG

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

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

1. Disconnect unified meter connector and A/C amp. connector.
2. Check continuity between blower motor harness connector M62 terminal 2 and unified meter and A/C amp. harness connector M50 terminal 53.

2 – 53 : Continuity should exist.

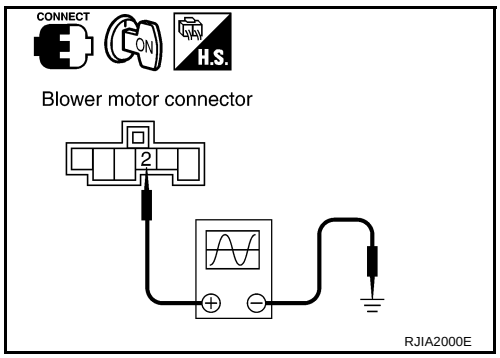


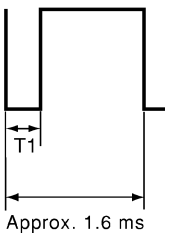
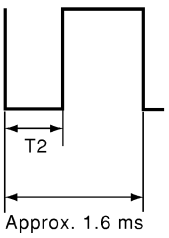
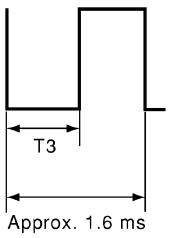
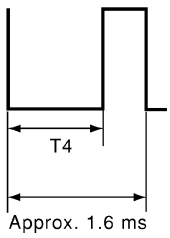
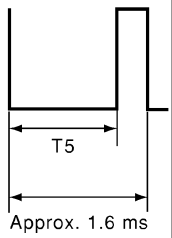
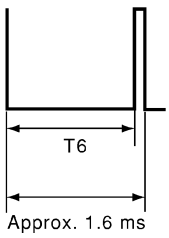
OK or NG

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

4. CHECK FOR UNIFIED METER AND A/C AMP. OUTPUT

1. Reconnect blower motor connector and unified meter and A/C amp. connector.
2. Turn ignition switch ON.
3. Change the fan speed from Lo to Hi, and check the duty ratios between blower motor harness connector M62 terminal 2 and ground by using an oscilloscope. Normal terminal 2 drive signal duty ratios are shown in the table below.



Blower fan speed	1st	5th	10th	15th	20th	25th
Blower motor connector M62 Terminal No. 2 (Oscilloscope)						
Duty ratio	Approx. 25%	Approx. 37%	Approx. 47%	Approx. 57%	Approx. 71%	Approx. 91%

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

RJIA1390E

OK or NG

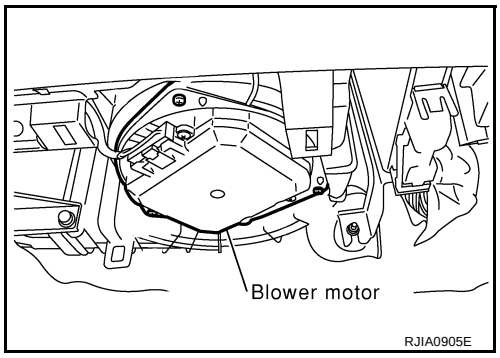
OK >> Replace blower motor after confirming the fan air flow does not change.
NG >> Replace unified meter and A/C amp.

COMPONENT INSPECTION

Blower Motor

Confirm smooth rotation of the blower motor.

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

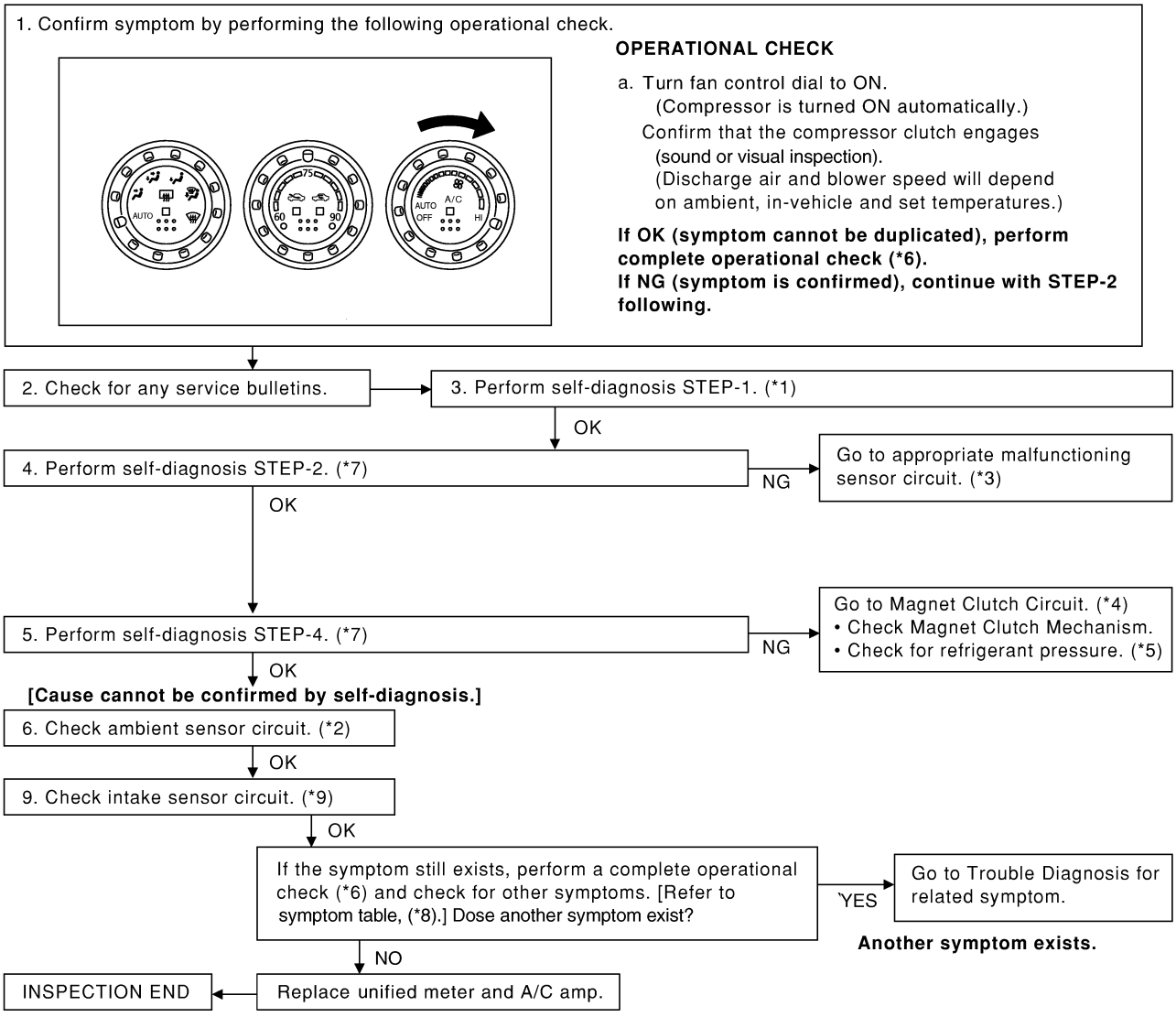


Magnet Clutch Circuit

NJS00015

SYMPTOM: Magnet clutch does not engage.

INSPECTION FLOW



SJIA1129E

*1 ATC-50, "FUNCTION CONFIRMATION PROCEDURE", see No. 1.	*2 ATC-95, "Ambient Sensor Circuit"	*3 ATC-50, "FUNCTION CONFIRMATION PROCEDURE", see No. 9.
*4 ATC-78, "DIAGNOSIS PROCEDURE FOR MAGNET CLUTCH"	*5 ATC-89, "TROUBLE DIAGNOSIS FOR UNUSUAL PRESSURE"	*6 ATC-56, "Operational Check"
*7 ATC-50, "FUNCTION CONFIRMATION PROCEDURE", see No. 5 to 7.	*8 ATC-38, "SYMPTOM TABLE"	*9 ATC-103, "Intake Sensor Circuit"

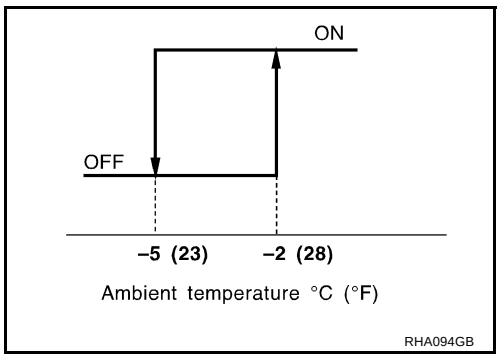
SYSTEM DESCRIPTION

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

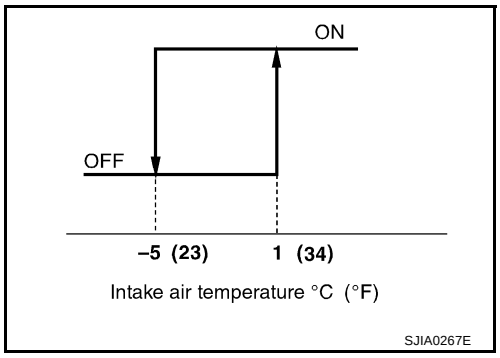
Low Temperature Protection Control

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

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

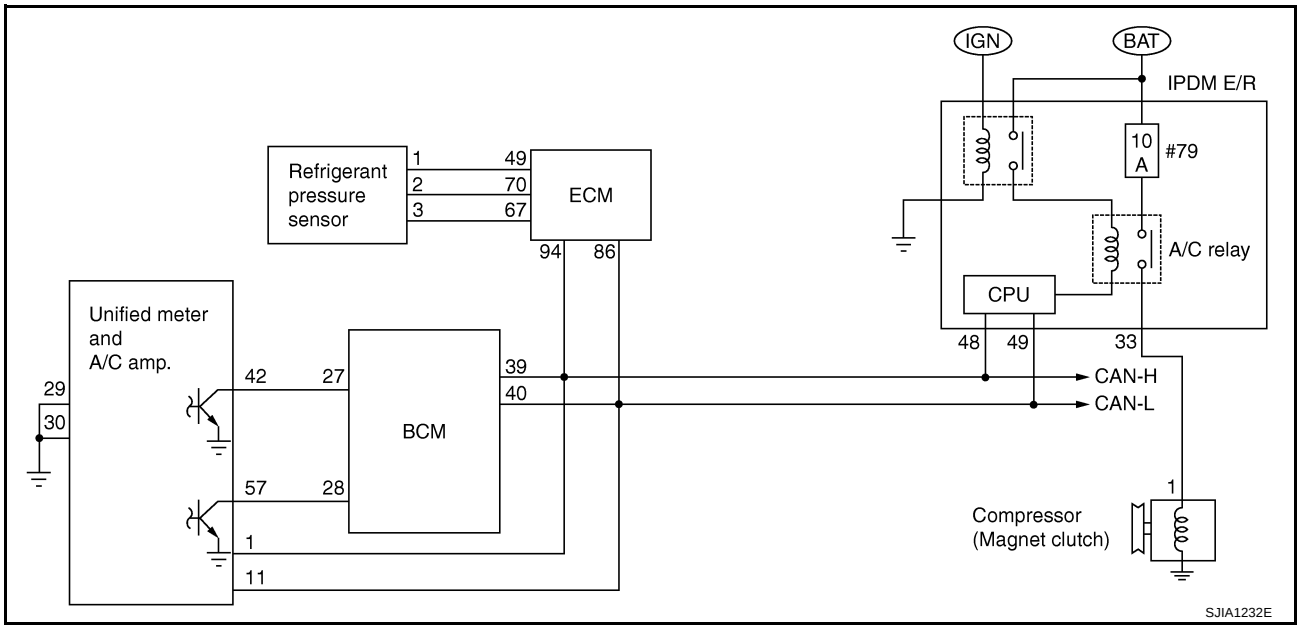


When intake air temperature is higher than 1°C (34°F), the compressor turns ON. The compressor turns OFF when intake air temperature is lower than –5°C (23°F).



DIAGNOSIS PROCEDURE FOR MAGNET CLUTCH

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



1. CHECK AMBIENT SENSOR CIRCUIT AND INTAKE SENSOR CIRCUIT

Check ambient sensor and intake sensor. Refer to ATC-50, "FUNCTION CONFIRMATION PROCEDURE" , see No. 9.

OK or NG

OK >> GO TO 2.

NG >>
- Malfunctioning ambient sensor: Refer to ATC-95, "Ambient Sensor Circuit" .
- Malfunctioning intake sensor: Refer to ATC-103, "Intake Sensor Circuit" .

2. PERFORM AUTO ACTIVE TEST

Refer to PG-22, "Auto Active Test" .

Dose the magnet clutch operate?

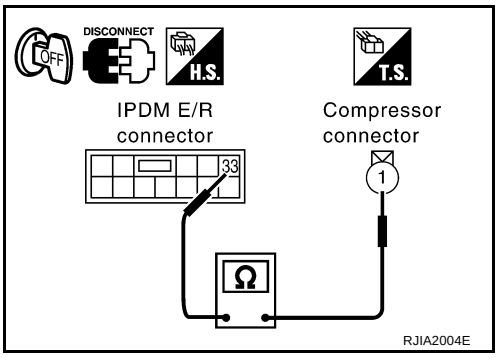
YES >>
- WITH CONSULT-II
  GO TO 5.
- WITHOUT CONSULT-II
  GO TO 6.

NO >> Check 10 A fuse (No. 79, located in IPDM E/R), and GO TO 3.

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

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector and compressor connector.
3. Check continuity between IPDM E/R harness connector E8 terminal 33 and compressor harness connector F24 terminal 1.

33 – 1 : Continuity should exist.



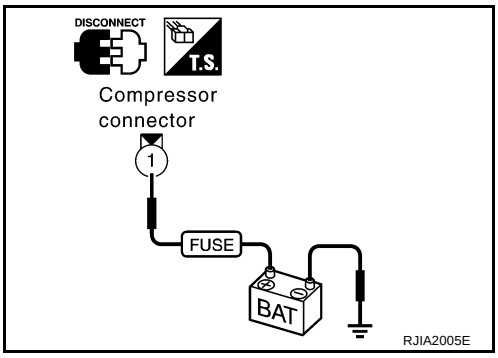
OK or NG

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

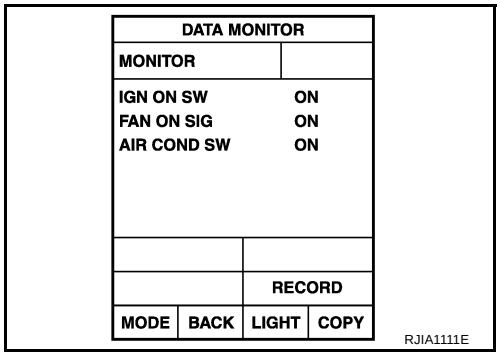
OK >>
1. Replace IPDM E/R.
2. Go to self-diagnosis procedure ATC-50, "FUNCTION CONFIRMATION PROCEDURE" and preform self-diagnosis STEP-4. Confirm that magnet clutch operation usual.

NG >>
1. Replace magnet clutch. Refer to ATC-129, "Removal and Installation of Compressor Clutch" .
2. Go to self-diagnosis procedure ATC-50, "FUNCTION CONFIRMATION PROCEDURE" and preform self-diagnosis STEP-4. Confirm that magnet clutch operation usual.

5. CHECK BCM INPUT (COMPRESSOR ON) SIGNAL

Check compressor ON/OFF signal. Refer to ATC-36, "CONSULT-II Function (BCM)" .

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



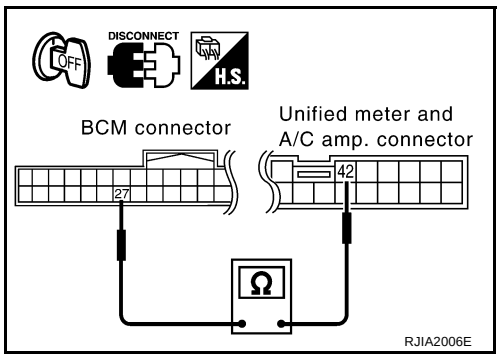
OK or NG

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

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 M90 terminal 27 and unified meter and A/C amp. harness connector M50 terminal 42.

27 – 42 : Continuity should exist.

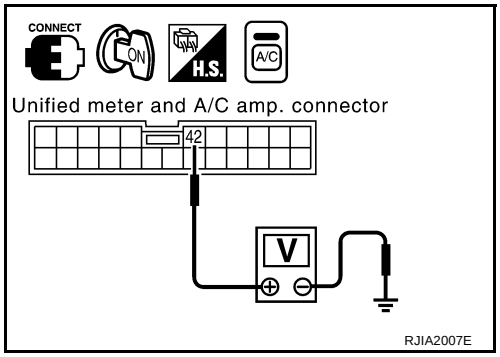


OK or NG

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

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 M50 terminal 42 and ground.



Terminals			Condition	Voltage
(+)		(–)		
Unified meter and A/C amp. connector	Terminal No.			
M50	42	Ground	A/C switch: ON (Blower motor operates.)	Approx. 0 V
			A/C switch: 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.

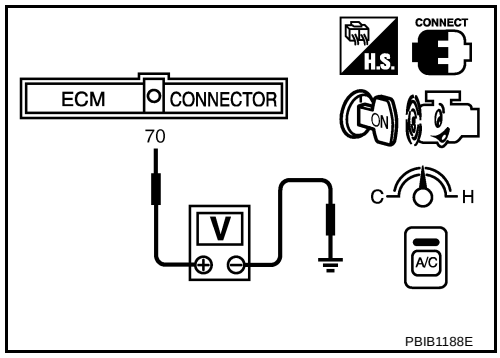
8. CHECK REFRIGERANT PRESSURE SENSOR

WITH CONSULT-II

1. Start the engine.
2. Check voltage of refrigerant pressure sensor. Refer to EC-137, "CONSULT-II Reference Value in Data Monitor" .

WITHOUT CONSULT-II

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



Terminals			Condition	Voltage
(+)		(–)		
ECM connector	Terminal No.			
F101	70	Ground	A/C switch: ON (Blower motor operates.)	Approx. 1.0 - 4.0 V

OK or NG

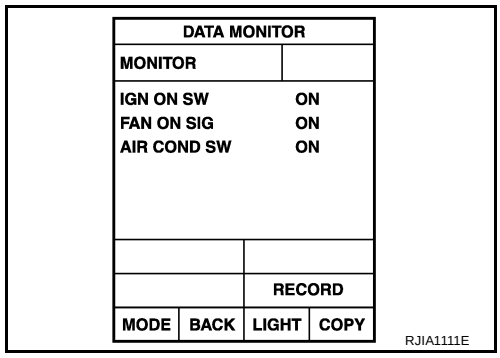
OK >> ● WITH CONSULT-II GO TO 9.
● WITHOUT CONSULT-II GO TO 10.

NG >> Refer to EC-710, "REFRIGERANT PRESSURE SENSOR" .

9. CHECK BCM INPUT (FAN ON) SIGNAL

Check FAN ON/OFF signal. Refer to ATC-36, "CONSULT-II Function (BCM)" .

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



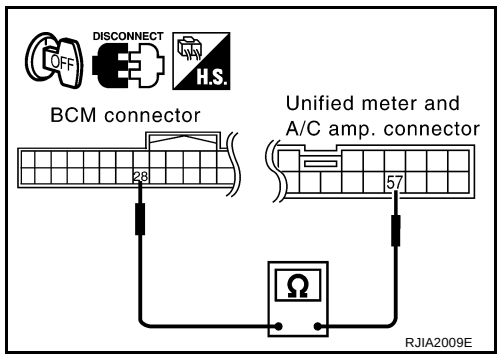
OK or NG

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

10. 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 M90 terminal 28 and unified meter and A/C amp. harness connector M50 terminal 57.

28 – 57 : Continuity should exist.

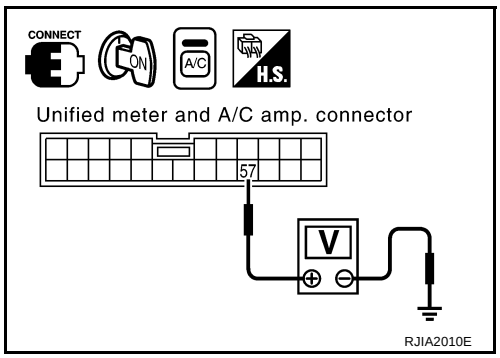


OK or NG

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

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

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 M50 terminal 57 and ground.



Terminals			Condition	Voltage
(+)		(–)		
Unified meter and A/C amp. connector	Terminal No.			
M50	57	Ground	Fan control dial: ON (Blower motor operates.)	Approx. 0 V
			Fan control dial: 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.

12. CHECK CAN COMMUNICATION

Check CAN communication. Refer to BCS-17, "CAN Communication Inspection Using CONSULT-II (Self-Diagnosis)" .

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

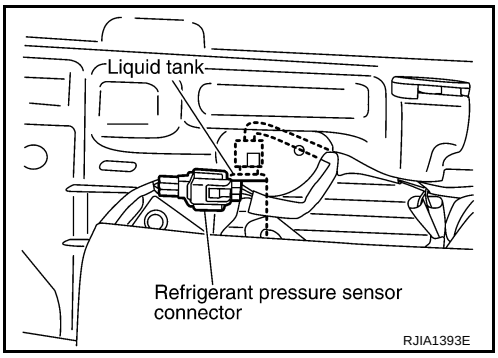
OK or NG

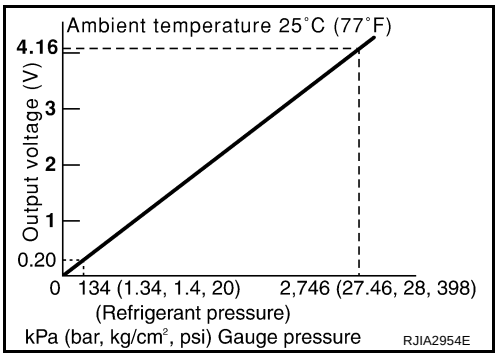
OK >> INSPECTION END
NG >> Repair or replace malfunctioning part(s).

COMPONENT INSPECTION

Refrigerant Pressure Sensor

The refrigerant pressure sensor is attached to the liquid tank.
Make sure that the A/C refrigerant pressure and the sensor output voltage are within the specified range as shown in the A/C operating condition figure. Refer to EC-710, "REFRIGERANT PRESSURE SENSOR" .





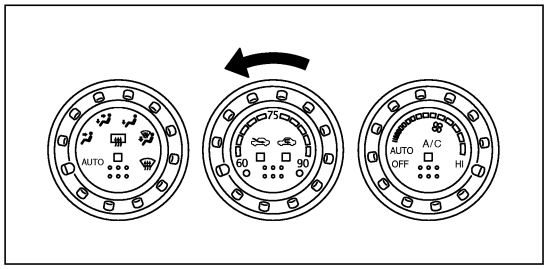
Insufficient Cooling

NJS00016

SYMPTOM: Insufficient cooling

INSPECTION FLOW

1. Confirm symptom by performing the following operational check.



OPERATIONAL CHECK – Temperature decrease

a. Turn temperature control dial counterclockwise until 18˚C (60˚F).

b. Check for cold air at discharge air outlets.

If OK (symptom cannot be duplicated), perform complete operational check (*10).
If NG (symptom is confirmed), continue with STEP-2 following.

2. Check for any service bulletins.

3. Perform self-diagnosis STEP-1. (*1)

OK

4. Perform self-diagnosis STEP-2. (*11)

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

OK

5. Perform self-diagnosis STEP-4. (*11)

NG → **Go to appropriate malfunctioning items.**
- Check LAN system circuit. (*6)
- Check blower motor circuit. (*7)
- Check magnet clutch circuit. (*8)

OK

6. Check compressor belt tension. Refer to (*13), “Checking Drive Belts”.

NG → Adjust or replace compressor belt.

OK

7. Check air mix door operation. (*2)

NG → Replace air mix door motor.

OK

8. Check cooling fan motor operation.

NG → Refer to (*14), “System Description”.

OK

9. Before connectiong Recovery / Recycling Recharging equipment to vehicle, check Recovery / Recycling Recharging equipment gauges.
No refrigerant pressure should be displayed.
If NG, recover refrigerant from equipment lines.

OK

10. Confirm refrigerant purity in supply tank using Recovery / Recycling Recharging equipment with refrigerant identifire.

NG → Refer to Contaminated refrigerant. (*12)

OK

11. Connect Recovery / Recycling Recharging equipment to vehicle. Confirm refrigerant purity in vehicle A/C system using Recovery / Recycling Recharging equipment with refrigerant identifire.

NG

OK

12. Check for evaporator core freeze up.

NG (Freeze up.) → Perform performance test diagnosis. Refer to (*9)

(Does not freeze up.)

OK

13. Check refrigeration cycle pressure with manifold gauge connected. Refer to (*3).

NG

OK

14. Check ducts for air leaks.

NG → Replair air leaks.

OK

15. Perform temperature setting trimmer. (*4)
(1) Set up AUXILIARY MECHANISM mode in self-diagnosis.
(2) Turn temperature dial counterclockwise as desired.

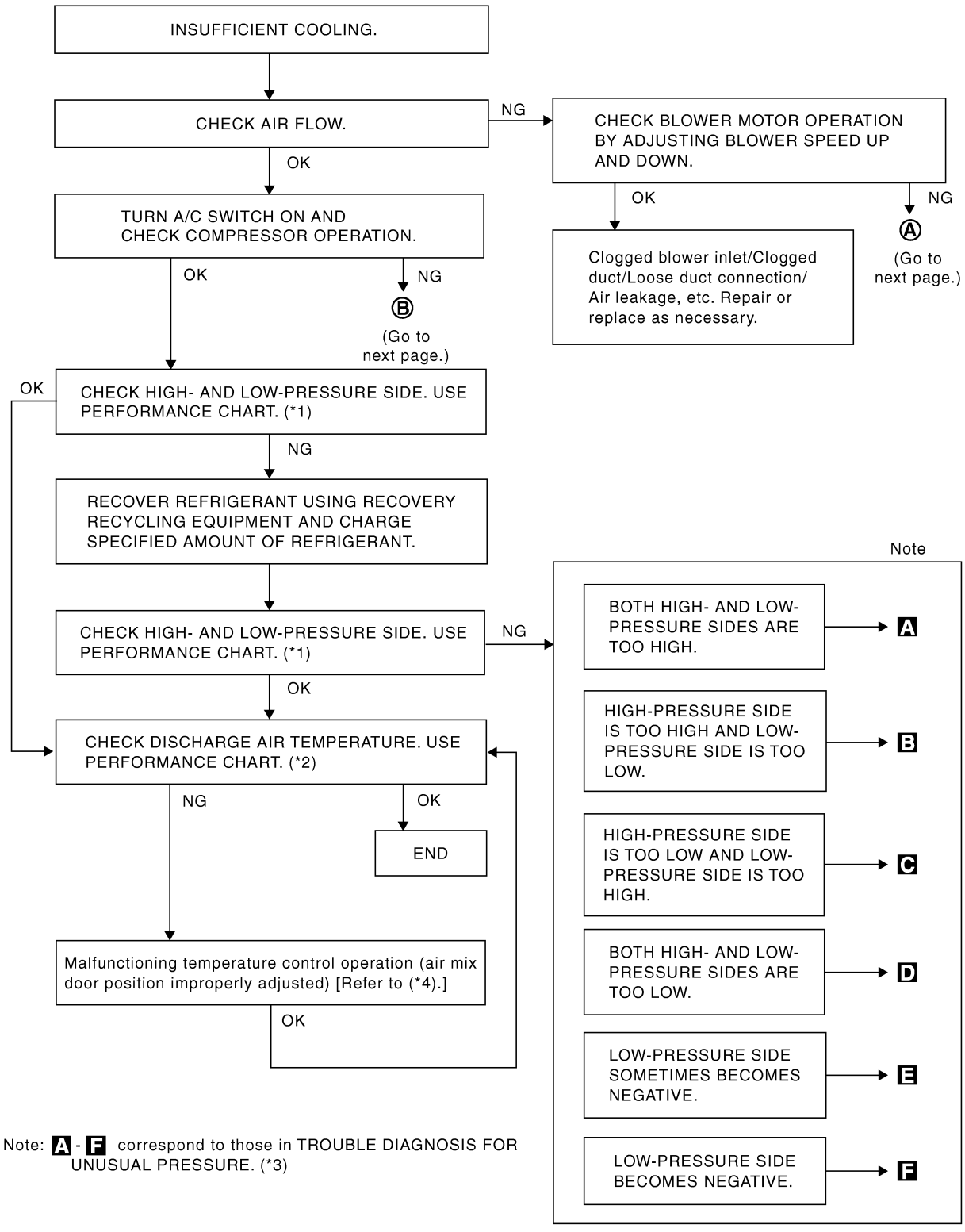
OK

INSPECTION END

SJIA1130E

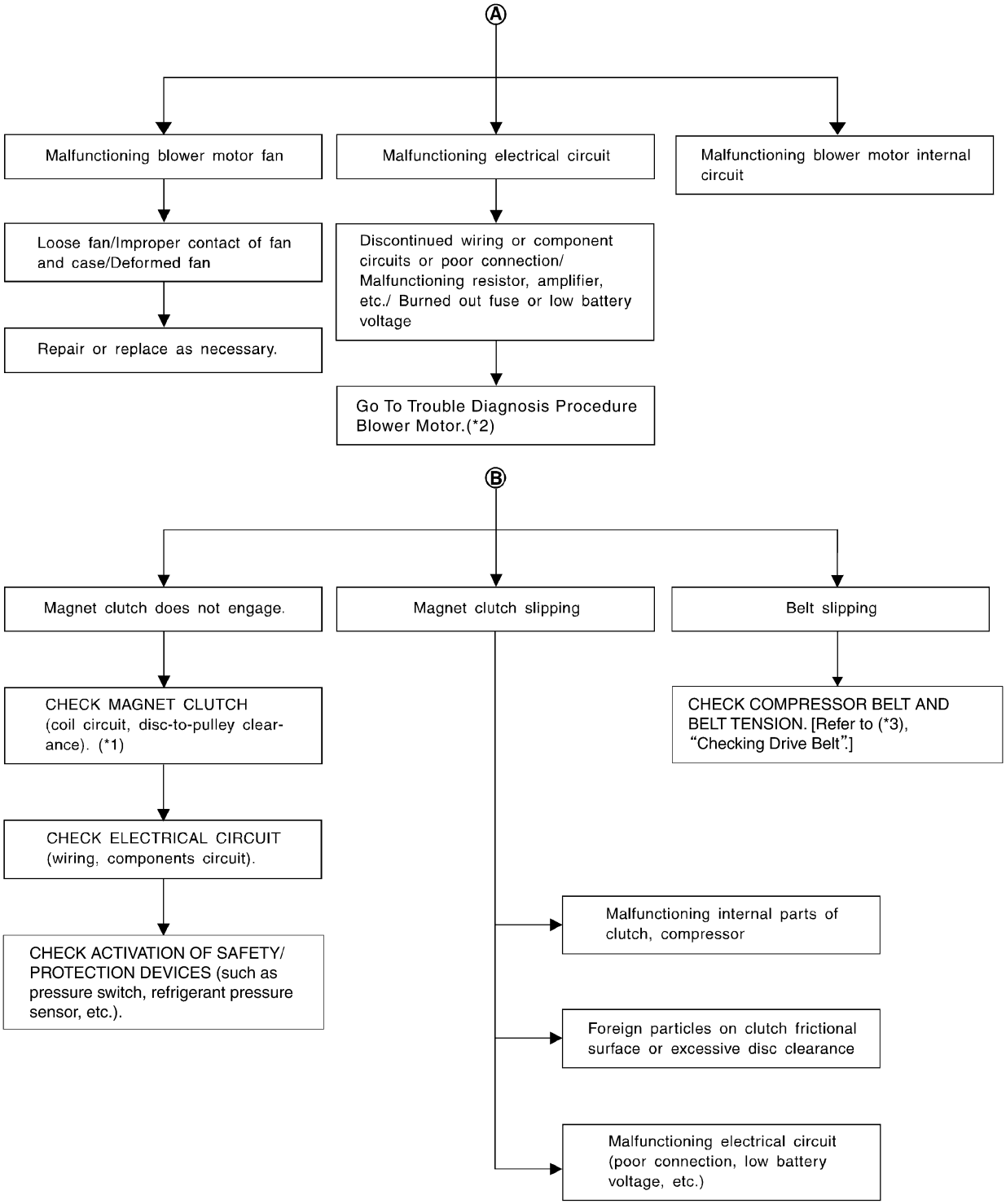
*1	ATC-50, "FUNCTION CONFIRMATION PROCEDURE", see No. 1.	*2	ATC-66, "Air Mix Door Motor Circuit"	*3	ATC-88, "Test Reading"
*4	ATC-54, "AUXILIARY MECHANISM: TEMPERATURE SETTING TRIMMER"	*5	ATC-50, "FUNCTION CONFIRMATION PROCEDURE", see No. 9.	*6	ATC-59, "LAN System Circuit"
*7	ATC-72, "Blower Motor Circuit"	*8	ATC-77, "Magnet Clutch Circuit"	*9	ATC-86, "PERFORMANCE TEST DIAGNOSIS"
*10	ATC-56, "Operational Check"	*11	ATC-50, "FUNCTION CONFIRMATION PROCEDURE", see No. 5 to 7.	*12	ATC-5, "CONTAMINATED REFRIGERANT"
*13	EM-14, "Checking Drive Belts"	*14	EC-550, "SYSTEM DESCRIPTION"		

PERFORMANCE TEST DIAGNOSIS



*1 ATC-88, "PERFORMANCE CHART" *2 ATC-88, "PERFORMANCE CHART" *3 ATC-89, "TROUBLE DIAGNOSIS FOR UNUSUAL PRESSURE"

*4 ATC-66, "Air Mix Door Motor Circuit"



RJIA3107E

*1 ATC-129, "Removal and Installation of Compressor Clutch" *2 ATC-72, "Blower Motor Circuit" *3 EM-14, "Checking Drive Belts"

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 control dial	(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	15 (59)	2.8 - 3.9 (37.0 - 39.0)
	20 (68)	5.3 - 7.7 (41.5 - 45.9)
	25 (77)	8.9 - 12.0 (48.0 - 53.6)
	30 (86)	13.0 - 16.7 (55.4 - 62.1)
	35 (95)	18.2 - 22.0 (64.8 - 71.6)
60 - 70	15 (59)	3.9 - 6.0 (39.0 - 42.8)
	20 (68)	7.7 - 10.0 (45.9 - 50.0)
	25 (77)	12.0 - 14.4 (53.6 - 57.9)
	30 (86)	16.7 - 19.8 (62.1 - 67.6)
	35 (95)	22.0 - 26.0 (71.6 - 78.8)

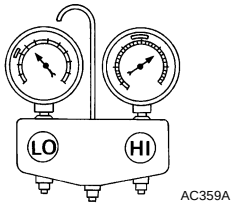
Ambient Air Temperature-to-operating Pressure Table

Ambient air		High-pressure (Discharge side) kPa (kg/cm^2 , psi)	Low-pressure (Suction side) kPa (kg/cm^2 , psi)
Relative humidity %	Air temperature °C (°F)		
50 - 70	15 (59)	600 - 770 (6.12 - 7.86, 87.0 - 111.7)	165 - 220 (1.68 - 2.24, 23.9 - 31.9)
	20 (68)	640 - 840 (6.53 - 8.57, 92.8 - 121.8)	170 - 235 (1.73 - 2.40, 24.7 - 34.1)
	25 (77)	790 - 1,030 (8.06 - 10.5, 114.6 - 149.4)	185 - 255 (1.89- 2.60, 26.8 - 37.0)
	30 (86)	1,050 - 1,340 (10.7 - 13.7, 152.3 - 194.3)	205 - 290 (2.10 - 2.96, 29.7 - 42.1)
	35 (95)	1,055 - 1,345 (10.8 - 13.7, 153.0 - 195.0)	240 - 335 (2.45 - 3.42, 34.8 - 48.6)

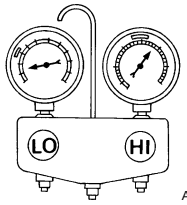
TROUBLE DIAGNOSIS FOR UNUSUAL PRESSURE

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).

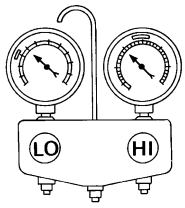
Both High- and Low-pressure Sides are Too High

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
Both high- and low-pressure sides are too high.  AC359A	Pressure is reduced soon after water is splashed on 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.	● Clean condenser. ● Check and repair cooling fan as necessary.
	● Low-pressure pipe is not cold. ● When compressor is stopped high-pressure value quickly drops by approximately 196 kPa (2 kg/cm^2 , 28 psi). It then decreases gradually thereafter.	Poor heat exchange in condenser. (After compressor operation stops, high-pressure decreases too slowly.) ↓ Air in refrigeration cycle.	Evacuate repeatedly and recharge system.
	Engine tends to overheat.	Engine cooling systems malfunction.	Check and repair each engine cooling system.
	● An area of the low-pressure pipe is colder than areas near the evaporator outlet. ● Plates are sometimes covered with frost.	● Excessive liquid refrigerant on low-pressure side. ● Excessive refrigerant discharge flow. ● Expansion valve is open a little compared with the specification. ↓ Improper expansion valve adjustment.	Replace expansion valve.

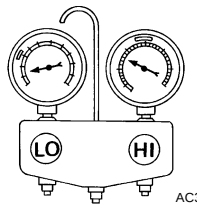
High-pressure Side is Too High and Low-pressure Side is Too Low

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
High-pressure side is too high and low-pressure side is too low.  AC360A	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.	● Check and repair or replace malfunctioning parts. ● Check lubricant for contamination.

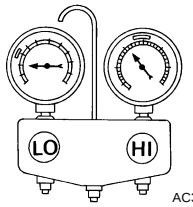
High-pressure Side is Too Low and Low-pressure Side is Too High

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
High-pressure side is too low and low-pressure side is too high.  AC356A	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.

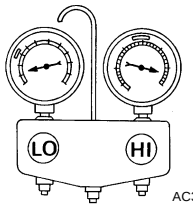
Both High- and Low-pressure Sides are Too Low

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
Both high- and low-pressure sides are too low.  AC353A	● 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.	● Replace liquid tank. ● Check lubricant for contamination.
	● 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.	● 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-143, "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.	● Remove foreign particles by using compressed air. ● Replace expantion 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.	● Check and repair malfunctioning parts. ● Check lubricant for contamination.
	Air flow volume is not enough or is too low.	Evaporator is frozen.	● Check intake sensor circuit. Refer to ATC-103, "Intake Sensor Circuit" . ● Replace compressor. ● Repair evaporator fins. ● Replace evaporator. ● Refer to ATC-72, "Blower Motor Circuit" .

Low-pressure Side Sometimes Becomes Negative

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
Low-pressure side sometimes becomes negative.  AC354A	● 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.	Refrigerant does not discharge cyclically. ↓ Moisture is frozen at expansion valve outlet and inlet. ↓ Water is mixed with refrigerant.	● Drain water from refrigerant or replace refrigerant. ● Replace liquid tank.

Low-pressure Side Becomes Negative

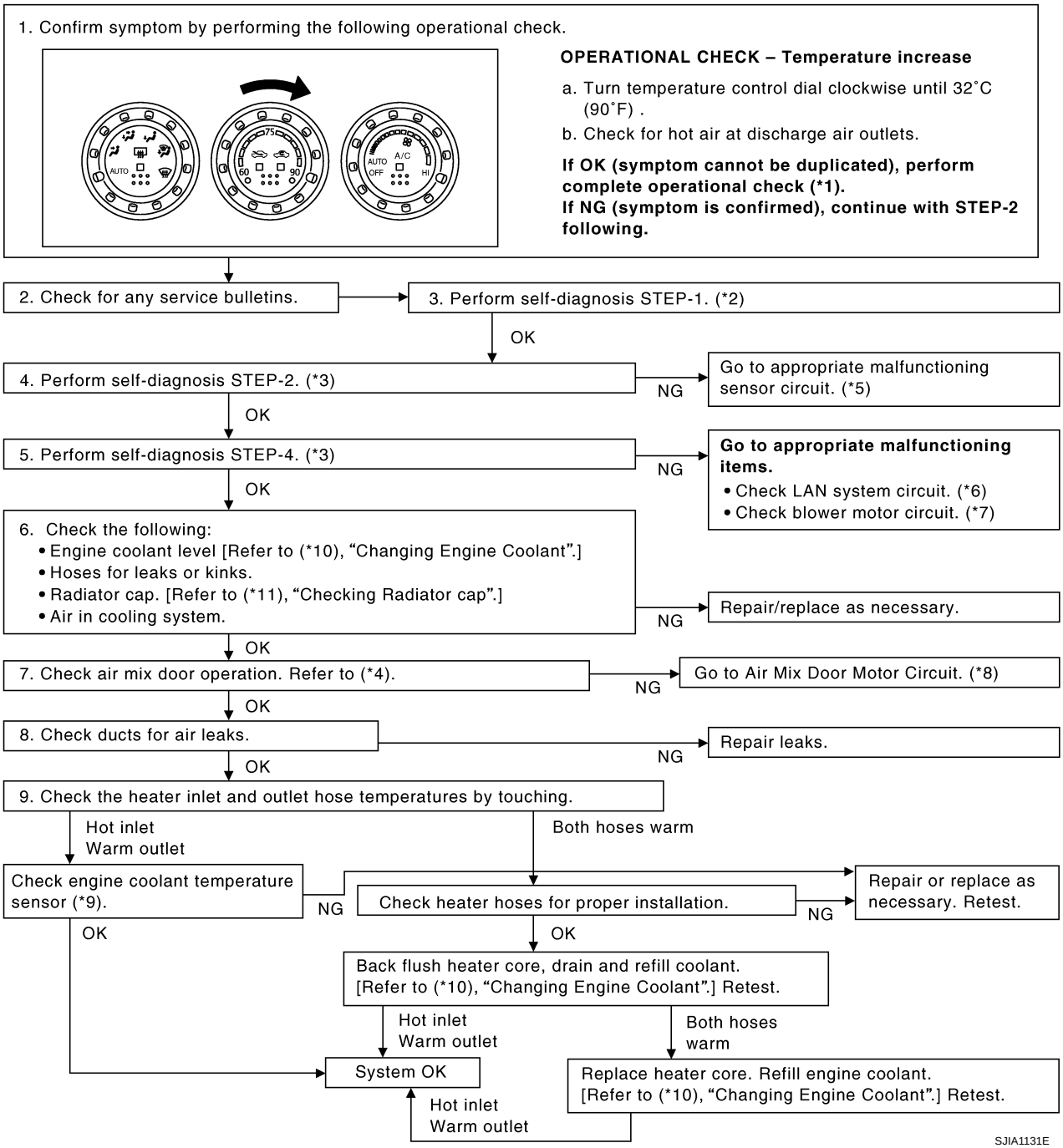
Gauge indication	Refrigerant cycle	Probable cause	Corrective action
Low-pressure side becomes negative.  AC362A	Liquid tank or front/rear side of expansion valve's pipe is frosted or dewed.	High-pressure side is closed and refrigerant does not flow. ↓ Expansion valve or liquid tank is frosted.	Leave 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. ● 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 problem, replace expansion valve. ● Replace liquid tank. ● Check lubricant for contamination.

Insufficient Heating

NJS00017

SYMPTOM: Insufficient heating

INSPECTION FLOW



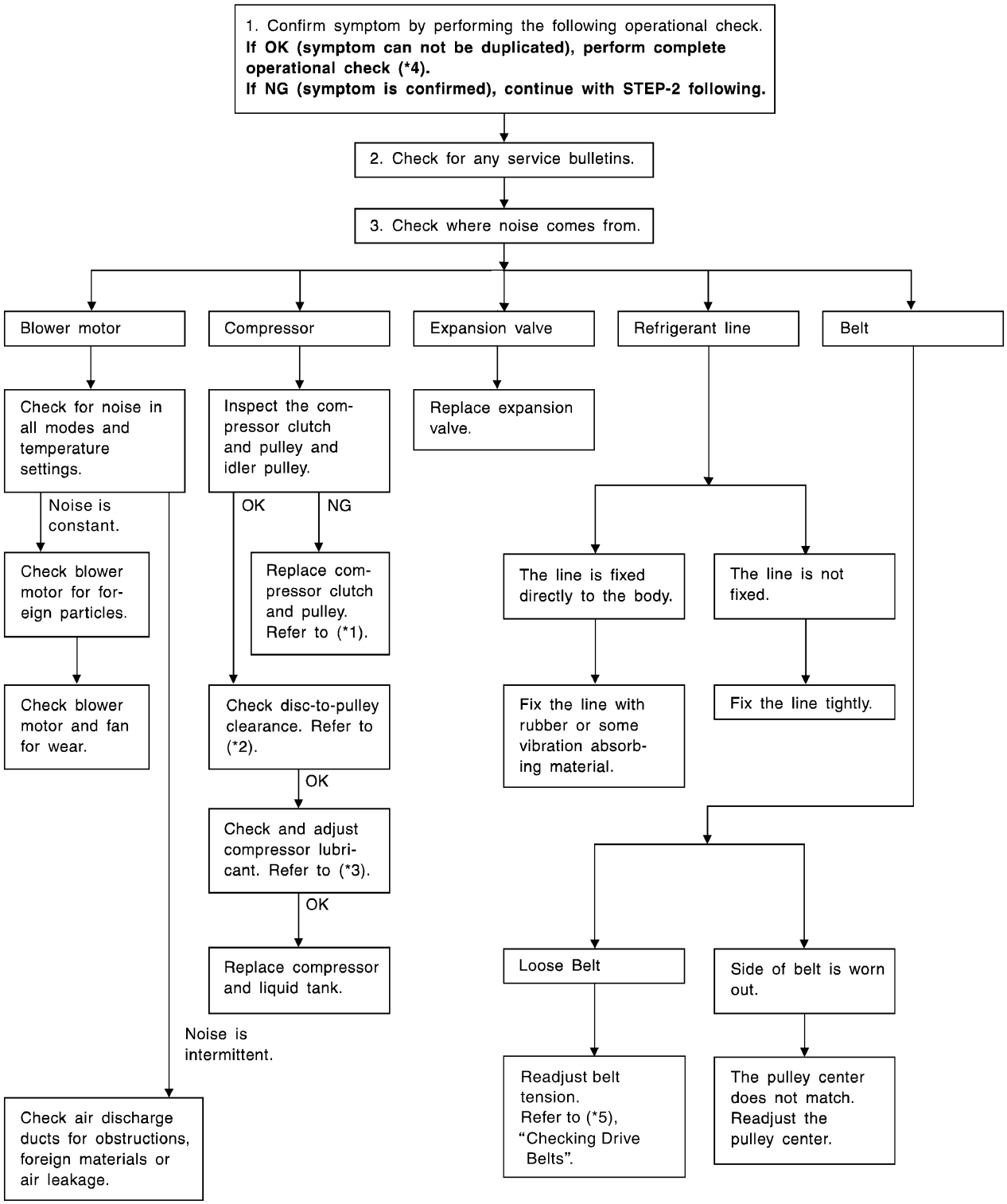
*1 ATC-56, "Operational Check"
*2 ATC-50, "FUNCTION CONFIRMATION PROCEDURE", see No. 1.
*3 ATC-50, "FUNCTION CONFIRMATION PROCEDURE", see No. 5 to 7.
*4 ATC-66, "Air Mix Door Motor Circuit"
*5 ATC-50, "FUNCTION CONFIRMATION PROCEDURE", see No. 9.
*6 ATC-59, "LAN System Circuit"
*7 ATC-72, "Blower Motor Circuit"
*8 ATC-66, "Air Mix Door Motor Circuit"
*9 EC-234, "DTC P0117, P0118 ECT SENSOR"
*10 CO-10, "Changing Engine Coolant"
*11 CO-15, "Checking Radiator Cap"

Noise

NJS00018

SYMPTOM: Noise

INSPECTION FLOW



RJIA3108E

*1 Compressor Clutch, ATC-129, "REMOVAL" .

*2 Compressor Clutch, ATC-131, "INSTALLATION" .

*3 ATC-24, "Maintenance of Lubricant Quantity in Compressor"

*4 ATC-56, "Operational Check"

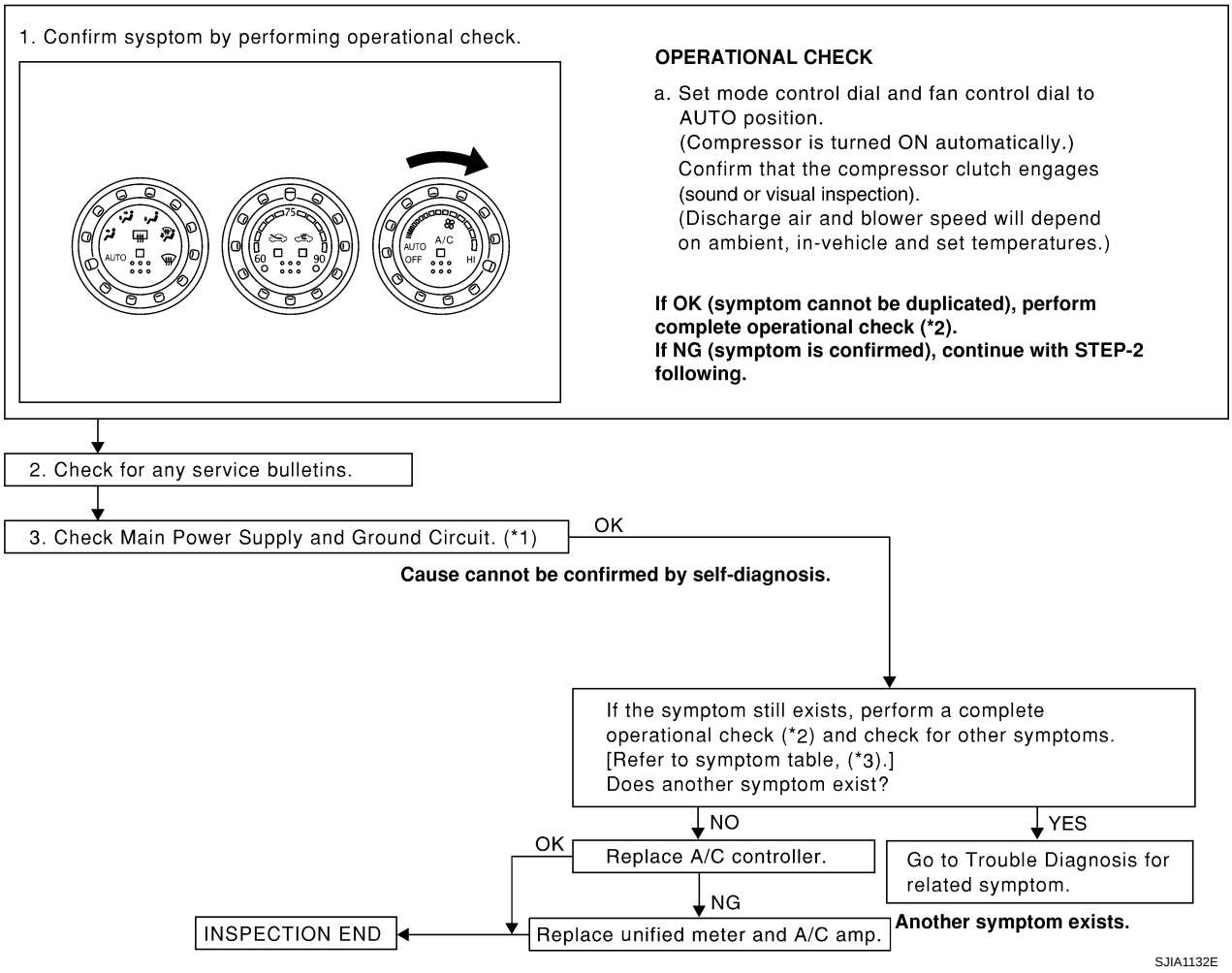
*5 EM-14, "Checking Drive Belts"

Self-diagnosis

NJS00019

SYMPTOM: Self-diagnosis cannot be performed.

INSPECTION FLOW



*1 ATC-57, "Power Supply and Ground Circuit for Auto Amp."
*2 ATC-56, "Operational Check"
*3 ATC-38, "SYMPTOM TABLE"

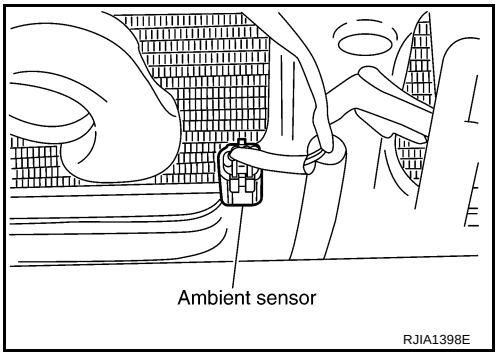
Ambient Sensor Circuit

NJS0001A

COMPONENT DESCRIPTION

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.



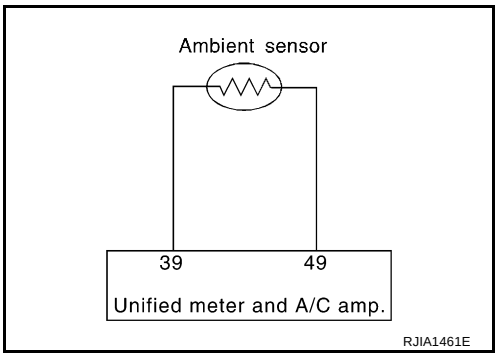
AMBIENT TEMPERATURE INPUT PROCESS

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 bumper area, location of the ambient sensor.

DIAGNOSIS PROCEDURE FOR AMBIENT SENSOR

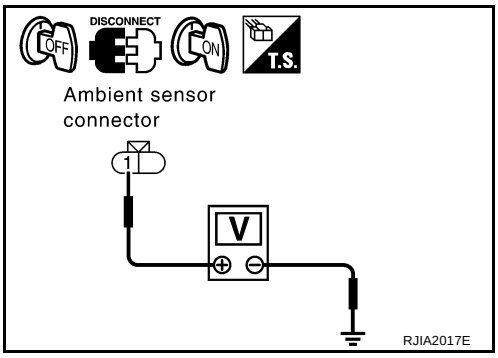
SYMPTOM: Ambient sensor circuit is open or shorted. (LED of A/C switch does not illuminate as a result of performing self-diagnosis STEP-2.)



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 E34 terminal 1 and ground.

1 – Ground : Approx. 5 V



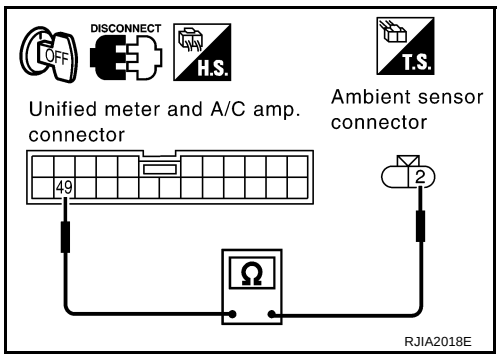
OK or NG

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

2. CHECK CIRCUIT CONTINUITY BETWEEN 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 E34 terminal 2 and unified meter and A/C amp. harness connector M50 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-97, "Ambient Sensor" .

OK or NG

OK >> 1. Replace unified meter and A/C amp.
2. Go to self-diagnosis ATC-50, "FUNCTION CONFIRMATION PROCEDURE" and perform self-diagnosis STEP-2.

NG >> 1. Replace ambient sensor.
2. Go to self-diagnosis ATC-50, "FUNCTION CONFIRMATION PROCEDURE" and perform self-diagnosis STEP-2.

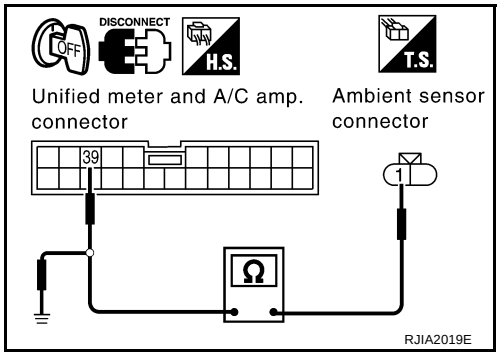
4. CHECK CIRCUIT CONTINUITY BETWEEN AMBIENT SENSOR AND UNIFIED METER AND A/C AMP.

1. Turn ignition switch OFF.
2. Disconnect unified meter and A/C amp. connector.
3. Check continuity between ambient sensor harness connector E34 terminal 1 and unified meter and A/C amp. harness connector M50 terminal 39.

1 – 39 : Continuity should exist.

4. Check continuity between ambient sensor harness connector E34 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-50, "FUNCTION CONFIRMATION PROCEDURE" and perform self-diagnosis STEP-2.

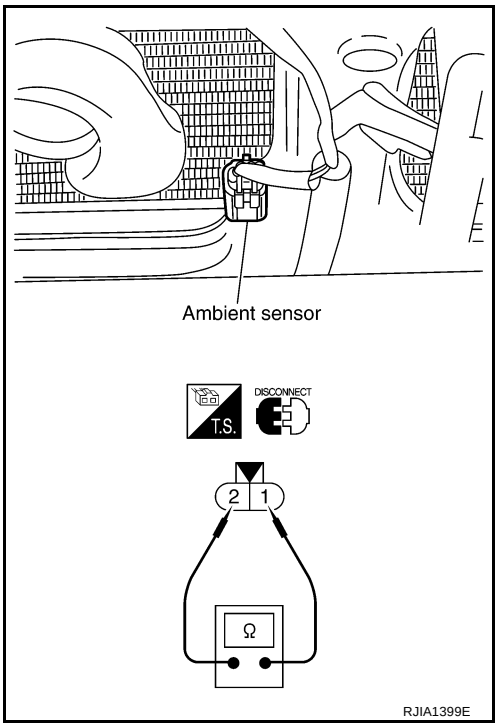
NG >> Repair harness or connector.

COMPONENT INSPECTION

Ambient Sensor

After disconnecting ambient sensor connector E34, measure resistance between terminals 1 and 2 at sensor side, using 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.

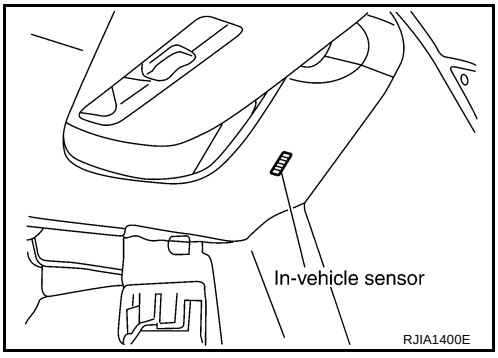
In-vehicle Sensor Circuit

NJS0001B

COMPONENT DESCRIPTION

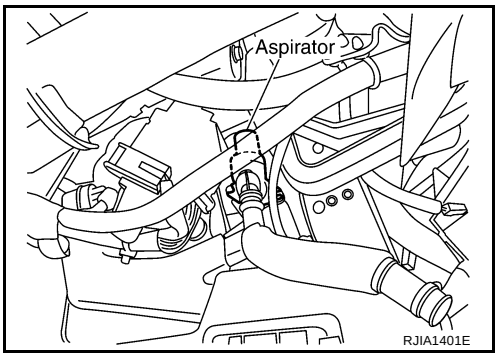
In-vehicle Sensor

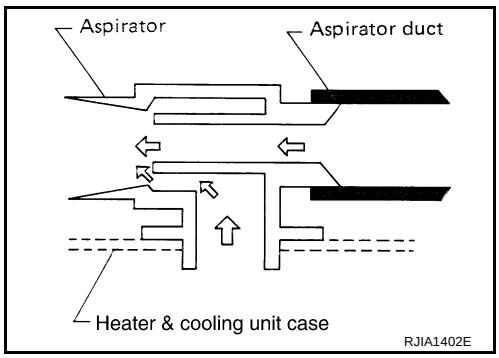
The in-vehicle sensor is located on instrument driver panel lower. It converts variations in temperature of compartment air drawn from the aspirator into a resistance value. It is then input into the unified meter and A/C amp.



Aspirator

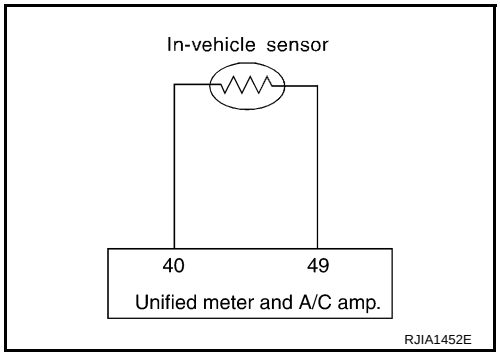
The aspirator is located on driver's side of heater & cooling unit. It produces vacuum pressure due to air discharged from the heater & cooling unit, continuously taking compartment air in the aspirator.





DIAGNOSIS PROCEDURE FOR IN-VEHICLE SENSOR

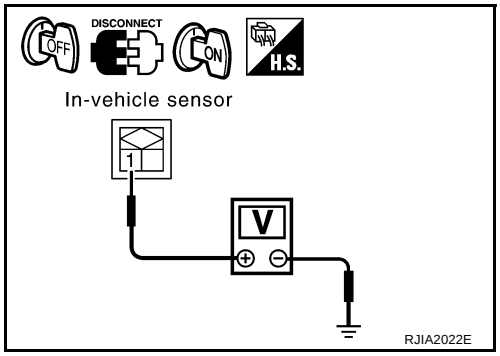
SYMPTOM: In-vehicle sensor circuit is open or shorted. (LED of A/C switch does not illuminate as a result of performing self-diagnosis STEP-2.)



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 M42 terminal 1 and ground.

1 – Ground : Approx. 5 V



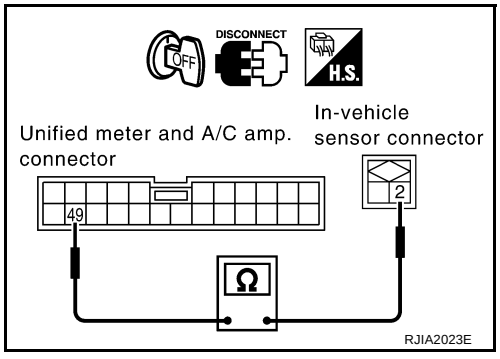
OK or NG

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 M42 terminal 2 and unified meter and A/C amp. harness connector M50 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-99, "In-vehicle Sensor" .

OK or NG

OK >> 1. Replace unified meter and A/C amp.
2. Go to self-diagnosis ATC-50, "FUNCTION CONFIRMATION PROCEDURE" and perform self-diagnosis STEP-2.

NG >> 1. Replace in-vehicle sensor.
2. Go to self-diagnosis ATC-50, "FUNCTION CONFIRMATION PROCEDURE" and perform self-diagnosis STEP-2.

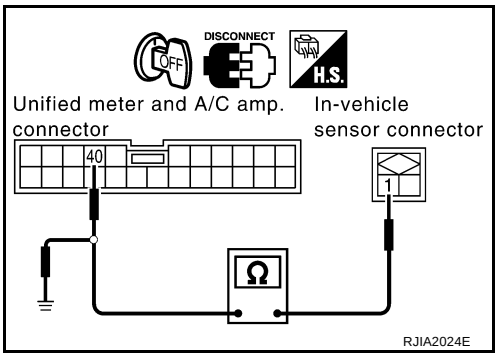
4. CHECK CIRCUIT CONTINUITY BETWEEN IN-VEHICLE SENSOR AND UNIFIED METER AND A/C AMP.

1. Turn ignition switch OFF.
2. Disconnect unified meter and A/C amp. connector.
3. Check continuity between in-vehicle sensor harness connector M42 terminal 1 and unified meter and A/C amp. harness connector M50 terminal 40.

1 – 40 : Continuity should exist.

4. Check continuity between in-vehicle sensor harness connector M42 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-50, "FUNCTION CONFIRMATION PROCEDURE" and perform self-diagnosis STEP-2.

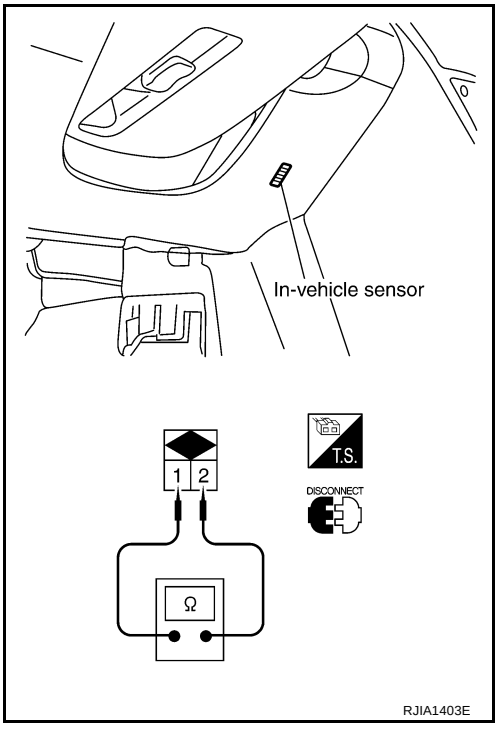
NG >> Repair harness or connector.

COMPONENT INSPECTION

In-vehicle Sensor

After disconnecting in-vehicle sensor connector M42, measure resistance between terminals 1 and 2 at sensor side, using 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



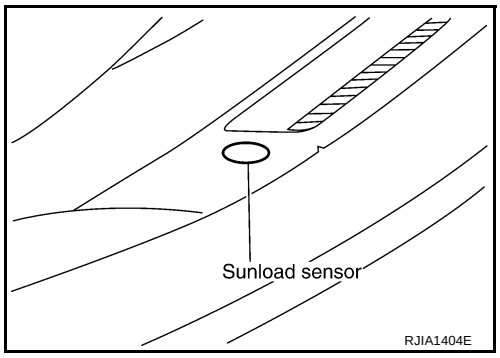
If NG, replace in-vehicle sensor.

Sunload Sensor Circuit

NJS0001C

COMPONENT DESCRIPTION

The sunload sensor is located on the passenger's 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.



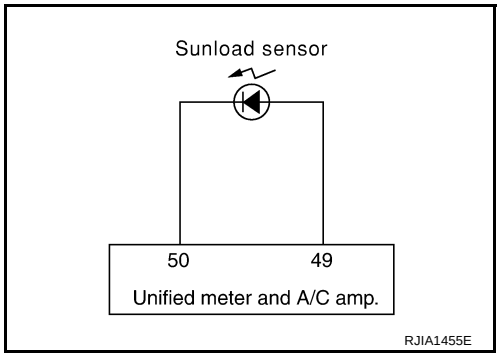
SUNLOAD INPUT PROCESS

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. (LED of A/C switch does not illuminate as a result of performing self-diagnosis STEP-2.)



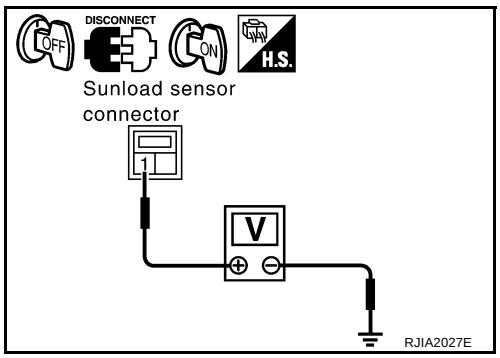
1. CHECK VOLTAGE BETWEEN SUNLOAD SENSOR AND GROUND

1. Disconnect sunload sensor connector.
2. Turn ignition switch ON.
3. Check voltage between sunload sensor harness connector M18 terminal 1 and ground.

1 – Ground : Approx. 5 V

OK or NG

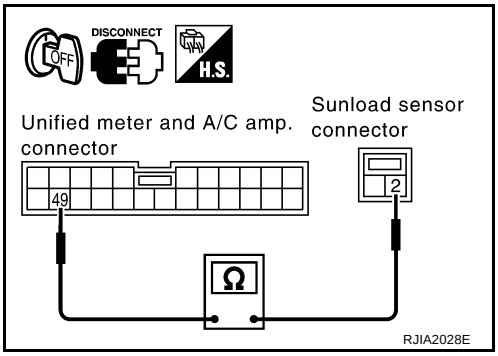
OK >> GO TO 2.
NG >> GO TO 4.



2. CHECK CIRCUIT CONTINUITY BETWEEN 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 M18 terminal 2 and unified meter and A/C amp. harness connector M50 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-102, "Sunload Sensor" .

OK or NG

OK >> 1. Replace unified meter and A/C amp.
2. Go to self-diagnosis ATC-50, "FUNCTION CONFIRMATION PROCEDURE" and perform self-diagnosis STEP-2.

NG >> 1. Replace sunload sensor.
2. Go to self-diagnosis ATC-50, "FUNCTION CONFIRMATION PROCEDURE" and perform self-diagnosis STEP-2.

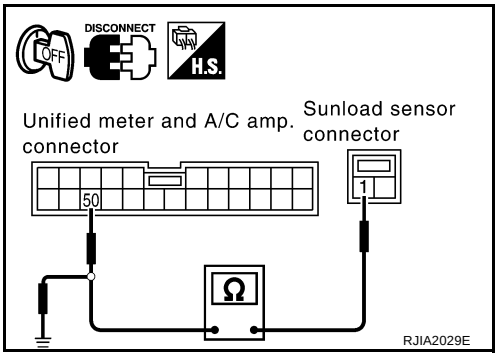
4. CHECK CIRCUIT CONTINUITY BETWEEN SUNLOAD SENSOR AND UNIFIED METER AND A/C AMP.

1. Turn ignition switch OFF.
2. Disconnect unified meter and A/C amp. connector.
3. Check continuity between sunload sensor harness connector M18 terminal 1 and unified meter and A/C amp. harness connector M50 terminal 50.

1 – 50 : Continuity should exist.

4. Check continuity between sunload sensor harness connector M18 terminal 1 and ground.

1 – Ground : Continuity should not exist.



OK or NG

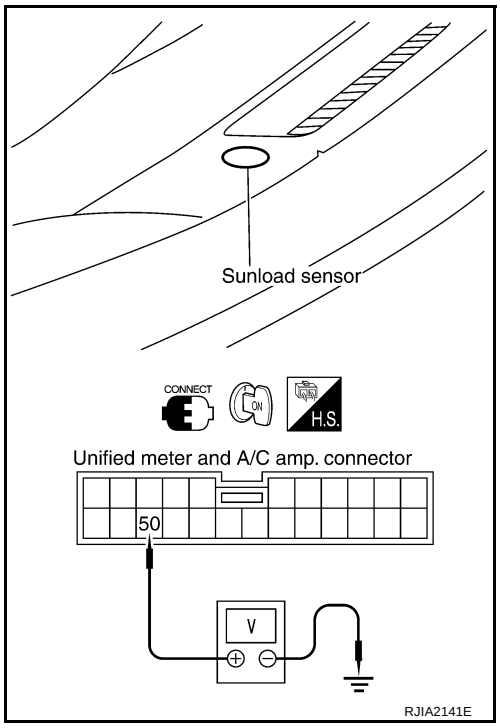
OK >> 1. Replace unified meter and A/C amp.
2. Go to self-diagnosis ATC-50, "FUNCTION CONFIRMATION PROCEDURE" and perform self-diagnosis STEP-2.

NG >> Repair harness or connector.

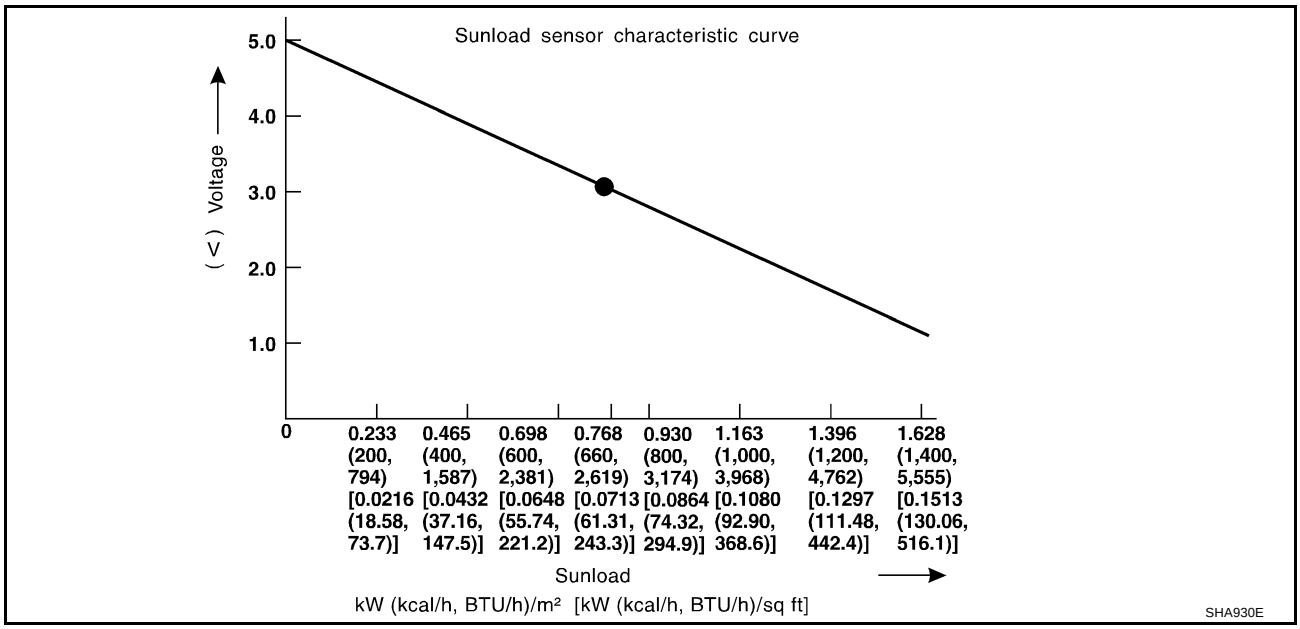
COMPONENT INSPECTION

Sunload Sensor

Measure voltage between unified meter and A/C amp. harness connector M50 terminal 50 and ground.



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



If NG, replace sunload sensor.

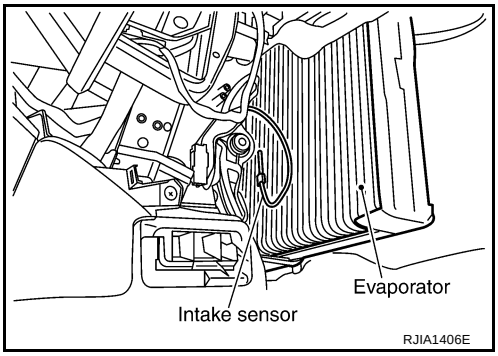
Intake Sensor Circuit

NJS0001D

COMPONENT DESCRIPTION

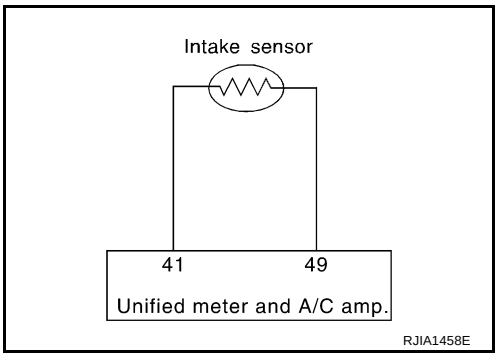
Intake Sensor

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. (LED of A/C switch does not illuminate as a result of performing self-diagnosis STEP-2.)



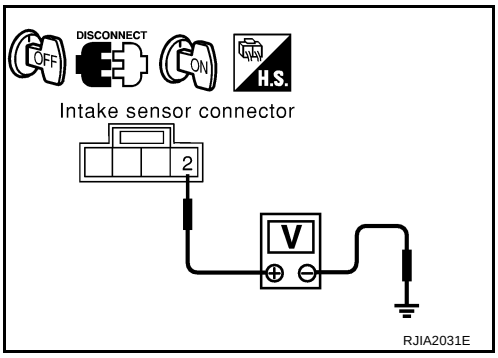
1. CHECK VOLTAGE BETWEEN INTAKE SENSOR AND GROUND

1. Disconnect intake sensor connector.
2. Turn ignition switch ON.
3. Check voltage between intake sensor harness connector M255 terminal 2 and ground.

2 – Ground : Approx. 5 V

OK or NG

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



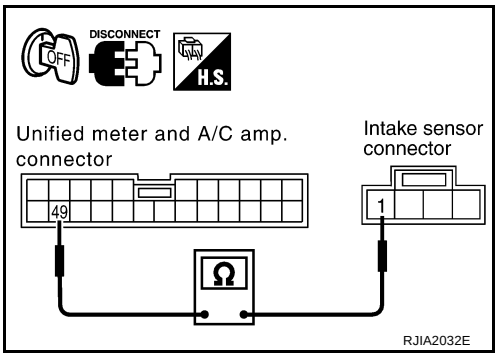
2. CHECK CIRCUIT CONTINUITY BETWEEN INTAKE SENSOR AND UNIFIED METER AND A/C AMP.

1. Turn ignition switch OFF.
2. Disconnect unified meter and A/C amp. connector.
3. Check continuity between intake sensor harness connector M255 terminal 1 and unified meter and A/C amp. harness connector M50 terminal 49.

1 – 49 : Continuity should exist.

OK or NG

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



3. CHECK INTAKE SENSOR

Refer to ATC-104, "Intake Sensor" .

OK or NG

OK >> 1. Replace unified meter and A/C amp.
2. Go to self-diagnosis ATC-50, "FUNCTION CONFIRMATION PROCEDURE" and perform self-diagnosis STEP-2.

NG >> 1. Replace intake sensor.
2. Go to self-diagnosis ATC-50, "FUNCTION CONFIRMATION PROCEDURE" and perform self-diagnosis STEP-2.

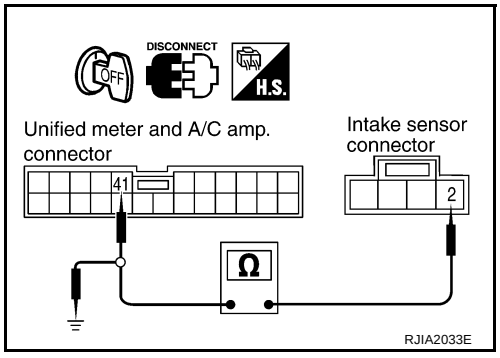
4. CHECK CIRCUIT CONTINUITY BETWEEN INTAKE SENSOR AND UNIFIED METER AND A/C AMP.

1. Turn ignition switch OFF.
2. Disconnect unified meter and A/C amp. connector.
3. Check continuity between intake sensor harness connector M255 terminal 2 and unified meter and A/C amp. harness connector M50 terminal 41.

2 – 41 : Continuity should exist.

4. Check continuity between intake sensor harness connector M255 terminal 2 and ground.

2 – Ground : Continuity should not exist.



OK or NG

OK >> 1. Replace unified meter and A/C amp.
2. Go to self-diagnosis ATC-50, "FUNCTION CONFIRMATION PROCEDURE" and perform self-diagnosis STEP-2.

NG >> Repair harness or connector.

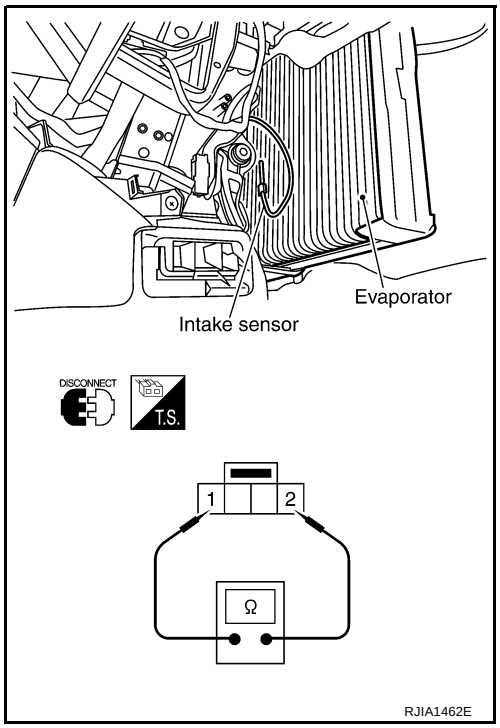
COMPONENT INSPECTION

Intake Sensor

After disconnecting intake sensor connector M255, measure resistance between terminals 1 and 2 at sensor side, using the table below.

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

If NG, replace intake sensor.



A/C CONTROLLER

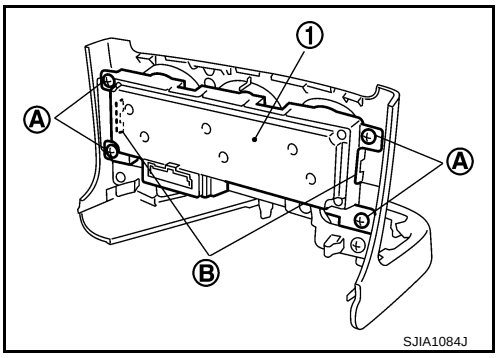
PFP:27500

Removal and Installation

NJS0001E

REMOVAL

1. Remove console finisher (A/T) or console boot (M/T). Refer to IP-11, "Removal and Installation" .
2. Remove mounting screws (A) and clips (B), and then remove A/C controller (1) from console finisher (A/T) or console boot (M/T).

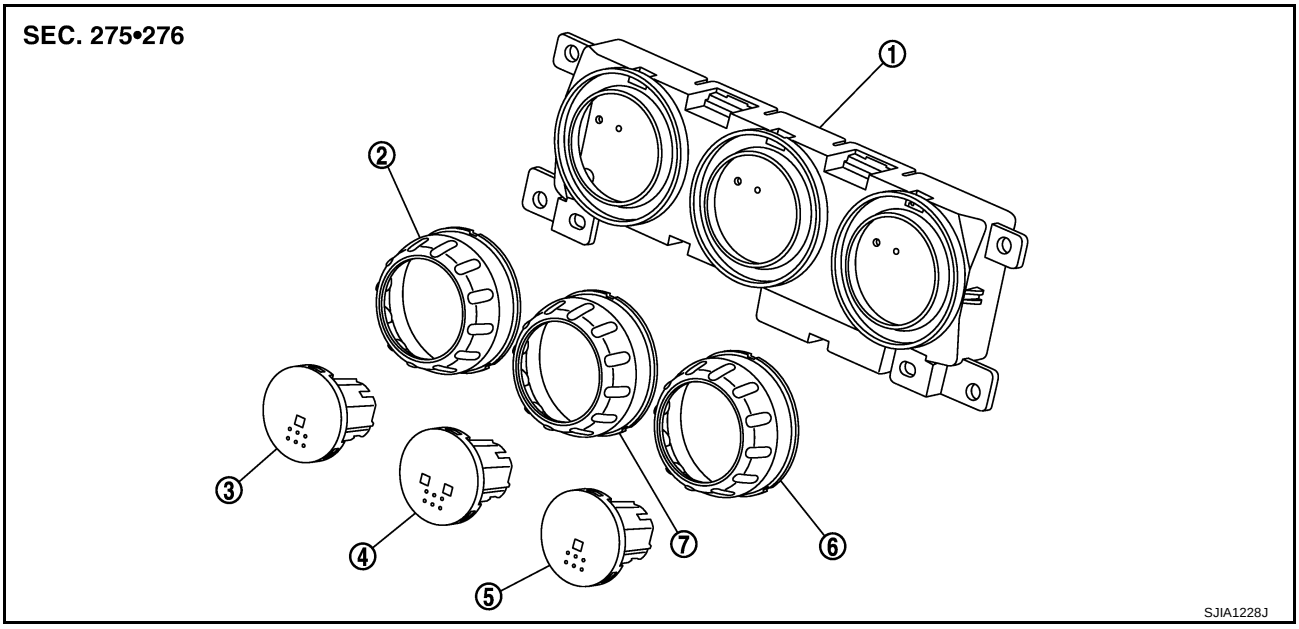


INSTALLATION

Installation is basically the reverse order of removal.

Disassembly and Assembly

NJS000CT



1. A/C controller assembly
2. MODE dial assembly
3. Rear DEF switch
4. Intake switch
5. A/C switch
6. FAN dial assembly
7. TEMP dial assembly

NOTE:

When disassembling controller, wind gummed tape around each dial assembly and pull out the dial assembly together with switch from the A/C controller assembly.

AUTO AMP

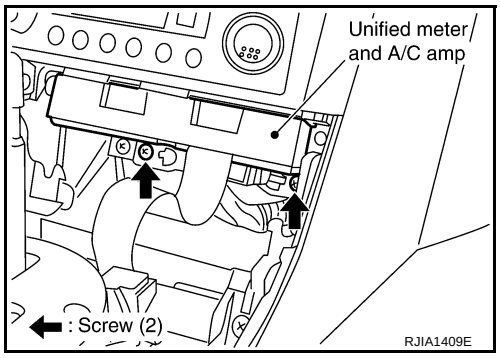
PFP:27760

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

NJS0001F

REMOVAL

1. Remove console finisher (A/T) or console boot (M/T). Refer to IP-11, "Removal and Installation" .
2. Remove mounting screws, and then remove unified meter and A/C amp.



INSTALLATION

Installation is basically the reverse order of removal.

AMBIENT SENSOR

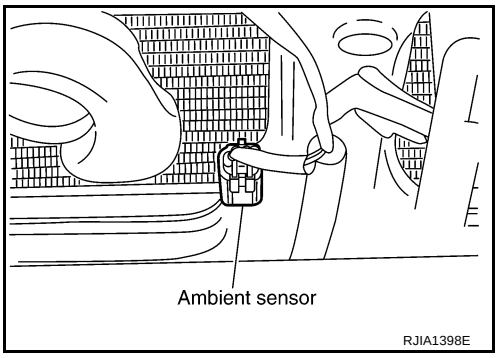
PFP:27722

Removal and Installation

NJS0001G

REMOVAL

1. Disconnect ambient sensor connector.
2. Remove ambient sensor.



INSTALLATION

Installation is basically the reverse order of removal.

IN-VEHICLE SENSOR

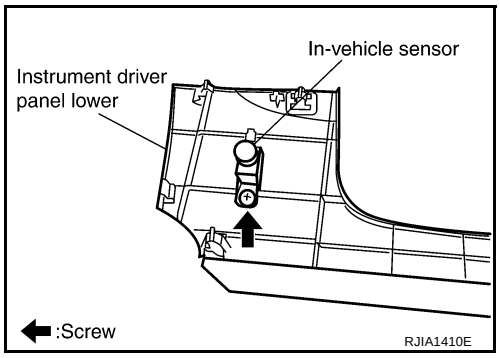
PFP:27720

Removal and Installation

NJS0001H

REMOVAL

1. Remove instrument driver panel lower. Refer to IP-11, "Removal and Installation" .
2. Remove mounting screw, and then remove in-vehicle sensor.



INSTALLATION

Installation is basically the reverse order of removal.

SUNLOAD SENSOR

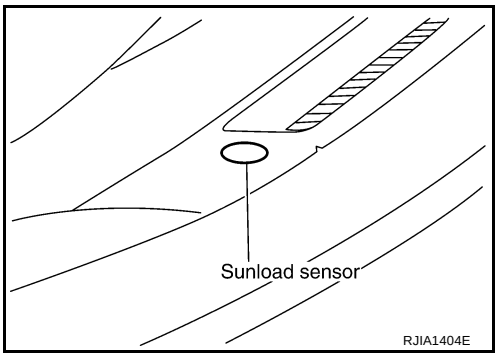
PFP:27721

Removal and Installation

NJS0001I

REMOVAL

1. Pull out sunload sensor from instrument panel.
2. Disconnect sunload sensor connector, and then remove sunload sensor.



INSTALLATION

Installation is basically the reverse order of removal.

INTAKE SENSOR

PFP:27723

Removal and Installation

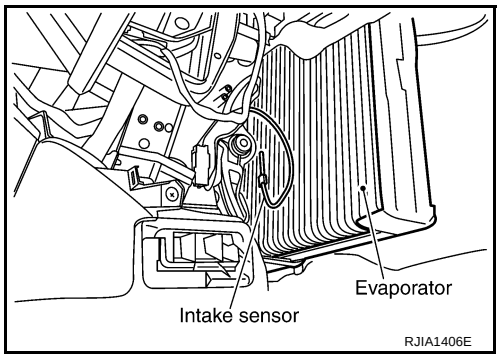
NJS0001J

REMOVAL

1. Remove low-pressure pipe and high-pressure pipe 2. Refer to ATC-137, "Removal and Installation of Low-pressure Pipe 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.**
- **Connection point for female-side piping is thin. So, when inserting male-side piping, take care not to deform female-side piping. Slowly insert in axial direction.**
- **Insert one-touch joint connection point securely until it clicks.**
- **After piping has been connected, pull male-side piping by hand to make sure piping does not come off.**
- **When recharging refrigerant, check for leaks.**

BLOWER UNIT

PFP:27200

Removal and Installation

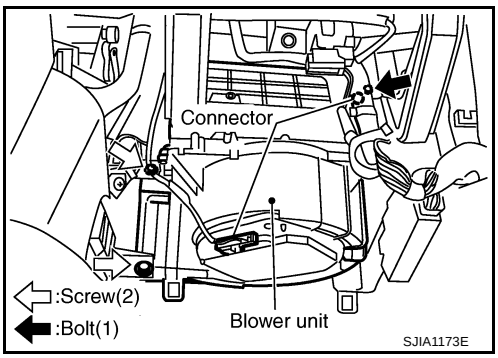
NJS0001K

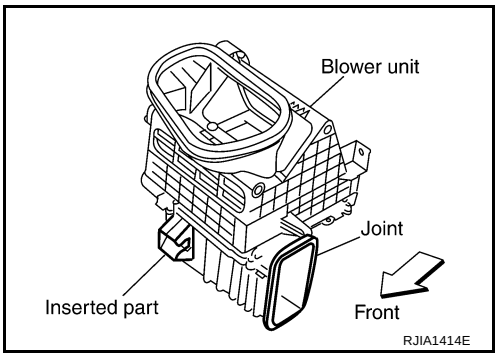
REMOVAL

1. Remove instrument passenger panel lower. Refer to IP-11, "Removal and Installation" .
2. Remove ECM with bracket attached.
3. Disconnect intake door motor connector and blower motor connector.
4. Remove mounting bolt and screws, and then remove blower unit.

CAUTION:

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





INSTALLATION

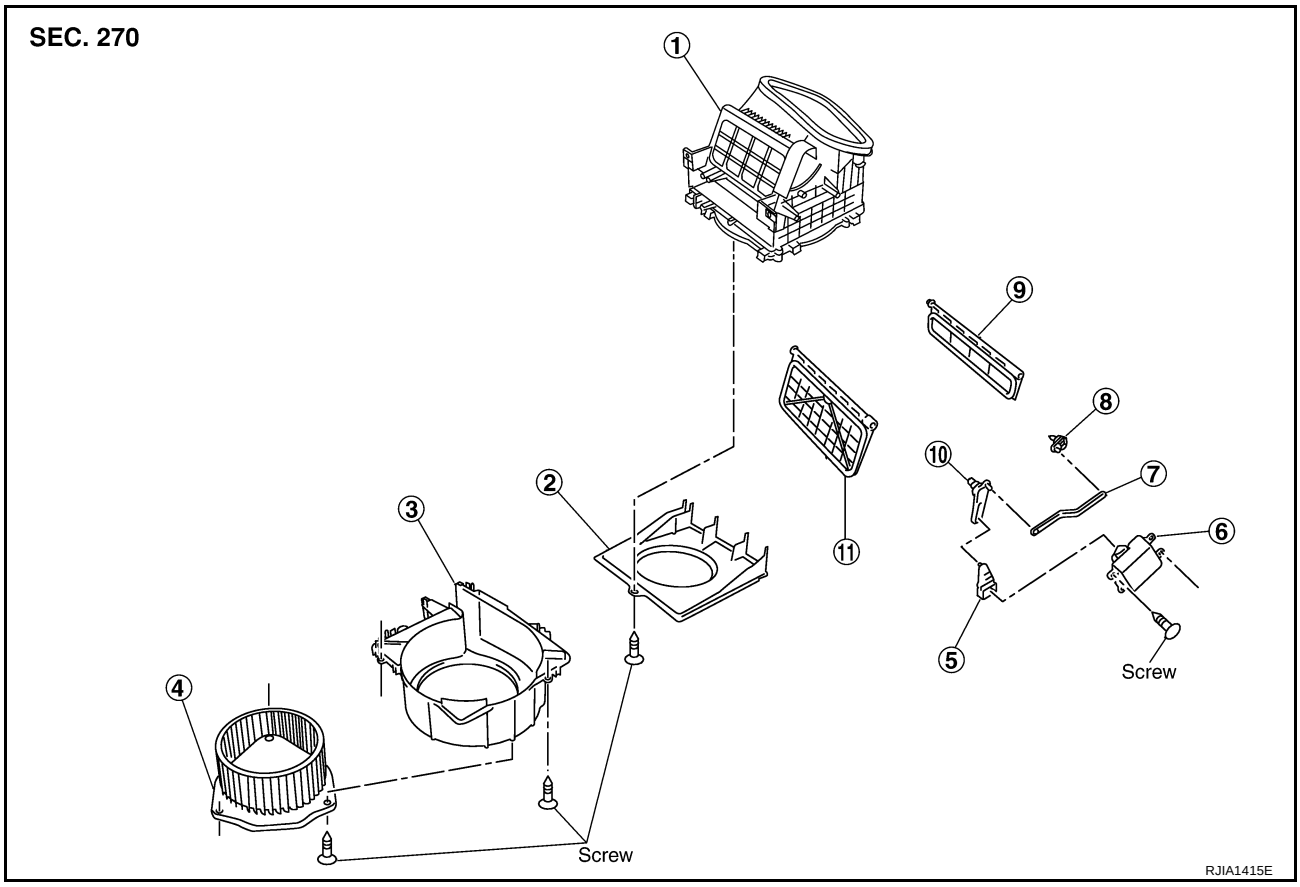
Installation is basically the reverse order of removal.

CAUTION:

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

Disassembly and Assembly

NJS0001L



1. Intake upper case
2. Intake bell mouth
3. Intake lower case
4. Blower motor assembly
5. Intake door lever 2
6. Intake door motor
7. Intake door link
8. Intake door lever 3
9. Intake door 2
10. Intake door lever 1
11. Intake door 1

BLOWER MOTOR

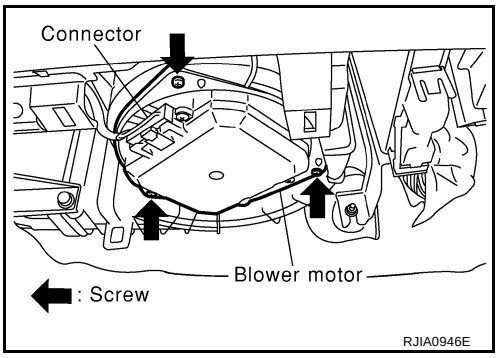
PFP:27226

Removal and Installation

NJS0001M

REMOVAL

1. Remove instrument passenger panel lower. Refer to IP-11, "Removal and Installation" .
2. Disconnect blower motor connector.
3. Remove mounting screws, and then remove blower motor.



INSTALLATION

Installation is basically the reverse order of removal.

INTAKE DOOR MOTOR

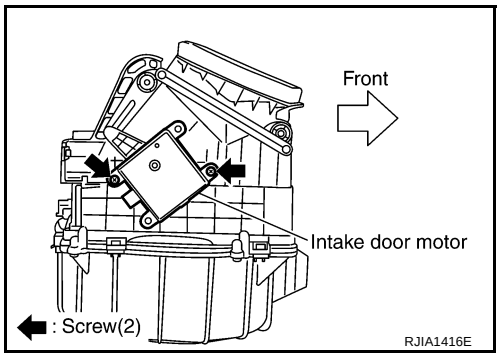
PFP:27730

Removal and Installation

NJS0001N

REMOVAL

1. Remove blower unit. Refer to ATC-111, "BLOWER UNIT" .
2. Remove mounting screws, and then remove intake door motor from blower unit.



INSTALLATION

Installation is basically the reverse order of removal.

HEATER & COOLING UNIT ASSEMBLY

PFP:27110

Removal and Installation

NJS0001O

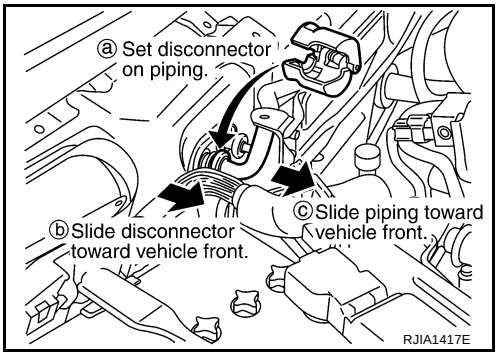
REMOVAL

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" .
3. Remove cowl top cover. Refer to EI-20, "COWL TOP" .
4. Disconnect low-pressure flexible hose and high-pressure pipe 1 from evaporator.

a. Set a disconnector [low-pressure side (SST: 9253089916), high-pressure side (SST: 9253089908)] on A/C piping.

b. Slide a disconnector toward vehicle front until it clicks.

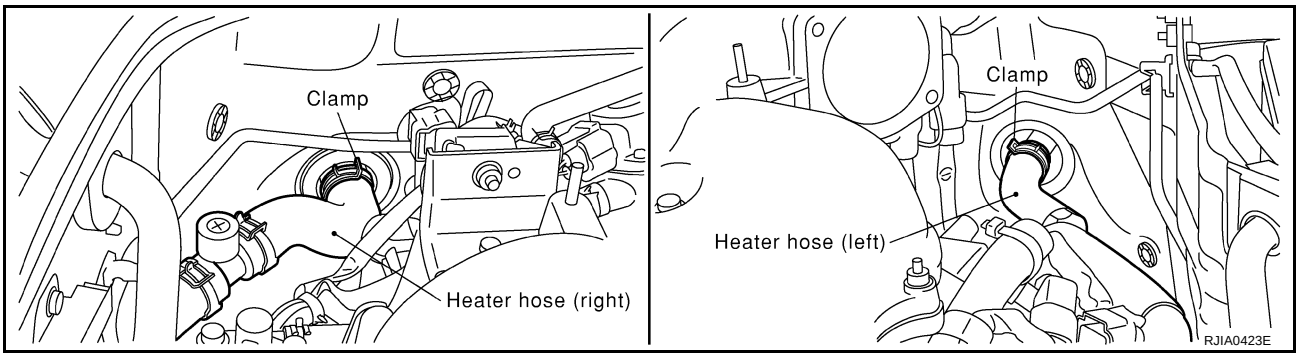
c. Slide A/C piping toward vehicle front and disconnect it.



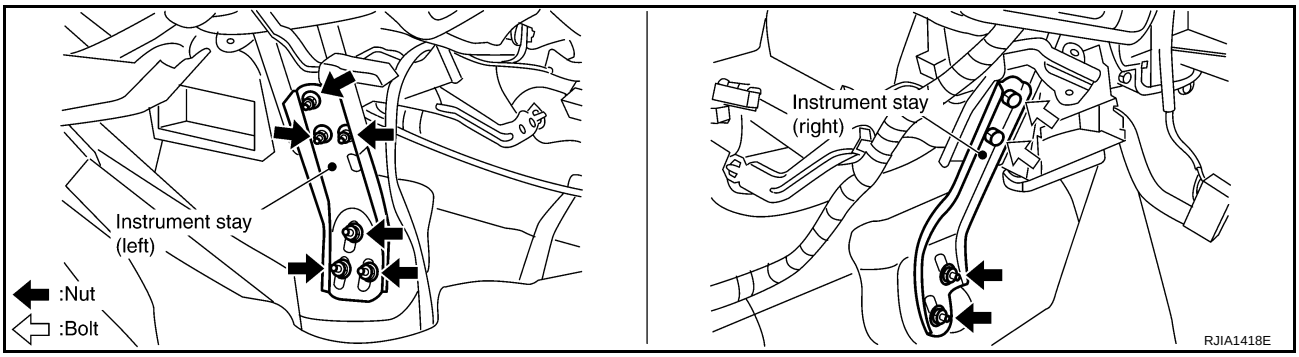
CAUTION:

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

5. Remove electric throttle control actuator. Refer to EM-18, "INTAKE MANIFOLD COLLECTOR" .
6. Remove clamps, and then disconnect two heater hoses from heater core.

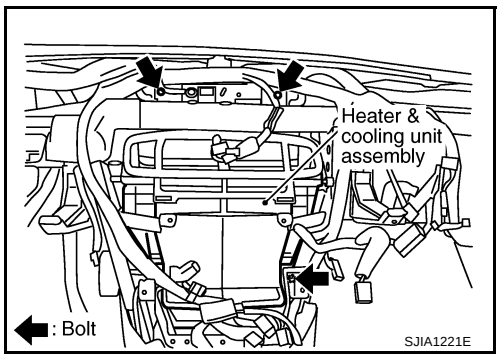


7. Remove instrument panel assembly. Refer to IP-11, "Removal and Installation" .
8. Remove blower unit. Refer to ATC-111, "BLOWER UNIT" .
9. Remove clips of vehicle harness from steering member.
10. Remove mounting nuts and bolts, and then remove instrument stays (left and right).

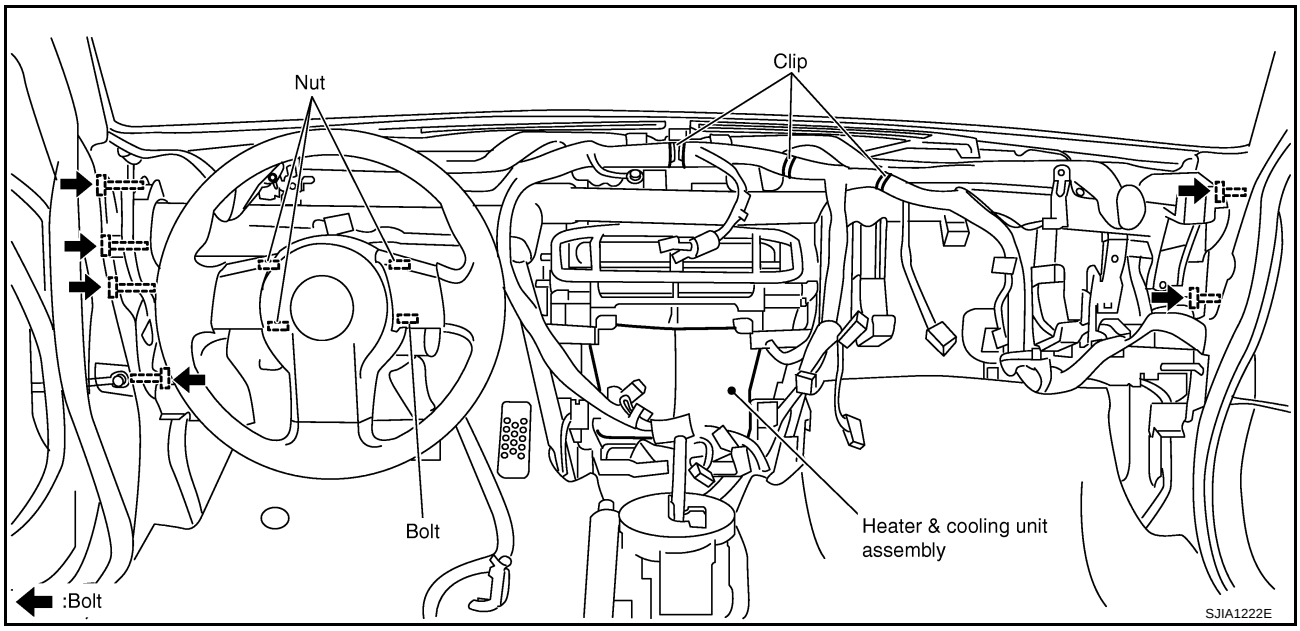


11. Remove defroster nozzle and ventilator ducts. Refer to ATC-124, "Removal of Defroster Nozzle, Ducts and Ventilator Ducts" .

12. Remove mounting bolts from heater & cooling unit assembly.



13. Remove steering column mounting nuts and bolt.
14. Remove steering member mounting bolts, and then remove steering member.



15. Remove heater & cooling unit assembly.

INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

- **Replace O-rings for A/C piping with new ones, and then apply compressor oil to it when installing it.**
- **Connection point for female-side piping is thin. So, when inserting male-side piping, take care not to deform female-side piping. Slowly insert in axial direction.**
- **Insert one-touch joint connection point securely until it clicks.**
- **After piping has been connected, pull male-side piping by hand to make sure piping does not come off.**
- **When recharging refrigerant, check for leaks.**

NOTE:

- When filling radiator with coolant, refer to CO-10, "Changing Engine Coolant" .
- Recharge the refrigerant.

Heater & cooling unit mounting bolts

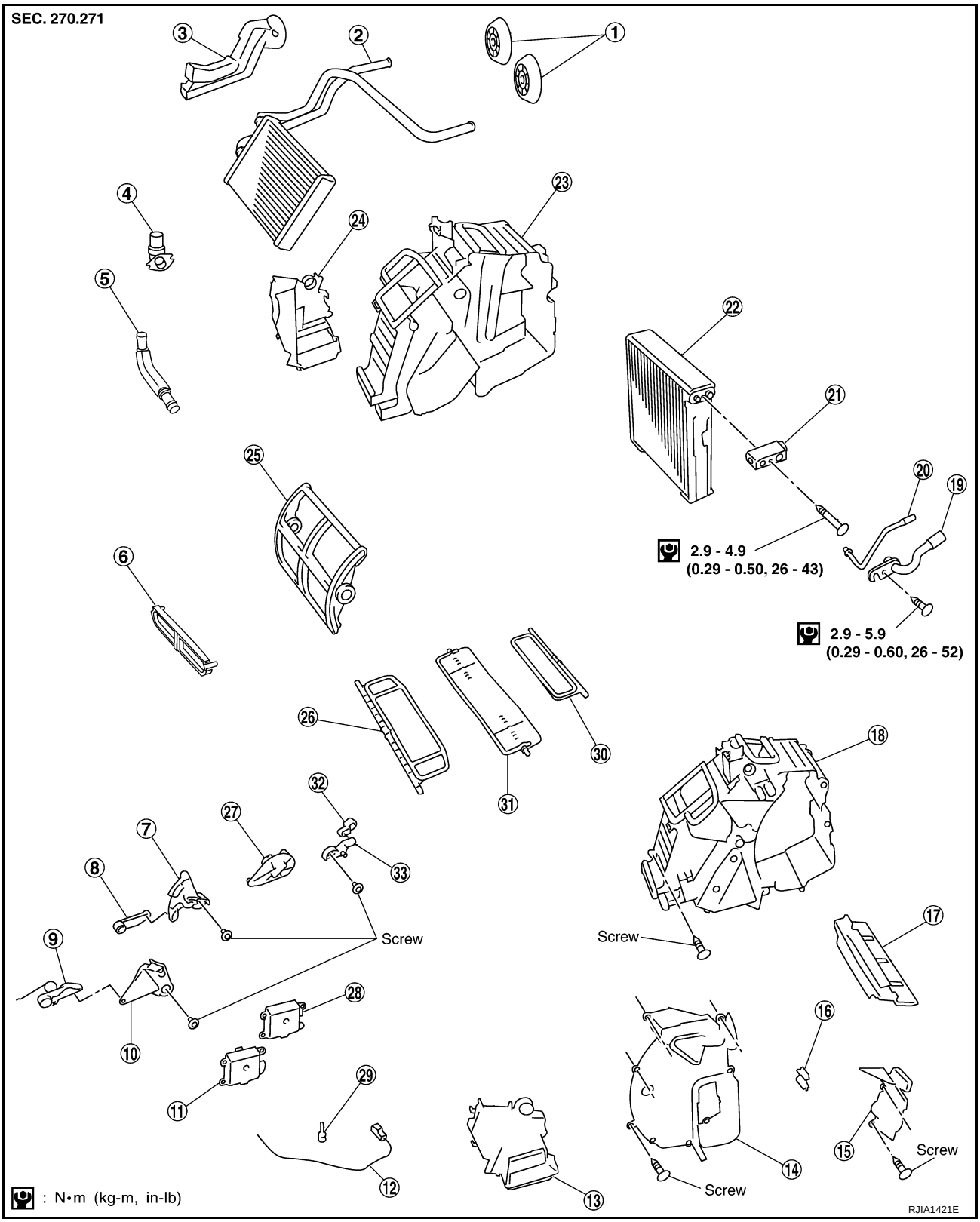
: 6.9 N·m (0.7 kg-m, 61 in-lb)

Steering member mounting nuts and bolt

: 12 N·m (1.25 kg-m, 9 ft-lb)

Disassembly and Assembly

NJS0001P



1. Heater pipe grommet
2. Heater core
3. Heater pipe cover
4. Aspirator
5. Aspirator duct
6. Rear foot cover
7. Max. cool door link
8. Max. cool door lever
9. Ventilator door lever
10. Ventilator door link
11. Air mix door motor
12. Intake sensor
13. Foot duct (right)
14. Evaporator cover
15. Evaporator cover adapter
16. Heater pipe bracket
17. Insulator
18. Heater case (right)

19. Low-pressure pipe
20. High-pressure pipe 2
21. Expansion valve
22. Evaporator
23. Heater case (left)
24. Foot duct (left)
25. Air mix door (slide door)
26. Ventilator door
27. Side link
28. Mode door motor
29. Intake sensor bracket
30. Defroster door
31. Max. cool door
32. Defroster door lever
33. Defroster door link

MODE DOOR MOTOR

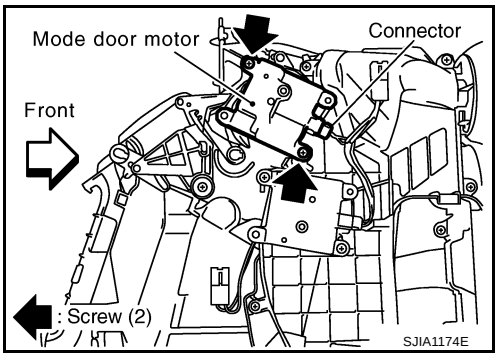
PFP:27731

Removal and Installation

NJS0001Q

REMOVAL

1. Remove blower unit. Refer to ATC-111, "BLOWER UNIT" .
2. Remove mounting screws from mode door motor.
3. Disconnect connector, and then remove mode door motor.



INSTALLATION

Installation is basically the reverse order of removal.

AIR MIX DOOR MOTOR

PFP:27732

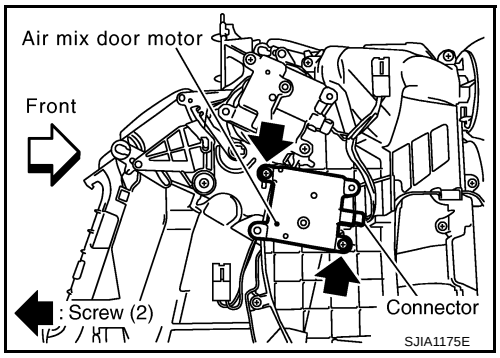
Removal and Installation

NJS0001R

REMOVAL

1. Set the temperature control dial at 18°C (60°F).
2. Open the driver and front passenger window, and then disconnect the battery cable from the negative terminal.

   CAUTION:
   After the battery cables are disconnected, do not open/close the driver and/or front passenger door with the window in the full up position. The automatic window adjusting function will not work and the side roof panel may be damaged.
3. Remove blower unit. Refer to ATC-111, "BLOWER UNIT" .
4. Disconnect air mix door motor connector.
5. Remove mounting screws, and then remove air mix door motor.



INSTALLATION

Installation is basically the reverse order of removal.

HEATER CORE

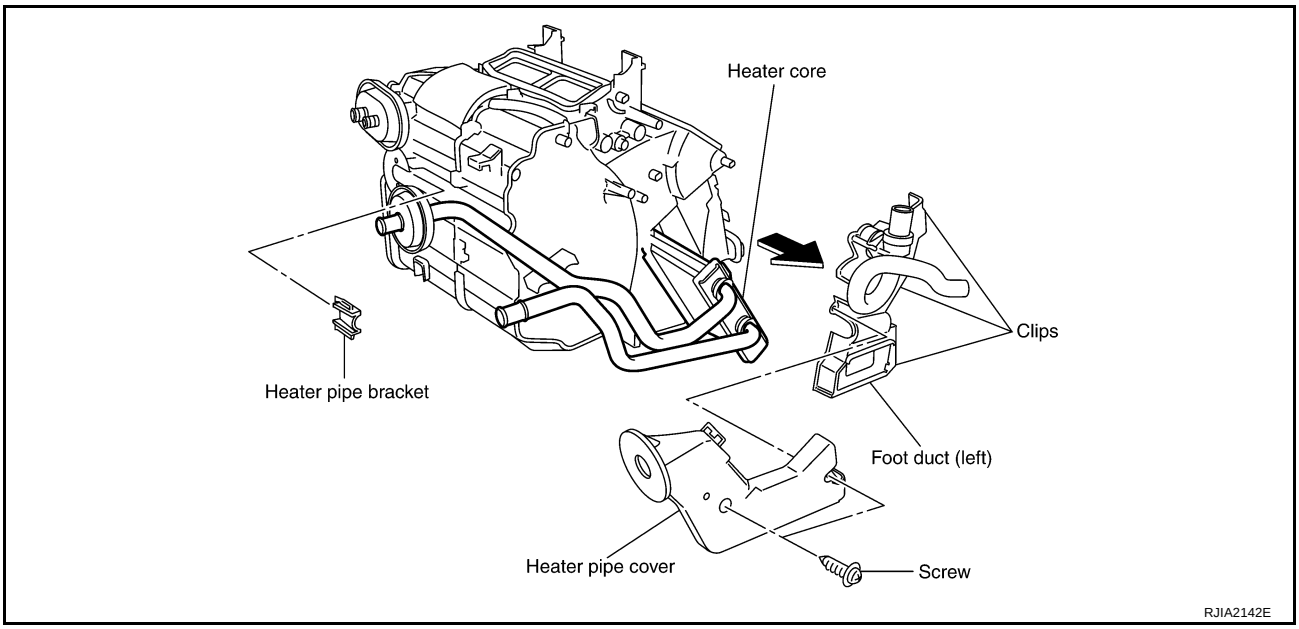
PFP:27140

Removal and Installation

NJS0001S

REMOVAL

1. Remove heater & cooling unit assembly. Refer to ATC-115, "HEATER & COOLING UNIT ASSEMBLY" .
2. Remove foot duct (left). Refer to ATC-125, "Removal of Foot Ducts" .



3. Remove mounting screws, and then remove heater pipe cover.
4. Remove heater pipe bracket and heater pipe grommet.
5. Slide heater core to leftward.

INSTALLATION

Installation is basically the reverse order of removal.

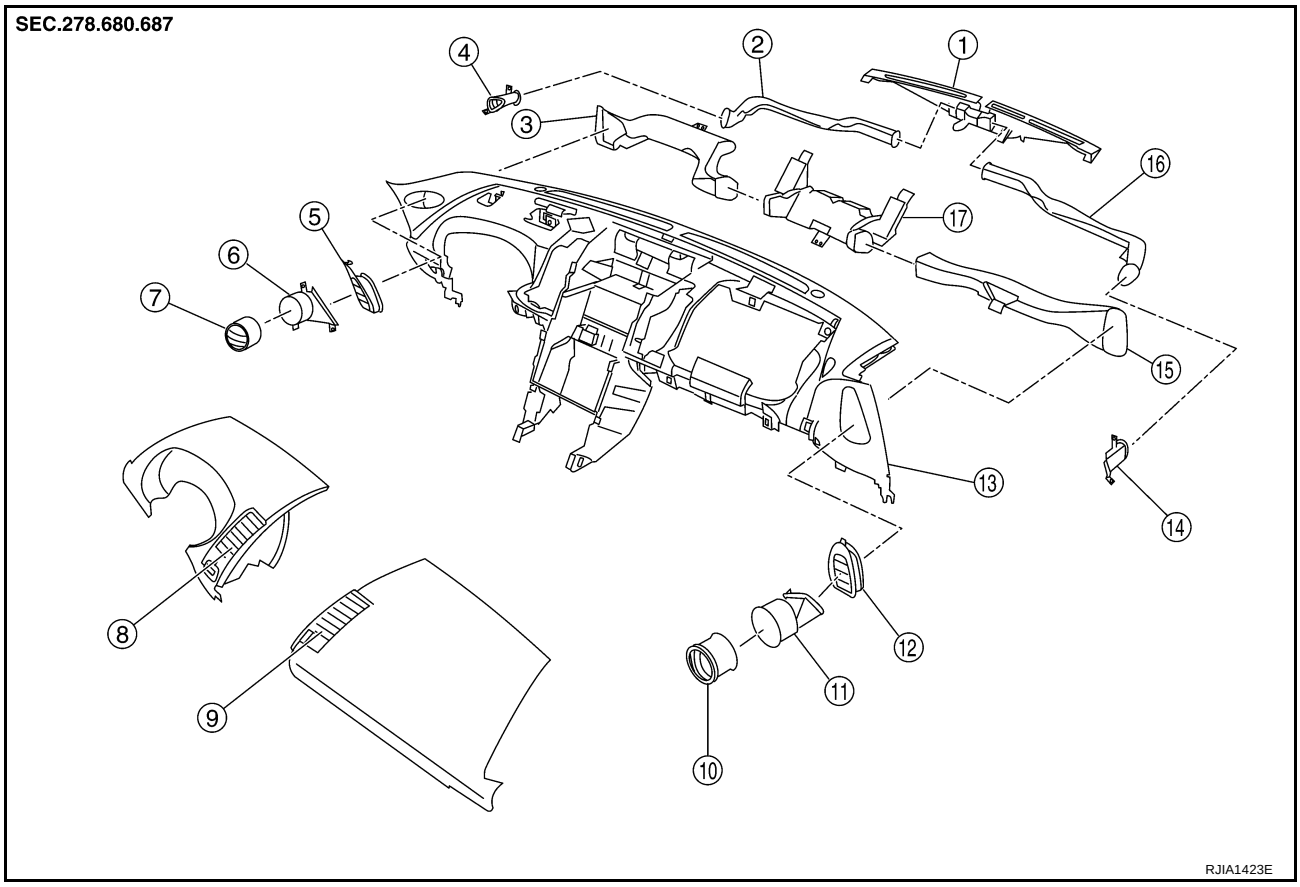
DUCTS AND GRILLES

PFP:27860

Removal and Installation

NJS0001T

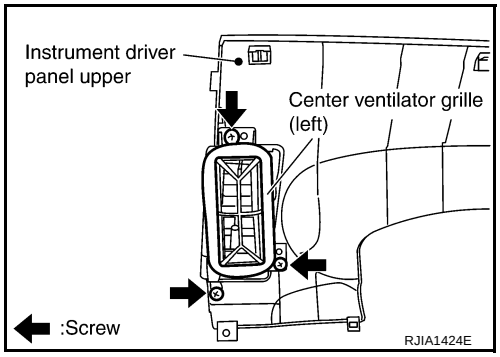
REMOVAL



1. Defroster nozzle
2. Side defroster duct 1 (left)
3. Side ventilator duct 1 (left)
4. Side defroster duct 2 (left)
5. Instrument side finisher (left)
6. Side ventilator duct 2 (left)
7. Side ventilator grille (left)
8. Center ventilator grille (left)
9. Center ventilator grille (right)
10. Side ventilator grille (right)
11. Side ventilator duct 2 (right)
12. Instrument side finisher (right)
13. Instrument panel
14. Side defroster duct 2 (right)
15. Side ventilator duct 1 (right)
16. Side defroster duct 1 (right)
17. Center ventilator duct

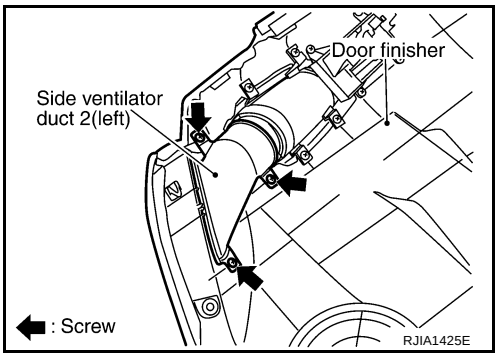
Removal of Center Ventilator Grilles

1. Remove instrument driver and passenger panel upper. Refer to IP-11, "Removal and Installation" .
2. Remove mounting screws, and then remove center ventilator grilles.

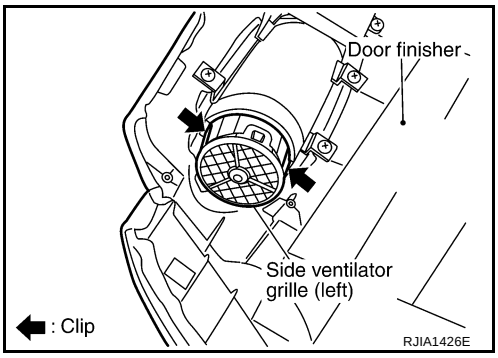


Removal of Side Ventilator Duct 2 and Grilles

1. Remove door finisher. Refer to EI-33, "DOOR FINISHER" .
2. Remove mounting screws, and then remove side ventilator duct 2 (left and right).

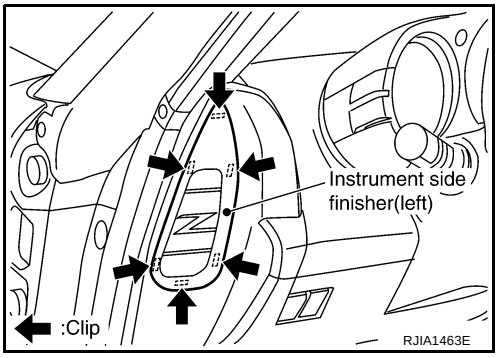


3. Remove mounting clips, and then remove side ventilator grilles (left and right).



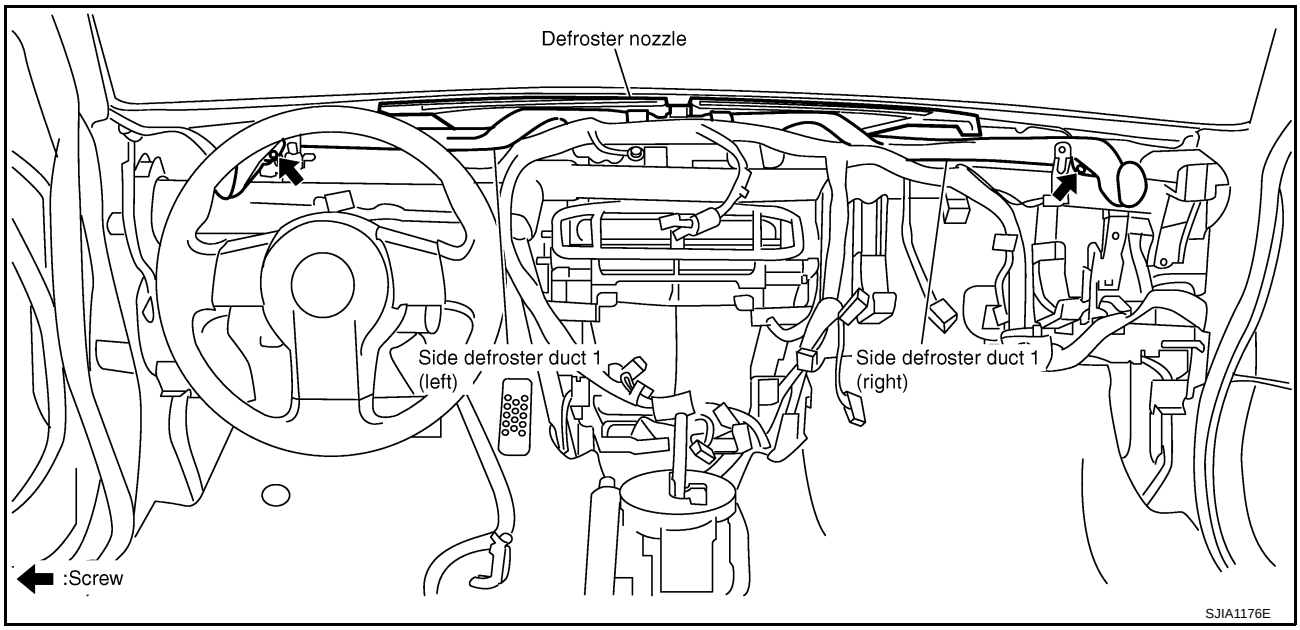
Removal of Instrument Side Finishers

Remove mounting clips, and then remove instrument side finishers (left and right).

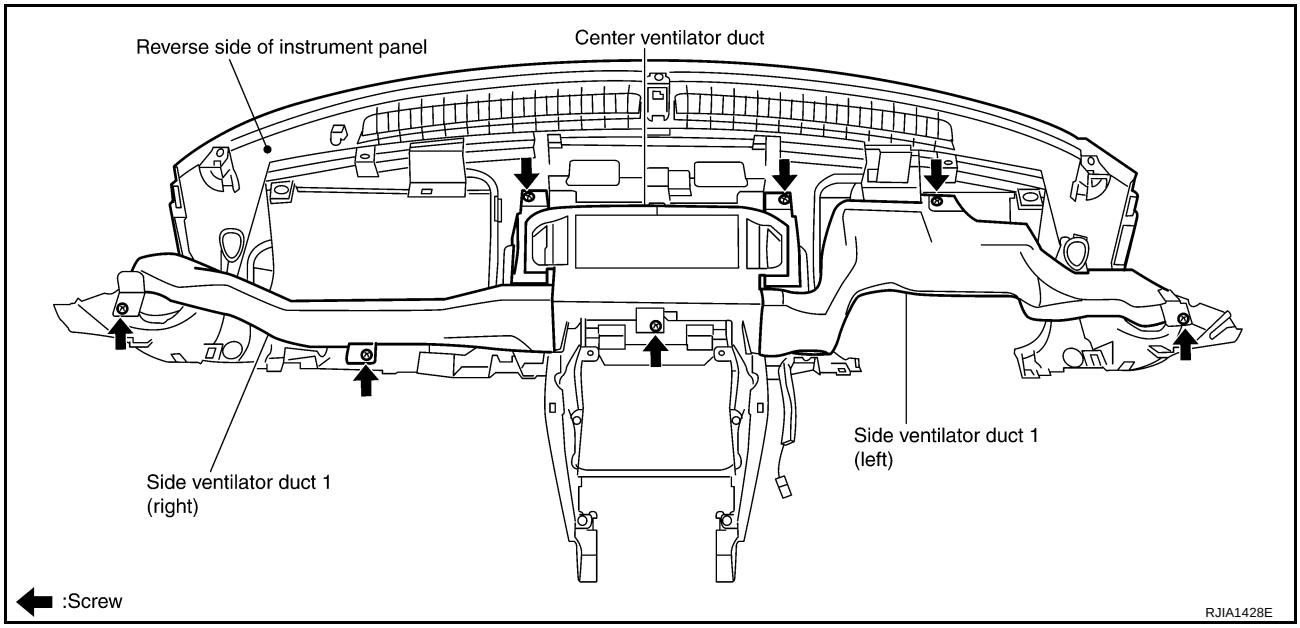


Removal of Defroster Nozzle, Ducts and Ventilator Ducts

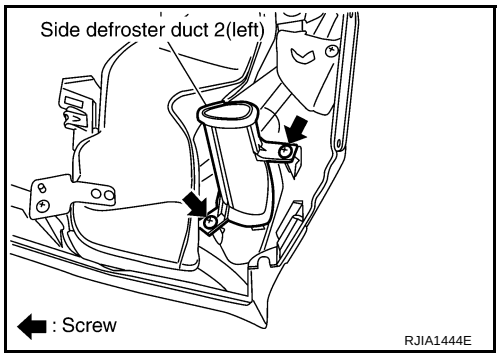
1. Remove instrument panel. Refer to IP-11, "Removal and Installation" .
2. Remove mounting screws, and then remove side defroster duct 1 (left and right).
3. Remove steering member, and then remove defroster nozzle.



4. Remove mounting screws, and then remove side ventilator duct 1 (left and right) and center ventilator duct from instrument panel.

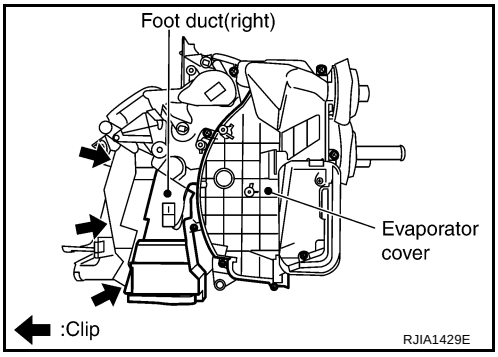


5. Remove mounting screws, and then remove side defroster duct 2 (left and right).



Removal of Foot Ducts

1. Remove heater & cooling unit assembly. Refer to ATC-115, "HEATER & COOLING UNIT ASSEMBLY" .
2. Remove evaporator cover, and then remove foot duct (right).
3. Remove aspirator and heater pipe cover.
4. Remove mounting clips, and then remove foot duct (left).



INSTALLATION

Installation is basically the reverse order of removal.

REFRIGERANT LINES

PFP:92600

HFC-134a (R-134a) Service Procedure

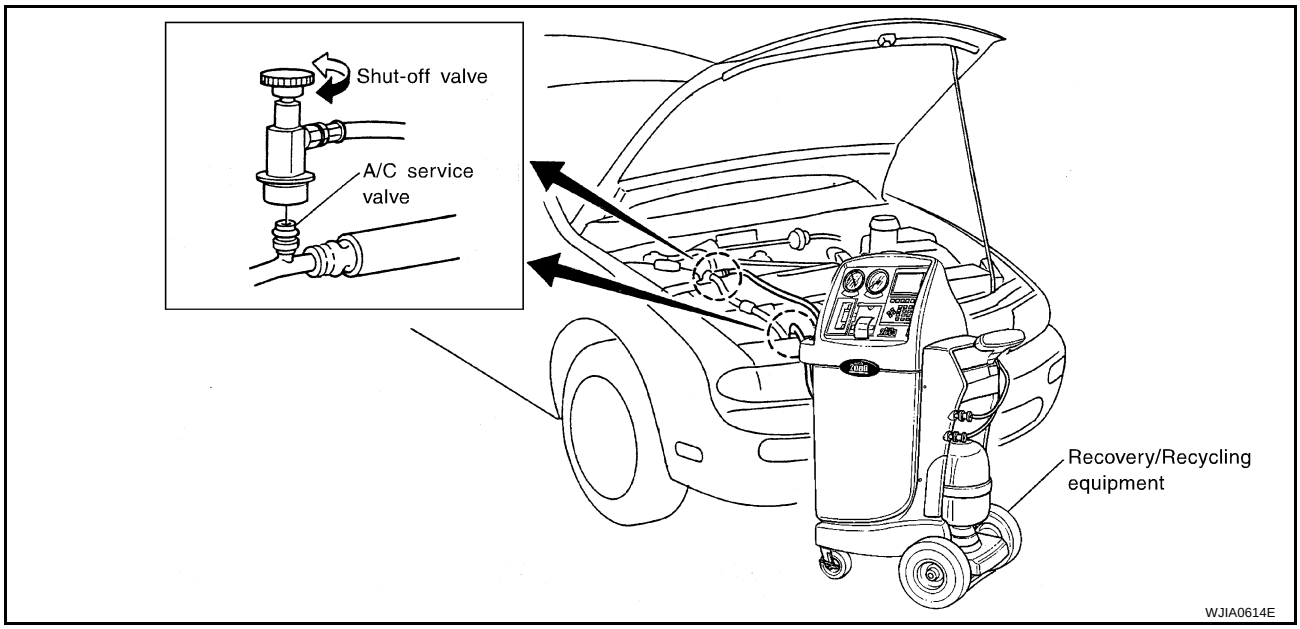
NJS0001U

SETTING OF SERVICE TOOLS AND EQUIPMENT

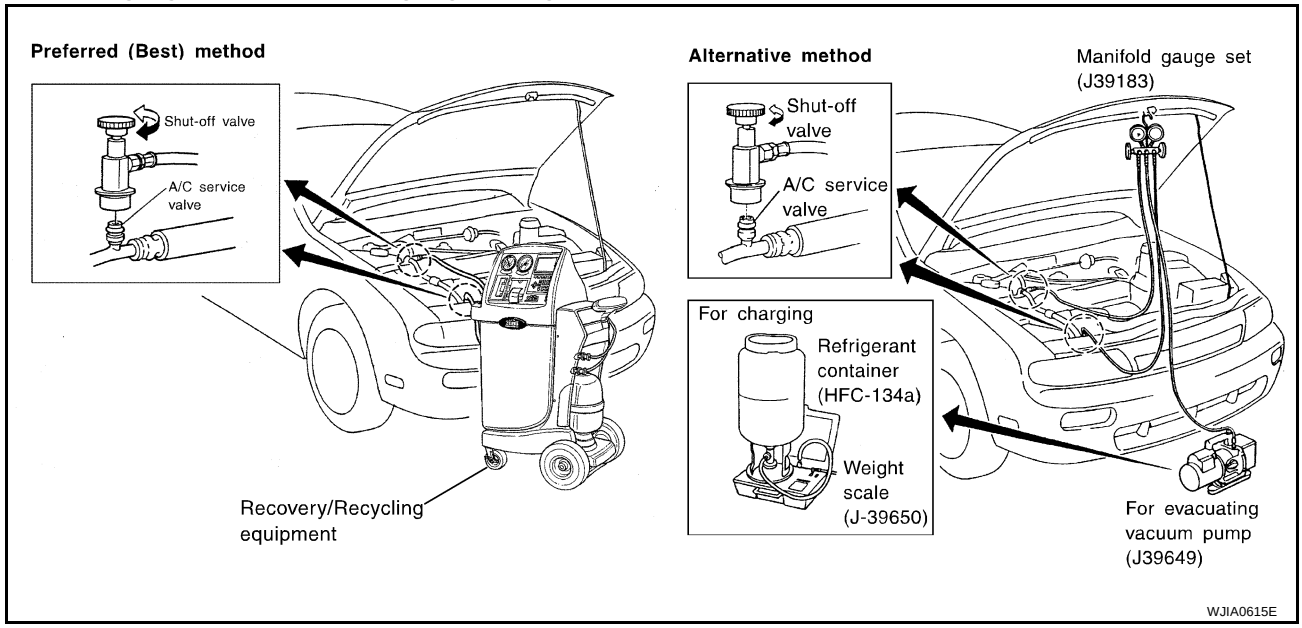
Discharging Refrigerant

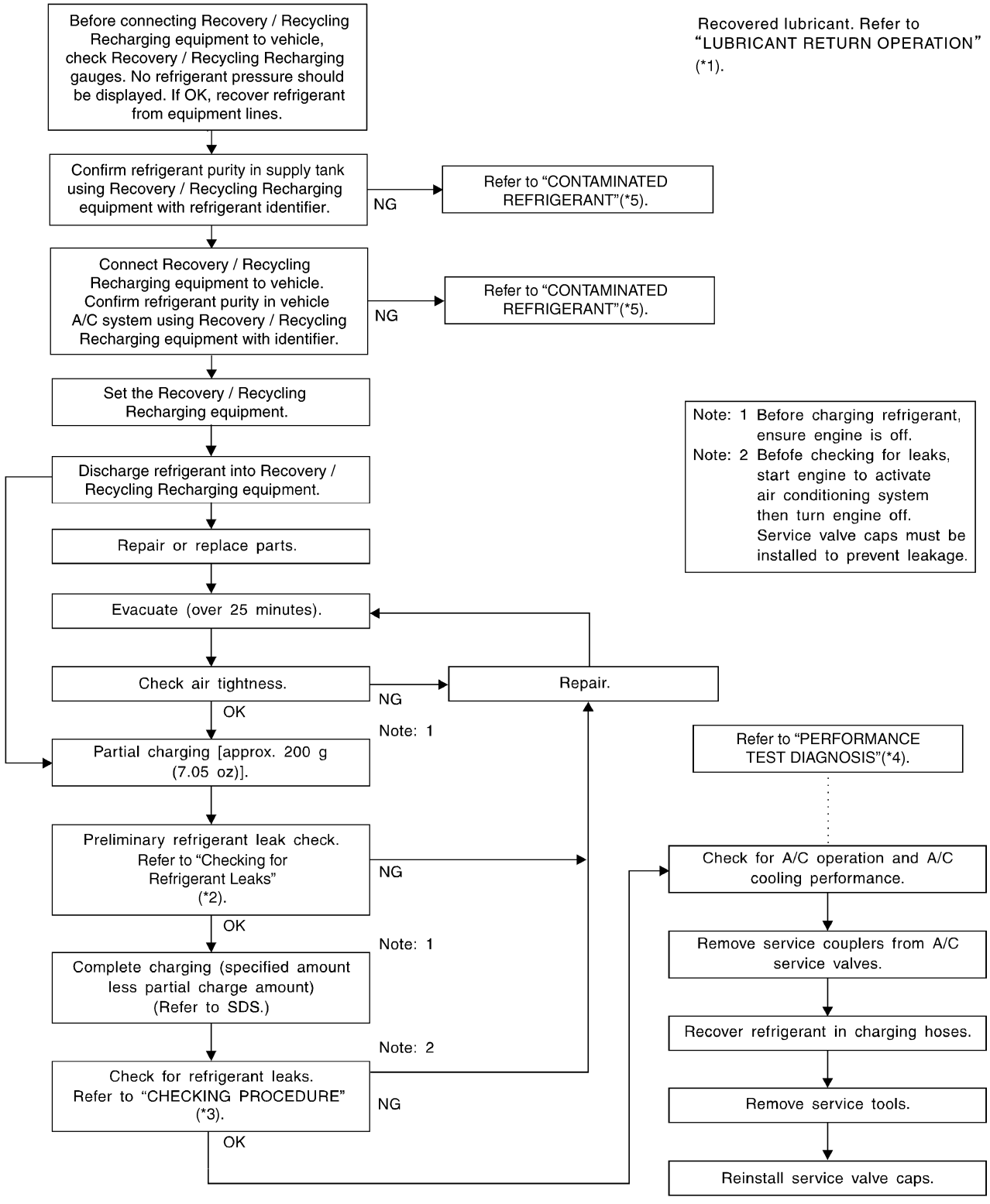
WARNING:

Avoid breathing A/C refrigerant and lubricant vapor or mist. Exposure may irritate eyes, nose and throat. Remove HFC-134a (R-134a) from A/C system using certified service equipment meeting requirements of SAE J-2210 [HFC-134a (R-134a) recycling equipment] or J-2209 [HFC-134a (R-134a) recovery equipment]. 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





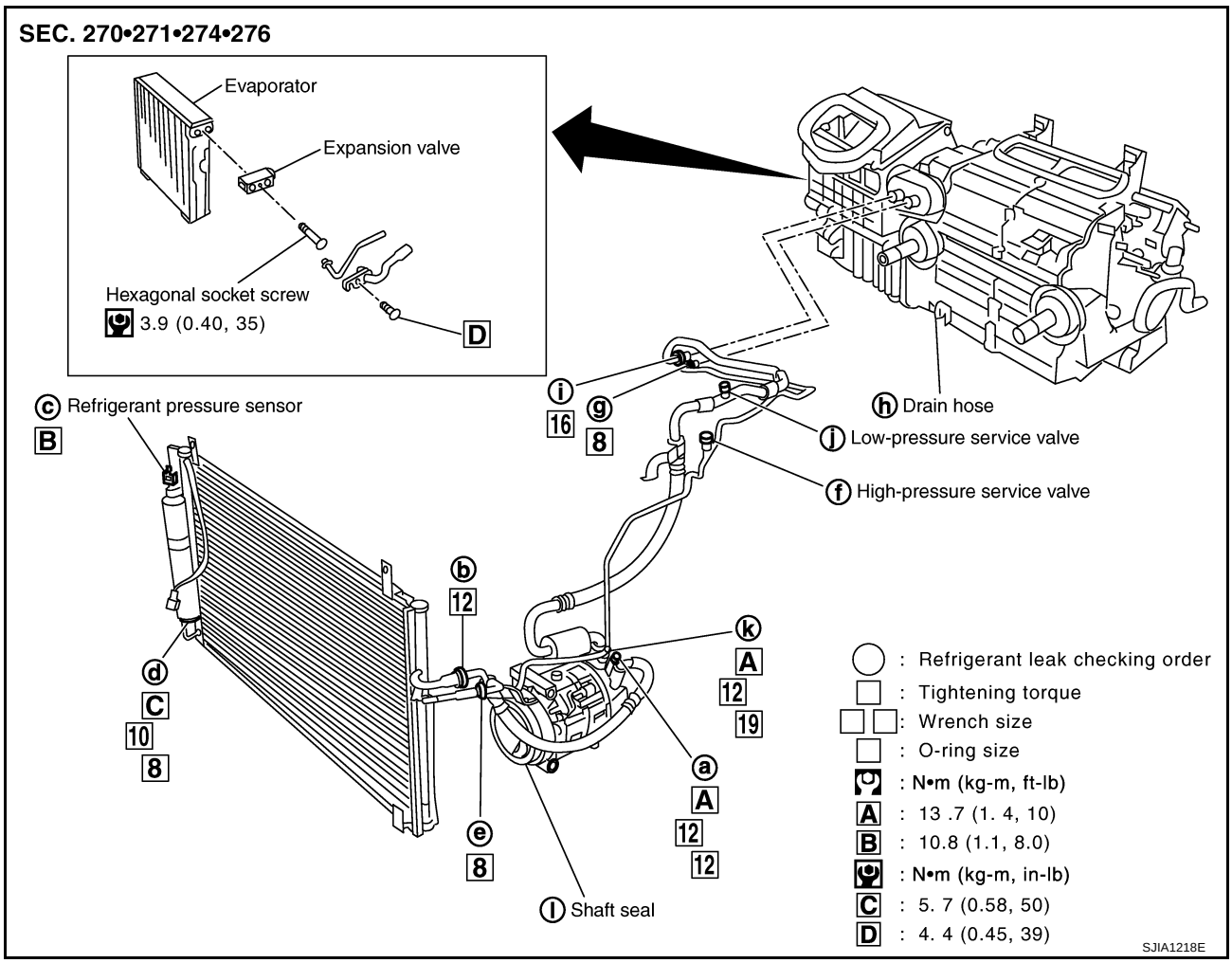
SJIA1275E

*1 ATC-24, "LUBRICANT RETURN OPERATION"
*2 ATC-143, "Checking for Refrigerant Leaks"
*3 ATC-145, "CHECKING PROCEDURE"
*4 ATC-86, "PERFORMANCE TEST DIAGNOSIS"
*5 ATC-5, "CONTAMINATED REFRIGERANT"

Components

NJS0001V

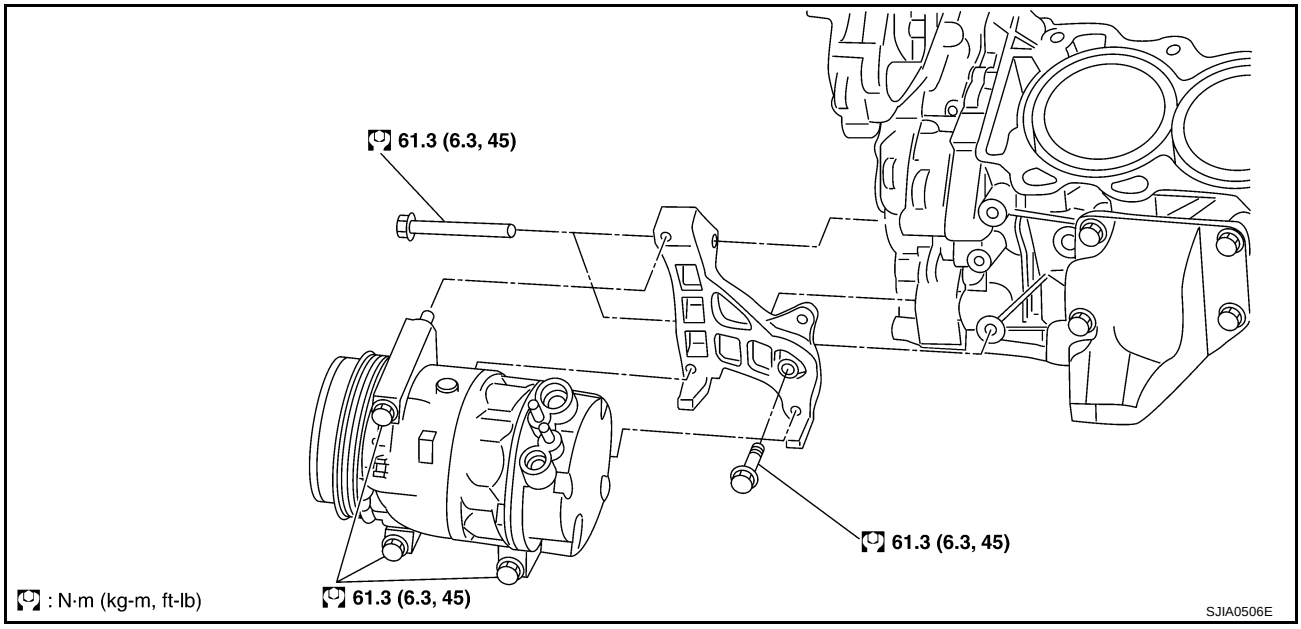
Refer to ATC-6, "Precautions for Refrigerant Connection" .



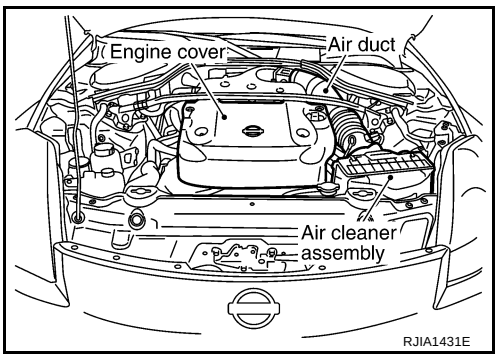
Removal and Installation of Compressor

NJS0001W

REMOVAL



1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
2. Remove air cleaner assembly and air duct. Refer to EM-16, "AIR CLEANER AND AIR DUCT" .
3. Remove engine under cover, using power tools.

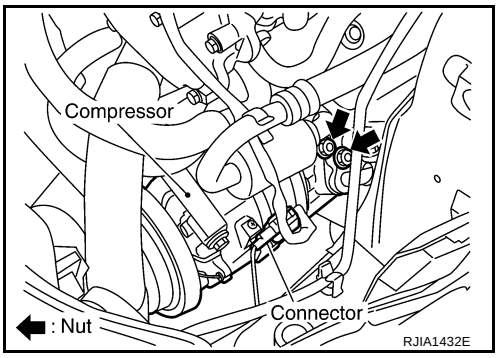


4. Remove mounting nuts from low-pressure flexible hose and high-pressure flexible hose.

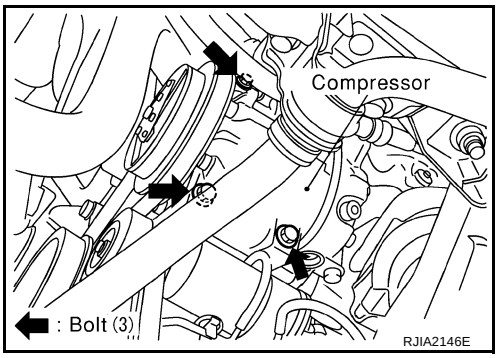
CAUTION:

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

5. Disconnect compressor connector.
6. Remove A/C compressor belt. Refer to EM-14, "DRIVE BELTS" .



7. Remove mounting bolts from compressor, using power tools.
8. Remove compressor downward of 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.**

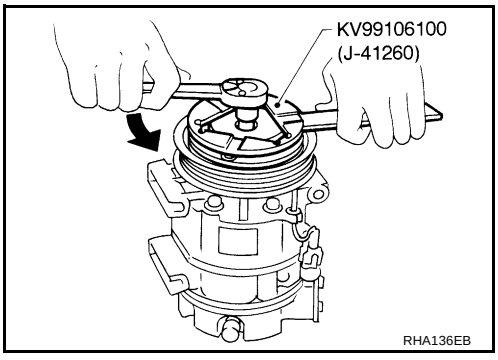
Removal and Installation of Compressor Clutch

NJS0001X

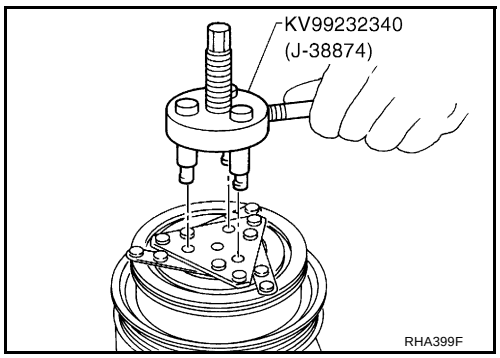
REMOVAL

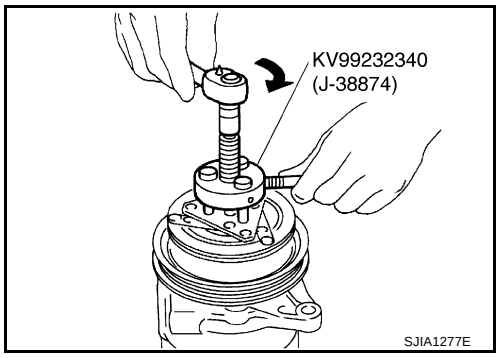
Overhaul

1. When removing center bolt, hold clutch disc with clutch disc wrench (SST).

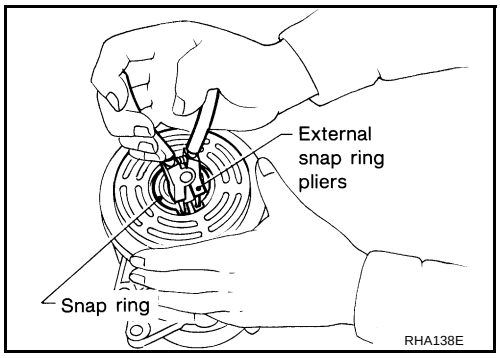


2. Remove clutch disc using clutch disc puller (SST).

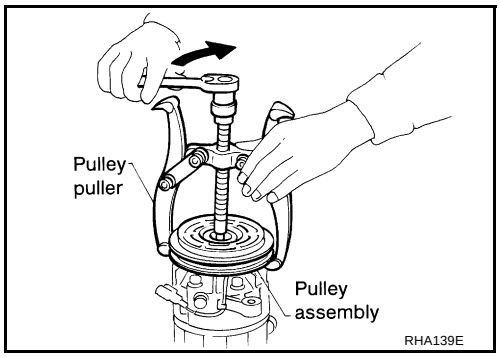




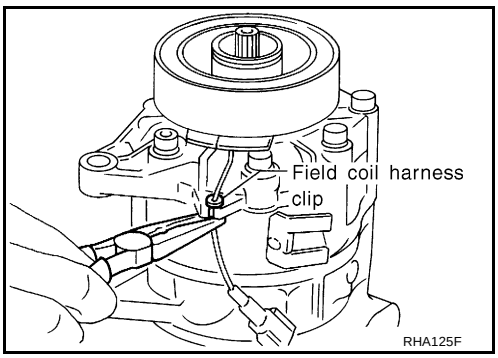
3. Remove snap ring using external snap ring pliers.



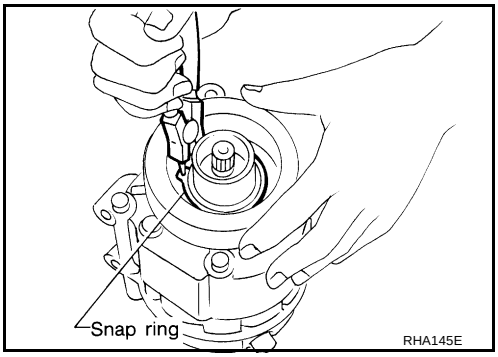
4. Position center pulley puller on the end of the drive shaft, and remove pulley assembly using any commercially available pulley puller.
   To prevent pulley groove from being deformed, puller claws should be positioned into the edge of the pulley assembly.



5. Remove field coil harness clip using a pair of pliers.



6. Remove snap ring using external snap ring pliers.

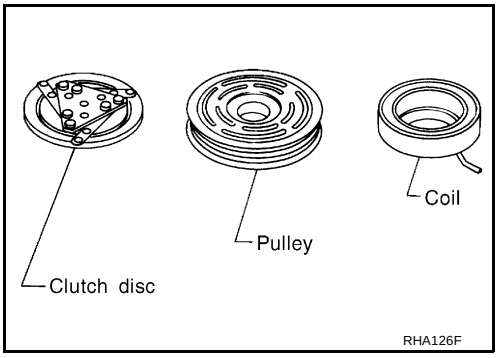


Inspection

Clutch disc
If the contact surface shows signs of damage due to excessive heat, replace clutch disc and pulley.

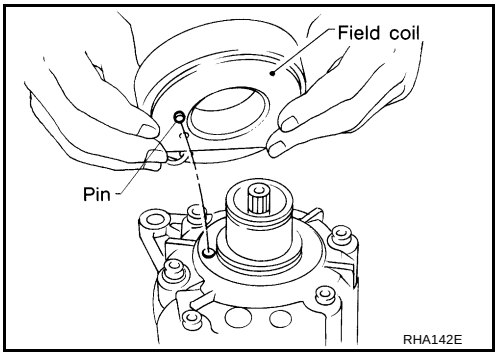
Pulley
Check appearance of pulley assembly. If contact surface of pulley shows signs of excessive grooving, replace clutch disc and pulley. The contact surfaces of pulley assembly should be cleaned with a suitable solvent before reinstallation.

Coil
Check coil for loose connection or cracked insulation.

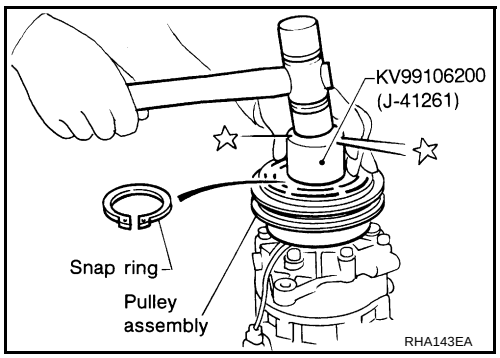


INSTALLATION

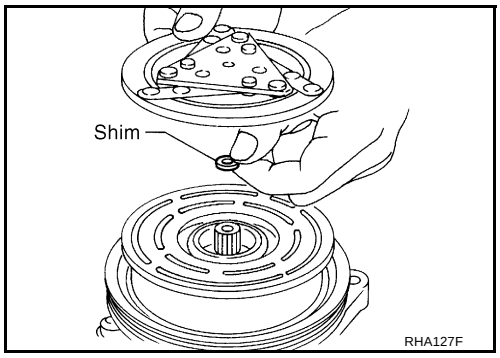
1. Install field coil.
   Be sure to align the coil's pin with the hole in the compressor's front head.
2. Install field coil harness clip using a screwdriver.



3. Install pulley assembly using installer (SST) and a hand press, and then install snap ring using snap ring pliers.



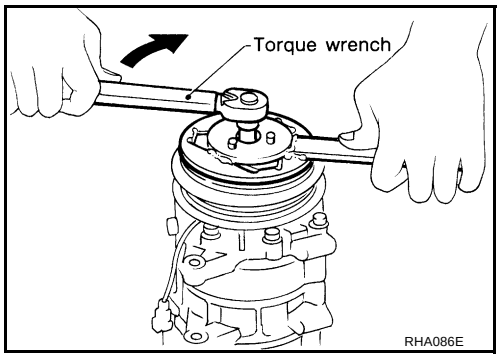
4. Install clutch disc on drive shaft, together with original shim(s). Press clutch disc down by hand.



5. Using holder to prevent clutch disc rotation.

   : 1.4 N·m (1.4 kg-m, 10 ft-lb)

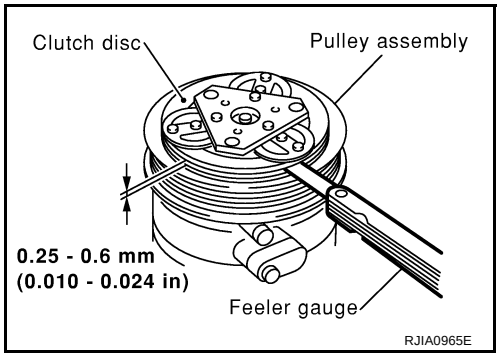
   After tightening the bolt, check that the pulley rotates smoothly.



6. Check clearance around the entire periphery of clutch disc.

   Disc to pulley clearance **: 0.25 - 0.60 mm (0.010 - 0.024 in)**

   If the specified clearance is not obtained, replace adjusting spacer and readjust.



Break-in Operation

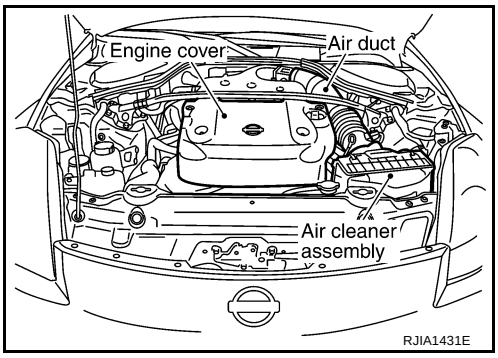
When replacing compressor clutch assembly, always carry out the break-in operation. This is done by engaging and disengaging the clutch about thirty-times. Break-in operation raises the level of transmitted torque.

Removal and Installation of Low-pressure Flexible Hose

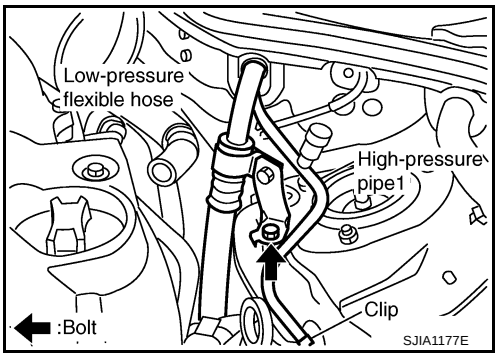
NJS0001Y

REMOVAL

1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
2. Remove cowl top cover. Refer to EI-20, "COWL TOP" .
3. Remove air cleaner assembly and air duct. Refer to EM-16, "AIR CLEANER AND AIR DUCT" .

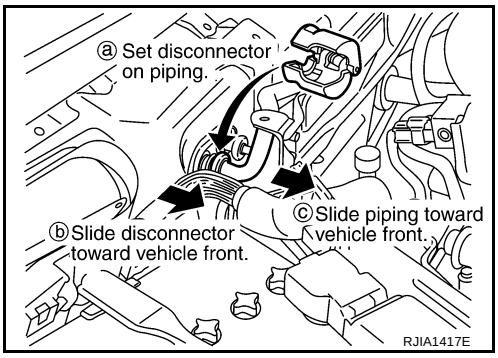


4. Remove mounting bolt from low-pressure flexible hose bracket.
5. Remove clip from high-pressure pipe 1.



6. Disconnect one-touch joint between low-pressure flexible hose and low-pressure pipe.

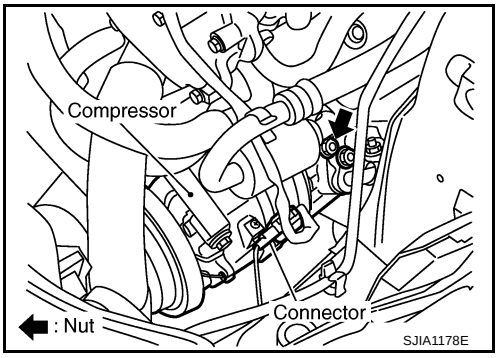
a. Set a disconnector (SST: 9253089916) on A/C piping.
b. Slide a disconnector toward vehicle front until it clicks.
c. Slide A/C piping toward vehicle front and disconnect it.



7. Remove mounting nut from low-pressure flexible hose. (Compressor side)

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

8. Remove low-pressure flexible hose.



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.**
- **Connection point for female-side piping is thin. So, when inserting male-side piping, take care not to deform female-side piping. Slowly insert in axial direction.**
- **Insert one-touch joint connection point securely until it clicks.**
- **After piping has been connected, pull male-side piping by hand to make sure piping does not come off.**
- **When recharging refrigerant, check for leaks.**

Low-pressure flexible hose bracket mounting bolt

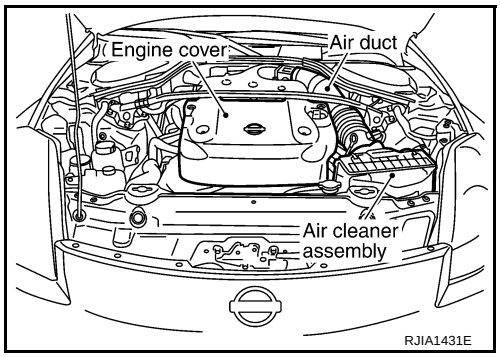
: 4.2 N·m (0.43 kg-m, 37 in-lb)

Removal and Installation of High-pressure Flexible Hose

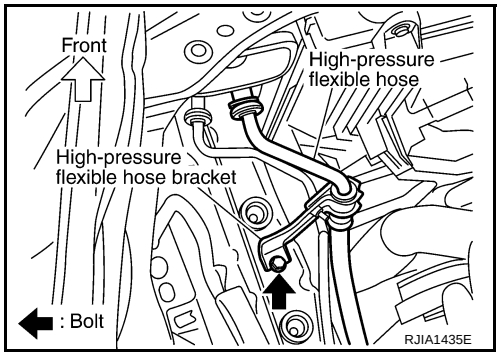
NJS0001Z

REMOVAL

1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
2. Remove air cleaner assembly and air duct. Refer to EM-16, "AIR CLEANER AND AIR DUCT" .



3. Remove mounting bolt from high-pressure flexible hose bracket.

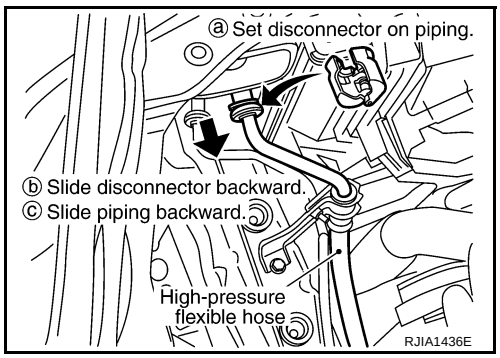


4. Disconnect one-touch joint between high-pressure flexible hose and condenser.

a. Set a disconnector (SST: 9253089912) on A/C piping.
b. Slide a disconnector backward until it clicks.
c. Slide A/C piping backward and disconnect it.

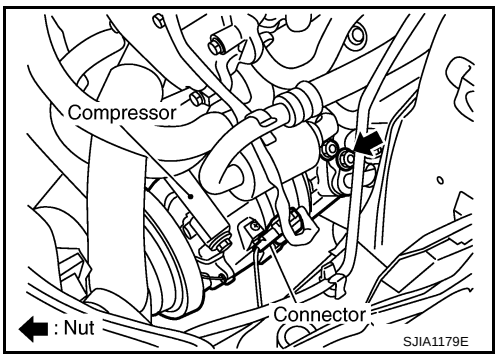
CAUTION:

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



5. Remove mounting nut from high-pressure flexible hose, 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 high-pressure flexible hose with new ones, and then apply compressor oil to it when installing it.**
- **Connection point for female-side piping is thin. So, when inserting male-side piping, take care not to deform female-side piping. Slowly insert in axial direction.**
- **Insert one-touch joint connection point securely until it clicks.**
- **After piping has been connected, pull male-side piping by hand to make sure piping does not come off.**
- **When recharging refrigerant, check for leaks.**

High-pressure flexible hose bracket mounting bolt

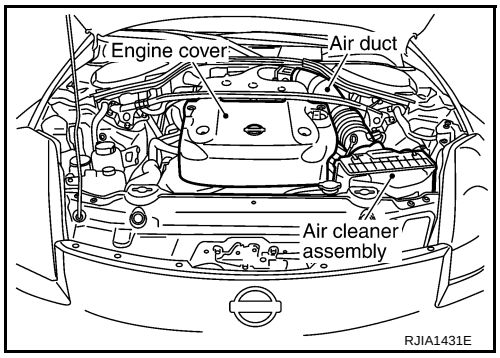
: 4.2 N·m (0.43 kg-m, 37 in-lb)

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

NJS00020

REMOVAL

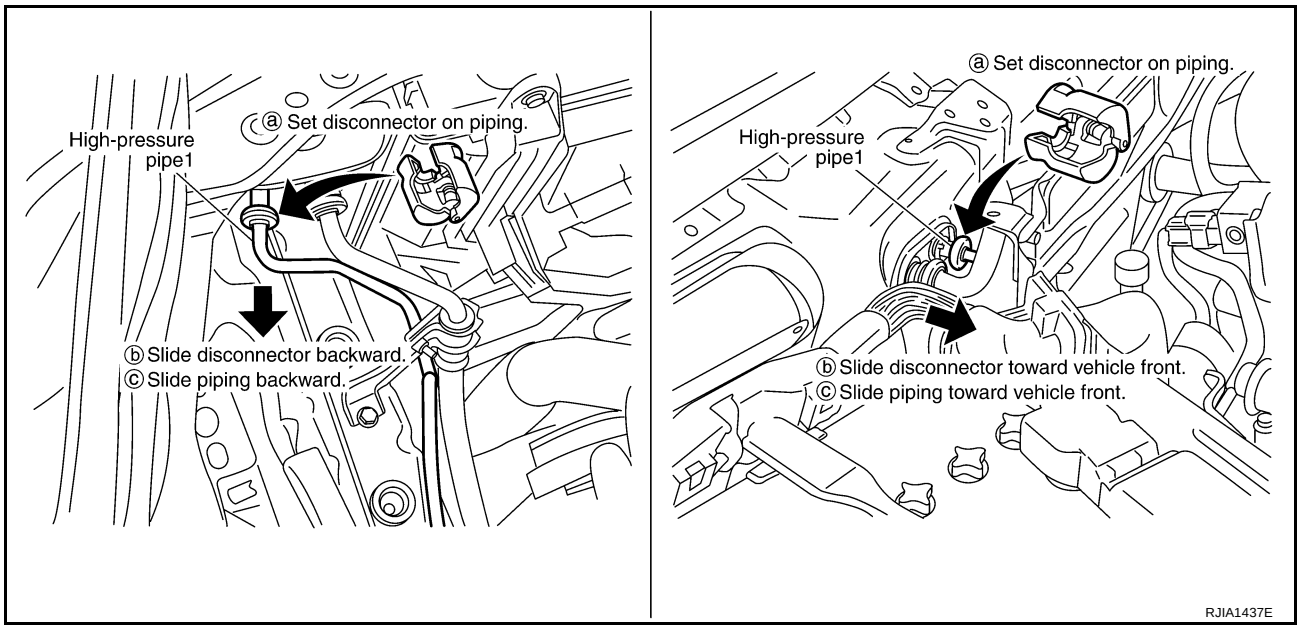
1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
2. Remove cowl top cover. Refer to EI-20, "COWL TOP" .
3. Remove air cleaner assembly and air duct. Refer to EM-16, "AIR CLEANER AND AIR DUCT" .
4. Remove tower bar. Refer to FSU-20, "TOWER BAR" .
5. Remove low-pressure flexible hose. Refer to ATC-133, "Removal and Installation of Low-pressure Flexible Hose" .
6. Remove high-pressure flexible hose bracket. Refer to ATC-134, "Removal and Installation of High-pressure Flexible Hose" .



7. Remove high-pressure flexible hose from vehicle clips.
8. Disconnect the one-touch joints of high-pressure pipe.

a. Set a disconnector (SST: 9253089908) on A/C piping.

b. Slide a disconnector toward vehicle front (or backward) until it clicks.



c. Slide A/C piping toward vehicle front (or backward) 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.

9. Remove high-pressure pipe 1.

INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

- **Replace O-rings of high-pressure pipe with new ones, and then apply compressor oil to it when installing it.**
- **Connection point for female-side piping is thin. So, when inserting male-side piping, take care not to deform female-side piping. Slowly insert in axial direction.**
- **Insert one-touch joint connection point securely until it clicks.**
- **After piping has been connected, pull male-side piping by hand to make sure piping does not come off.**
- **When recharging refrigerant, check for leaks.**

High-pressure flexible hose bracket mounting bolt

: 4.2 N·m (0.43 kg-m, 37 in-lb)

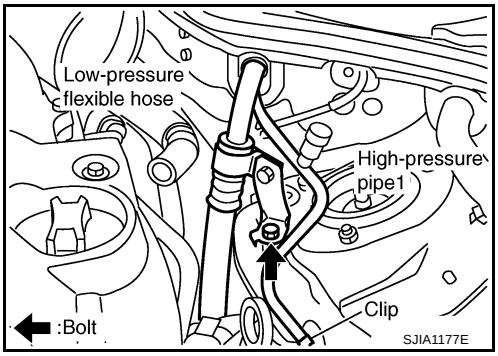
Removal and Installation of Low-pressure Pipe and High-pressure Pipe 2

NJS00021

REMOVAL

1. Set the temperature control dial at 18°C (60°F).
2. Open the driver and passenger window, and then disconnect the battery cable from the negative terminal.

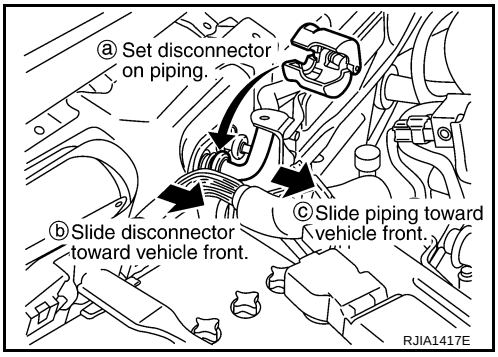
   CAUTION:
   After the battery cables are disconnected, never open/close the driver and/or front passenger door with the window in the full up position. The automatic window adjusting function will not work and the side roof panel may be damaged.
3. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
4. Remove cowl top cover. Refer to EI-20, "COWL TOP" .
5. Remove mounting bolt for low-pressure flexible hose bracket.
6. Remove high-pressure pipe 1 from vehicle clips.



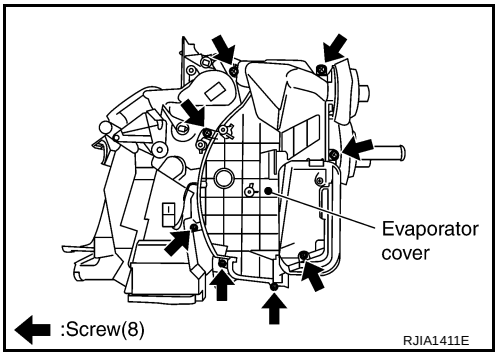
7. Disconnect one-touch joints.

a. Set a disconnector [high-pressure side (SST: 9253089908), low-pressure side (SST: 9253089916)] on A/C piping.
b. Slide a disconnector 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.

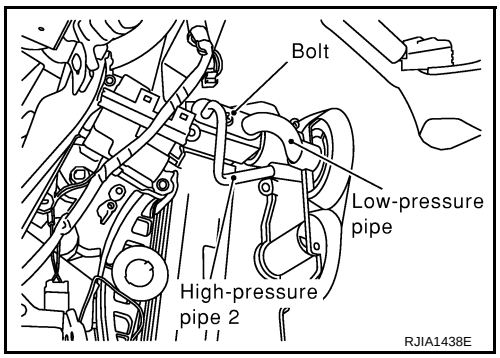


8. Remove instrument passenger panel lower. Refer to IP-11, "Removal and Installation" .
9. Remove blower unit. Refer to ATC-111, "BLOWER UNIT" .
10. Remove air mix door motor and mode door motor. Refer to ATC-120, "AIR MIX DOOR MOTOR" and ATC-119, "MODE DOOR MOTOR" .
11. Remove mounting screws, and then remove evaporator cover.



12. Remove mounting bolt, and then remove low-pressure pipe 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.**
- **Connection point for female-side piping is thin. So, when inserting male-side piping, take care not to deform female-side piping. Slowly insert in axial direction.**
- **Insert one-touch joint connection point securely until it clicks.**
- **After piping has been connected, pull male-side piping by hand to make sure piping does not come off.**
- **When recharging refrigerant, check for leaks.**

Low-pressure flexible hose bracket mounting bolt

: 4.2 N·m (0.43 kg-m, 37 in-lb)

Removal and Installation of Liquid Tank

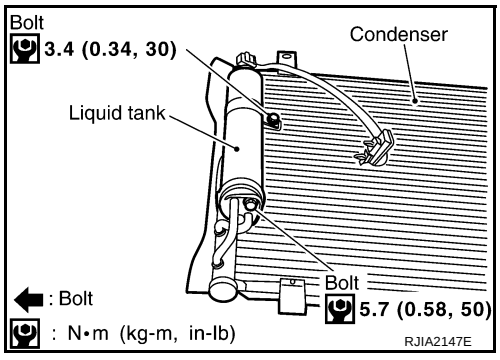
NJS00022

REMOVAL

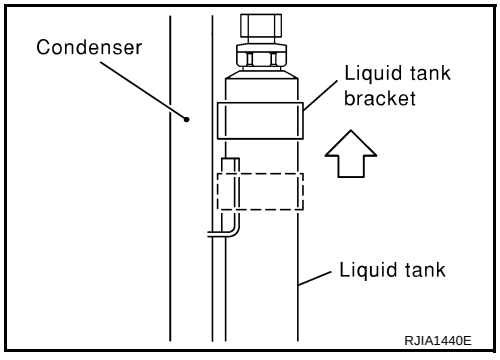
1. Remove condenser. Refer to ATC-139, "Removal and Installation of Condenser" .
2. Clean liquid tank and its surrounding area, and remove dirt and rust from liquid tank.

CAUTION:
Be sure to clean carefully.

3. Remove mounting bolts from liquid tank.



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

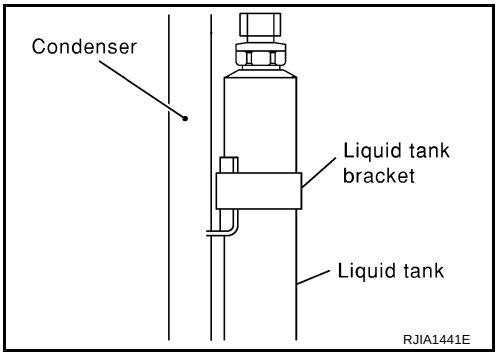


INSTALLATION

Installation is basically the reverse order of removal.

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.**

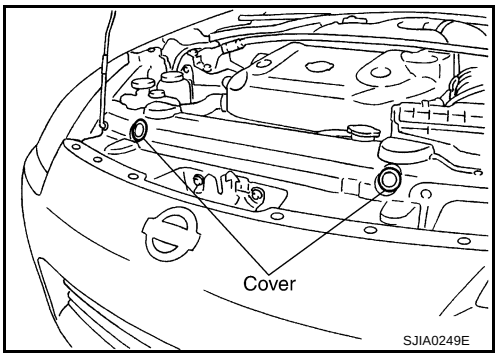


Removal and Installation of Condenser

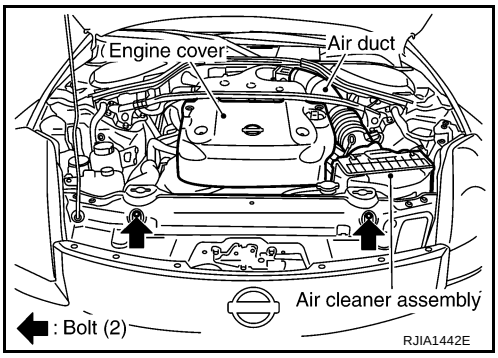
NJS00023

REMOVAL

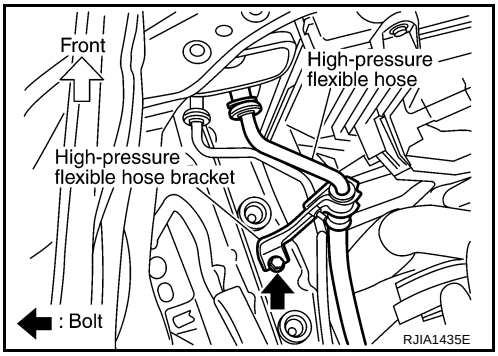
1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
2. Drain engine coolant. Refer to CO-10, "Changing Engine Coolant" .
3. Remove cover for condenser mounting bolt.



4. Remove engine cover, air cleaner assembly and air duct. Refer to EM-18, "INTAKE MANIFOLD COLLECTOR" and EM-16, "AIR CLEANER AND AIR DUCT" .
5. Remove radiator fan shroud after removing radiator upper hose.
6. Remove mounting bolt for condenser.



7. Remove mounting bolt from high-pressure flexible hose bracket.



8. Disconnect high-pressure flexible hose and high-pressure pipe 1 from condenser.

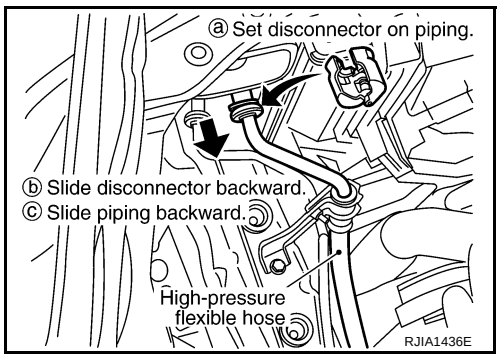
a. Set a disconnector [condenser outlet (SST: 9253089908), condenser inlet (SST: 9253089912)] on A/C piping.

b. Slide a disconnector backward until it clicks.

c. Slide A/C piping backward and disconnect it.

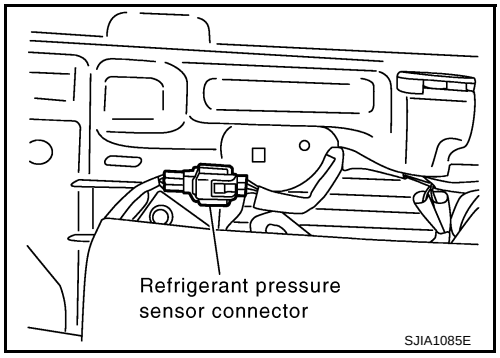
CAUTION:

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

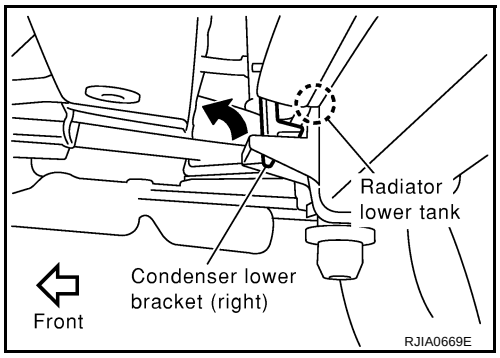


9. Remove radiator upper mount, move radiator and condenser to the engine side.

10. Disconnect refrigerant pressure sensor connector.



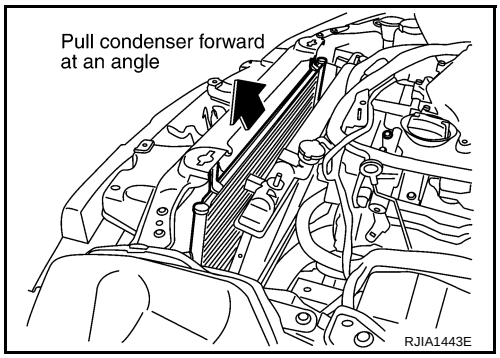
11. Lift condenser up slightly and tilt it toward front of vehicle. (This is because condenser lower bracket is on bottom of radiator tank.)



12. Pull condenser forward at an angle. Remove condenser from radiator.

CAUTION:

Be careful not to damage the core surface of the 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.**
- **Connection point for female-side piping is thin. So, when inserting male-side piping, take care not to deform female-side piping. Slowly insert in axial direction.**
- **Insert one-touch joint connection point securely until it clicks.**
- **After piping has been connected, pull male-side piping by hand to make sure piping does not come off.**

- **When recharging refrigerant, check for leaks.**

Condenser mounting bolt

: 6.1 N·m (0.62 kg-m, 54 in-lb)

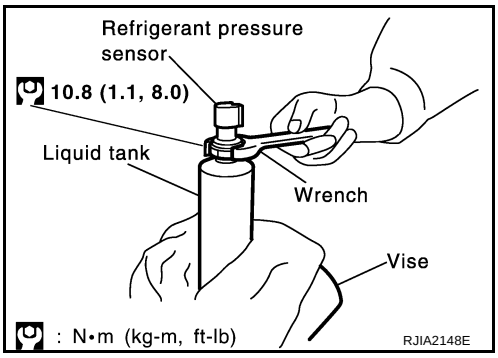
Removal and Installation of Refrigerant Pressure Sensor

NJS00024

REMOVAL

1. Remove liquid tank. Refer to ATC-138, "Removal and Installation of Liquid Tank" .
2. Using a vise, secure liquid tank, and then remove refrigerant pressure sensor.

CAUTION:
When working, be careful not to damage condenser.



INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

- **Apply compressor oil to the O-ring of the refrigerant pressure sensor when installing it.**
- **When recharging refrigerant, check for leaks.**

Removal and Installation of Evaporator

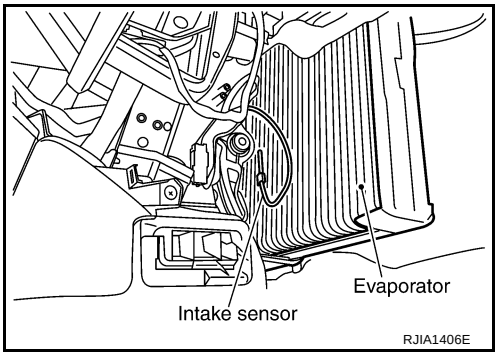
NJS00025

REMOVAL

1. Remove low-pressure pipe and high-pressure pipe 2. Refer to ATC-137, "Removal and Installation of Low-pressure Pipe 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.



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.**
- **Connection point for female-side piping is thin. So, when inserting male-side piping, take care not to deform female-side piping. Slowly insert in axial direction.**
- **Insert one-touch joint connection point securely until it clicks.**
- **After piping has been connected, pull male-side piping by hand to make sure piping does not come off.**
- **O-rings are different from low-pressure flexible hose (high-pressure pipe 1) and low-pressure pipe (high-pressure pipe 2).**

- **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.**

Low-pressure flexible hose bracket mounting bolt

: 4.2 N·m (0.43 kg-m, 37 in-lb)

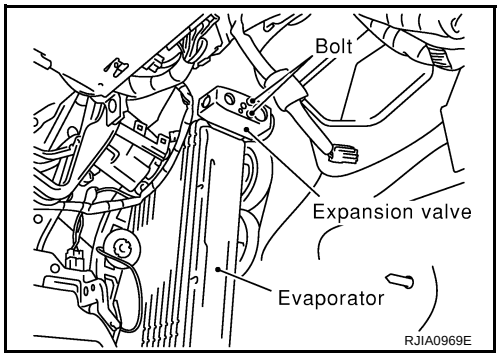
Removal and Installation of Expansion Valve

NJS00026

REMOVAL

1. Remove low-pressure pipe and high-pressure pipe 2. Refer to ATC-137, "Removal and Installation of Low-pressure Pipe 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. Remove moounting bolts, and then remove expansion valve.



INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

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

Checking for Refrigerant Leaks

NJS00027

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 electronic refrigerant leak detector or fluorescent dye leak detector (SST: J-42220).
If dye is observed, confirm the leak with an electronic refrigerant 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 electronic 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 electronic 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

NJS00028

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 electronic refrigerant 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

NJS00029

(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 (3.52kg/cm^2 , 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 fitting.
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 fitting.

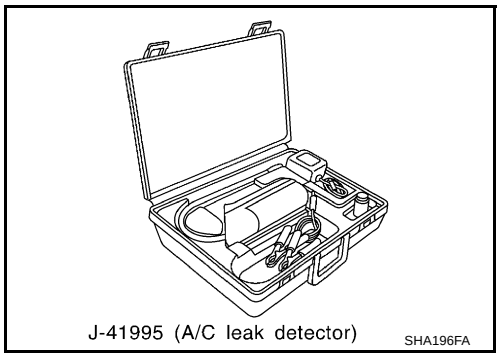
   CAUTION:
   Be careful the A/C system or replacing a component, pour the dye directly into the open system connection and proceed with the service procedures.
7. Operate the A/C system for a minimum of 20 minutes to mix the dye with the system oil. Depending on the leak size, operating conditions and 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.

Electronic Refrigerant Leak Detector

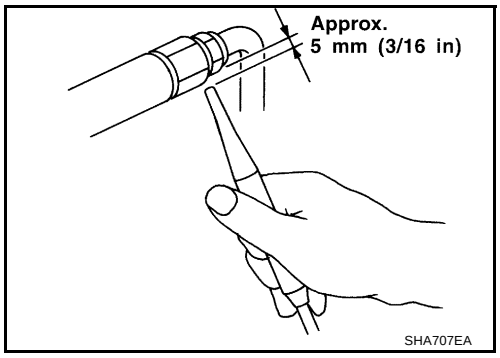
NJS0002A

PRECAUTIONS FOR HANDLING LEAK DETECTOR

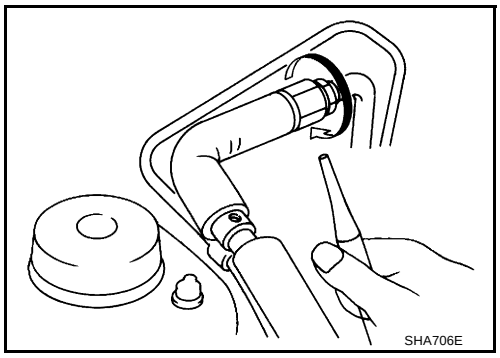
When performing a refrigerant leak check, use an A/C electrical leak detector (SST) or equivalent. Ensure that the instrument is calibrated and set properly per the operating instructions.
The leak detector is a delicate device. In order to use the leak detector properly, read the operating instructions and perform any specified maintenance.



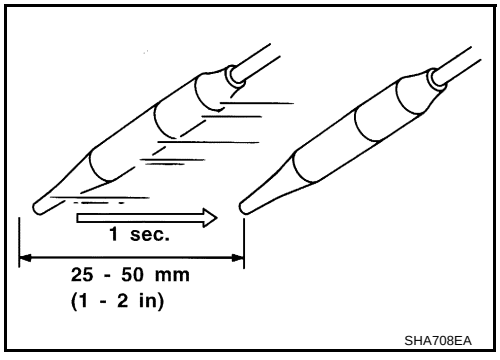
1. Position probe approximately 5 mm (3/16 in) away from point to be checked.



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



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



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

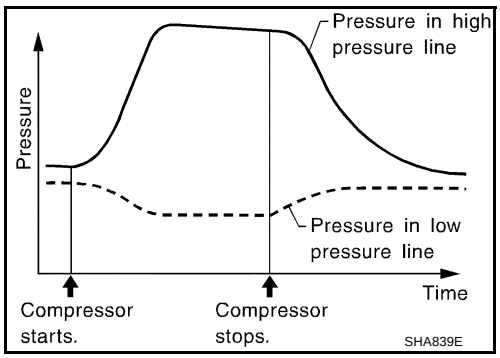
   NOTE:
   At temperatures below 16°C (61°F), leaks may not be detected since the system may not reach 345 kPa (3.52 kg/cm^2 , 50 psi).
4. Perform the leak test from the high-pressure side (compressor discharge a to evaporator inlet g) to the low-pressure side (evaporator drain hose h to shaft seal l). Refer to ATC-128, "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.
   Liquid tank
   Check the fitting of refrigerant pressure sensor.
   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 engine.
8. Set the heater A/C control as follows;

a. A/C switch: ON
b. MODE control dial: VENT (Ventilation)
c. Intake position: Recirculation
d. Temperature control dial: Max. cold
e. Fan speed: High

9. Run engine at 1,500 rpm for at least 2 minutes.
10. Stop 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 recovery/recycling recharging equipment to vehicle, check recovery/recycling recharging equipment gauges. No refrigerant pressure should be displayed. If pressure is displayed, recover refrigerant from equipment lines and then check refrigerant purity.
12. Confirm refrigerant purity in supply tank using recovery/recycling recharging equipment and refrigerant identifier.
13. Confirm refrigerant purity in vehicle A/C system using recovery/recycling recharging equipment and refrigerant identifier.
14. Discharge A/C system using approved refrigerant recovery/recycling recharging equipment. Repair the leaking fitting or component if necessary.
15. Evacuate and recharge A/C system and perform the leak test to confirm no refrigerant leaks.
16. Perform A/C performance test to ensure system works properly.

SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

Compressor

NJS0002B

Model		Calsonic Kansei make CWV-615M
Type		V-6 variable displacement
Displacement cm^3 (cu in)/rev	Max.	146 (8.91)
	Min.	13.5 (0.824)
Cylinder bore × stroke mm (in)		35.2 (1.386) × [2.3 - 25 (0.091 - 0.98)]
Direction of rotation		Clockwise (viewed from drive end)
Drive belt		Poly V

Lubricant

NJS0002C

Model		Calsonic Kansei make CWV-615M
Name		Nissan A/C System Oil Type S (DH-PS)
Part number		KLH00-PAGS0
Capacity m ℓ (US fl oz, Imp fl oz)	Total in system	180 (6.0, 6.3)
	Compressor (Service part) charging amount	180 (6.0, 6.3)

Refrigerant

NJS0002D

Type	HFC-134a (R-134a)
Capacity kg (lb)	0.55 (1.21)

Engine Idling Speed

NJS0002E

Refer to EC-76, "Idle Speed and Ignition Timing Check" .

Belt Tension

NJS0002F

Refer to EM-14, "DRIVE BELTS" .