SECTION ATC
AUTOMATIC AIR CONDITIONER

CONTENTS

PRECAUTIONS

PFP:00001

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

NJS0002G

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

NJS000CU

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

NJS0002H

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.**
  - **Never allow lubricant (Nissan A/C System Oil Type S) to come in contact with styrene foam 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

NJS0002I

WARNING:

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

Precautions for Refrigerant Connection

NJS0002K

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

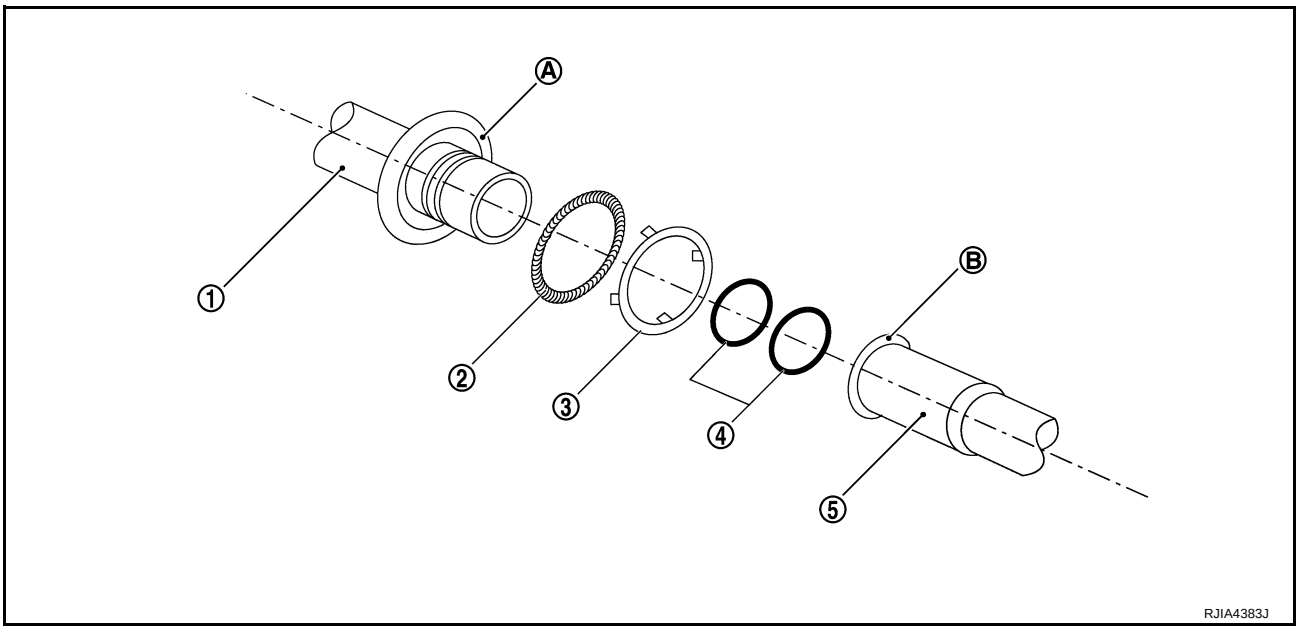
- Expansion valve to evaporator
- Refrigerant pressure sensor to condenser

ABOUT ONE-TOUCH JOINT

Description

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

COMPONENT PARTS



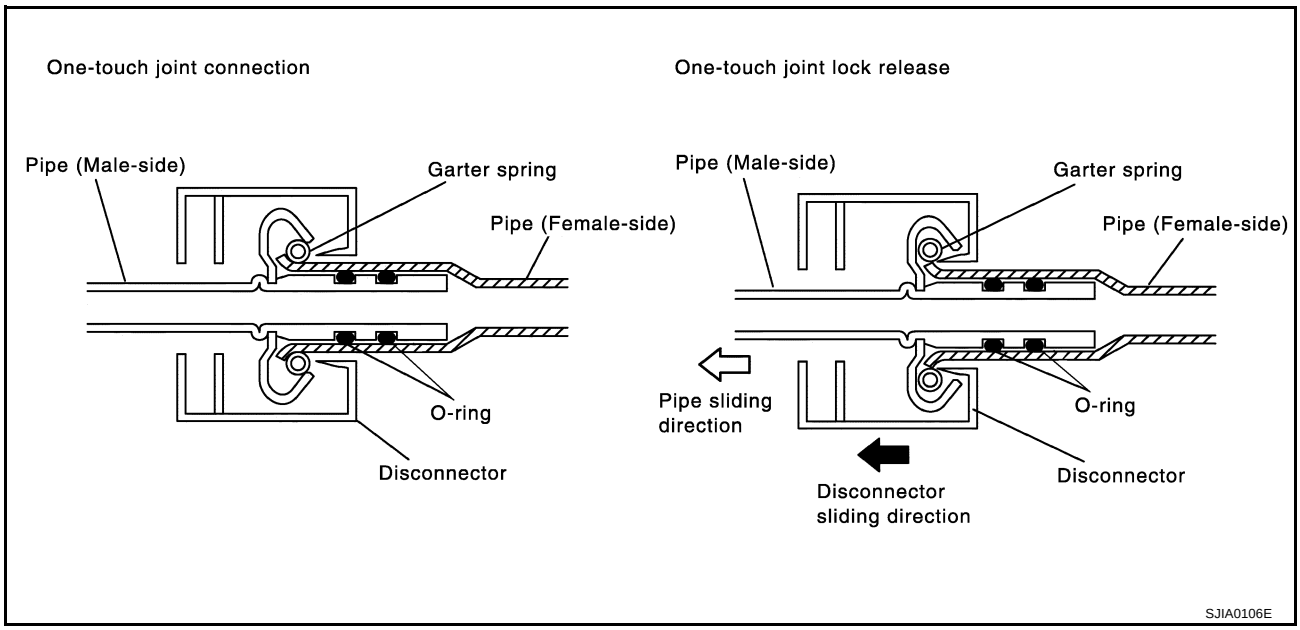
FUNCTIONS OF COMPONENT PARTS

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:

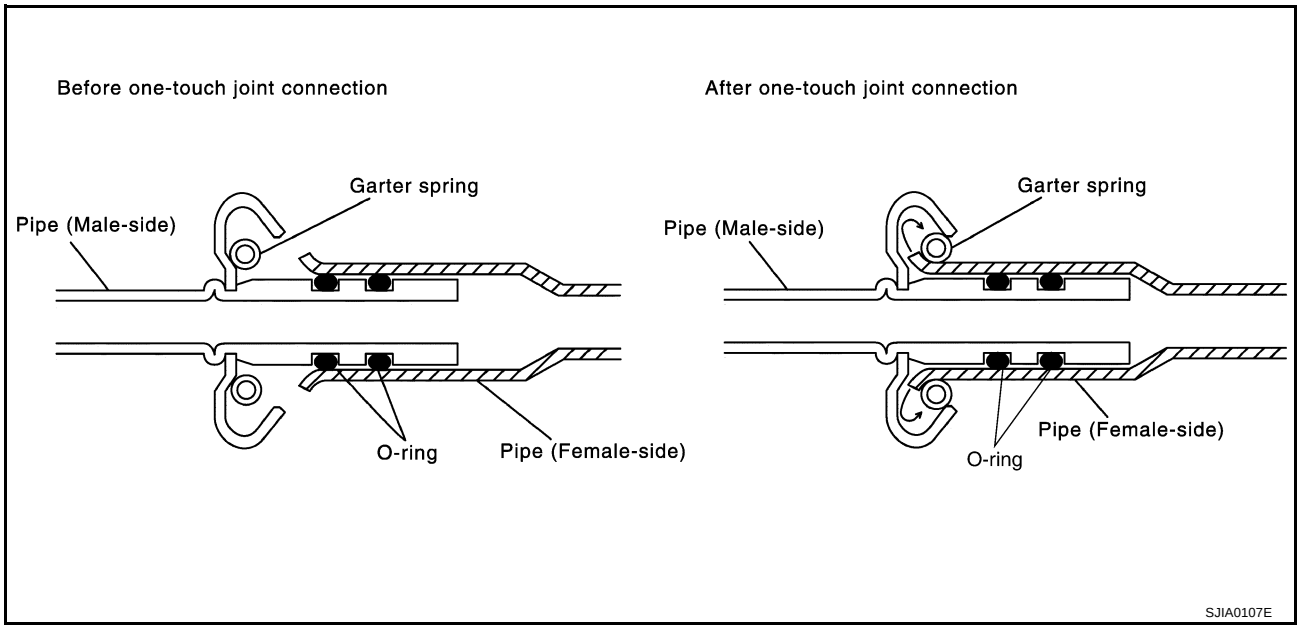
- Garter spring (2) cannot be removed from cage (A) of male-side piping.
- Indicator ring (3) remains near piping connection point, however, this is not a malfunction. (This is to check piping connection during factory assembly.)

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 is thin and easy to deform. Slowly insert the male-side piping straight in axial direction.**
   - **Insert piping securely until a click is heard.**

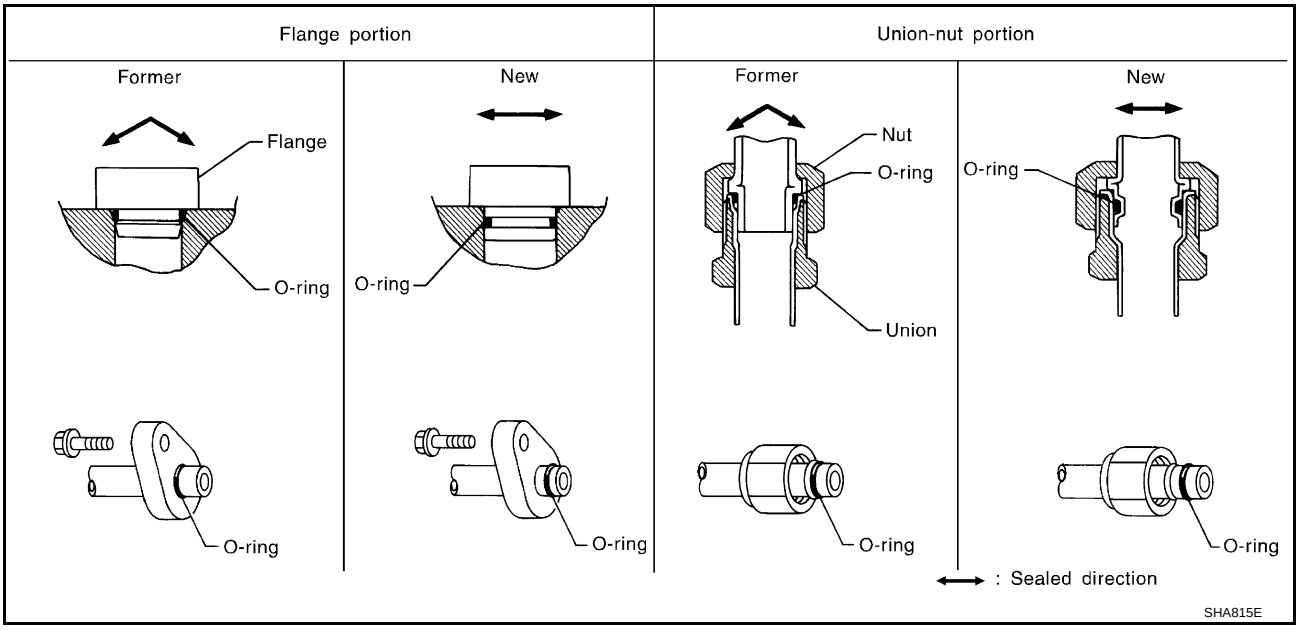
- **After piping connection is completed, pull male-side piping by hand to make sure that connection does not come loose.**

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

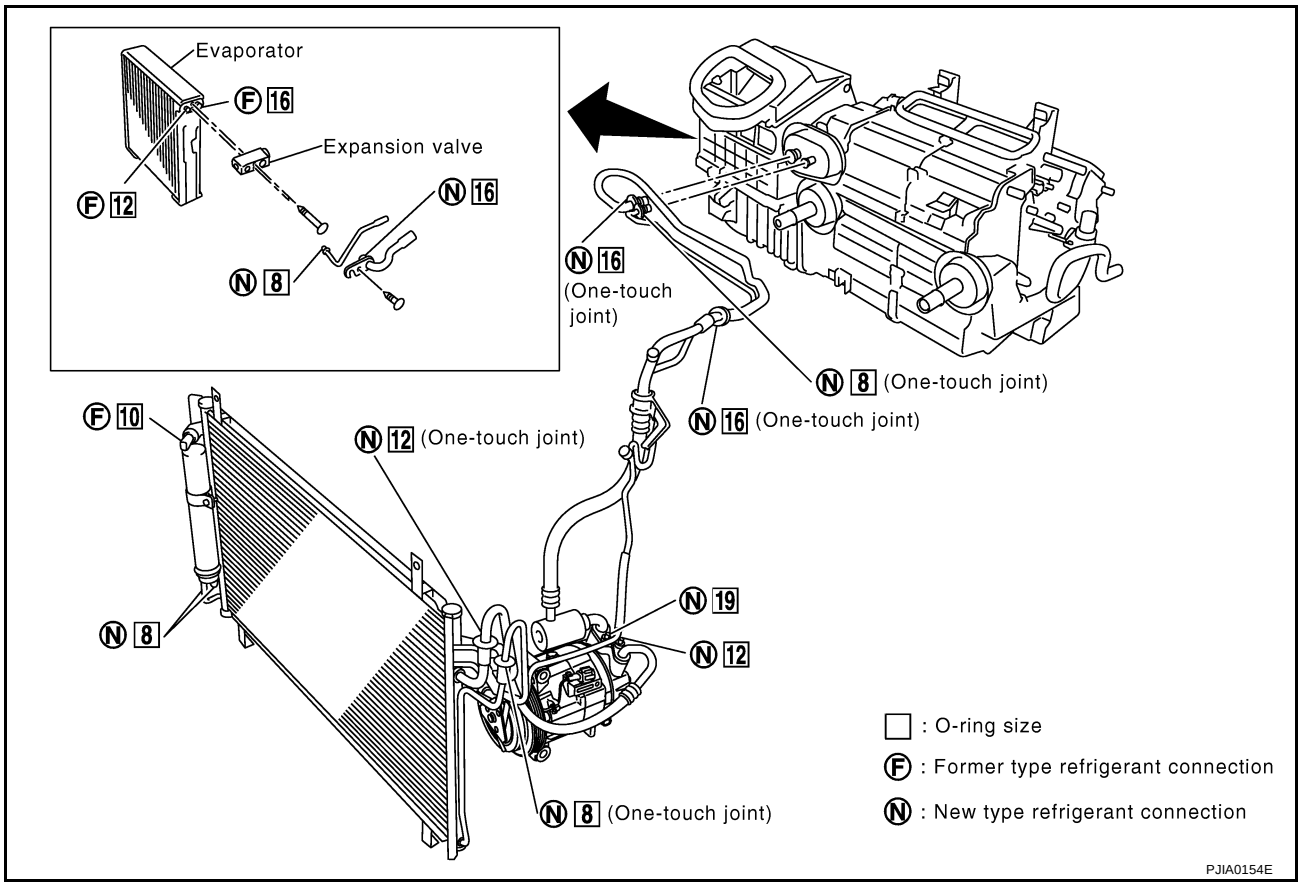
- Low-pressure flexible hose to low-pressure pipe 1 (O-ring size: 16)
- Low-pressure pipe 1 to low-pressure pipe 2 (O-ring size: 16)
- High-pressure flexible hose to condenser (O-ring size: 12)
- High-pressure pipe 1 to High-pressure pipe 2 (O-ring size: 8)
- High-pressure pipe 1 to condenser (O-ring 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 possibility of the O-ring being caught in, or damaged by, the mating part. The sealing direction of the O-ring is now set vertically in relation to the contacting surface of the mating part to improve sealing characteristics.
- 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 may leak at the connection.

O-Ring Part Numbers and Specifications

Connection type	Piping connection point		Part number	QTY	O-ring size
New	Low-pressure flexible hose to low-pressure pipe 1 (One-touch joint)		92473 N8221	2	16
	Low-pressure pipe 1 to low-pressure pipe 2 (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 2 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 condenser		J2476 89956	1	10
	Expansion valve to evaporator	Inlet	92475 71L00	1	12
		Outlet	92475 72L00	1	16

WARNING:

Make sure all refrigerant is discharged into the recycling equipment and the pressure in the system is less than atmospheric pressure. Then gradually loosen the discharge side hose fitting and remove it.

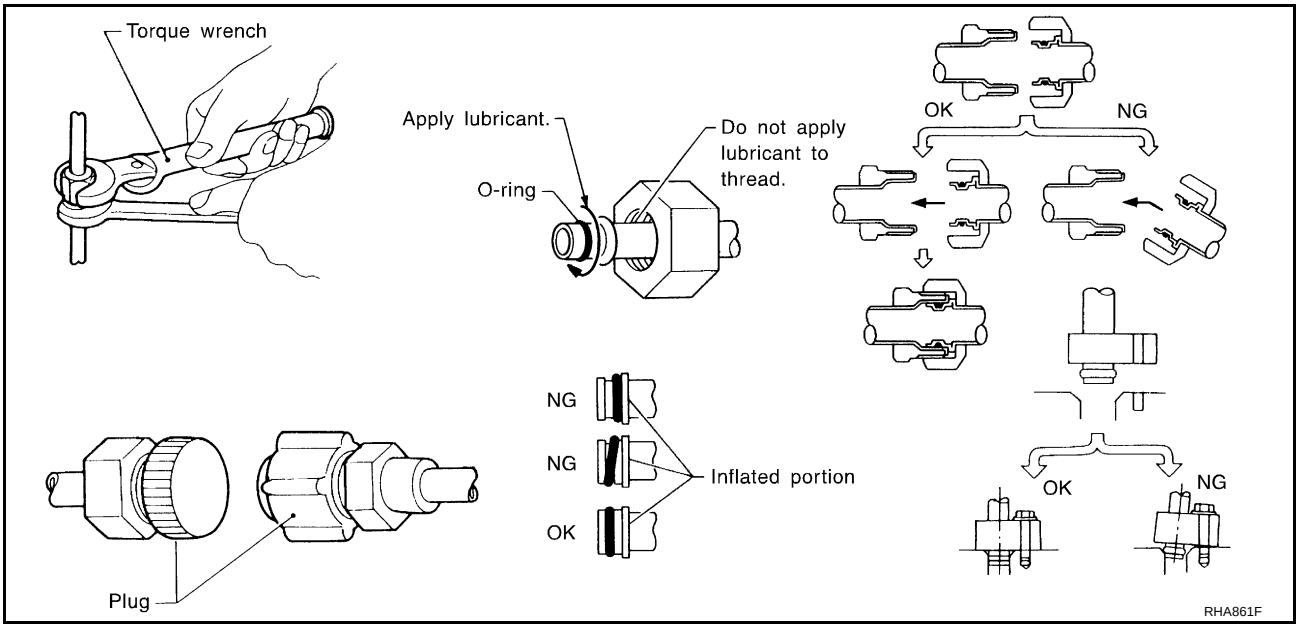
CAUTION:

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

- **When the compressor is removed, store it in the same way at 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 dust and moisture.**
- **When installing an air conditioner in the vehicle, connect the pipes at the final stage of the operation. Never remove the seal caps of pipes and other components until just before required for connection.**
- **Allow components stored in cool areas to warm to working area temperature before removing seal caps. This prevents condensation from forming inside A/C components.**
- **Thoroughly remove moisture from the refrigeration system before charging the refrigerant.**
- **Always replace used O-rings.**
- **When connecting tubes, apply lubricant to circle of the O-rings shown in illustration. Be careful not to apply lubricant to threaded portion.**

Name : Nissan A/C System Oil Type S

- **O-ring must be closely attached to the groove of tube.**
- **When replacing the O-ring, be careful not to damage O-ring and tube.**
- **Connect tube until a click can be heard, then tighten the nut or bolt by hand. 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

NJS0002L

- **Plug all openings to prevent moisture and foreign matter from entering.**
- **When the compressor is removed, store it in the same way at it is when mounted on the car.**
- **When replacing or repairing compressor, follow “Maintenance of Lubricant Quantity in Compressor” exactly. Refer to ATC-25, "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

NJS0002M

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.

ELECTRICAL LEAK DETECTOR

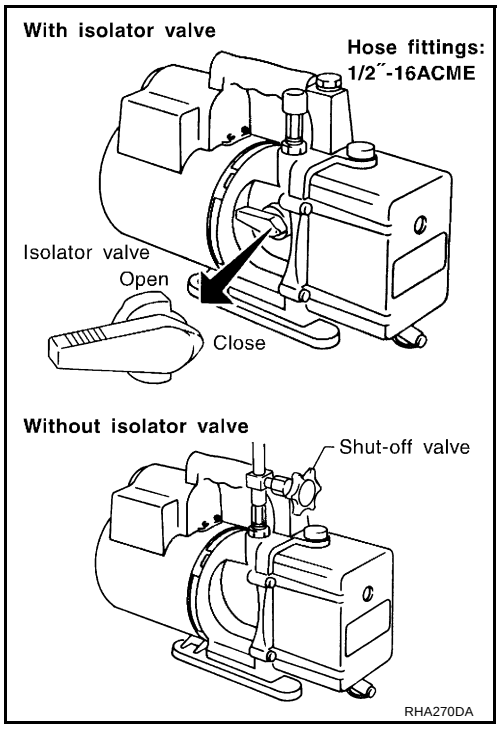
Be certain to follow the manufacturer's instructions for tester operation and tester maintenance.

VACUUM PUMP

The lubricant contained inside the vacuum pump is not compatible with the specified lubricant for HFC-134a (R-134a) A/C systems. The vent side of the vacuum pump is exposed to atmospheric pressure. So the vacuum pump lubricant may migrate out of the pump into the service hose. This is possible when the pump is switched off after evacuation (vacuuming) and hose is connected to it.
To prevent this migration, use a manual valve placed near the hose-to-pump connection, as follows.

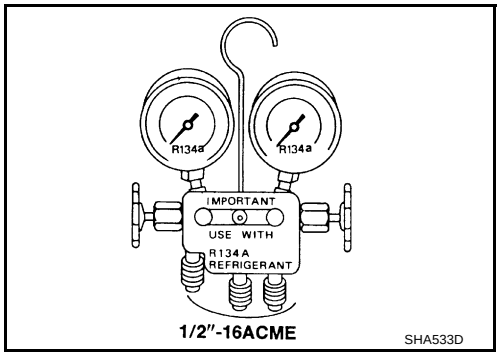
- Usually vacuum pumps have a manual isolator valve as part of the pump. Close this valve to isolate the service hose from the pump.
- For pumps without an isolator, use a hose equipped with a manual shut-off valve near the pump end. Close the valve to isolate the hose from the pump.
- If the hose has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

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



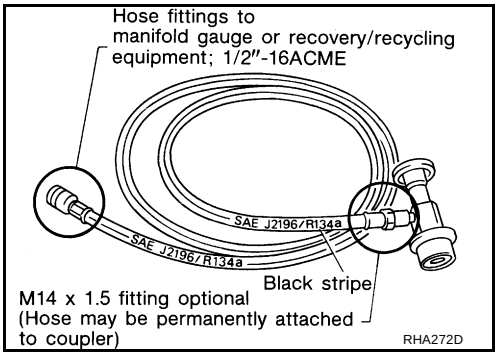
MANIFOLD GAUGE SET

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



SERVICE HOSES

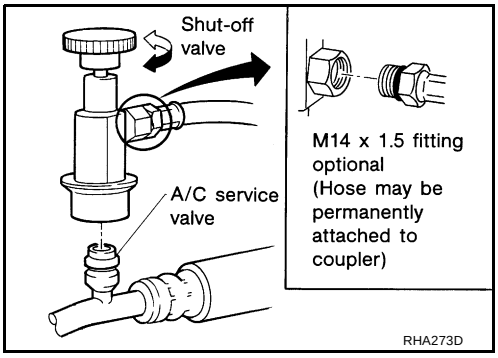
Be certain that the service hoses display the markings described (colored hose with black stripe). All hoses must include positive shut-off devices (either manual or automatic) near the end of the hoses opposite to the manifold gauge.



SERVICE COUPLERS

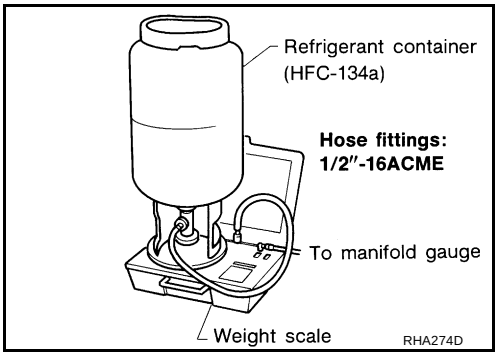
Never attempt to connect HFC-134a (R-134a) service couplers to a CFC-12 (R-12) A/C system. The HFC-134a (R-134a) couplers will not properly connect to the CFC-12 (R-12) system. However, if an improper connection is attempted, discharging and contamination may occur.

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 electrical scale or of quality recycle/recharge equipment.

Precautions for Leak Detection Dye

NJS0002N

- The A/C system contains a fluorescent leak detection dye used for locating refrigerant leaks. An ultraviolet (UV) lamp is required to illuminate the dye when inspecting for leaks.
- Always wear fluorescence enhancing UV safety goggles to protect your eyes and enhance the visibility of the fluorescent dye.
- The fluorescent dye leak detector is not a replacement for an electrical leak detector (SST: J-41995). The fluorescent dye leak detector should be used in conjunction with an electrical leak detector (SST: J-41995) to pin-point refrigerant leaks.
- For the purpose of safety and customer's satisfaction, read and follow all manufacture's operating instructions and precautions prior to performing the work.
- A compressor shaft seal should not necessarily be repaired because of dye seepage. The compressor shaft seal should only be repaired after confirming the leak with an electrical leak detector (SST: J-41995).
- Always remove any remaining dye from the leak area after repairs are completed to avoid a misdiagnosis during a future service.

- Never allow dye to come into contact with painted body panels or interior components. If dye is spilled, clean immediately with the approved dye cleaner. Fluorescent dye left on a surface for an extended period of time cannot be removed.
- Never spray the fluorescent dye cleaning agent on hot surfaces (engine exhaust manifold, etc.).
- Never use more than one refrigerant dye bottle (1/4 ounce /7.4 cc) per A/C system.
- Leak detection dyes for HFC-134a (R-134a) and CFC-12 (R-12) A/C systems are different. Never use HFC-134a (R-134a) leak detection dye in CFC-12 (R-12) A/C system, or CFC-12 (R-12) leak detection dye in HFC-134a (R-134a) A/C system, or A/C system damage may result.
- The fluorescent properties of the dye will remain for three years or a little over unless a compressor malfunction occurs.

IDENTIFICATION

NOTE:
Vehicles with factory installed fluorescent dye have a green label.
Vehicles without factory installed fluorescent dye have a blue label.

IDENTIFICATION LABEL FOR VEHICLE

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

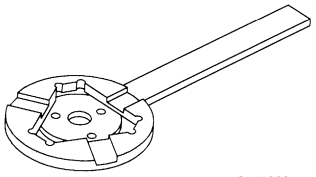
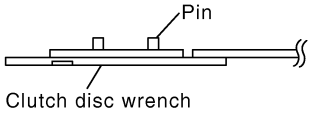
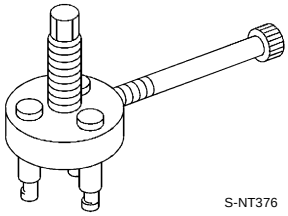
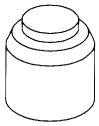
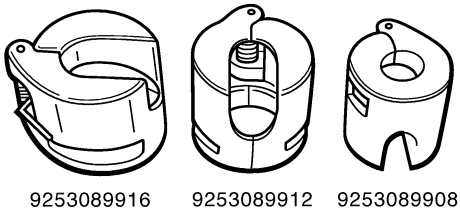
PREPARATION

PFP:00002

Special Service Tools

NJS0002P

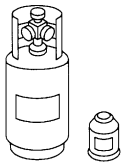
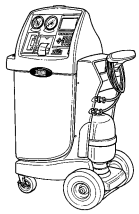
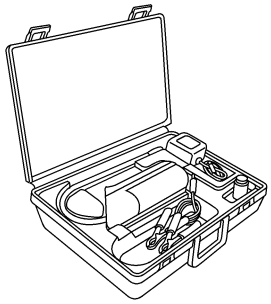
The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

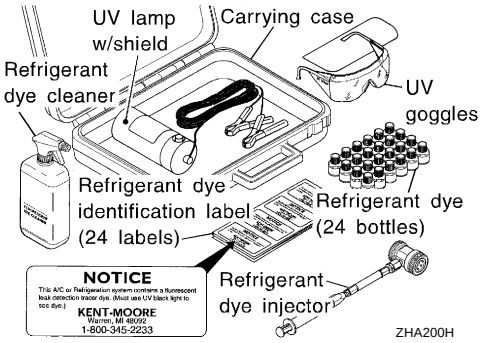
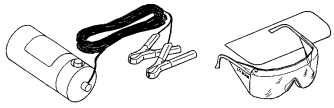
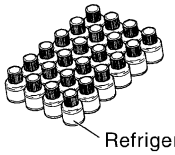
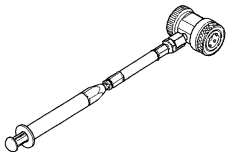
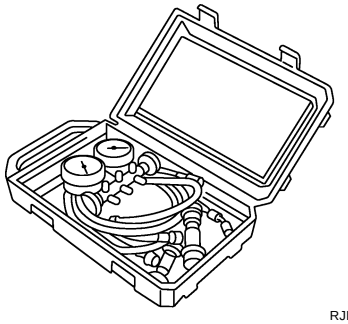
Tool number (Kent-Moore No.) Tool name		Description
KV99106100 (J-41260) Clutch disc wrench	 S-NT232  SJIA1168E	Removing shaft nut and clutch disc
KV99232340 (J-38874) Clutch disc puller	 S-NT376	Removing clutch disc
KV99106200 (J-41261) Pulley installer	 S-NT235	Installing pulley
9253089908 (for high-pressure 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

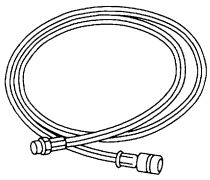
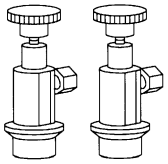
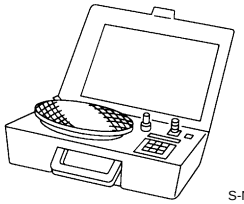
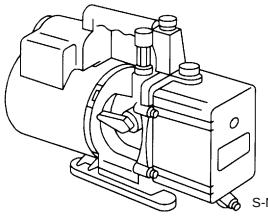
HFC-134a (R-134a) Service Tools and Equipment

NJS0002Q

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

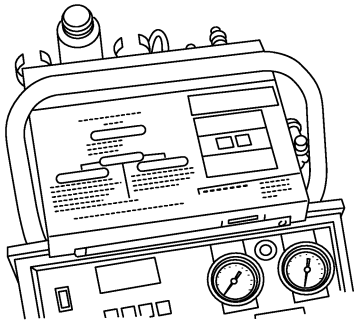
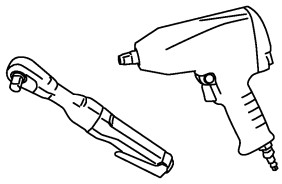
Tool number (Kent-Moore No.) Tool name		Description
HFC-134a (R-134a) refrigerant	 S-NT196	Container color: Light blue Container marking: HFC-134a (R-134a) Fitting size: Thread size ● Large container 1/2″ -16 ACME
Nissan A/C System Oil Type S (DH-PS)	 S-NT197	Type: Polyalkylene glycol oil (PAG), type S (DH-PS) Application: HFC-134a (R-134a) 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 A/C 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

NJS0002R

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

NJS0002S

REFRIGERANT FLOW

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

FREEZE PROTECTION

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

Refrigerant System Protection

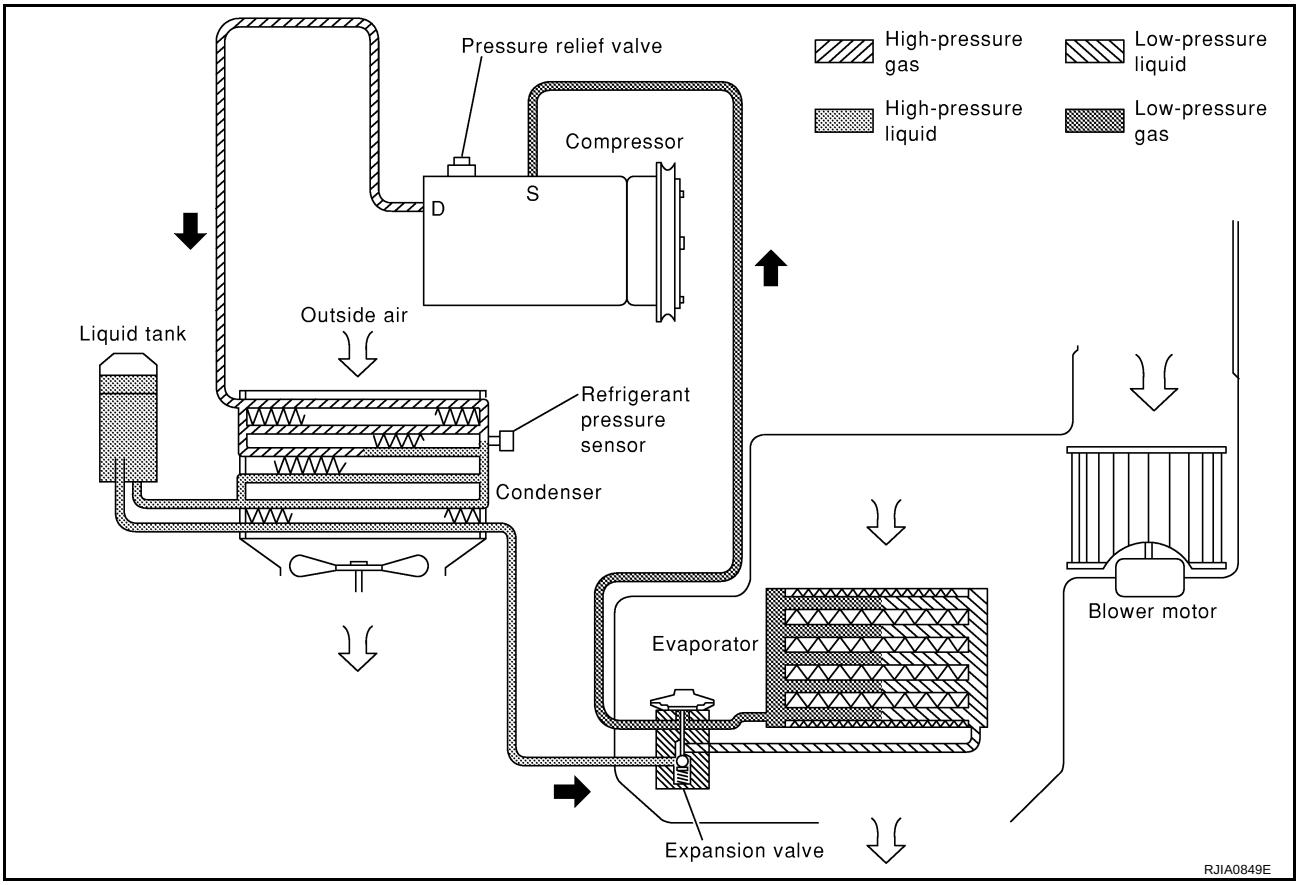
NJS0002T

REFRIGERANT PRESSURE SENSOR

The refrigerant system is protected against excessively high- or low-pressures by the refrigerant pressure sensor, located on the condenser. If the system pressure rises above, or falls below the specifications, the refrigerant pressure sensor detects the pressure inside the refrigerant line and sends the voltage signal to the ECM. ECM makes the A/C relay go OFF and stops the compressor when pressure on the high-pressure side detected by refrigerant pressure sensor is over about 3,119 kPa (31.8 kg/cm^2 , 452 psi), or below about 118 kPa (1.2 kg/cm^2 , 17 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

NJS0002U

GENERAL INFORMATION

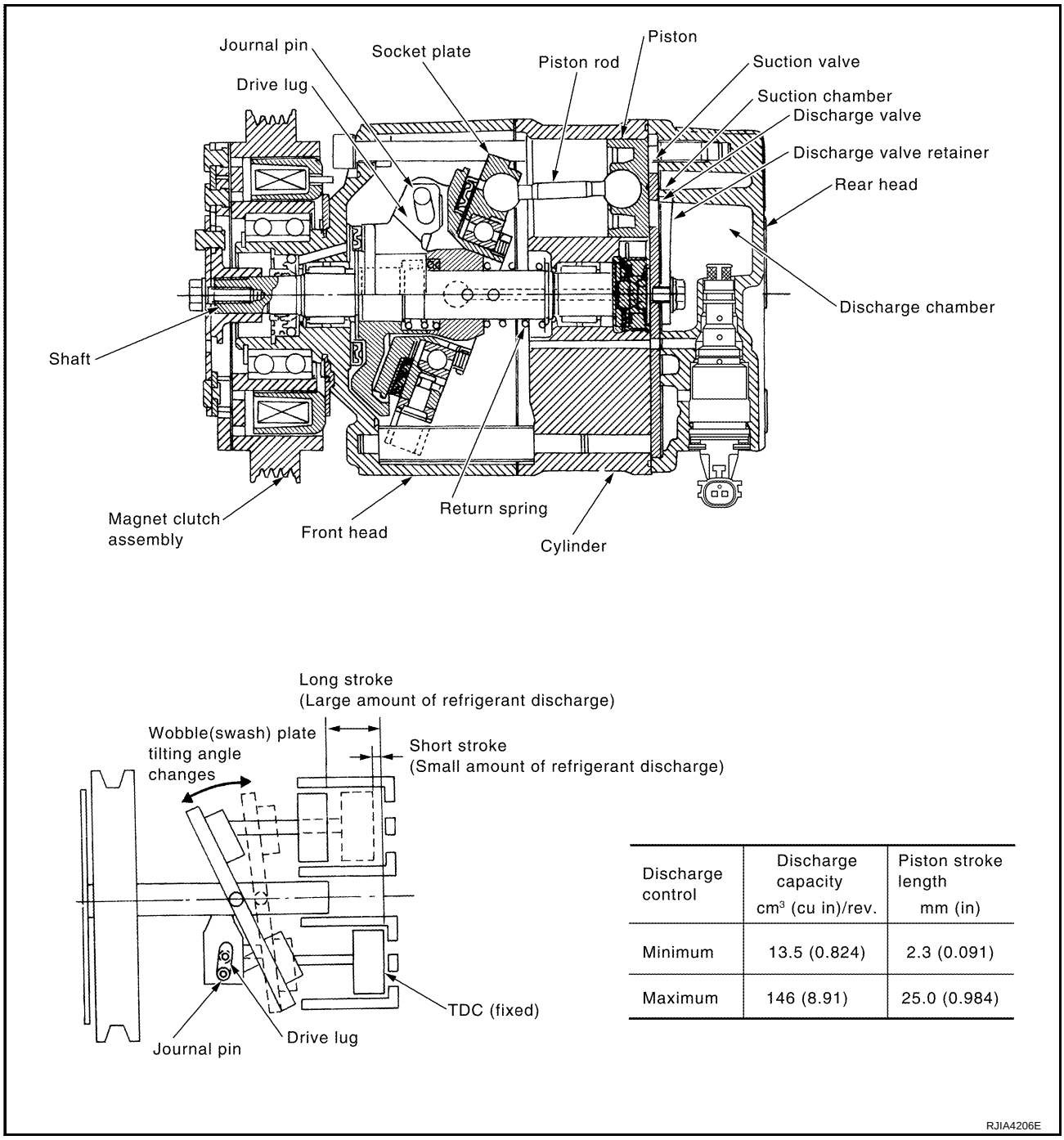
1. The V-6 variable compressor differs from previous units. The outlet air temperatures of the V-6 variable compressor do not drop too far below 5°C (41°F) when:
   Evaporator intake air temperature is less than 20°C (68°F).
   Engine is running at speeds less than 1,500 rpm.
   This is because the V-6 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.

DESCRIPTION

General

The variable compressor is 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 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 (0.984)

Operation

1. Control Valve

– By changing high-pressure valve lift amount, built-in electronic control valve executes the following:

• Controls high-pressure valve discharge amount.

• Changes crankcase pressure in compressor.

• Changes angle of wobble (swash) plate.

– Amount of high-pressure valve lift is determined by factors below.

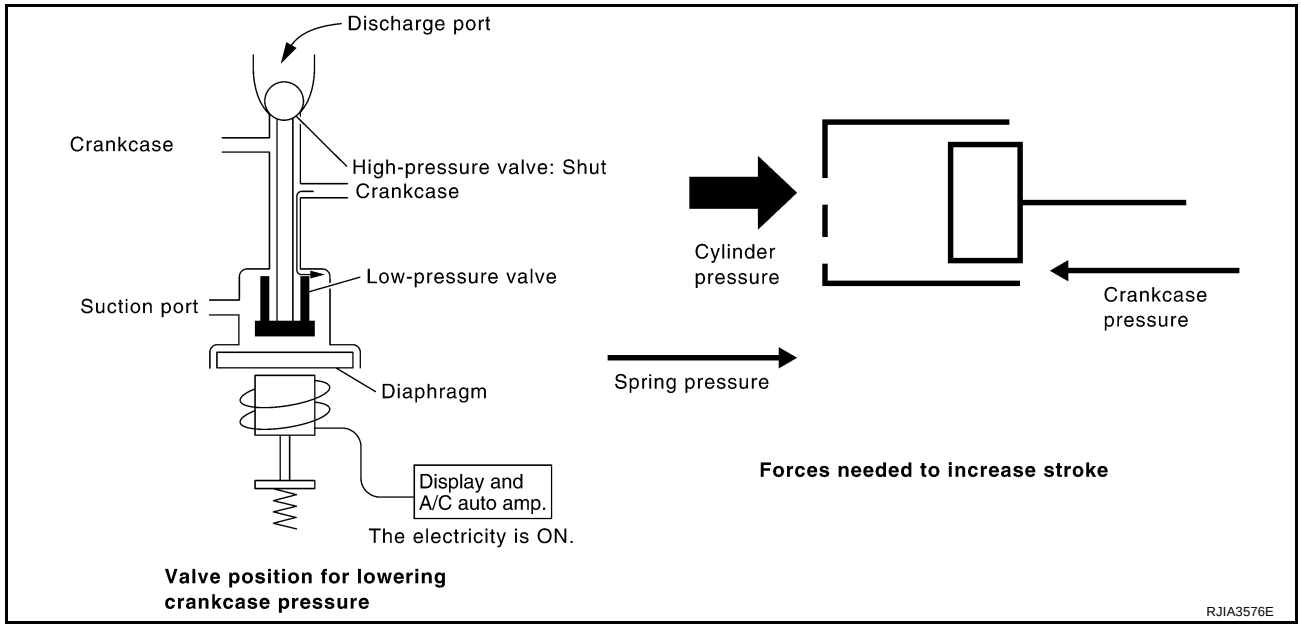
• Low-pressure applied to diaphragm

• Spring load of set spring

• Balance of magnetic force generated by magnet coil

– Electronic control valve (ECV) magnet coil receives electric signal (duty control) from display and A/C auto amp. Then, magnetic force generated by electric current is changed to control high-pressure valve lift amount.

2. Maximum Cooling
   High-pressure valve is closed by magnetic force generated by electric signal sent from display and A/C auto amp. At this time, cylinder moves full stroke due to pressure balance between inside crankcase (Pc) and suction line (Ps).
   Under this condition, the wobble (swash) plate is set to the maximum stroke position.

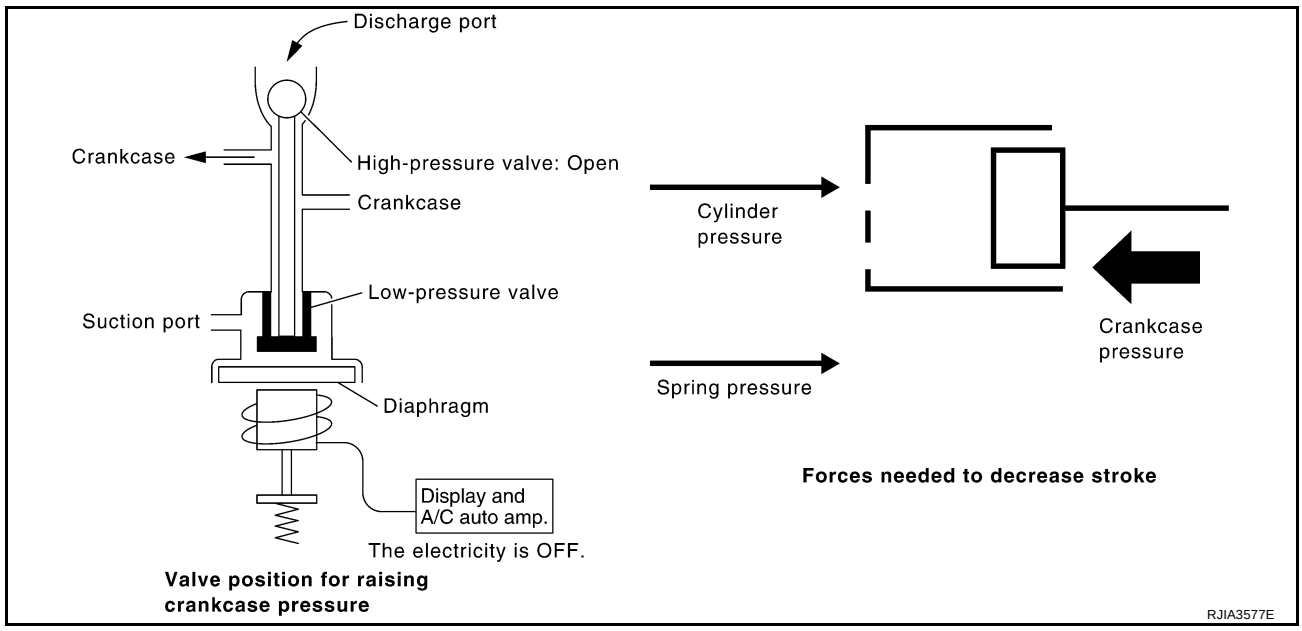


3. Capacity Control
   When no electric signal is sent from display and A/C auto amp. (current: OFF), high-pressure valve is opened by spring force.
   Since suction pressure is low, it makes the suction port close and the discharge port open. Thus, crankcase pressure becomes high as high-pressure enters the crankcase.

– The force acts around the journal pin near the wobble (swash) plate, and is generated by the pressure difference 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.

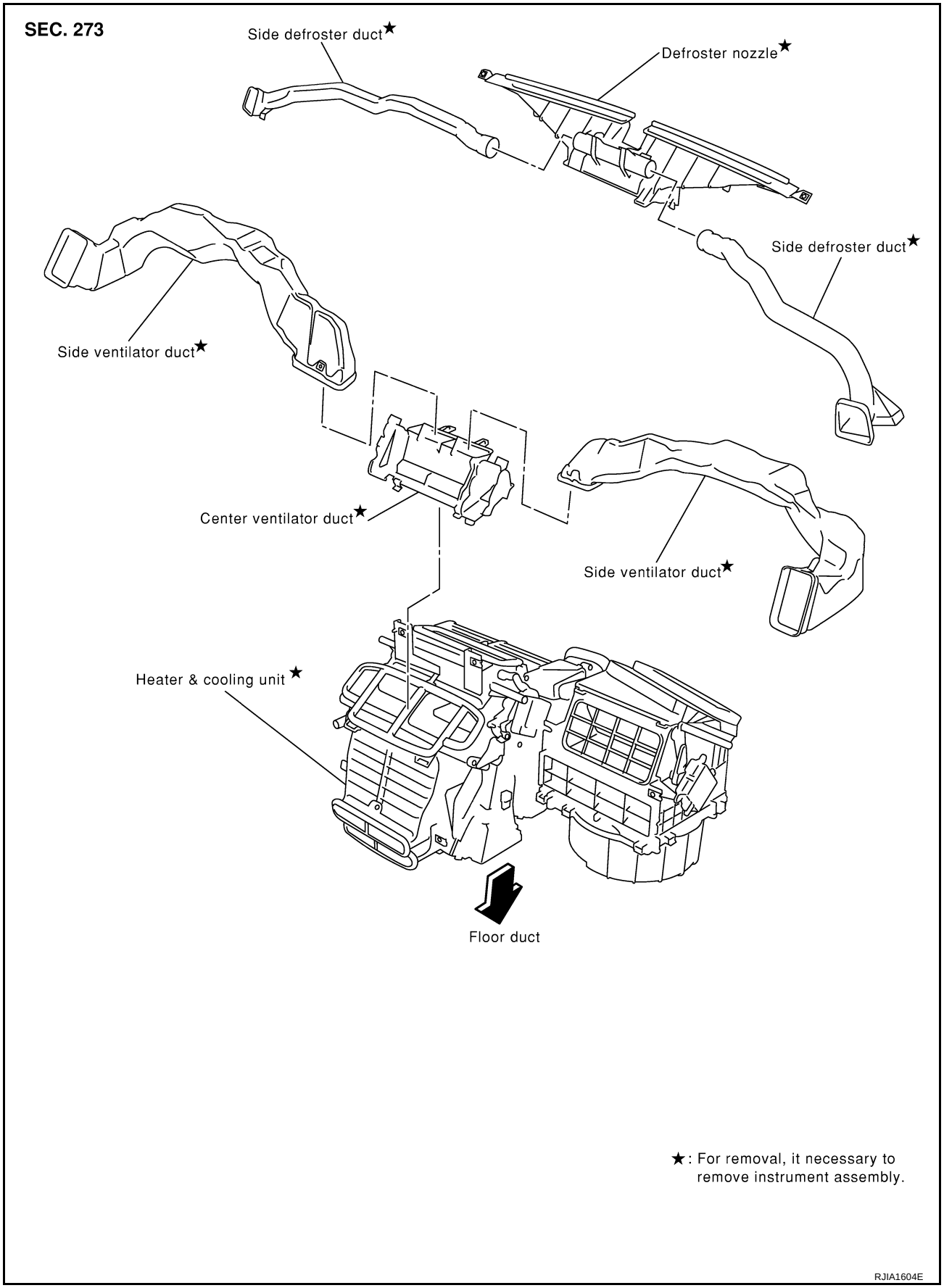


Valve position for raising crankcase pressure

Forces needed to decrease stroke

Component Layout

NJS0002V



LUBRICANT

PFP:KLG00

Maintenance of Lubricant Quantity in Compressor

NJS0002W

The lubricant in the compressor circulates through the system with the refrigerant. Add lubricant to compressor when replacing any component or after a large refrigerant leakage occurred. It is important to maintain the specified amount.
If lubricant quantity is not maintained properly, the following malfunctions may result:

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

LUBRICANT

Name : Nissan A/C System Oil Type S

LUBRICANT RETURN OPERATION

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

1. CHECK LUBRICANT RETURN OPERATION

Can lubricant return operation be performed?

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

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

OK or NG

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

2. PERFORM LUBRICANT RETURN OPERATION, PROCEEDING AS FOLLOWS

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

>> GO TO 3.

3. CHECK REPLACEMENT PART

Should the compressor be replaced?

YES >> GO TO ATC-27, "LUBRICANT ADJUSTING PROCEDURE FOR COMPRESSOR REPLACEMENT" .
NO >> GO TO ATC-26, "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:

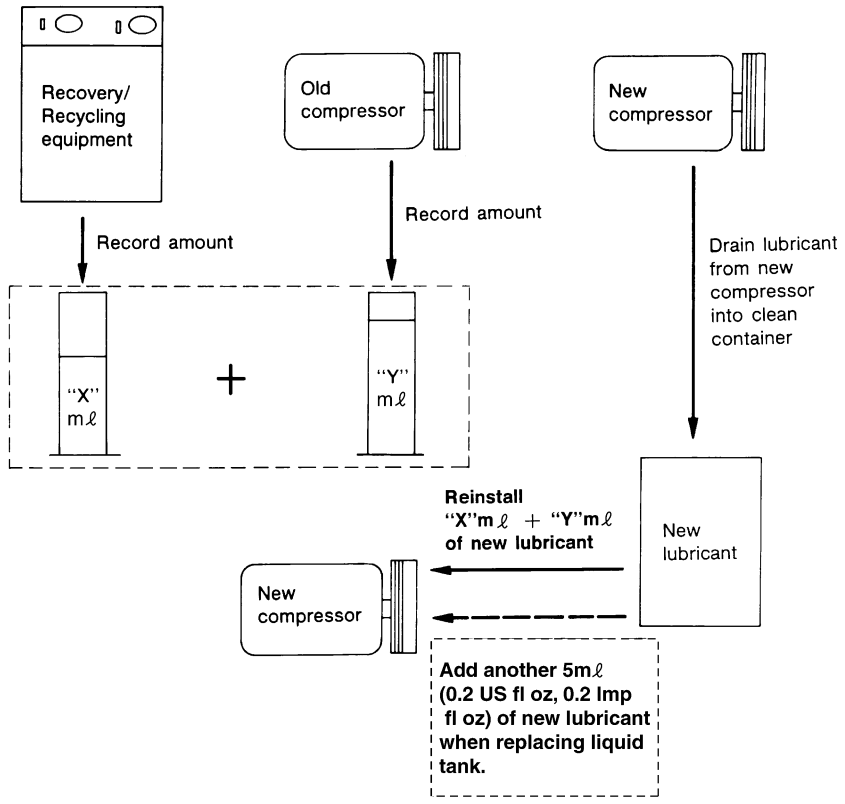
Part replaced	Lubricant to be added to system	Remarks
	Amount of lubricant m ℓ (US fl oz., Imp fl oz.)	
Evaporator	75 (2.5, 2.6)	—
Condenser	35 (1.2, 1.2)	—
Liquid tank	10 (0.3, 0.4)	—
In case of refrigerant leak	30 (1.0, 1.1)	Large leak
	—	Small leak *1

*1: If the 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-6, "CONTAMINATED REFRIGERANT" .
3. Confirm refrigerant purity in vehicle A/C system using recovery/recycling recharging equipment and refrigerant identifier. If NG, refer to ATC-6, "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 mℓ (0.2 US fl oz., 0.2 Imp fl oz.) of lubricant at this time.
   Do not add this 5 mℓ (0.2 US fl oz., 0.2 Imp fl oz.) of lubricant when replaces the compressor only.

Lubricant adjusting procedure for compressor replacement



RJIA3578E

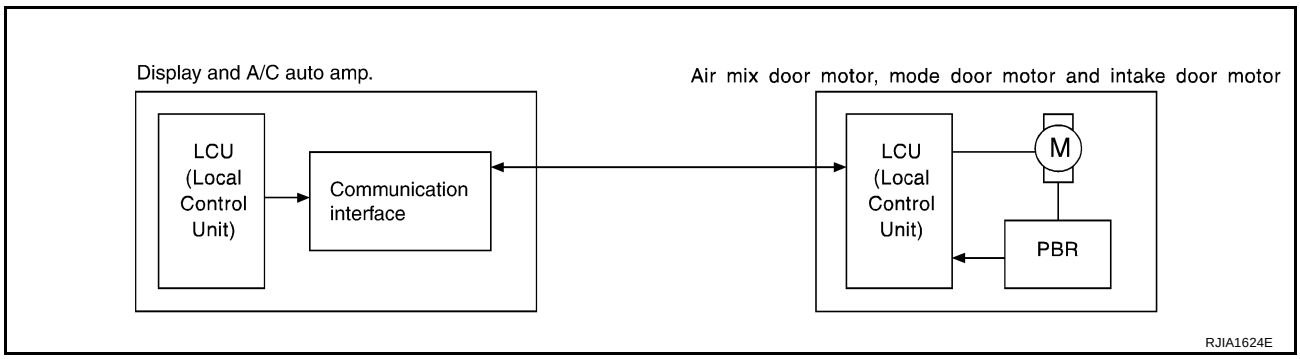
AIR CONDITIONER CONTROL

PFP:27500

Description of Air Conditioner LAN Control System

NJS0002X

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

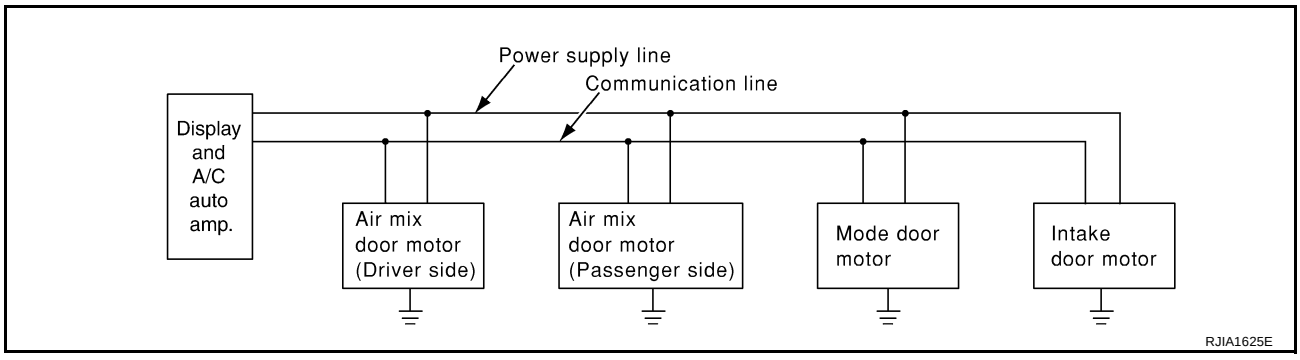


System Construction

NJS0002Y

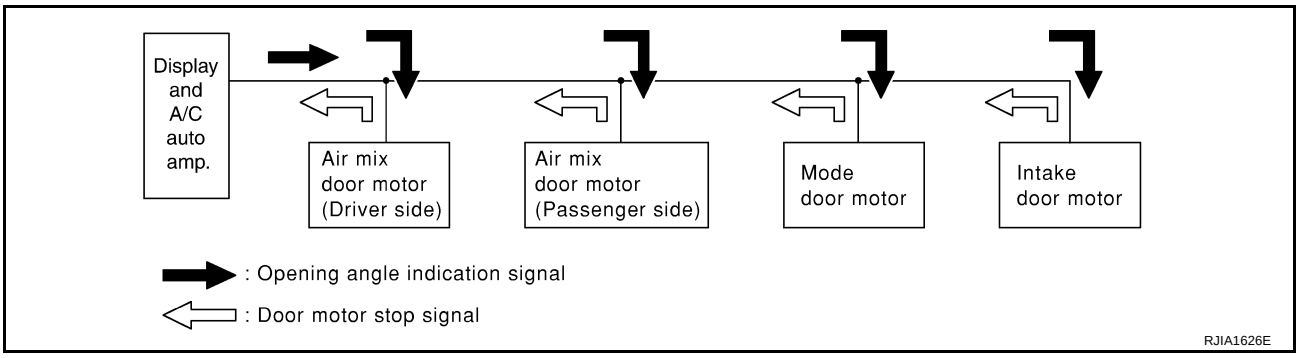
A small network is constructed between the display and A/C auto amp., air mix door motors, mode door motor and intake door motor. The display and A/C auto amp. and motors are connected by data transmission lines and motor power supply lines. The LAN network is built through the ground circuits of each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

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



OPERATION

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



TRANSMISSION DATA AND TRANSMISSION ORDER

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

Opening angle:

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

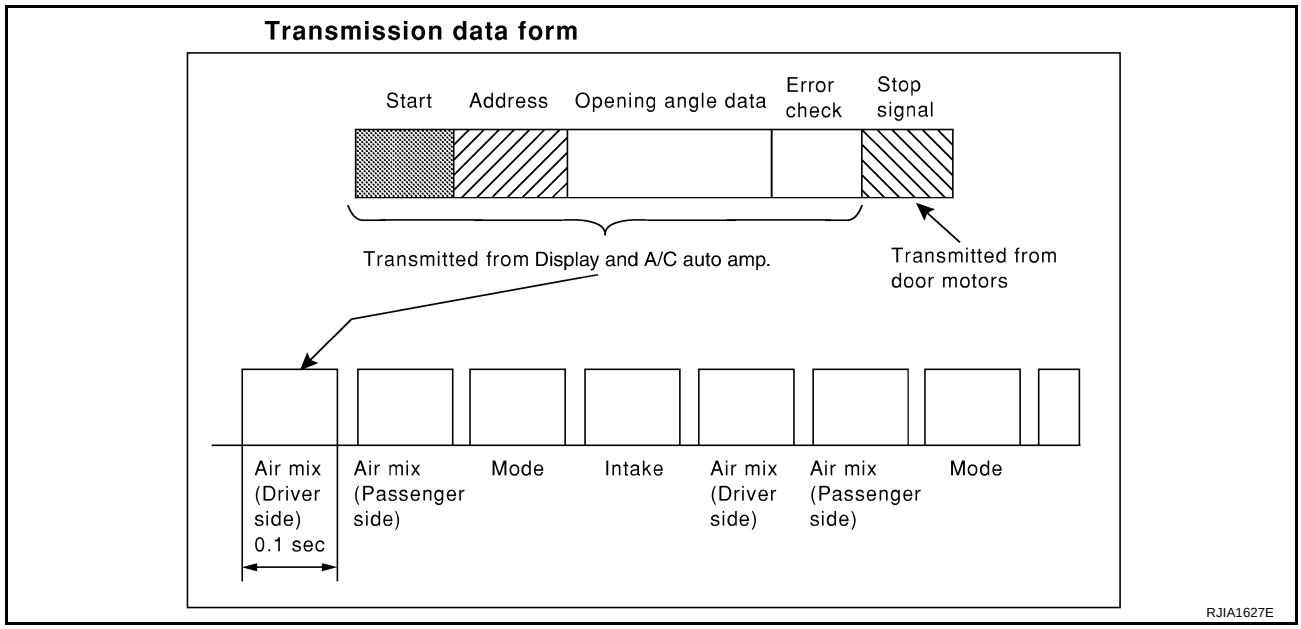
Error Check:

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

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

Stop signal:

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



AIR MIX DOOR CONTROL (AUTOMATIC TEMPERATURE CONTROL)

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

FAN SPEED CONTROL

Blower speed is automatically controlled by the temperature setting, ambient temperature, in-vehicle temperature, intake temperature, amount of sunload and air mix door position.
With pressing AUTO switch, the blower motor starts to gradually increase air flow volume.
When engine coolant temperature is low, the blower motor operation is delayed to prevent cool air from flowing.

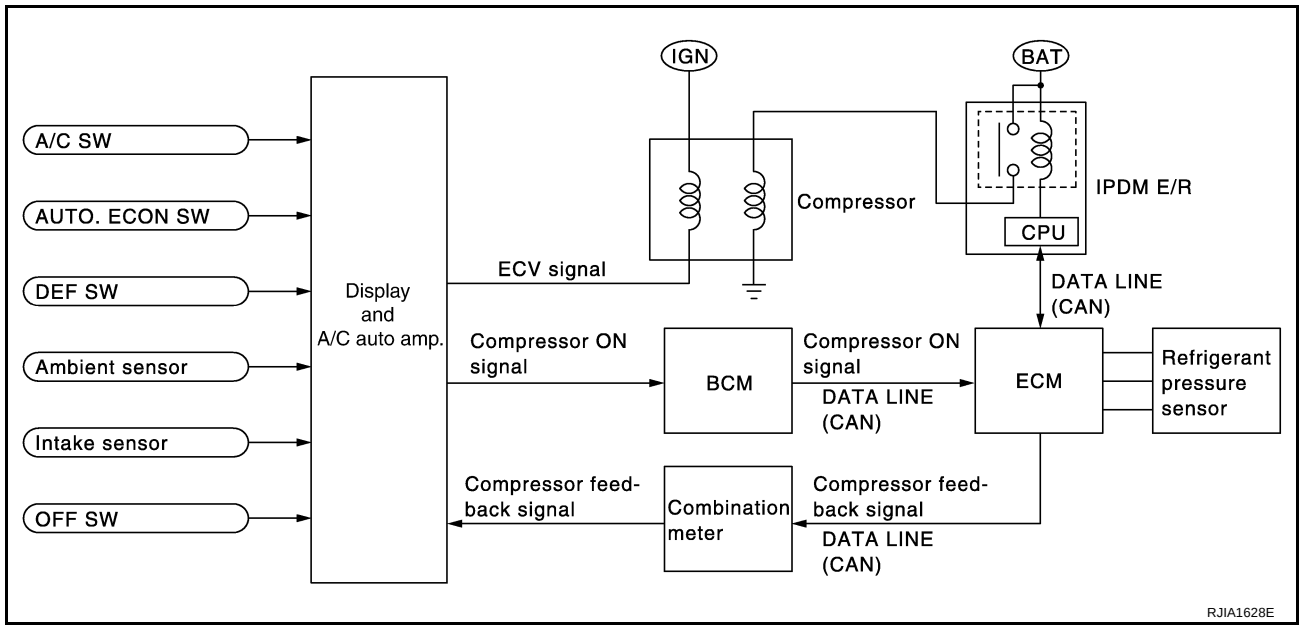
INTAKE DOOR CONTROL

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

MODE DOOR CONTROL

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

MAGNET CLUTCH CONTROL



When A/C switch, AUTO.ECON switch or DEF switch is pressed, display and A/C auto amp. transmits compressor ON signal to BCM.
BCM sends compressor ON signal to ECM, via CAN communication.
ECM judges whether compressor can be turned ON, based on each sensor status (refrigerant-pressure sensor signal, throttle angle, etc.). If it judges compressor can be turned ON, it sends compressor ON signal to IPDM E/R, via CAN communication.
Upon receipt of compressor ON signal from ECM, IPDM E/R turns A/C relay ON to operate compressor.
When sending compressor ON signal to IPDM E/R via CAN communication, ECM simultaneously sends compressor feedback signal to meter control unit via CAN communication.
Meter control unit sends compressor feedback signal to display and A/C auto amp., then, uses input compressor feedback signal to control air inlet.

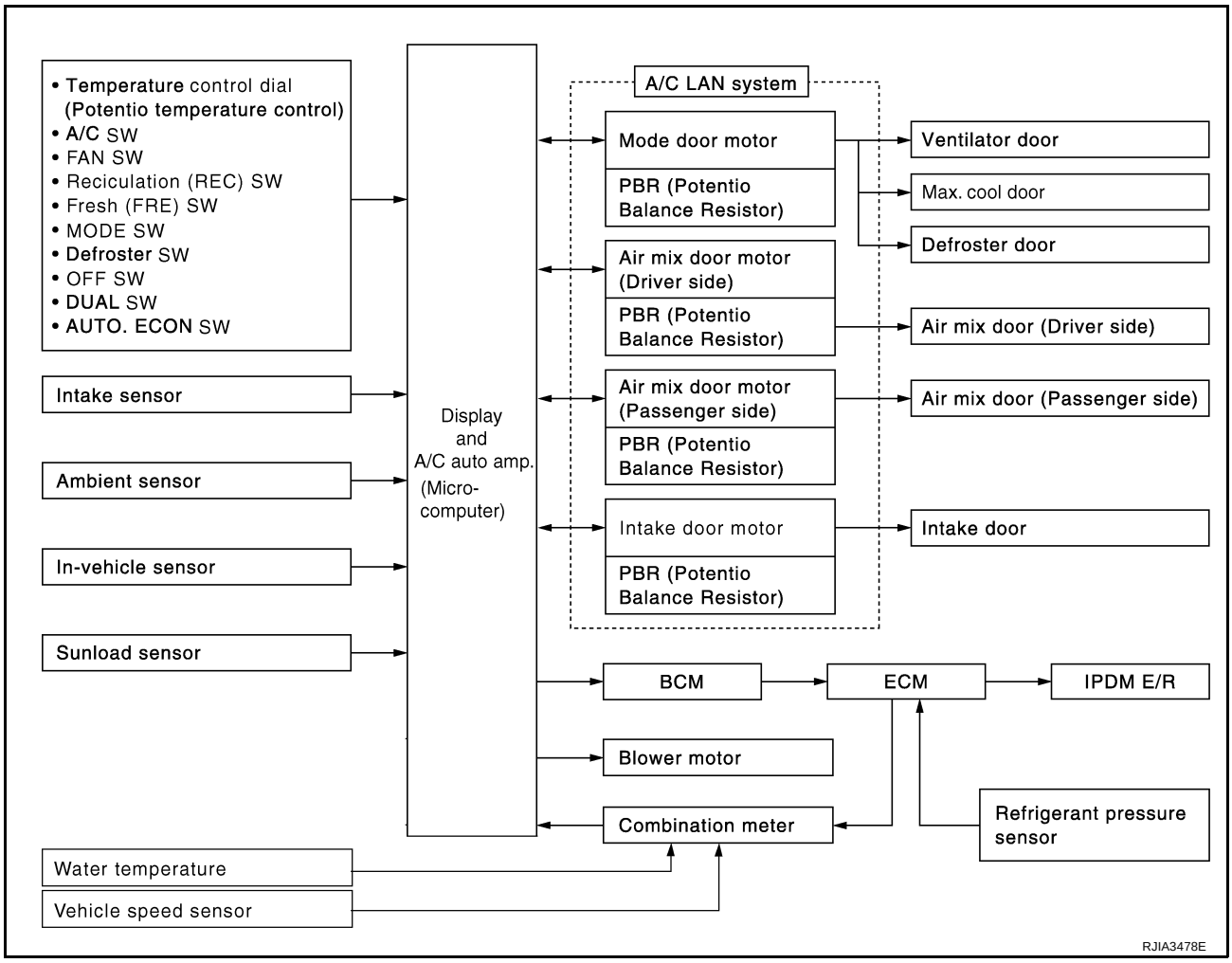
SELF-DIAGNOSIS SYSTEM

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

Description of Control System

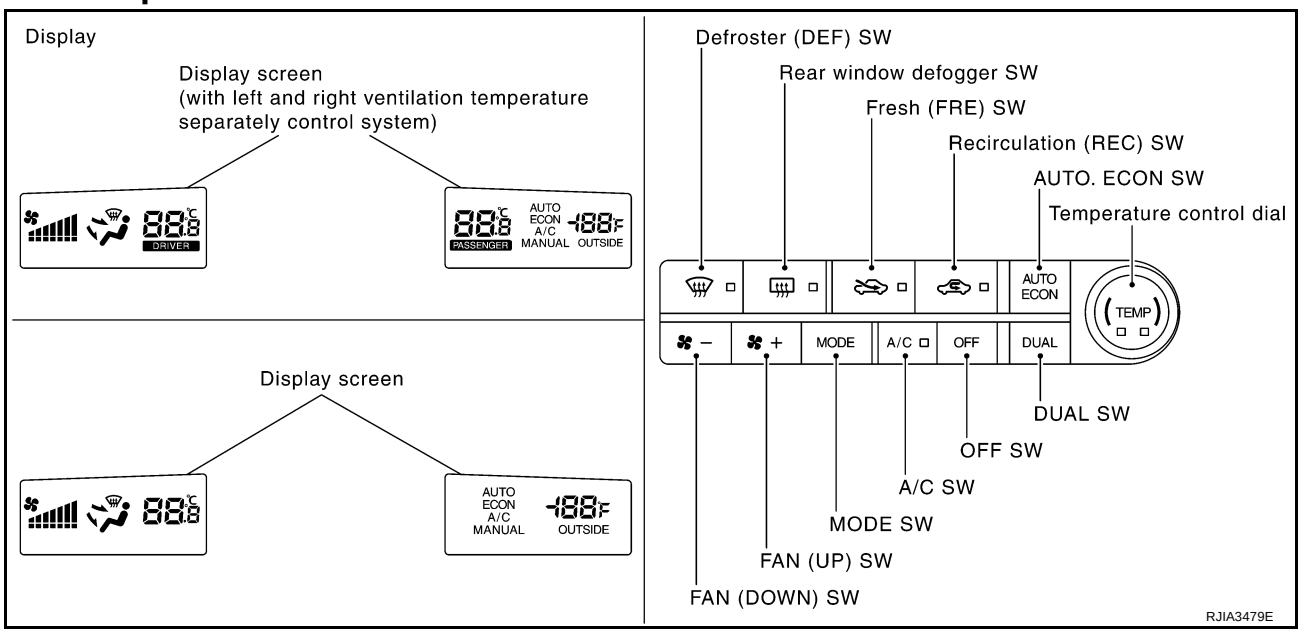
NJS0002Z

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



Control Operation

NJS00030



DISPLAY SCREEN

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

AUTO.ECON SWITCH

- The compressor, intake doors, air mix doors, mode doors and blower speed are automatically controlled so that the in-vehicle temperature will reach, and be maintained at the set temperature selected by the operator.
- When pressing AUTO.ECON switch, air inlet, air outlet, fan speed, and discharge air temperature are automatically controlled. (Inlet is automatically controlled only when FRE or REC switch is OFF.)
- Press AUTO.ECON switch again. “ECON” appears on display and control is switched to economy control.

TEMPERATURE CONTROL DIAL (POTENTIO TEMPERATURE CONTROL)

The set temperature is increased or decreased with this dial.

RECIRCULATION (REC) SWITCH

- When REC switch is ON, REC switch LED turns ON, air inlet is fixed to REC, and compressor will turn ON.
- When REC switch is ON and is pressed for approximately 1.5 seconds or longer, REC and FRE switch LEDs blink twice. Then, automatic control mode is entered. Inlet status is displayed even during automatically controlled.
- When FRE switch is turned ON, air outlet switches to D/F or DEF position, or when compressor is turned from ON to OFF, REC switch is automatically turned OFF (fixed to FRE mode).

FRESH (FRE) SWITCH

- When FRE switch is ON, FRE switch LED turns ON, and air inlet is fixed to FRE.
- When FRE switch is ON and is pressed for approximately 1.5 seconds or longer, REC and FRE switch LEDs blink twice. Then, automatic control mode is entered. Inlet status is displayed even during automatically controlled.
- When REC switch is turned ON, FRE switch is automatically turned OFF (fixed to REC mode). FRE mode can be re-entered by pressing FRE switch again.

DEFROSTER (DEF) SWITCH

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

REAR WINDOW DEFOGGER SWITCH

When illumination is ON, rear window is defogged.

OFF SWITCH

Compressor and blower are OFF, intake doors are automatically controlled, and mode doors are set to the foot position.

A/C SWITCH

Compressor is ON or OFF with this switch.
(Pressing the A/C switch when the A/C switch is ON, will turn OFF the A/C switch and compressor.)

MODE SWITCH

The air discharge outlets is controlled by this switch.
When air outlet switches to D/F or DEF position, compressor will turn ON and fixed to FRE mode.

FAN SWITCHES

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

DUAL SWITCH (WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATELY CONTROL SYSTEM)

- When air conditioner system is operating and DUAL switch is pressed, only underlined portion of driver’s seat set temperature indication on display (left-hand side) turns ON (and display shows “DRIVER”). Then, changing set temperature for driver’s seat is possible using temperature control dial.

- When DUAL switch is pressed again, only underlined portion of passenger's seat set temperature indication on display (right-hand side) turns ON (and display shows "PASSENGER"). Then, changing set temperature for passenger's seat is possible using temperature control dial.
- When DUAL switch is pressed again, underlined portions of both seats set temperature indications turn ON (and display shows "DRIVER" and "PASSENGER"). Set temperatures for left and right can be set equal to temperature for driver's seat, with temperature control dial.

Fail-safe Function

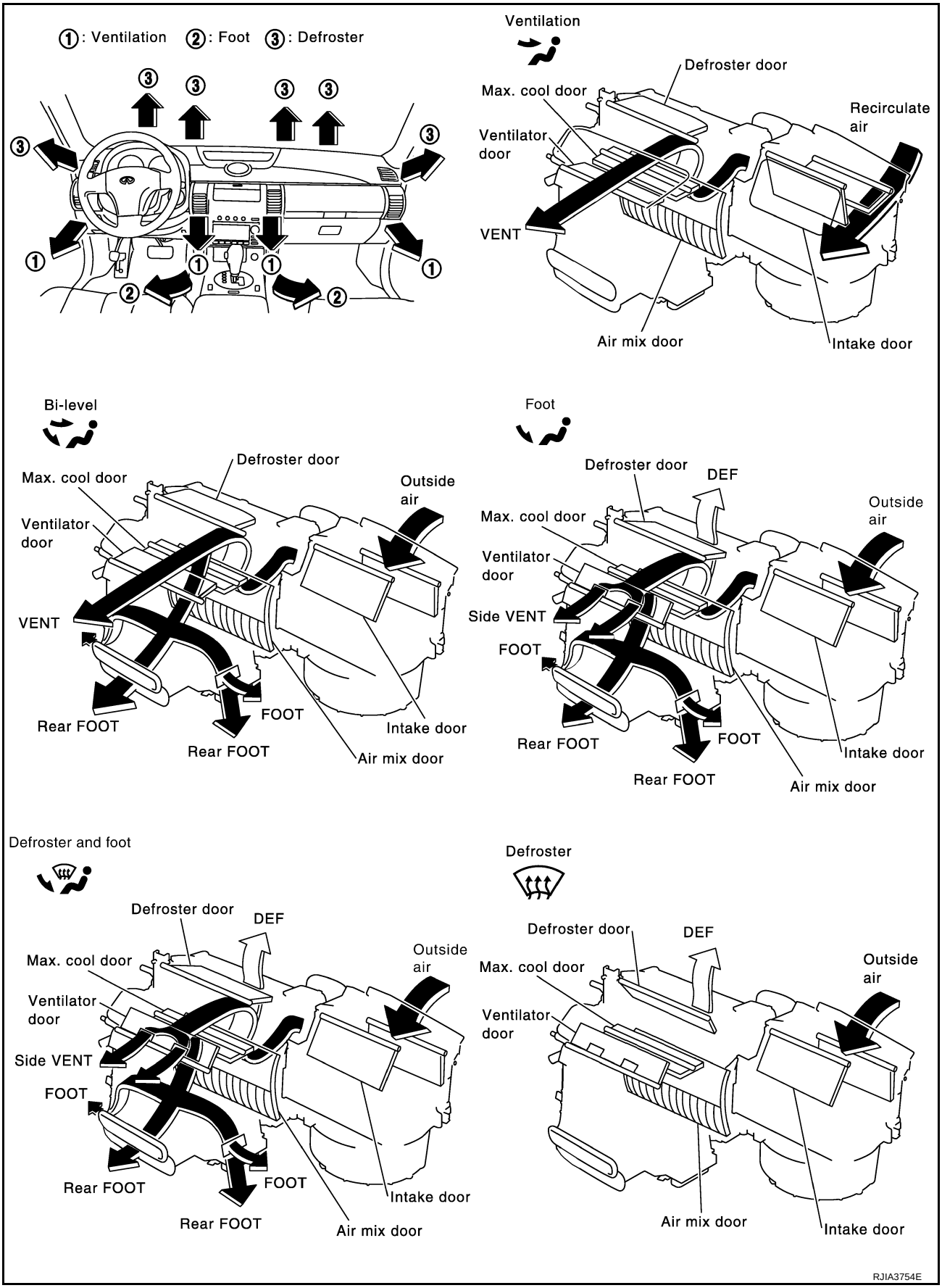
NJS00031

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

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

Discharge Air Flow

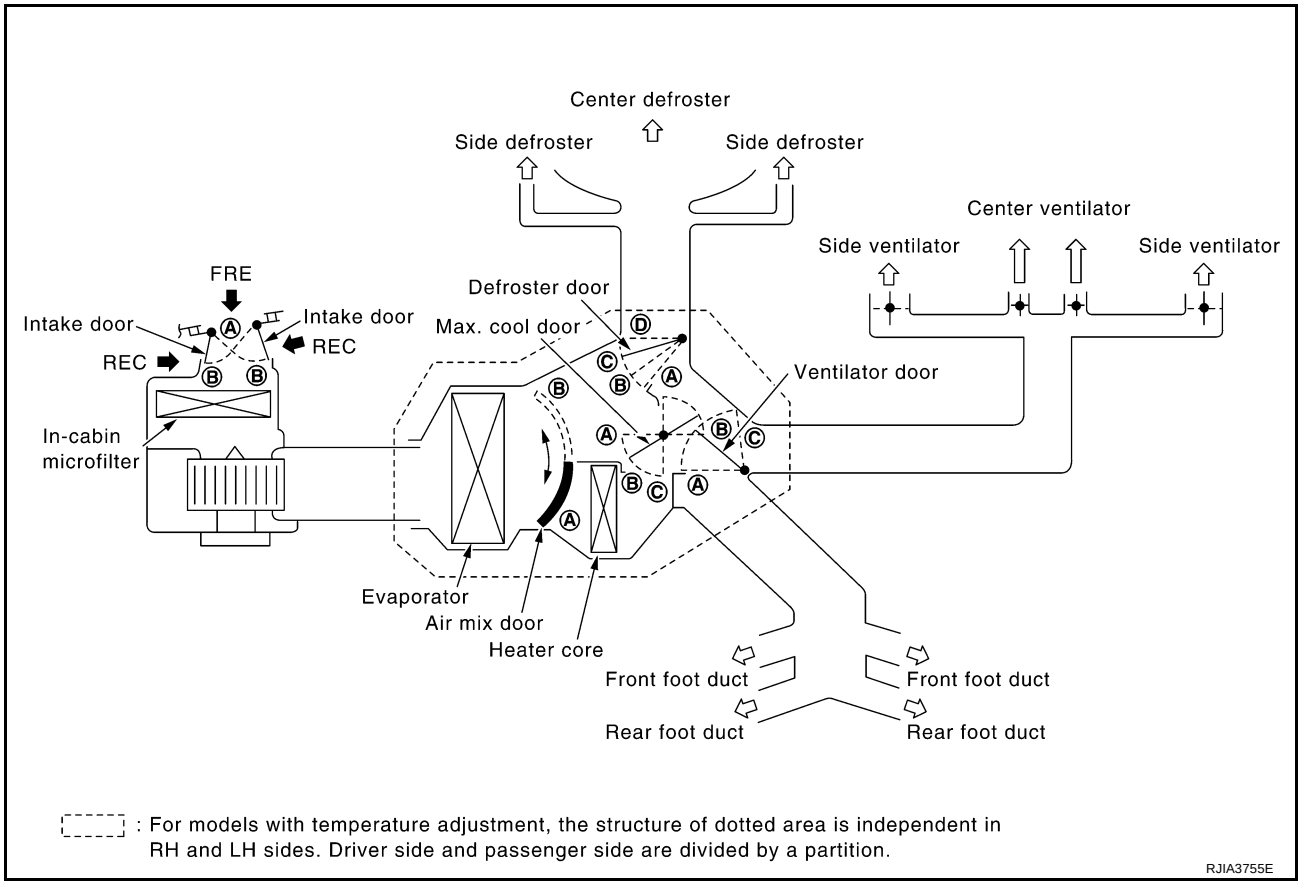
NJS00032



System Description

NJS00033

SWITCHES AND THEIR CONTROL FUNCTION



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

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

RJIA3480E

CAN Communication System Description

NJS00034

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-47, "CAN System Specification Chart" .

TROUBLE DIAGNOSIS

PFP:00004

CONSULT-II Function (BCM)

NJS00035

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

Refer to GI-37, "CONSULT-II Start Procedure" .

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.

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”.

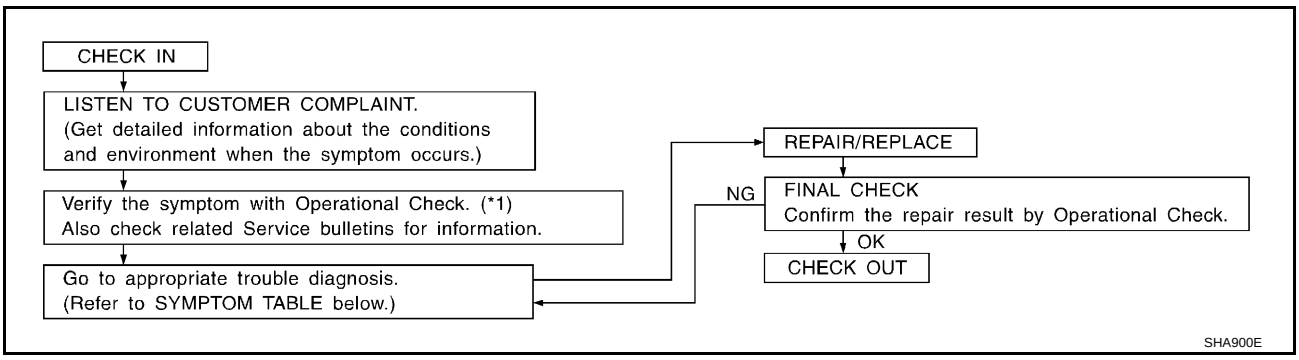
Display Item List

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

NJS00036

WORK FLOW



*1 ATC-60, "Operational Check"

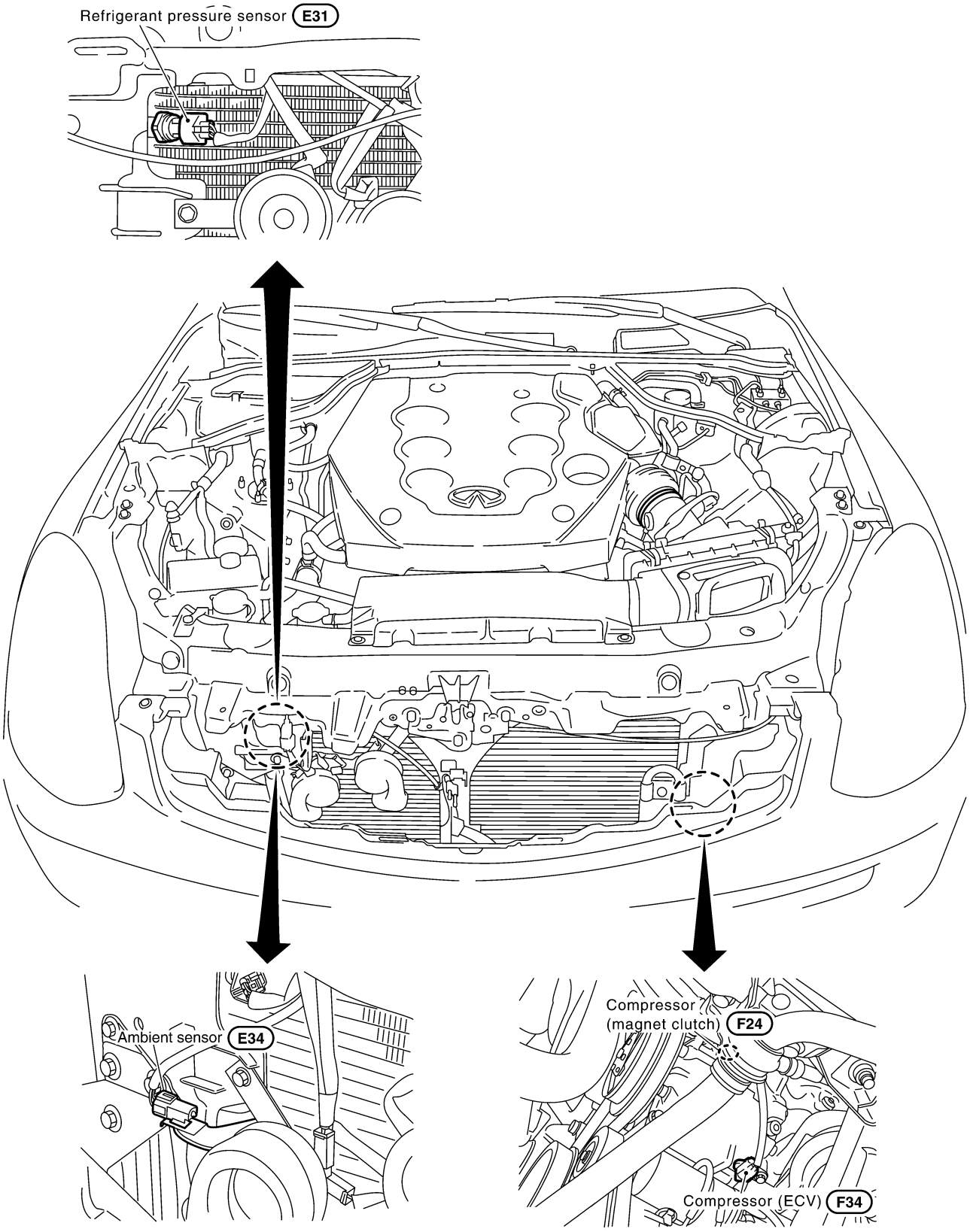
SYMPTOM TABLE

Symptom	Reference Page	
A/C system does not come on.	Go to Trouble Diagnosis Procedure for A/C System.	ATC-61, "Power Supply and Ground Circuit for Auto Amp."
A/C system cannot be controlled.	Go to Trouble Diagnosis Procedure for Multiplex Communication Circuit.	ATC-111, "Multiplex Communication Circuit"
Air outlet does not change. Mode door motor does not operate normally.	Go to Trouble Diagnosis Procedure for Mode Door Motor. (LAN)	ATC-68, "Mode Door Motor Circuit"
Discharge air temperature does not change. Air mix door motor does not operate normally.	Go to Trouble Diagnosis Procedure for Air Mix Door Motor. (LAN)	ATC-71, "Air Mix Door Motor Circuit"
Intake door does not change. Intake door motor does not operate normally.	Go to Trouble Diagnosis Procedure for Intake Door Motor. (LAN)	ATC-74, "Intake Door Motor Circuit"
Blower motor operation is malfunctioning.	Go to Trouble Diagnosis Procedure for Blower Motor.	ATC-77, "Blower Motor Circuit"
Magnet clutch does not engage.	Go to Trouble Diagnosis Procedure for Magnet Clutch.	ATC-82, "Magnet Clutch Circuit"
Insufficient cooling	Go to Trouble Diagnosis Procedure for Insufficient Cooling.	ATC-89, "Insufficient Cooling"
	Go to Diagnosis Procedure for Insufficient Cooling.	ATC-95, "DIAGNOSIS PROCEDURE FOR INSUFFICIENT COOLING"
Insufficient heating	Go to Trouble Diagnosis Procedure for Insufficient Heating.	ATC-97, "Insufficient Heating"
Noise	Go to Trouble Diagnosis Procedure for Noise.	ATC-98, "Noise"
Self-diagnosis cannot be performed.	Go to Trouble Diagnosis Procedure for Self-diagnosis.	ATC-99, "Self-diagnosis"
Memory function does not operate.	Go to Trouble Diagnosis Procedure for Memory Function.	ATC-100, "Memory Function"

Component Parts and Harness Connector Location

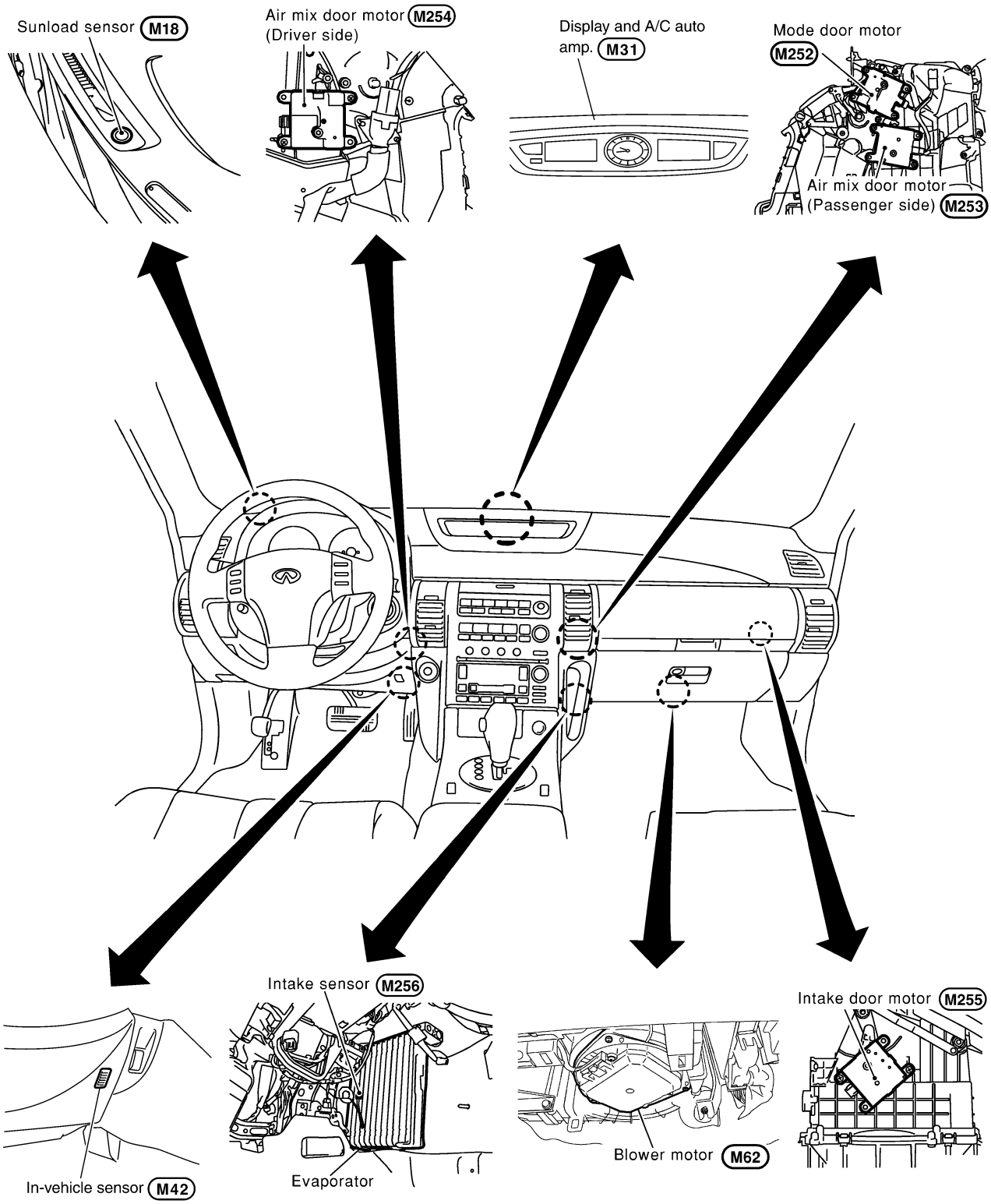
NJS00037

ENGINE COMPARTMENT



SJIA0637E

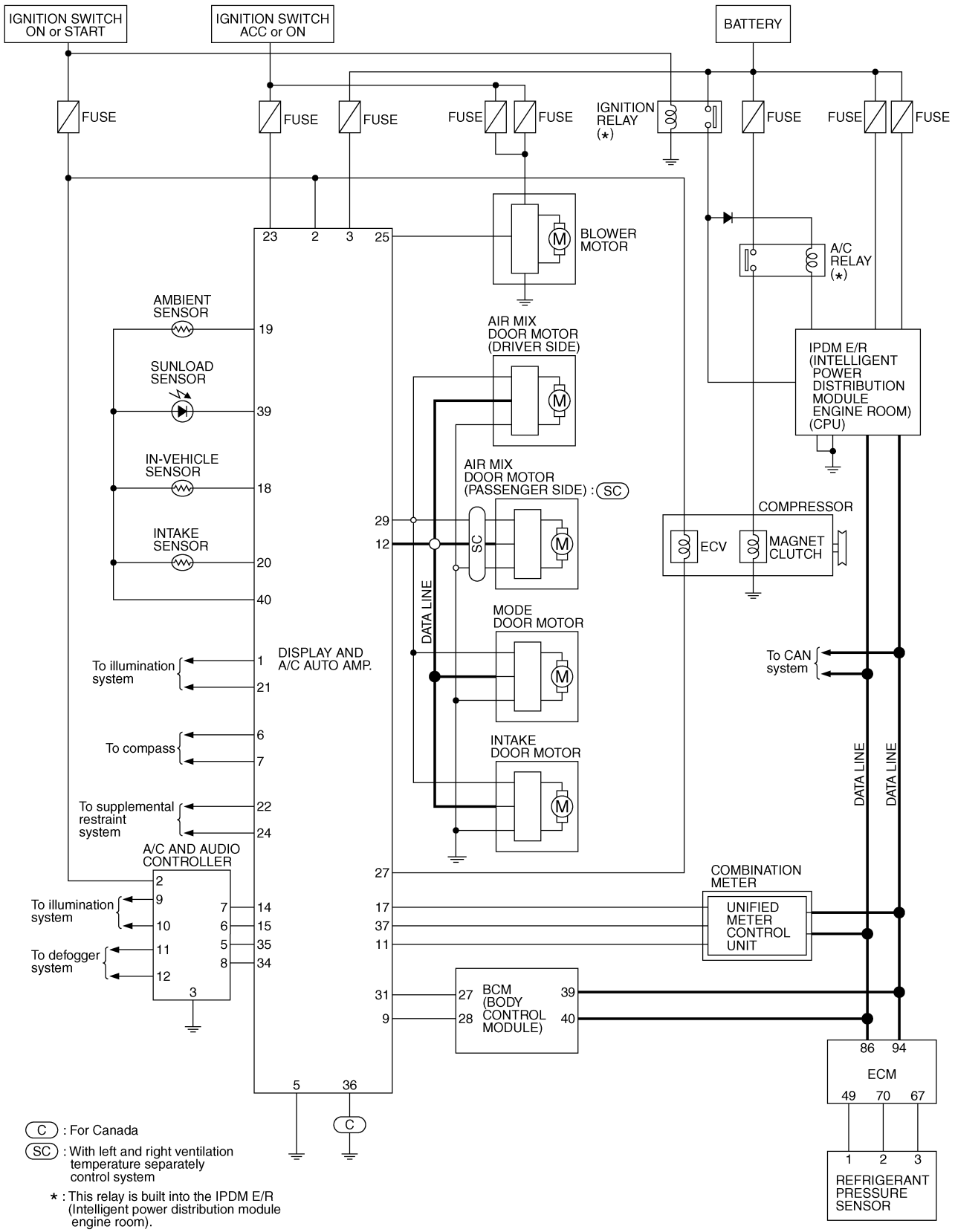
PASSENGER COMPARTMENT



RJIA3581E

Schematic

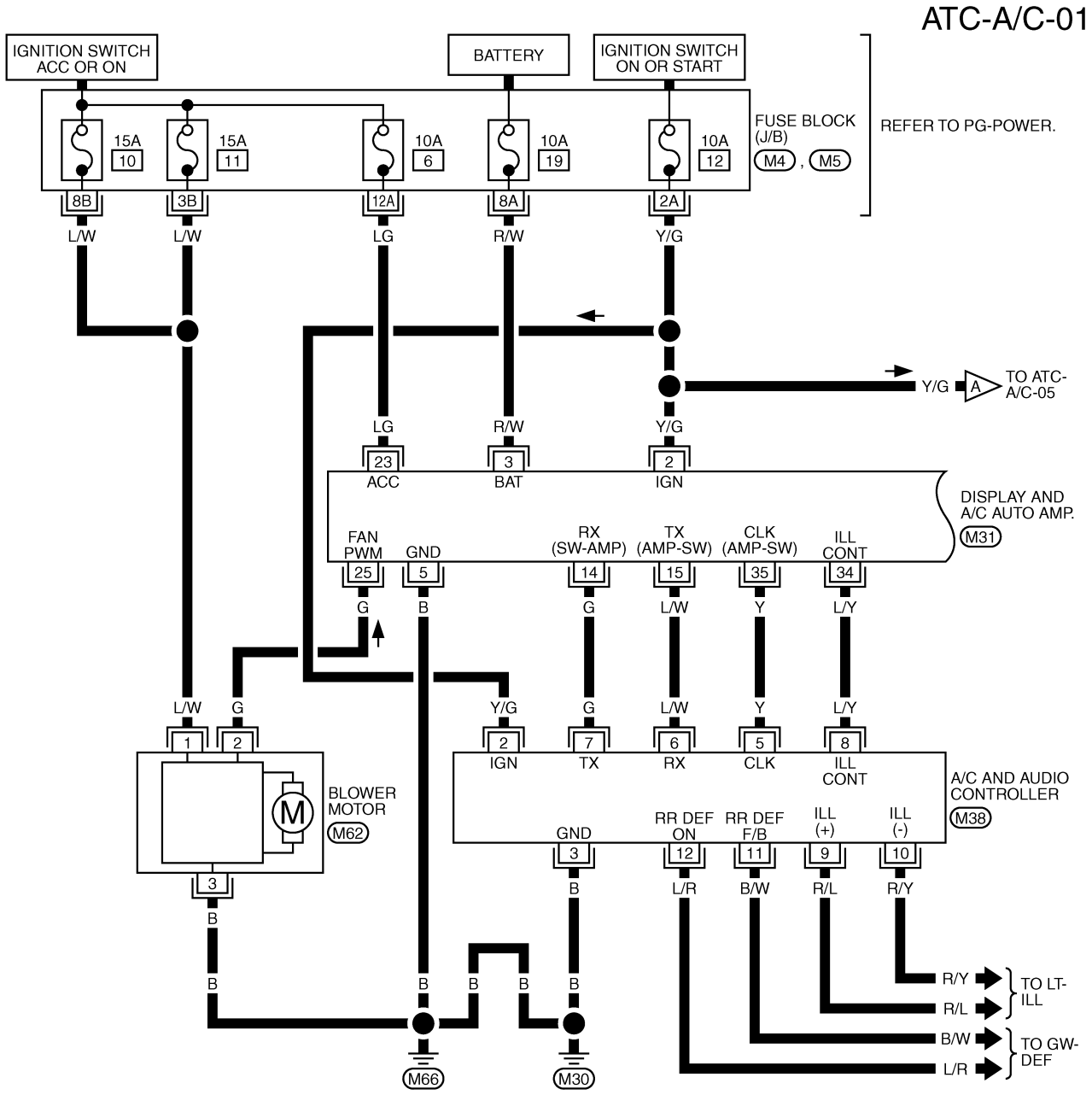
NJS00038

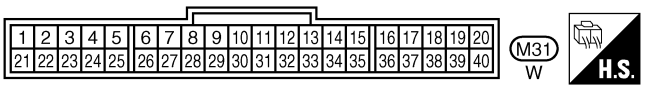


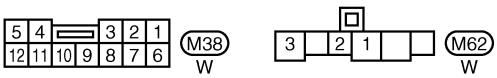
TJWM0139E

Wiring Diagram — A/C —

NJS00039

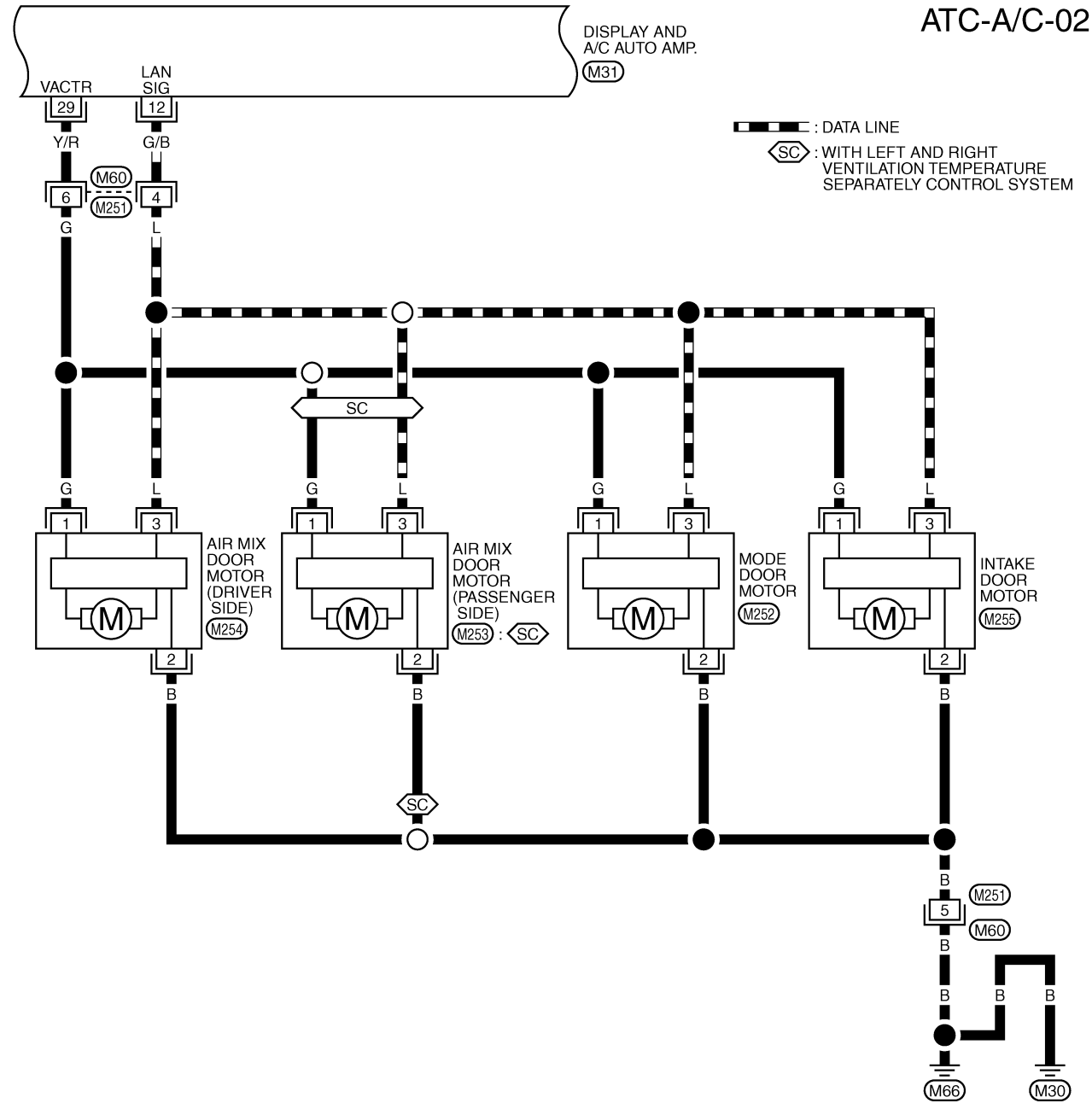


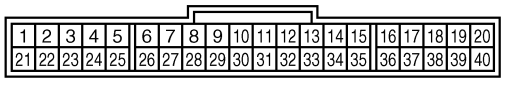




REFER TO THE FOLLOWING.
M4, M5 -FUSE BLOCK-JUNCTION BOX (J/B)

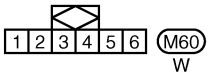
TJWM0140E



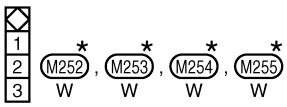


M31
W

H.S.



M60
W

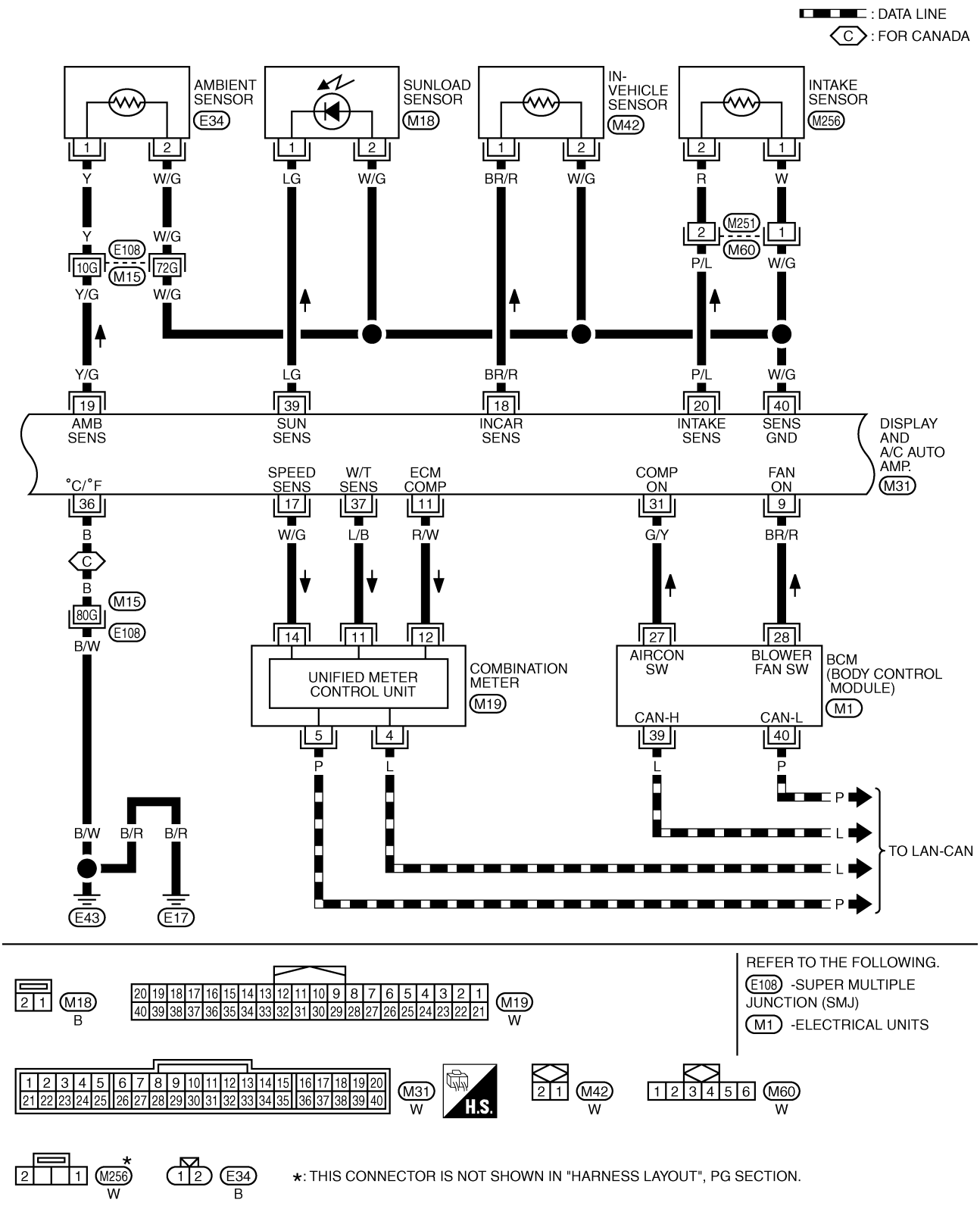


* M252 W , * M253 W , * M254 W , * M255 W

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

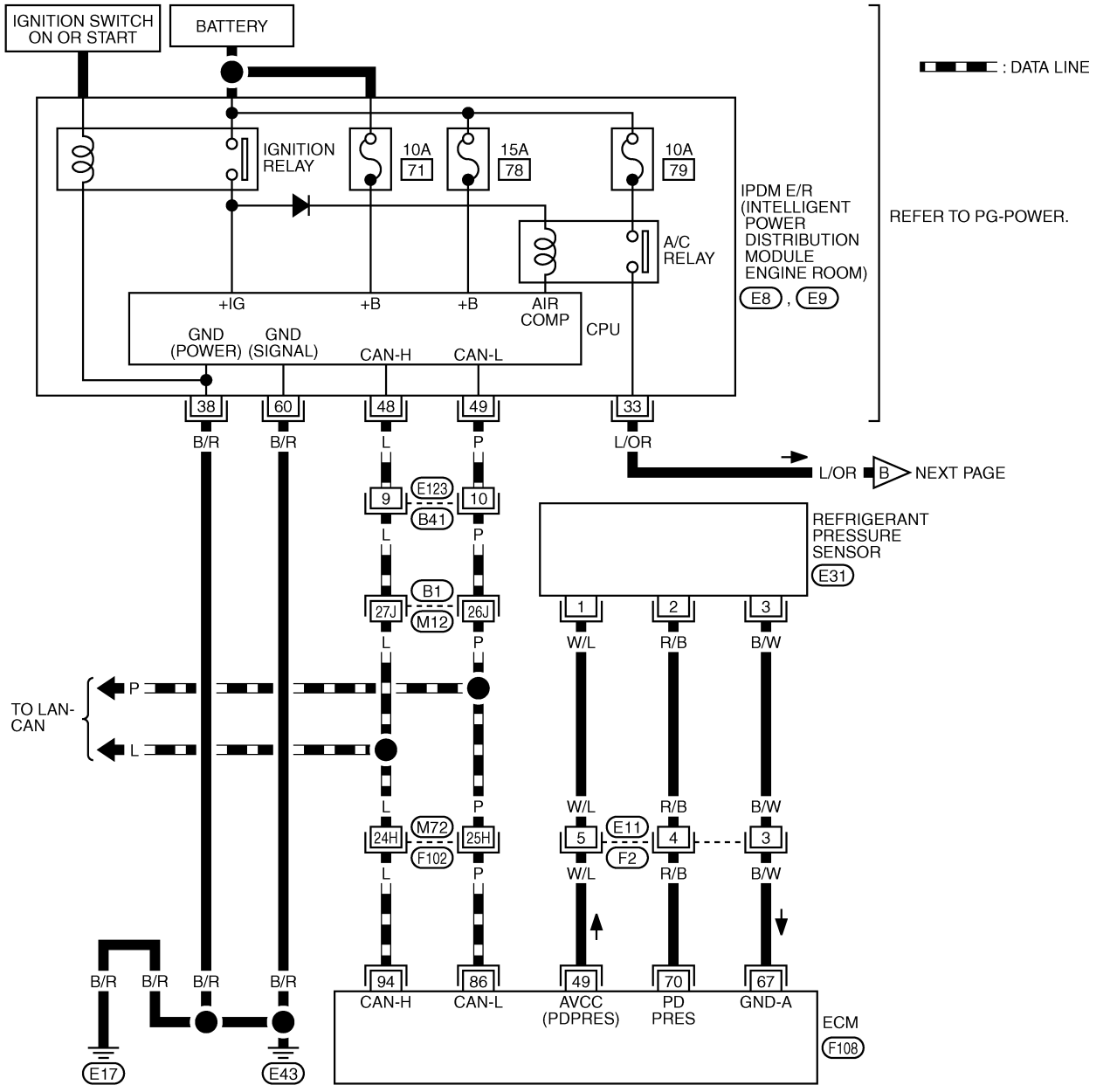
TJWM0141E

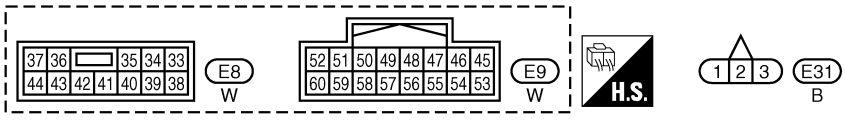
ATC-A/C-03

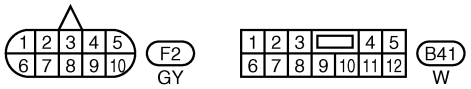


TJWM0145E

ATC-A/C-04



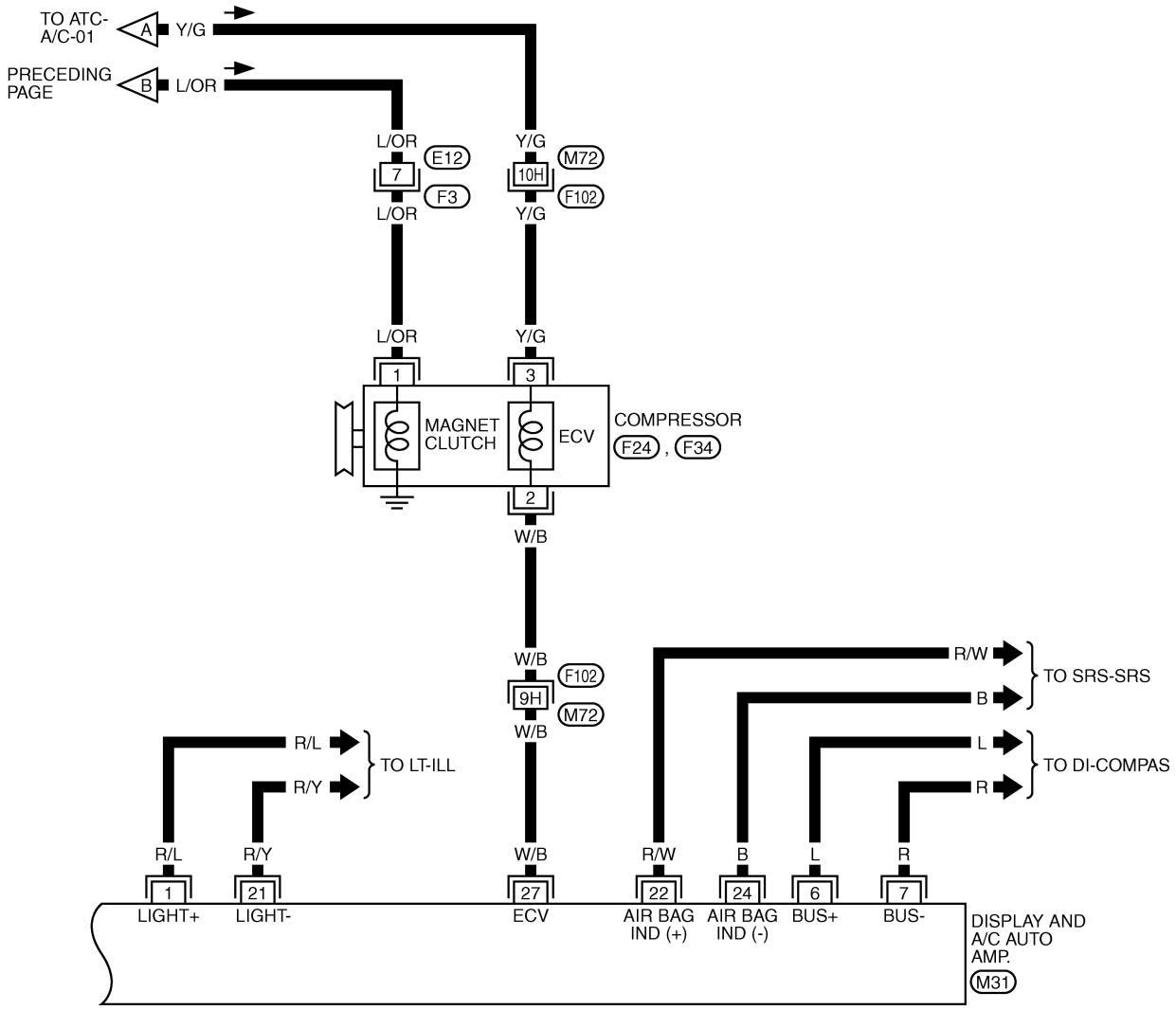


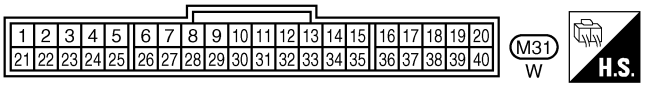


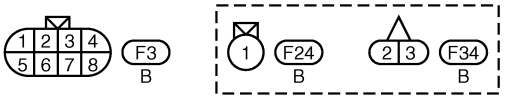
REFER TO THE FOLLOWING.
F102 , B1 -SUPER MULTIPLE JUNCTION (SMJ)
F108 -ELECTRICAL UNITS

TJWM0210E

ATC-A/C-05







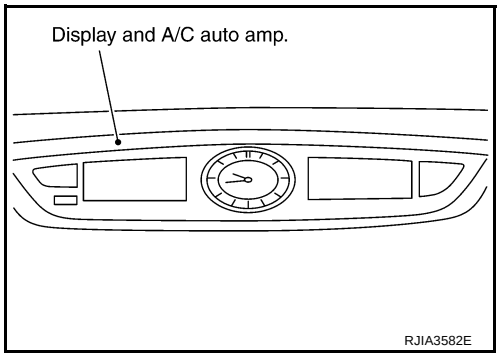
REFER TO THE FOLLOWING.
F102 -SUPER MULTIPLE JUNCTION (SMJ)

TJWM0144E

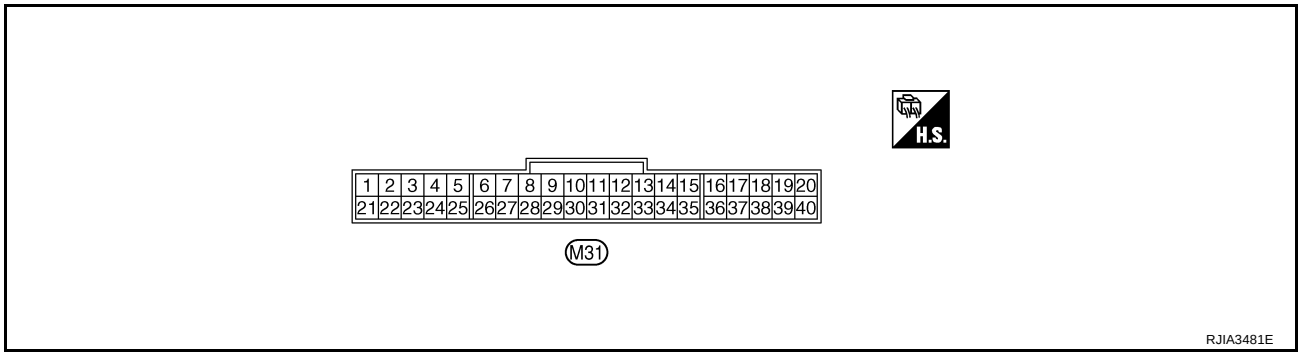
Auto Amp. Terminals and Reference Value

NJS0003A

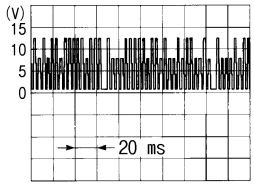
Measure voltage between each terminal and ground by referring terminals and reference value for display and A/C auto amp.

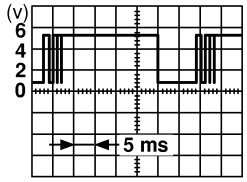
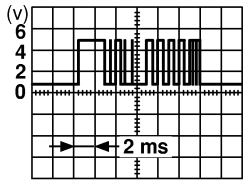
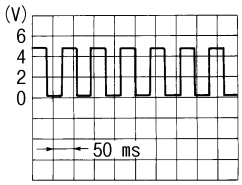
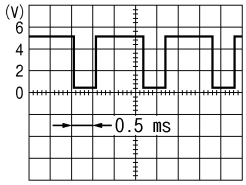
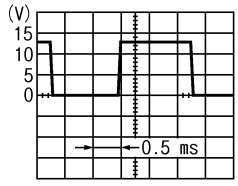


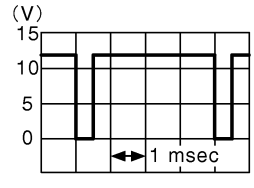
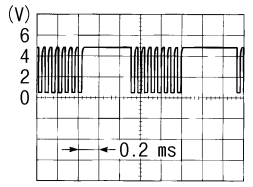
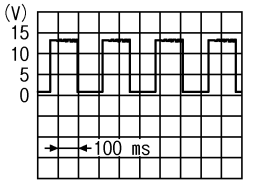
PIN CONNECTOR TERMINAL LAYOUT



TERMINALS AND REFERENCE VALUE FOR DISPLAY AND A/C AUTO AMP.

Terminal No.	Wire color	Item	Ignition switch	Condition	Voltage (V)
1	R/L	Power supply for illumination	ON	Lighting switch: ON	Approx. 12
				Lighting switch: OFF	Approx. 0
2	Y/G	Power supply from IGN	ON	—	Battery voltage
3	R/W	Power supply from BAT	OFF	—	Battery voltage
5	B	Ground	ON	—	Approx. 0
9	BR/R	Blower motor ON signal	ON	A/C switch: ON (Blower motor operates.)	Approx. 0
				OFF switch: ON (A/C system: OFF)	Approx. 5
11	R/W	Compressor feedback signal (Low-pressure cut)	ON	A/C switch: ON (Blower motor operates.)	Approx. 0
				A/C switch: ON (When refrigerant pressure sensor connector is disconnected.)	Approx. 5
12	G/B	A/C LAN signal	ON	—	 SJIA1453J

Terminal No.	Wire color	Item	Ignition switch	Condition	Voltage (V)
14	G	Multiplex communication (RX) signal (A/C and audio controller → Display and A/C auto amp.)	ON	—	 RJIA0213E
15	L/W	Multiplex communication (TX) signal (Display and A/C auto amp. → A/C and audio controller)	ON	—	 RJIA0212E
17	W/G	Vehicle speed signal	ON	Speedometer operated [When vehicle speed is approx. 40 km/h (25 MPH)]	 SJIA1476J
18	BR/R	In-vehicle sensor	—	—	—
19	Y/G	Ambient sensor	—	—	—
20	P/L	Intake sensor	—	—	—
21	R/Y	Illumination ground	ON	—	Approx. 0
23	LG	Power supply from ACC	ACC	—	Battery voltage
25	G	Blower motor control signal	ON	Blower speed: 1st speed (manual)	 SJIA1454J
27	W/B	ECV (Electronic Control Valve) signal	ON	Self-diagnosis: STEP-4 (Code No. 45)	 SJIA1523J
29	Y/R	Power supply for each door motor	ON	—	Battery voltage
31	G/Y	Compressor ON signal	ON	A/C switch: ON (Blower motor operates.)	Approx. 0
				OFF switch: ON (A/C system: OFF)	Approx. 5

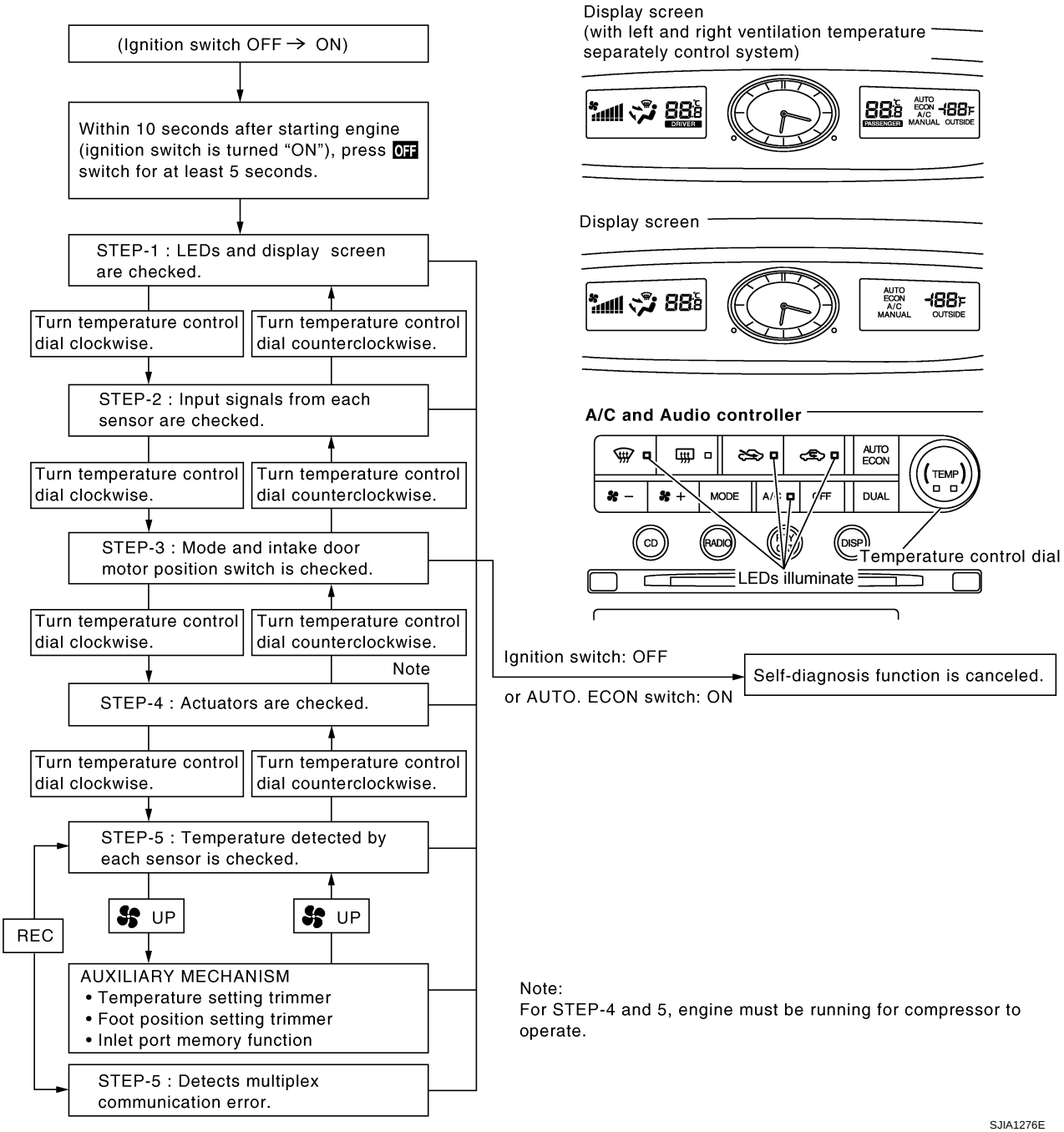
Terminal No.	Wire color	Item	Ignition switch	Condition	Voltage (V)
34	L/Y	Illumination control signal	ON	—	 SJIA1835E
35	Y	Multiplex communication (CLK) signal	ON	—	 SJIA1479J
36	B	Changeover °C/°F (For Canada)	—	—	Approx. 0
37	L/B	Engine coolant temperature sensor signal	ON	At idle [after warming up, approx. 80°C (176°F)] **NOTE:** The waveforms vary depending on coolant temperature.	 SJIA1480J
39	LG	Sunload sensor	—	—	—
40	W/G	Sensor ground	ON	—	Approx. 0

Self-diagnosis Function

NJS0003B

DESCRIPTION

The self-diagnosis system diagnoses sensors, door motors, blower motor, etc. by system line. Refer to applicable sections (items) for details. Shifting from normal control to the self-diagnosis system is accomplished by starting the engine (turning the ignition switch ON) and pressing OFF switch for at least 5 seconds. The OFF switch must be pressed within 10 seconds after starting the engine (ignition switch is turned ON). This system will be canceled by either pressing AUTO.ECON switch or turning the ignition switch OFF. Shifting from one step is accomplished by means of turning temperature control dial, as required.
Shifting from STEP-5 to AUXILIARY MECHANISM is accomplished by means of pushing (fan) UP switch.



FUNCTION CONFIRMATION PROCEDURE

1. SET IN SELF-DIAGNOSIS MODE

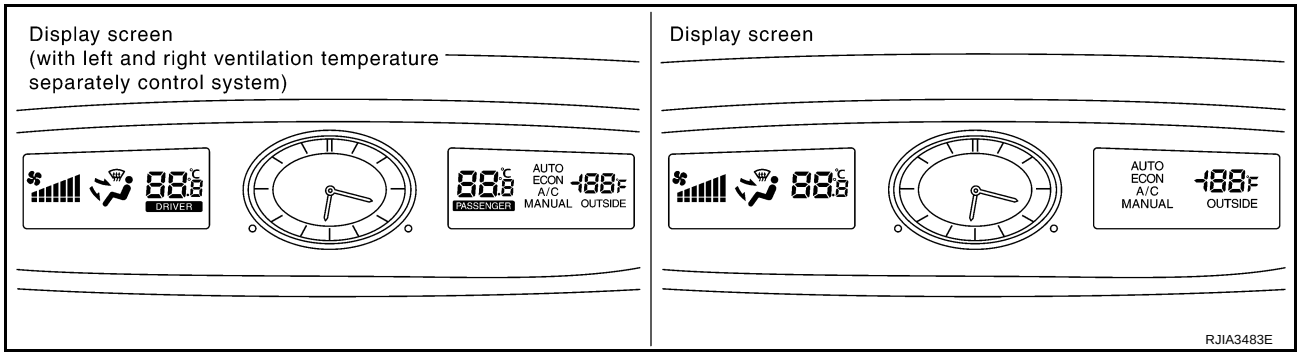
1. Turn ignition switch ON.
2. Set in self-diagnosis mode as follows. Within 10 seconds after starting engine (ignition switch is turned ON.), press OFF switch for at least 5 seconds.

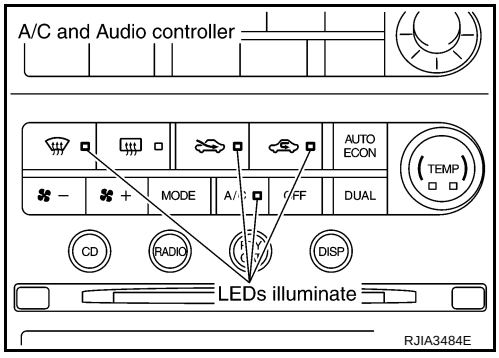
NOTE:
If battery voltage drops below 12 V during diagnosis STEP-3, door motor speed becomes slower and as a result, the system may generate an error even when operation is normal. To avoid this, start engine before performing this diagnosis.

>> GO TO 2.

2. STEP-1: LEDS AND DISPLAY ARE CHECKED

Check LED illumination and display screen.





OK or NG

OK >> GO TO 3.
NG >> Malfunctioning OFF switch or display and A/C auto amp. Refer to ATC-111, "Multiplex Communication Circuit" .

3. CHECK TO ADVANCE SELF-DIAGNOSIS STEP-2

Turn temperature control dial clockwise.

Advance to self-diagnosis STEP-2?

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

4. CHECK TO RETURN SELF-DIAGNOSIS STEP-1

Turn temperature control dial counterclockwise.

Return to self-diagnosis STEP-1?

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

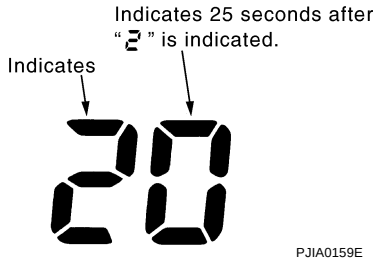
5. STEP-2: SENSOR CIRCUITS ARE CHECKED FOR OPEN OR SHORT CIRCUIT

Turn temperature control dial clockwise.

Does code No. 20 appear on the display?

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

Display (when all sensors are in good order)



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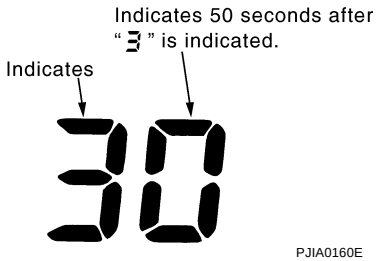
6. STEP-3: MODE DOOR AND INTAKE DOOR POSITIONS ARE CHECKED

Turn temperature control dial clockwise.

Does code No. 30 appear on the display?

YES >> GO TO 7.
NO >> GO TO 15.

Display (when all doors are in good order)



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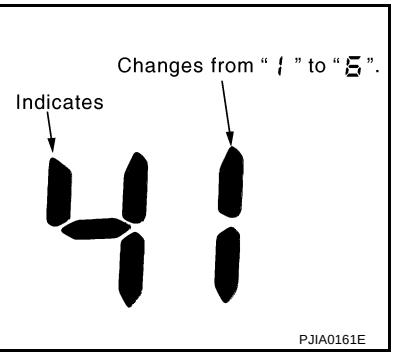
7. STEP-4: OPERATION OF EACH DOOR MOTOR IS CHECKED

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

>> GO TO 8.



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8. CHECK ACTUATORS

Refer to the following chart and check 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%	–	–
	58%	42%	–
	19% (25%)	61% (75%)	20% (–)
	16%	54%	30%
	–	–	100%

( ): Manually control

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Code No.	41	42	43	44	45	46
Mode door position	VENT	B/L 1	B/L 2	FOOT*1	D/F	DEF
Intake door position	REC	REC	20%FRE	FRE	FRE	FRE
Air mix door position	FULL COLD	FULL COLD	FULL HOT	FULL HOT	FULL HOT	FULL HOT
Blower motor duty ratio	37%	91%	65%	65%	65%	91%
Compressor	ON	ON	OFF	OFF	ON	ON
Electronic control valve (ECV) duty ratio	100%	100%	0%	0%	50%	100%

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

*1: FOOT position during automatic control. Refer to ATC-59, "AUXILIARY MECHANISM: FOOT POSITION SETTING TRIMMER" .

OK or NG

OK >> GO TO 9.

NG >>
- Air outlet does not change.
  Go to Mode Door Motor Circuit. Refer to ATC-68, "Mode Door Motor Circuit" .
- Intake door does not change.
  Go to Intake Door Motor Circuit. Refer to ATC-74, "Intake Door Motor Circuit" .
- Discharge air temperature does not change.
  Go to Air Mix Door Motor Circuit. Refer to ATC-71, "Air Mix Door Motor Circuit" .
- Blower motor operation is malfunctioning.
  Go to Blower Motor Circuit. Refer to ATC-77, "Blower Motor Circuit" .
- Magnet clutch does not engage.
  Go to Magnet Clutch Circuit. Refer to ATC-82, "Magnet Clutch Circuit" .

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

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

>> GO TO 10.

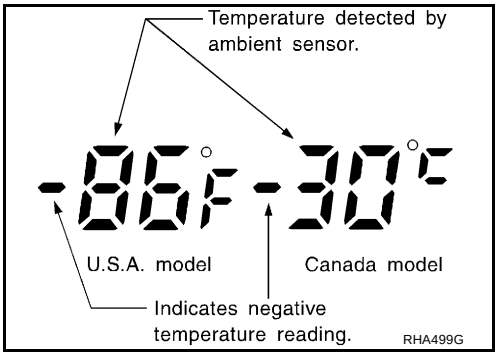
10. CHECK AMBIENT SENSOR

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

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

OK or NG

OK >> GO TO 11.
NG >> Go to Ambient Sensor Circuit. Refer to ATC-100, "Ambient Sensor Circuit" .



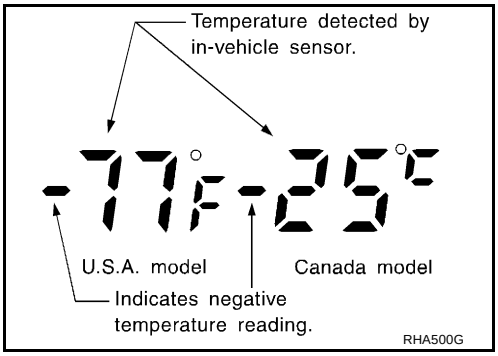
11. CHECK IN-VEHICLE SENSOR

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

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

OK or NG

OK >> GO TO 12.
NG >> Go to In-vehicle Sensor Circuit. Refer to ATC-103, "In-vehicle Sensor Circuit" .



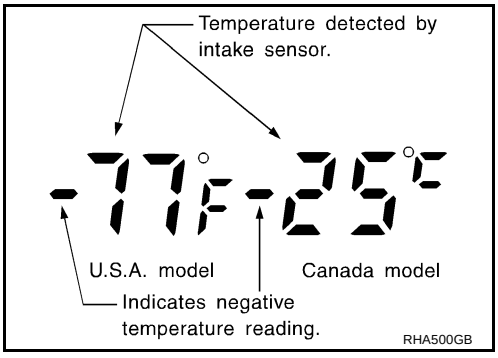
12. CHECK INTAKE SENSOR

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

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

OK or NG

OK >> GO TO 13.
NG >> Go to Intake Sensor Circuit. Refer to ATC-109, "Intake Sensor Circuit" .



13. CHECK MULTIPLEX COMMUNICATION ERROR

1. Press recirculation (REC) switch.
2. Multiplex communication error between display and A/C auto amp. and A/C and audio controller can be detected as self-diagnosis results.
   (If plural errors occur, the display of each error will blink twice for 0.5 second intervals.)

Is multiplex communication error detected as self-diagnosis results?

YES >> Go to multiplex communication circuit. Refer to ATC-111, "Multiplex Communication Circuit" .
NO >> 1. Turn ignition switch OFF or AUTO. ECON switch ON.
2. INSPECTION END

Display	Multiplex communication error
52	In good order
52	A/C and Audio controller ⇨Display and A/C Auto amp.
52	Display and A/C Auto amp. ⇨A/C and Audio controller

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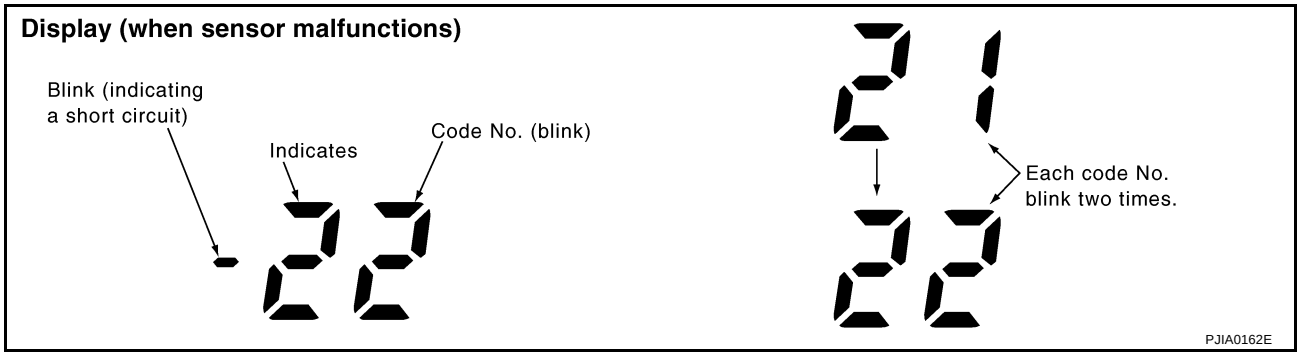
14. CHECK MALFUNCTIONING SENSOR AND DOOR MOTOR

Refer to the following chart for malfunctioning code No.
(If two or more sensors malfunction, corresponding code Nos. blink respectively twice.)
(If two door motors malfunction, corresponding code Nos. blink respectively once.)
*1: Perform self-diagnosis STEP-2 under sunshine.
When performing indoors, aim a light (more than 60 W) at sunload sensor, otherwise code No.25 will indicate despite that sunload sensor is functioning properly.

Code No.	Malfunctioning sensor and door motor (Including circuits)		Reference page
21 / –21	Ambient sensor		*2
22 / –22	In-vehicle sensor		*3
24 / –24	Intake sensor		*4
25 / –25	Sunload sensor *1		*5
26 / –26	With DUAL switch	Air mix door motor PBR (Driver side)	*6
	Without DUAL switch	Air mix door motor PBR (Passenger side)	
27 / –27	With DUAL switch only	Air mix door motor PBR (Passenger side)	

*2: ATC-101, "DIAGNOSIS PROCEDURE FOR AMBIENT SENSOR" .
*3: ATC-104, "DIAGNOSIS PROCEDURE FOR IN-VEHICLE SENSOR" .
*4: ATC-109, "DIAGNOSIS PROCEDURE FOR INTAKE SENSOR" .
*5: ATC-106, "DIAGNOSIS PROCEDURE FOR SUNLOAD SENSOR" .
*6: ATC-73, "DIAGNOSIS PROCEDURE FOR AIR MIX DOOR MOTOR PBR" .

Display (when sensor malfunctions)



>> INSPECTION END

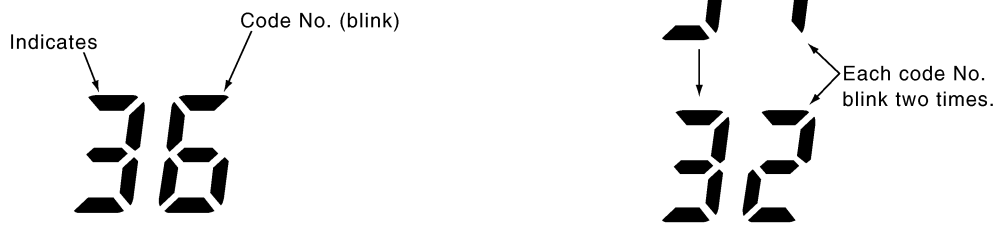
15. CHECK MALFUNCTIONING DOOR MOTOR POSITION SWITCH

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

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

(If two or more mode or intake door motors malfunction, corresponding code Nos. blink respectively twice.)
*1: If mode door motor harness connector is disconnected, the following display pattern will appear.
31→32→33→34→35→36→Return to 31
*2: If intake door motor harness connector is disconnected, the following display pattern will appear.
37→38→39→Return to 37
*3: FOOT position during automatic control. Refer to ATC-59, "AUXILIARY MECHANISM: FOOT POSITION SETTING TRIMMER" .
*4: ATC-70, "DIAGNOSIS PROCEDURE FOR MODE DOOR MOTOR" .
*5: ATC-76, "DIAGNOSIS PROCEDURE FOR INTAKE DOOR MOTOR" .

Display (when door motors malfunctions)

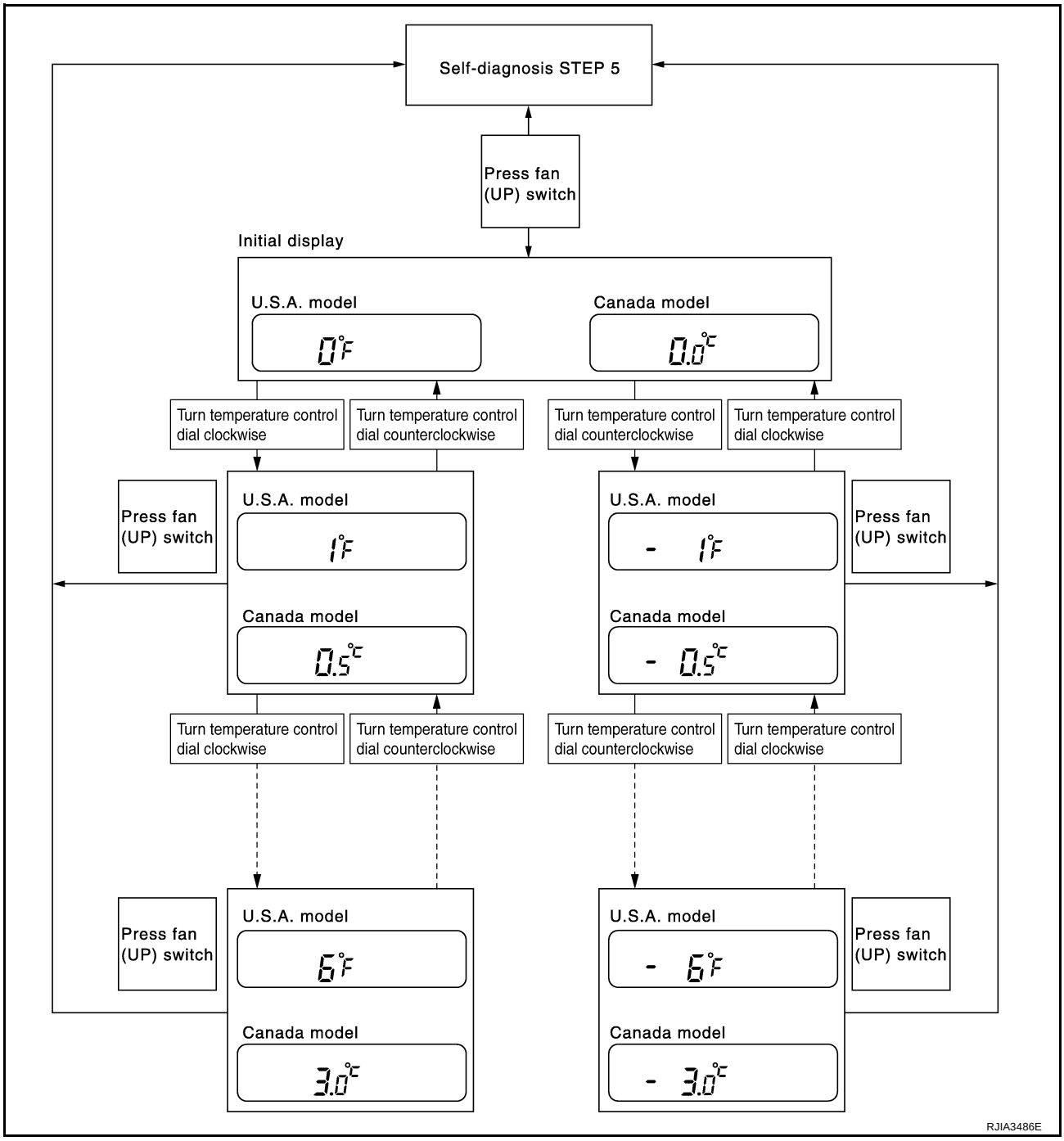


>> INSPECTION END

AUXILIARY MECHANISM: TEMPERATURE SETTING TRIMMER

The trimmer compensates for differences in range of ±3°C (±6°F) between temperature setting (displayed digitally) and temperature felt by customer.
Operating procedures for this trimmer are as follows:

1. Begin self-diagnosis STEP-5 mode. Refer to ATC-51, "Self-diagnosis Function" .
2. Press ֍ (fan) UP switch to set system in auxiliary mode.
3. Display shows “61” in auxiliary mechanism. It takes approximately 3 seconds to enable setting operation.
4. Turn temperature control dial as desired. Temperature will change at a rate of 0.5°C (1.0°F) each time a dial is turned.



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

AUXILIARY MECHANISM: FOOT POSITION SETTING TRIMMER

Wind distribution ratio in FOOT mode can be set.
Operating procedures for this trimmer are as follows:

1. Begin self-diagnosis STEP-5 mode. Refer to ATC-51, "Self-diagnosis Function" .
2. Press ✲ (fan) UP switch to set system in auxiliary mode.
3. Display shows “61” in auxiliary mechanism. It takes approximately 3 seconds to enable setting operation.
4. Press the mode switch as desired.

Display	Discharge air flow					
	Automatically controls the mode door			Manually controls the mode door		
	VENT	FOOT	DEF	VENT	FOOT	DEF
(Initial setting)	19%	61%	20%	25%	75%	–
	19%	61%	20%	19%	61%	20%
	25%	75%	–	19%	61%	20%
	25%	75%	–	25%	75%	–

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

AUXILIARY MECHANISM: INLET PORT MEMORY FUNCTION

When ignition switch is turned from OFF to ON, inlet port memory function at manual mode can be set.
Operating procedures for this trimmer are as follows:

1. Begin self-diagnosis STEP-5 mode. Refer to ATC-51, "Self-diagnosis Function" .
2. Press ✲ (fan) UP switch to set system in auxiliary mode.
3. Press the recirculation (REC) and fresh (FRE) switch as desired.

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

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

Operational Check

NJS0003C

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

Conditions : Engine running at normal operating temperature

CHECKING MEMORY FUNCTION

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

If NG, go to trouble diagnosis procedure for ATC-100, "Memory Function" .
If OK, continue the check.

CHECKING BLOWER

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

If NG, go to trouble diagnosis procedure for ATC-77, "Blower Motor Circuit" .
If OK, continue the check.

CHECKING DISCHARGE AIR

1. Press MODE switch and DEF switch.
2. Each position indicator should change shape.
3. Confirm that discharge air comes out according to the air distribution table. Refer to ATC-35, "Discharge Air Flow" .

Intake door position is checked in the next step.
If NG, go to trouble diagnosis procedure for ATC-68, "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 D/F or DEF is selected.

Discharge air flow

Mode door position	Air outlet/distribution		
	Vent	Foot	Defroster
	100%	–	–
	58%	42%	–
	19% (25%)	61% (75%)	20% (–)
	16%	54%	30%
	–	–	100%

( ): Manually control

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CHECKING INTAKE AIR

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

If NG, go to trouble diagnosis procedure for ATC-74, "Intake Door Motor Circuit" .
If OK, continue the check.

CHECKING TEMPERATURE DECREASE

1. Turn temperature control dial counterclockwise until 18°C (60°F) is displayed.
2. Check for cold air at discharge air outlets.

If NG, go to trouble diagnosis procedure for ATC-89, "Insufficient Cooling" .
If OK, continue the check.

CHECKING TEMPERATURE INCREASE

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

If NG, go to trouble diagnosis procedure for ATC-97, "Insufficient Heating" .
If OK, continue the check.

CHECKING A/C SWITCH

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

If NG, go to trouble diagnosis procedure for ATC-82, "Magnet Clutch Circuit" .
If OK, continue the check.

CHECKING AUTO. ECON MODE

1. Press AUTO. ECON switch.
2. Display should indicate AUTO (not ECON).
3. Press AUTO. ECON switch again.
4. Display should indicate ECON.
   - Confirm that discharge air and blower speed will depend on ambient, in-vehicle, and set temperatures.

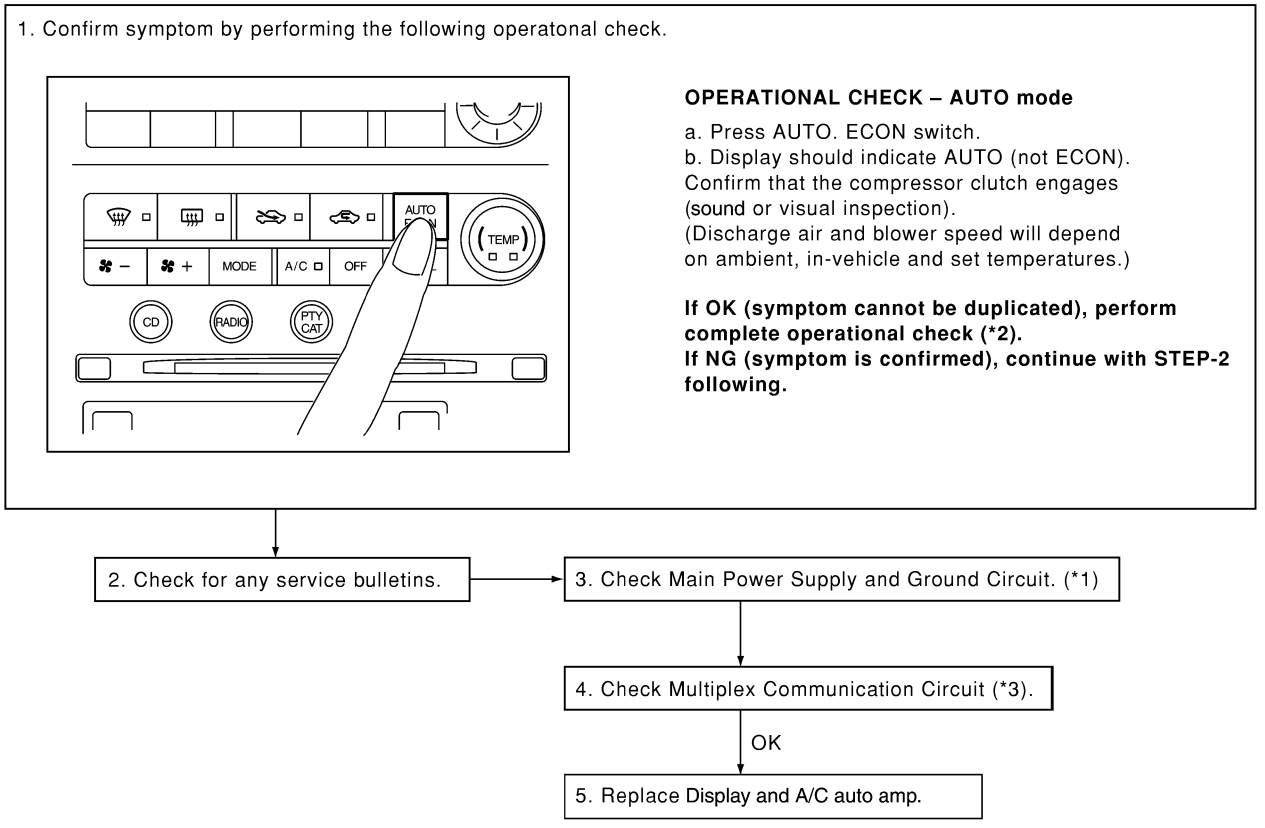
If NG, go to trouble diagnosis procedure for ATC-61, "Power Supply and Ground Circuit for Auto Amp." , then if necessary, trouble diagnosis procedure for ATC-82, "Magnet Clutch Circuit" .
If all operational checks are OK (symptom cannot be duplicated), go to Incident Simulation Tests in GI-27, "How to Perform Efficient Diagnosis for an Electrical Incident" and perform tests as outlined to simulate driving conditions environment. If symptom appears, refer to ATC-39, "SYMPTOM TABLE" and perform applicable trouble diagnosis procedures.

Power Supply and Ground Circuit for Auto Amp.

NJS0003D

SYMPTOM: A/C system does not come on.

INSPECTION FLOW



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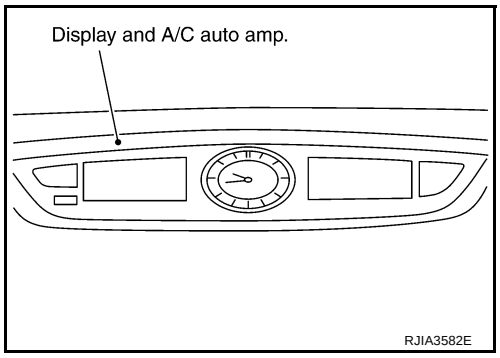
*1 ATC-62, "DIAGNOSIS PROCEDURE FOR A/C SYSTEM"
*2 ATC-60, "Operational Check"
*3 ATC-111, "Multiplex Communication Circuit"

COMPONENT DESCRIPTION

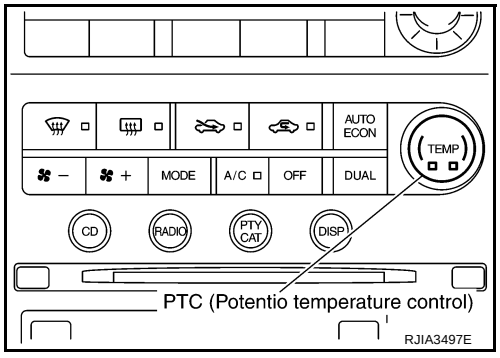
Display and A/C Auto Amp. (Automatic Amplifier)

The display and A/C auto 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 display and A/C auto amp. from the A/C and audio controller using multiplex communication.
Self-diagnosis functions are also built into display and A/C auto amp. to provide quick check of malfunctions in the auto air conditioner system.



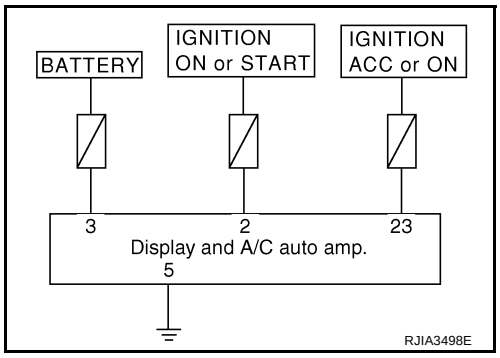
Potentio Temperature Control (PTC)

The PTC is built into the A/C and audio controller. It can be set at an interval of 0.5°C (1.0°F) in the 18°C (60°F) to 32°C (90°F) temperature range by turning temperature control dial. The set temperature is displayed.



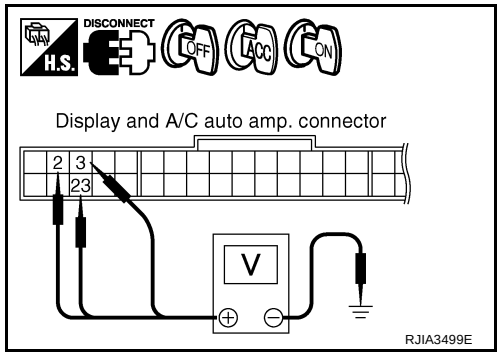
DIAGNOSIS PROCEDURE FOR A/C SYSTEM

SYMPTOM: A/C system does not come on.



1. CHECK POWER SUPPLY CIRCUIT FOR DISPLAY AND A/C AUTO AMP.

1. Disconnect display and A/C auto amp. connector.
2. Check voltage between display and A/C auto amp. harness connector M31 terminals 2, 3, 23 and ground.



Terminals			Ignition switch position		
(+)		(–)	OFF	ACC	ON
Display and A/C auto amp. connector	Terminal No.				
M31	2	Ground	Approx. 0 V	Approx. 0 V	Battery voltage
M31	3		Battery voltage	Battery voltage	Battery voltage
M31	23		Approx. 0 V	Battery voltage	Battery voltage

OK or NG

OK >> GO TO 2.

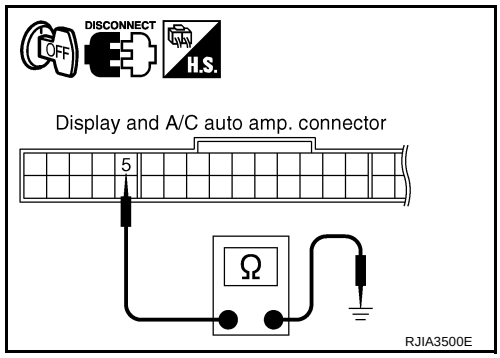
NG >> Check 10A fuses [Nos. 6, 12 and 19, located in the fuse block (J/B)]. Refer to PG-73, "FUSE BLOCK - JUNCTION BOX (J/B)" .

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

2. CHECK GROUND CIRCUIT FOR DISPLAY AND A/C AUTO AMP.

1. Turn ignition switch OFF.
2. Check continuity between display and A/C auto amp. harness connector M31 terminal 5 and ground.

5 – Ground : Continuity should exist.



OK or NG

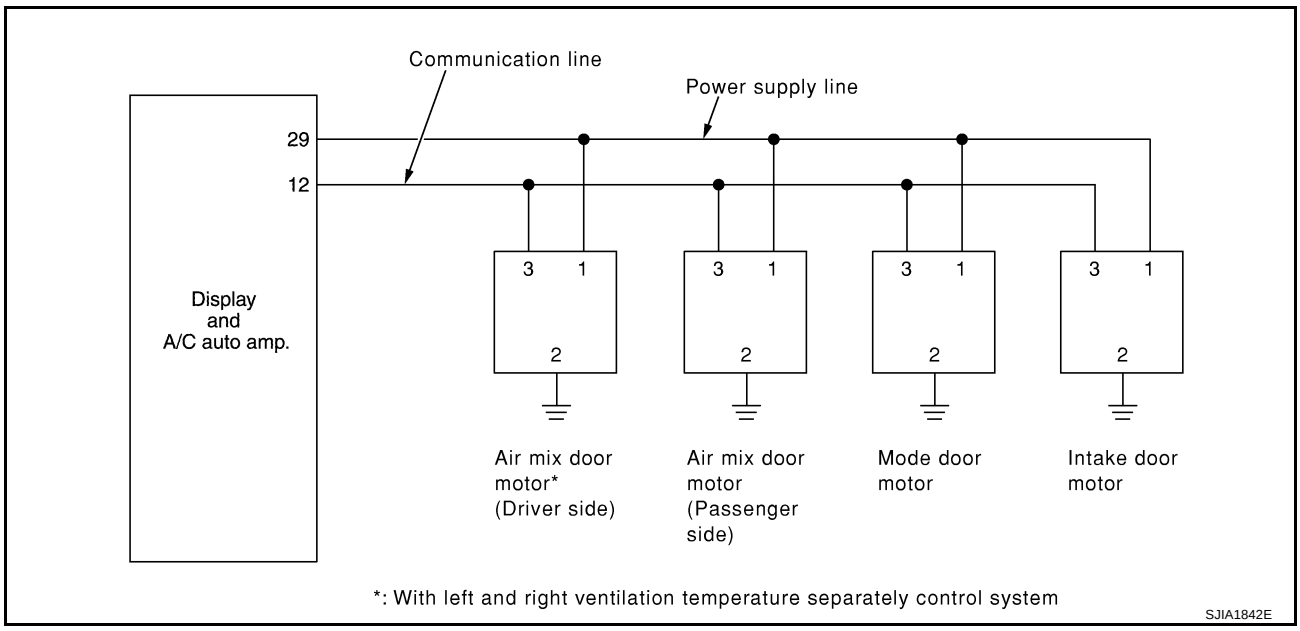
OK >> Replace display and A/C auto amp.

NG >> Repair harness or connector.

LAN System Circuit

NJS0003E

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

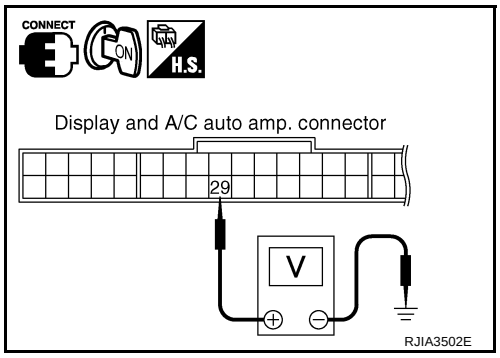


DIAGNOSIS PROCEDURE FOR LAN CIRCUIT

1. CHECK POWER SUPPLY FOR DISPLAY AND A/C AUTO AMP.

1. Turn ignition switch ON.
2. Check voltage between display and A/C auto amp. harness connector M31 terminal 29 and ground.

29 – Ground : Battery voltage

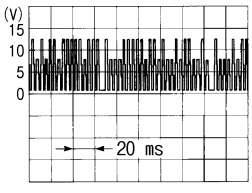


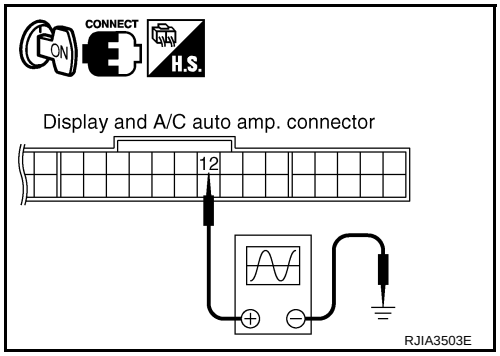
OK or NG

OK >> GO TO 2.
NG >> Replace display and A/C auto amp.

2. CHECK SIGNAL FOR DISPLAY AND A/C AUTO AMP.

Confirm A/C LAN signal between display and A/C auto amp. harness connector M31 terminal 12 and ground using an oscilloscope.

Terminals			Voltage
(+)		(–)	
Display and A/C auto amp. connector	Terminal No.		
M31	12	Ground	



OK or NG

OK >> GO TO 3.
NG >> Replace display and A/C auto amp.

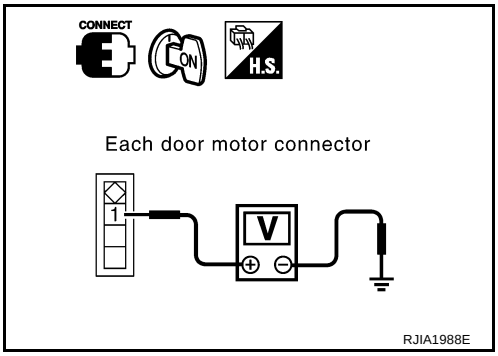
3. CHECK POWER SUPPLY FOR EACH DOOR MOTOR

Check voltage between each door motor harness connector terminal 1 and ground.

1 – Ground : Battery voltage

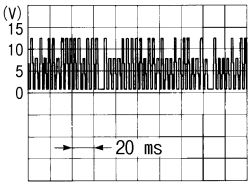
OK or NG

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 (+) Connector	Terminals (+) Terminal No.	(–)	Voltage
Mode	M252	3	Ground	
Air mix (Passenger side)	M253	3		
Air mix (Driver side)*	M254	3		
Intake	M255	3		

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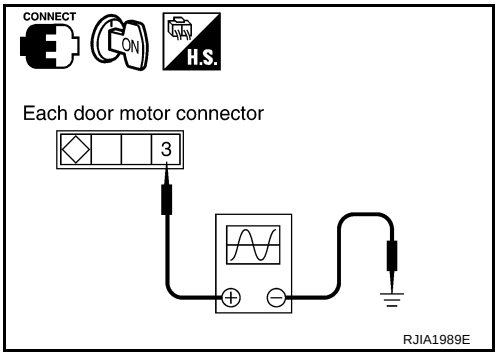
*: With left and right ventilation temperature separately control system

OK or NG

OK >> GO TO 5.
NG >> Repair harness or connector.



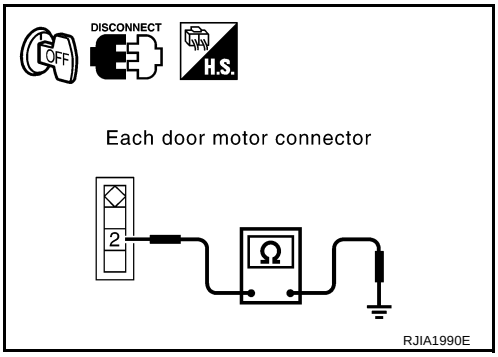
5. CHECK MOTOR GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect each door motor connector.
3. Check continuity between each door motor harness connector 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 operation of each door motor.

OK or NG

OK >> (Return to operate normally.)
- Poor contact in motor connector.

NG >> (Does not operate normally.)
- GO TO 7.

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

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

OK or NG

OK >> [Air mix (driver side, passenger side) and intake door motors operate normally.]
- Replace mode door motor.

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

8. CHECK MODE DOOR MOTOR AND INTAKE DOOR MOTOR OPERATION

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

OK or NG

OK >> (Mode and intake door motors operate normally.)
- GO TO 10.

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

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

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

OK or NG

OK >> [Mode and air mix door motor (driver side, passenger side) operate normally.]
- Replace intake door motor.

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

10. CHECK AIR MIX DOOR MOTOR OPERATION

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

OK or NG

OK >> [Air mix door motor (passenger side) operates normally.]
- Replace air mix door motor (driver side).

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

Mode Door Motor Circuit

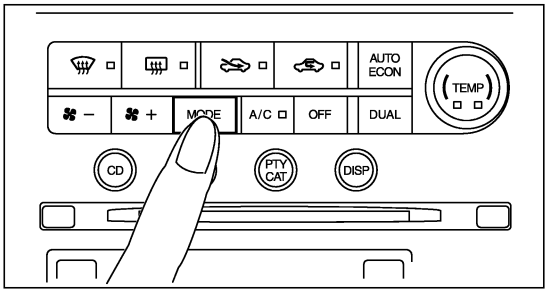
NJS0003F

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. Press mode switch and DEF switch.
b. Each position indicator should change shape.

Discharge air flow

Mode door position	Air outlet/distribution		
	Vent	Foot	Defroster
	100%	–	–
	58%	42%	–
	19% (25%)	61% (75%)	20% (–)
	16%	54%	30%
	–	–	100%

( ): Manually control

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

NOTE:

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

2. Check for any service bulletins.
3. Perform self-diagnosis STEP-1. (*3)
4. Perform self-diagnosis STEP-2. (*4)
   - OK → OK
   - NG → Go to appropriate malfunctioning sensor circuit. (*9)
5. Perform self-diagnosis STEP-3. (*4)
   - NG → Go to DIAGNOSIS PROCEDURE FOR LAN SYSTEM CIRCUIT. (*10)
   - OK
6. Perform self-diagnosis STEP-4. (*4)
   - NG → Check mode door control linkage. (*11)
     - NG → Repair or adjust control linkage.
   - OK **[Cause cannot be confirmed by self-diagnosis.]**
7. Check ambient sensor circuit. (*5)
   - OK
8. Check in-vehicle sensor circuit. (*6)
   - OK
9. Check sunload sensor circuit. (*7)
   - OK
10. Check intake sensor circuit. (*13)
    - OK
11. Check air mix door motor PBR circuit. (*8)
    - OK → If the symptom still exists, perform a complete operational check (*2) and check for other symptoms.
      [Refer to symptom table, (*12).]
      Does another symptom exist?
      - YES → Go to Trouble Diagnosis for related symptoms. **[Another symptom exists.]**
      - NO → Replace display and A/C auto amp. → INSPECTION END

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*1 ATC-35, "Discharge Air Flow"
*2 ATC-60, "Operational Check"
*3 ATC-52, "FUNCTION CONFIRMATION PROCEDURE", see No. 1.
*4 ATC-52, "FUNCTION CONFIRMATION PROCEDURE", see No. 5 to 7.
*5 ATC-100, "Ambient Sensor Circuit"
*6 ATC-103, "In-vehicle Sensor Circuit"
*7 ATC-106, "Sunload Sensor Circuit"
*8 ATC-73, "Air Mix Door Motor PBR Circuit"
*9 ATC-52, "FUNCTION CONFIRMATION PROCEDURE", see No. 14.

*10 ATC-64, "DIAGNOSIS PROCEDURE FOR LAN CIRCUIT"
*11 ATC-129, "MODE DOOR MOTOR"
*12 ATC-39, "SYMPTOM TABLE"
*13 ATC-109, "Intake Sensor Circuit"

SYSTEM DESCRIPTION

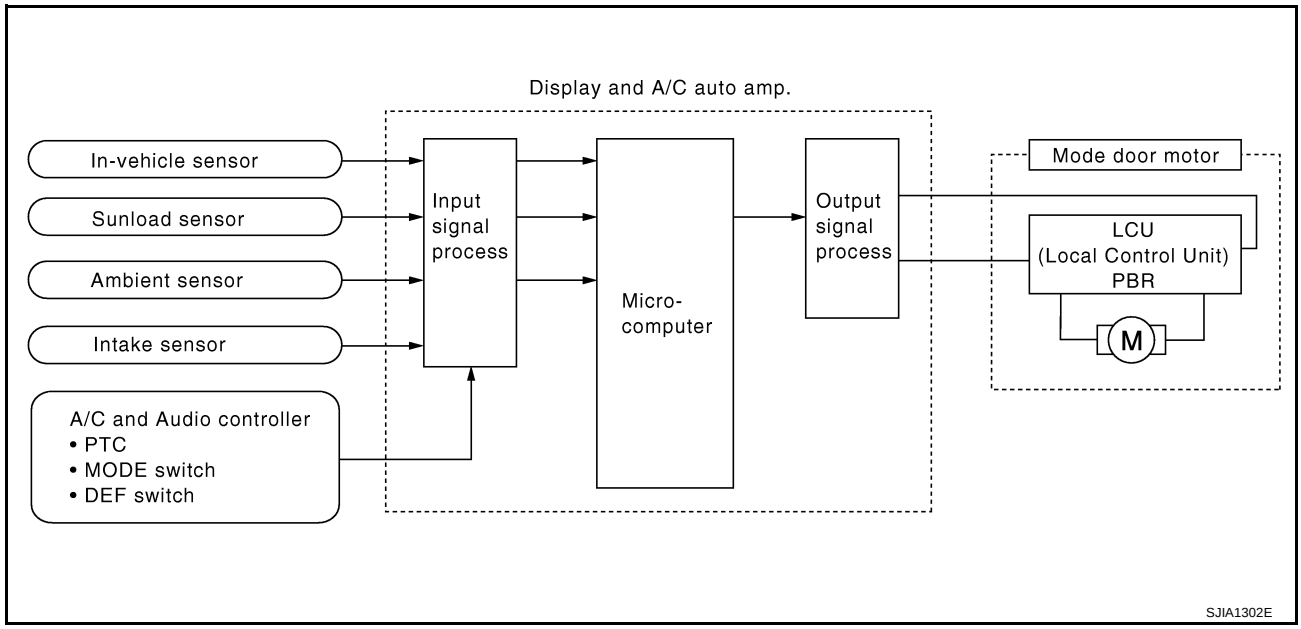
Component Parts

Mode door control system components are:

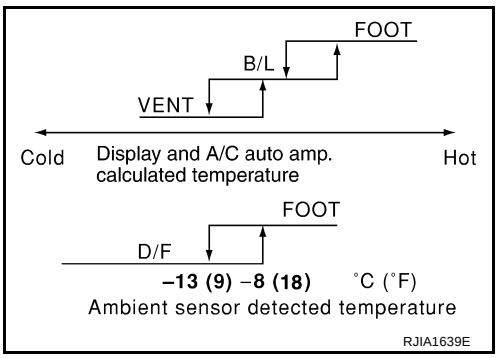
- Display and A/C auto amp.
- Mode door motor (LCU)
- A/C LAN system (PBR built-in mode door motor, air mix door motor and intake door motor)
- In-vehicle sensor
- Ambient sensor
- Sunload sensor
- Intake sensor

System Operation

The display and A/C auto amp. receives data from each of the sensors. The display and A/C auto 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 display and A/C auto amp. and each of the motor position sensors are compared by the LCUs in each door motor with the existing decision and opening angles. Subsequently, HOT/COLD, DEF/VENT and FRE/REC operation is selected. The new selection data are returned to the display and A/C auto amp.



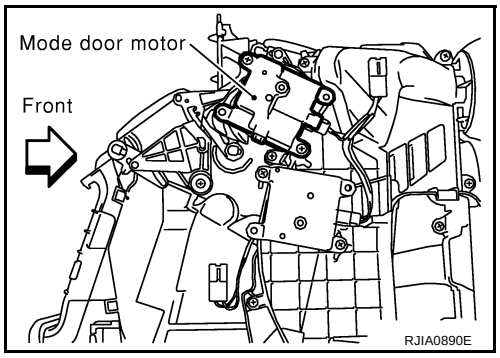
Mode Door Control Specification



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 display and A/C auto 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-64, "DIAGNOSIS PROCEDURE FOR LAN CIRCUIT" .

Air Mix Door Motor Circuit

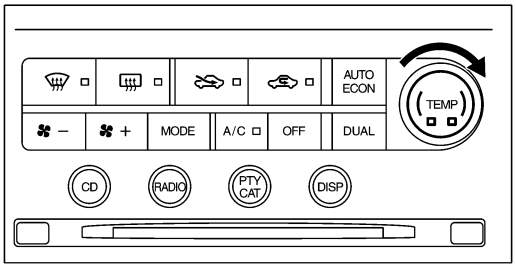
NJS0003G

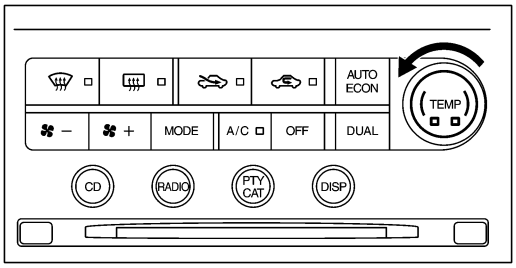
SYMPTOM

- 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) is displayed.
b. Check for hot air at discharge air outlets.

Temperature decrease

a. Turn temperature control dial counterclockwise until 18°C (60°F) is displayed.
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
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 display and A/C auto amp. → INSPECTION END

NG → Check air mix door motor. (*8)
NG → Replace air mix door motor.
OK → Go to LAN system circuit. (*7)

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*1 ATC-52, "FUNCTION CONFIRMATION PROCEDURE", see No. 1.
*2 ATC-100, "Ambient Sensor Circuit"
*3 ATC-103, "In-vehicle Sensor Circuit"
*4 ATC-106, "Sunload Sensor Circuit"
*5 ATC-73, "Air Mix Door Motor PBR Circuit"
*6 ATC-52, "FUNCTION CONFIRMATION PROCEDURE", see No. 14.
*7 ATC-64, "LAN System Circuit"
*8 ATC-71, "Air Mix Door Motor Circuit"
*9 ATC-60, "Operational Check"
*10 ATC-39, "SYMPTOM TABLE"
*11 ATC-109, "Intake Sensor Circuit"
*12 ATC-52, "FUNCTION CONFIRMATION PROCEDURE", see No. 5 to 7.

SYSTEM DESCRIPTION

Component Parts

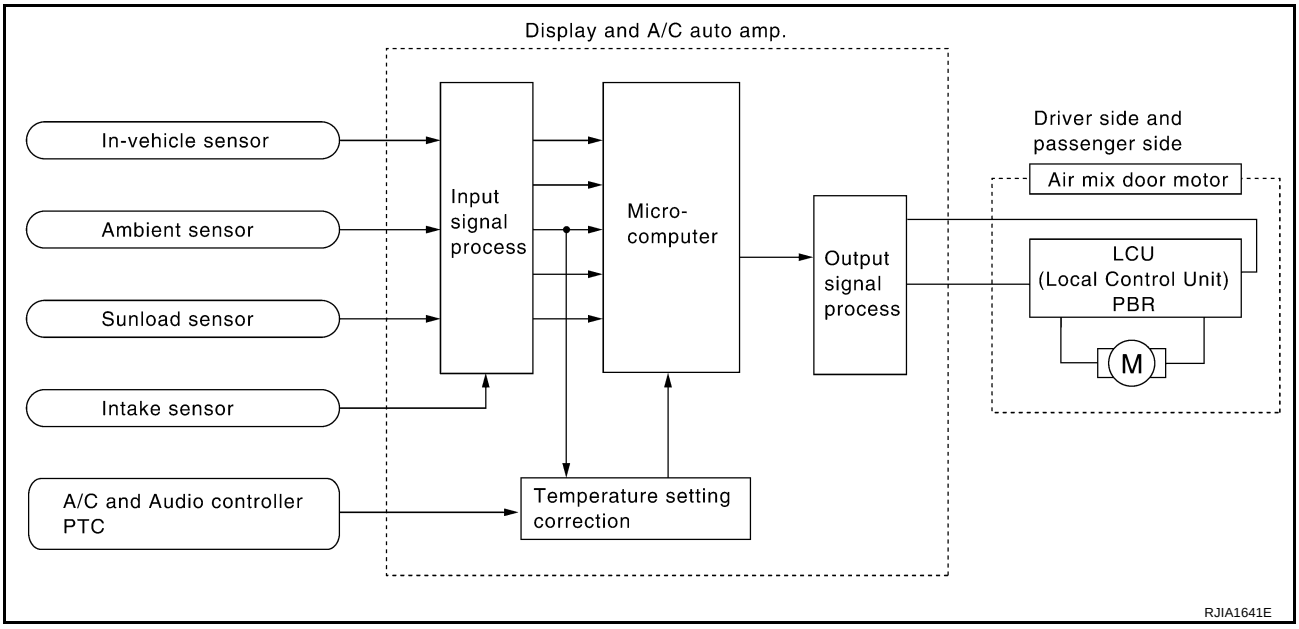
Air mix door control system components are:

- Display and A/C auto 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

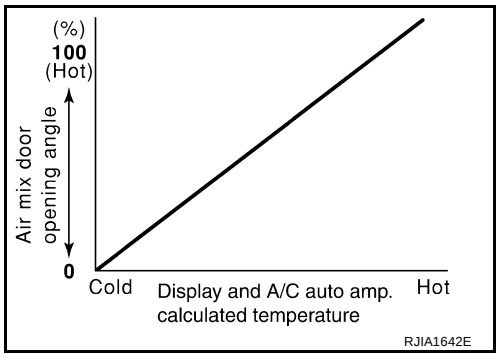
System Operation

The display and A/C auto amp. receives data from each of the sensors. The display and A/C auto 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 display and A/C auto amp. and each of the motor position sensors are compared by the LCUs in each door motor with the existing decision and opening angles. Subsequently, HOT/COLD, DEF/VENT and FRE/REC operation is selected. The new selection data are returned to the display and A/C auto amp.



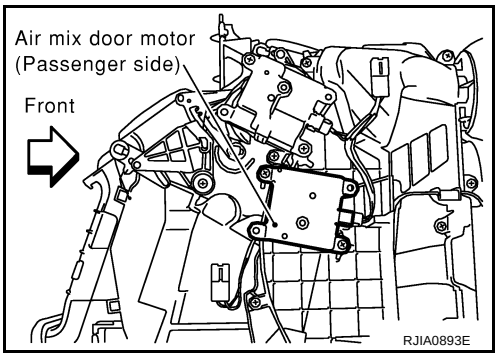
Air Mix Door Control Specification

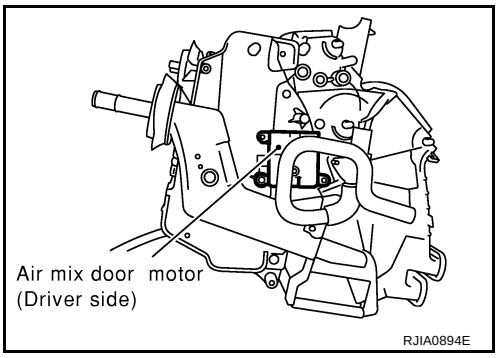


COMPONENT DESCRIPTION

Air Mix Door Motor

The air mix door motors are attached to the heater & cooling unit assembly. It rotates so that the air mix door is opened or closed to a position set by the display and A/C auto amp. Motor rotation is then sent conveyed through a shaft and the air mix door position feedback is then sent to the display and A/C auto 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-64, "DIAGNOSIS PROCEDURE FOR LAN CIRCUIT" .

Air Mix Door Motor PBR Circuit

NJS0003H

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-64, "DIAGNOSIS PROCEDURE FOR LAN CIRCUIT" .

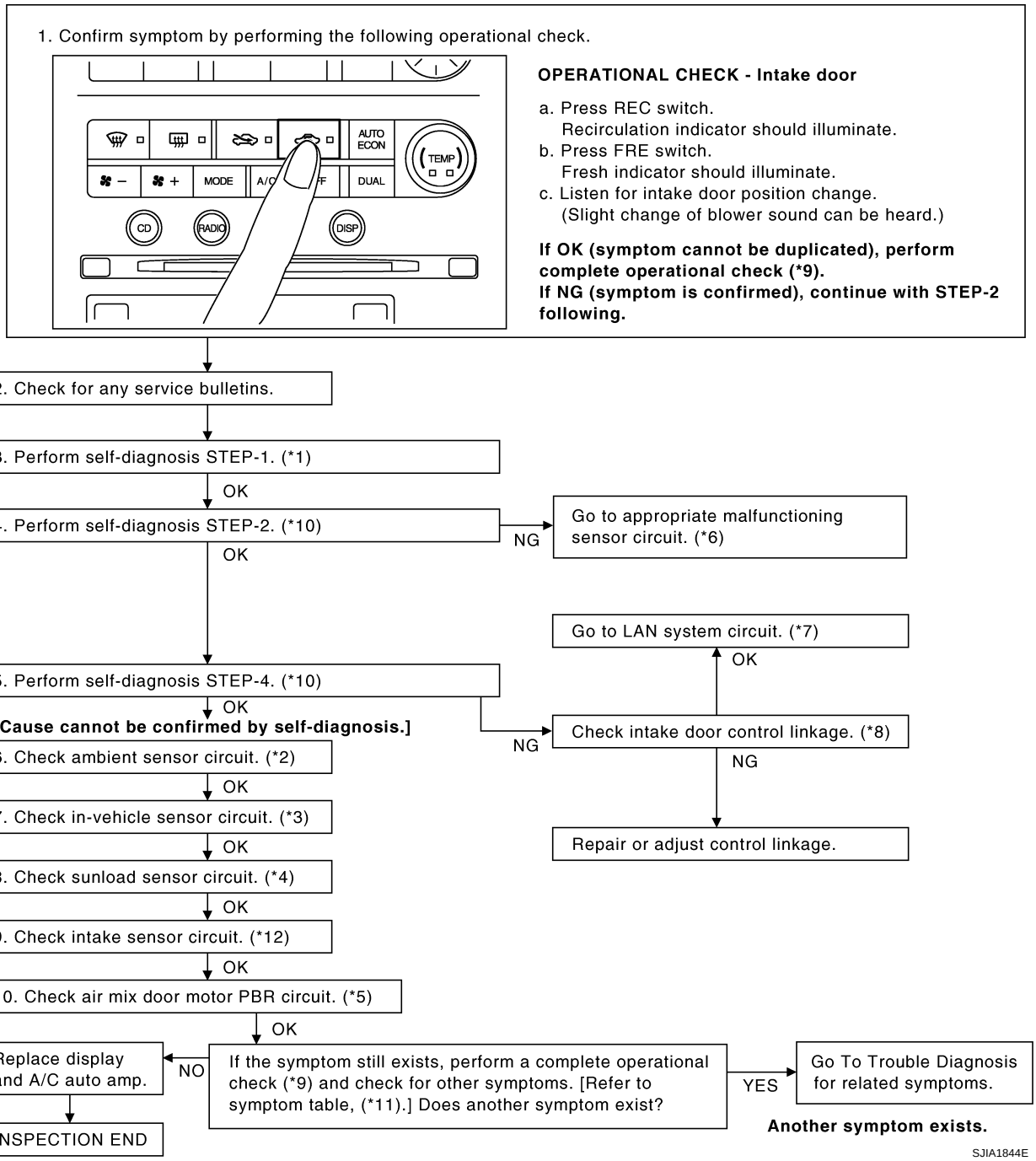
Intake Door Motor Circuit

NJS0003I

SYMPTOM

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

INSPECTION FLOW



*1	ATC-52, "FUNCTION CONFIRMATION PROCEDURE", see No. 1.	*2	ATC-100, "Ambient Sensor Circuit"	*3	ATC-103, "In-vehicle Sensor Circuit"
*4	ATC-106, "Sunload Sensor Circuit"	*5	ATC-73, "Air Mix Door Motor PBR Circuit"	*6	ATC-52, "FUNCTION CONFIRMATION PROCEDURE", see No. 14.
*7	ATC-64, "LAN System Circuit"	*8	ATC-122, "INTAKE DOOR MOTOR"	*9	ATC-60, "Operational Check"
*10	ATC-52, "FUNCTION CONFIRMATION PROCEDURE", see No. 5 to 7.	*11	ATC-39, "SYMPTOM TABLE"	*12	ATC-109, "Intake Sensor Circuit"

SYSTEM DESCRIPTION

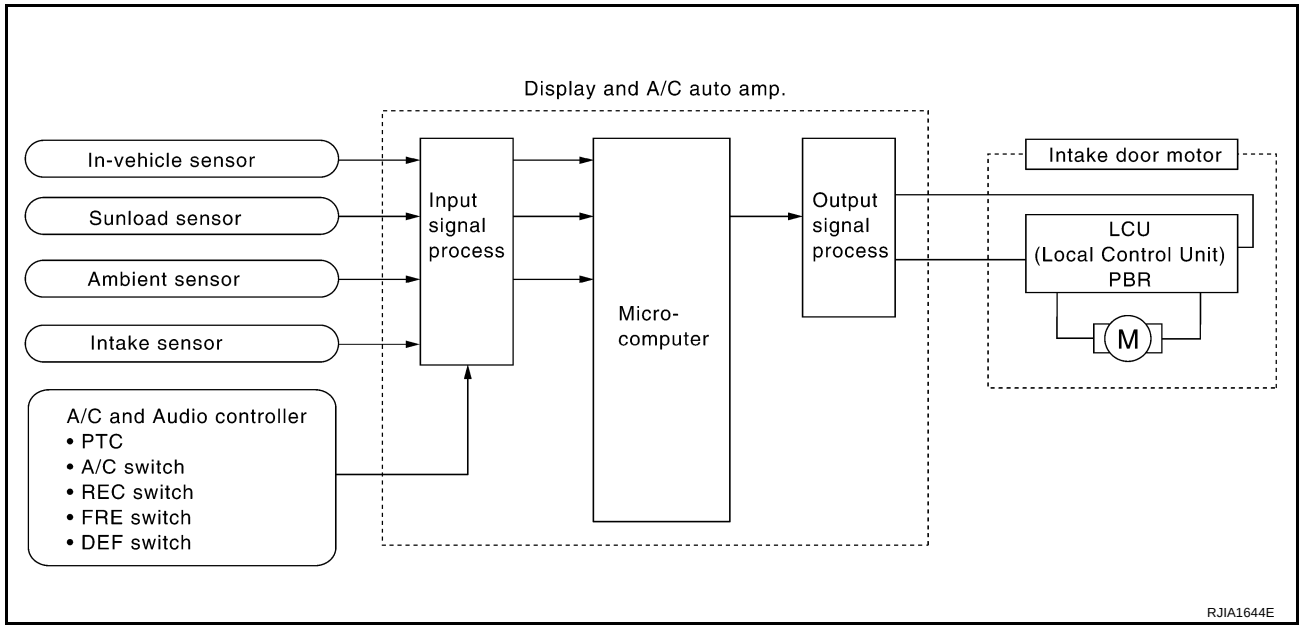
Component Parts

Intake door control system components are:

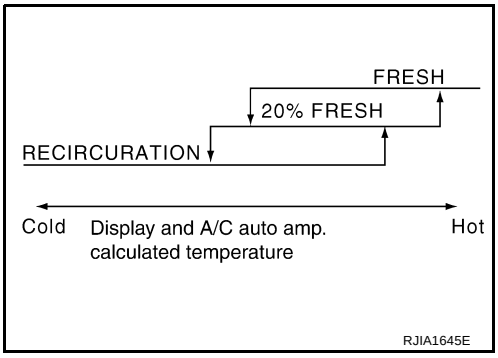
- Display and A/C auto amp.
- Intake door motor (LCU)
- A/C LAN system (PBR built-in mode door motor, air mix door motor and intake door motor)
- In-vehicle sensor
- Ambient sensor
- Sunload sensor
- Intake sensor

System Operation

The intake door control determines intake door position based on the ambient temperature, the intake air temperature and the in-vehicle temperature. When the DEF switch is pressed, the display and A/C auto amp. sets the intake door at the FRE position. When the OFF switch is pressed, the display and A/C auto amp. operates the intake doors are automatically controlled.



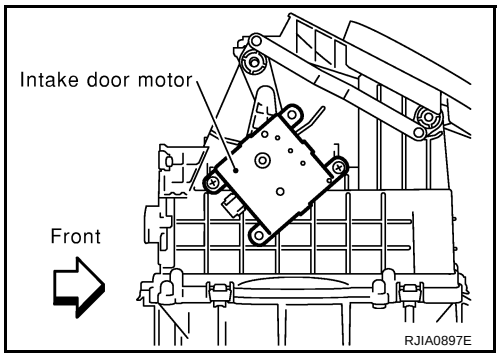
Intake Door Control Specification



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 display and A/C auto amp. Motor rotation is conveyed to a lever which activates the intake door.



DIAGNOSIS PROCEDURE FOR INTAKE DOOR MOTOR

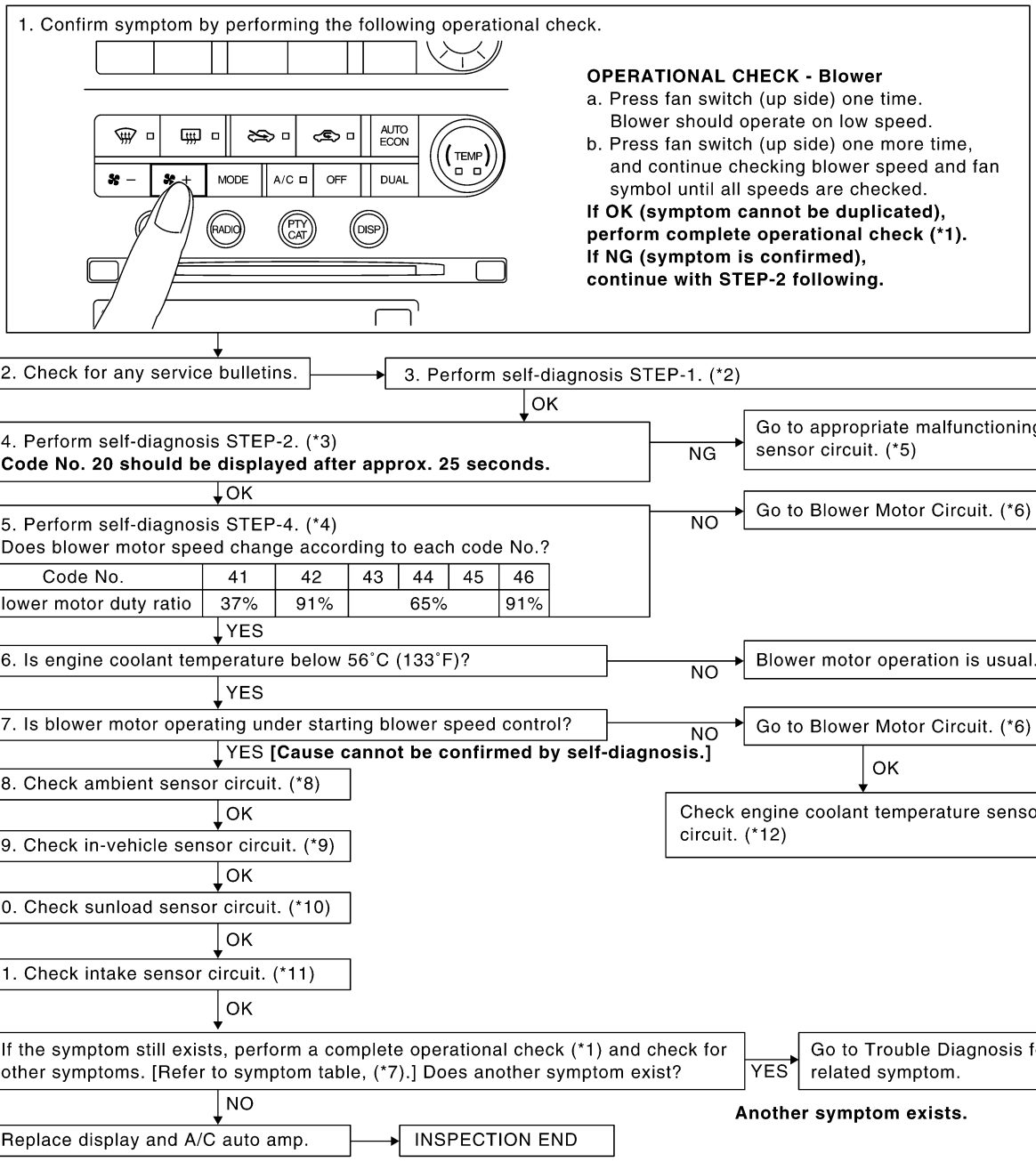
SYMPTOM: Intake door motor does not operate normally.
Perform diagnosis procedure. Refer to ATC-64, "DIAGNOSIS PROCEDURE FOR LAN CIRCUIT" .

Blower Motor Circuit

NJS0003J

SYMPTOM: Blower motor operation is malfunctioning.

INSPECTION FLOW



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*1	ATC-60, "Operational Check"	*2	ATC-52, "FUNCTION CONFIRMATION PROCEDURE", see No. 1.	*3	ATC-52, "FUNCTION CONFIRMATION PROCEDURE", see No. 5.
*4	ATC-52, "FUNCTION CONFIRMATION PROCEDURE", see No. 7.	*5	ATC-52, "FUNCTION CONFIRMATION PROCEDURE", see No. 14.	*6	ATC-79, "DIAGNOSIS PROCEDURE FOR BLOWER MOTOR"
*7	ATC-39, "SYMPTOM TABLE"	*8	ATC-100, "Ambient Sensor Circuit"	*9	ATC-103, "In-vehicle Sensor Circuit"
*10	ATC-106, "Sunload Sensor Circuit"	*11	ATC-109, "Intake Sensor Circuit"	*12	EC-227, "DTC P0117, P0118 ECT SENSOR"

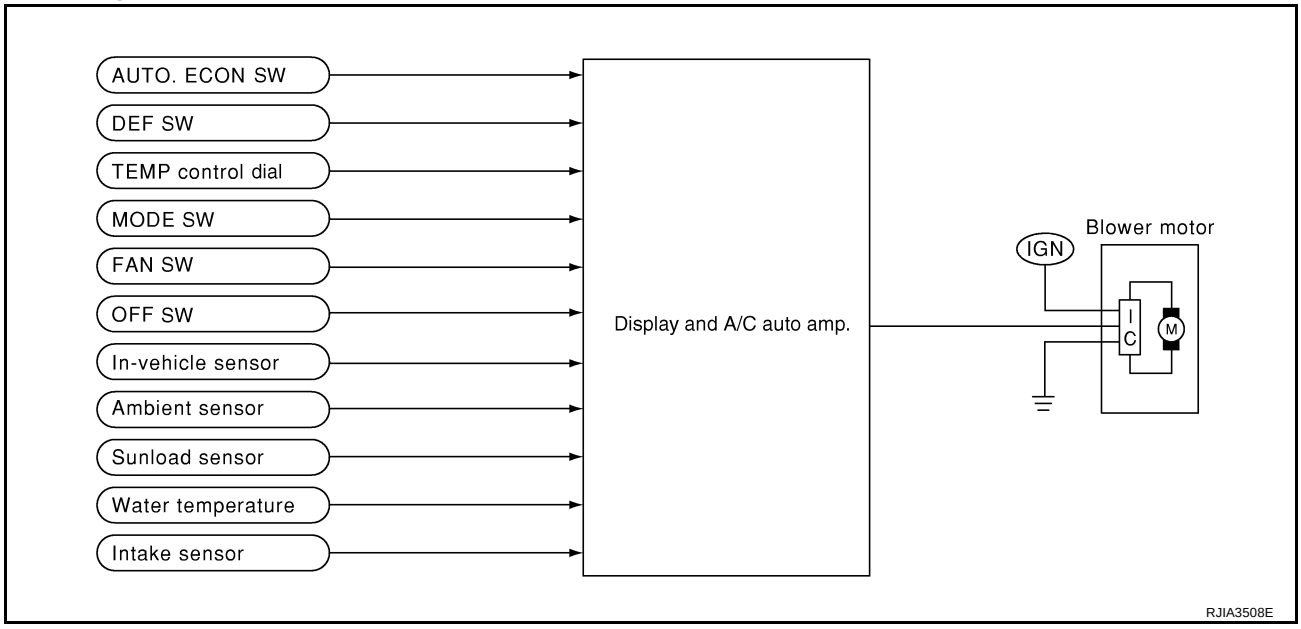
SYSTEM DESCRIPTION

Component Parts

Fan speed control system components are:

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

Starting Fan Speed Control

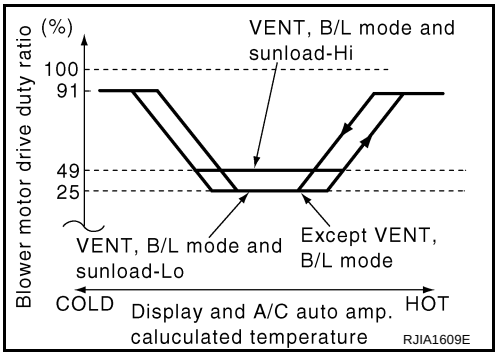
Start up from COLD SOAK Condition (Automatic mode)
In a cold start up condition where the engine coolant temperature is below 56°C (133°F), the blower will not operate for a short period of time (up to 150 seconds). The exact start delay time varies depending on the ambient and engine coolant temperature.
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), at which time 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 pressed. The blower speed will gradually rise to the objective speed over a time period of 3 seconds or less (actual time depends on the objective blower speed).

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 low speed is at duty ratio 25%. During high sunload conditions, the display and A/C auto amp. raise the blower speed (duty ratio 49%).

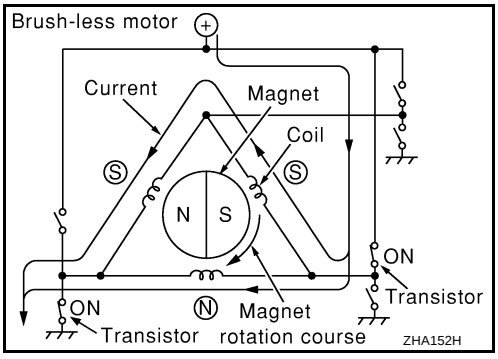
Fan Speed Control Specification



COMPONENT DESCRIPTION

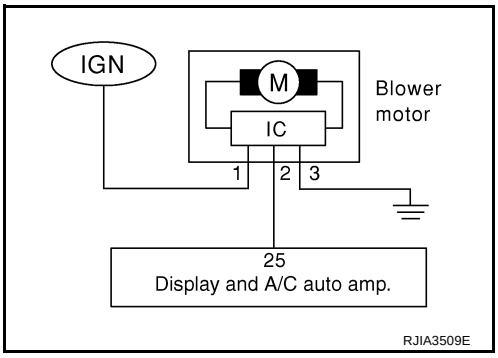
Brush-less Motor

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

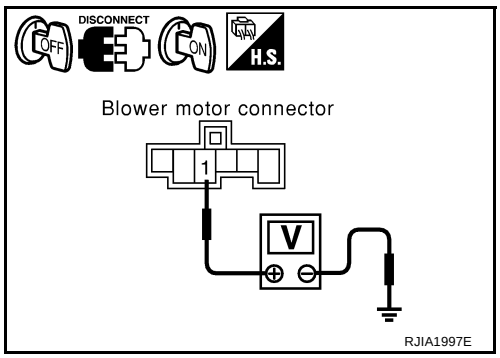
SYMPTOM: Blower motor operation is malfunctioning.



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

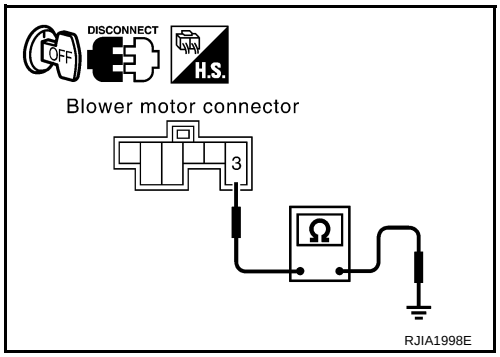
OK >> GO TO 2.
NG >> Check power supply circuit and 15A fuses [Nos. 10 and 11, located in the fuse block (J/B)]. Refer to PG-73, "FUSE BLOCK - JUNCTION BOX (J/B)" .

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

2. CHECK 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.



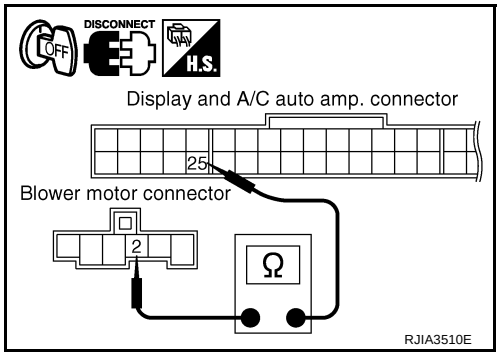
OK or NG

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

3. CHECK CIRCUIT CONTINUITY BLOWER MOTOR AND DISPLAY AND A/C AUTO AMP.

1. Disconnect display and A/C auto amp. connector.
2. Check continuity between blower motor harness connector M62 terminal 2 and display and A/C auto amp. harness connector M31 terminal 25.

2 – 25 : Continuity should exist.

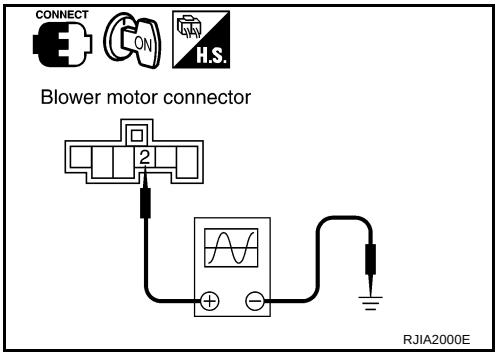


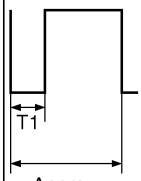
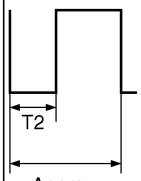
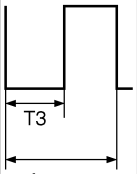
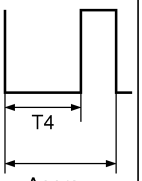
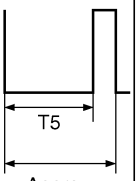
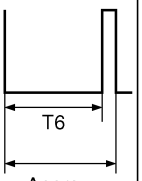
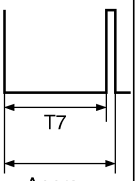
OK or NG

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

4. CHECK DISPLAY AND A/C AUTO AMP. OUTPUT SIGNAL

1. Reconnect blower motor connector and display and A/C auto 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	2nd	3rd	4th	5th	6th	7th
Blower motor connector M62 terminal No. 2 (Oscilloscope)	 T1 Approx. 1.6 ms	 T2 Approx. 1.6 ms	 T3 Approx. 1.6 ms	 T4 Approx. 1.6 ms	 T5 Approx. 1.6 ms	 T6 Approx. 1.6 ms	 T7 Approx. 1.6 ms
Duty ratio	Approx. 21 - 33%	Approx. 35 - 43%	Approx. 45 - 53%	Approx. 55 - 63%	Approx. 65 - 75%	Approx. 77 - 87%	Approx. 89 - 91%

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

RJIA3511E

OK or NG

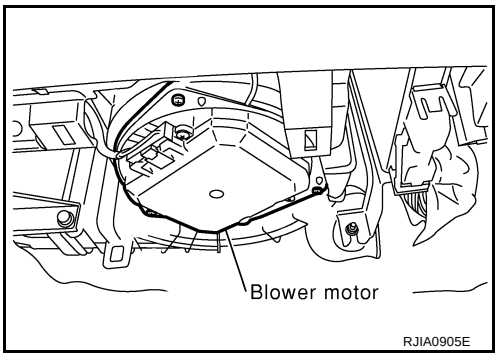
OK >> Replace blower motor after confirming the fan air flow does not change.
NG >> Replace display and A/C auto amp.

COMPONENT INSPECTION

Blower Motor

Confirm smooth rotation of the blower motor.

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

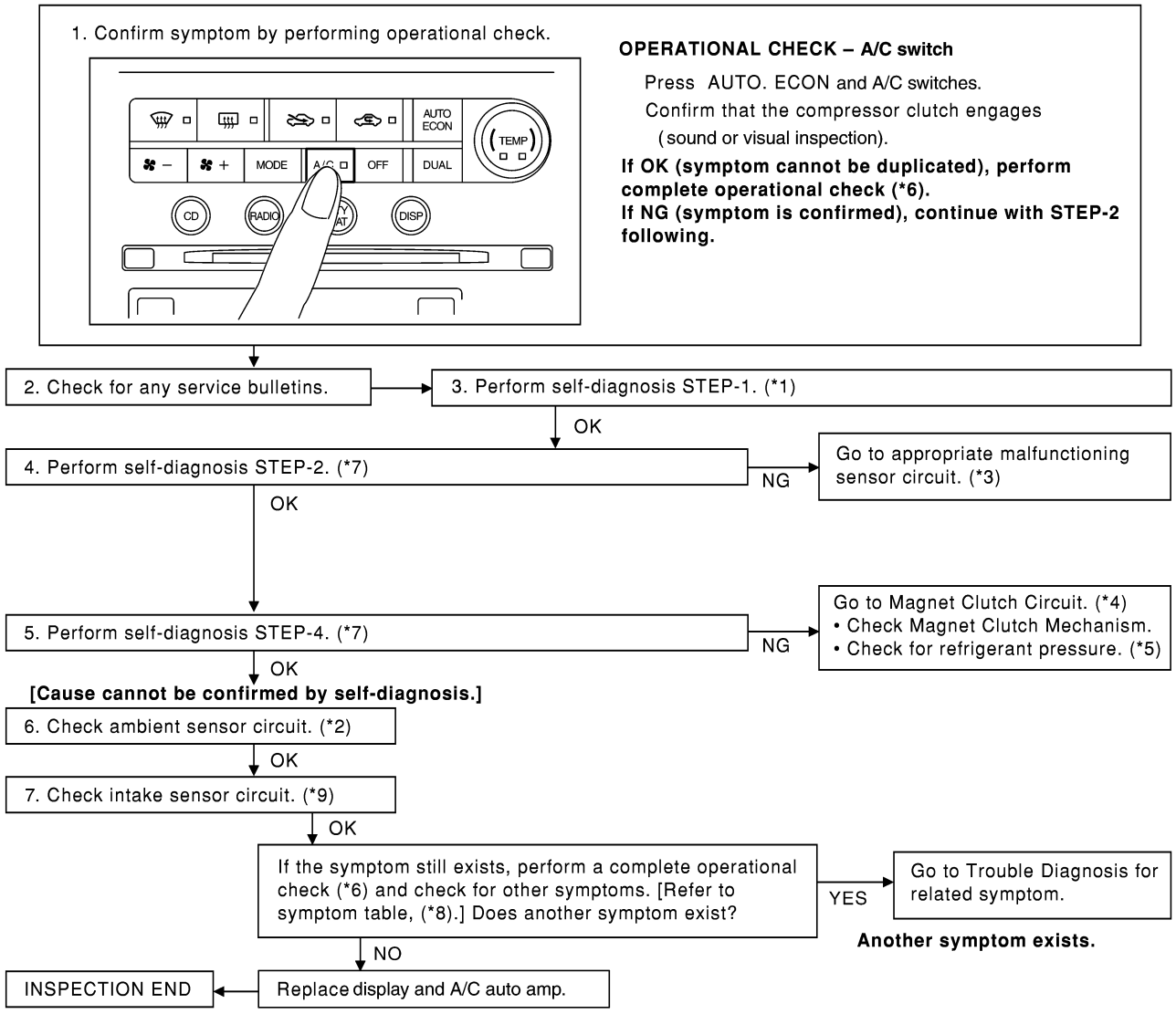


Magnet Clutch Circuit

NJS0003K

SYMPTOM: Magnet clutch does not engage.

INSPECTION FLOW



RJIA3512E

*1 ATC-52, "FUNCTION CONFIRMATION PROCEDURE", see No. 1.
*2 ATC-100, "Ambient Sensor Circuit"
*3 ATC-52, "FUNCTION CONFIRMATION PROCEDURE", see No. 14.
*4 ATC-83, "DIAGNOSIS PROCEDURE FOR MAGNET CLUTCH"
*5 ATC-93, "TROUBLE DIAGNOSIS FOR UNUSUAL PRESSURE"
*6 ATC-60, "Operational Check"
*7 ATC-52, "FUNCTION CONFIRMATION PROCEDURE", see No. 5 to 7.
*8 ATC-39, "SYMPTOM TABLE"
*9 ATC-109, "Intake Sensor Circuit"

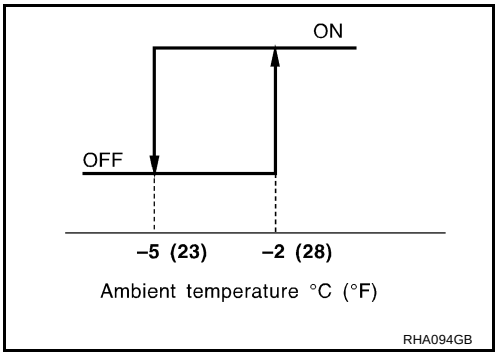
SYSTEM DESCRIPTION

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

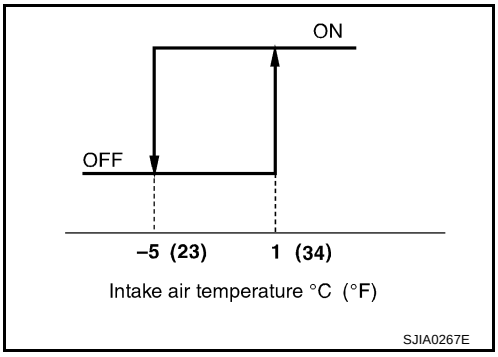
Low Temperature Protection Control

Display and A/C auto amp. will turn the 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).

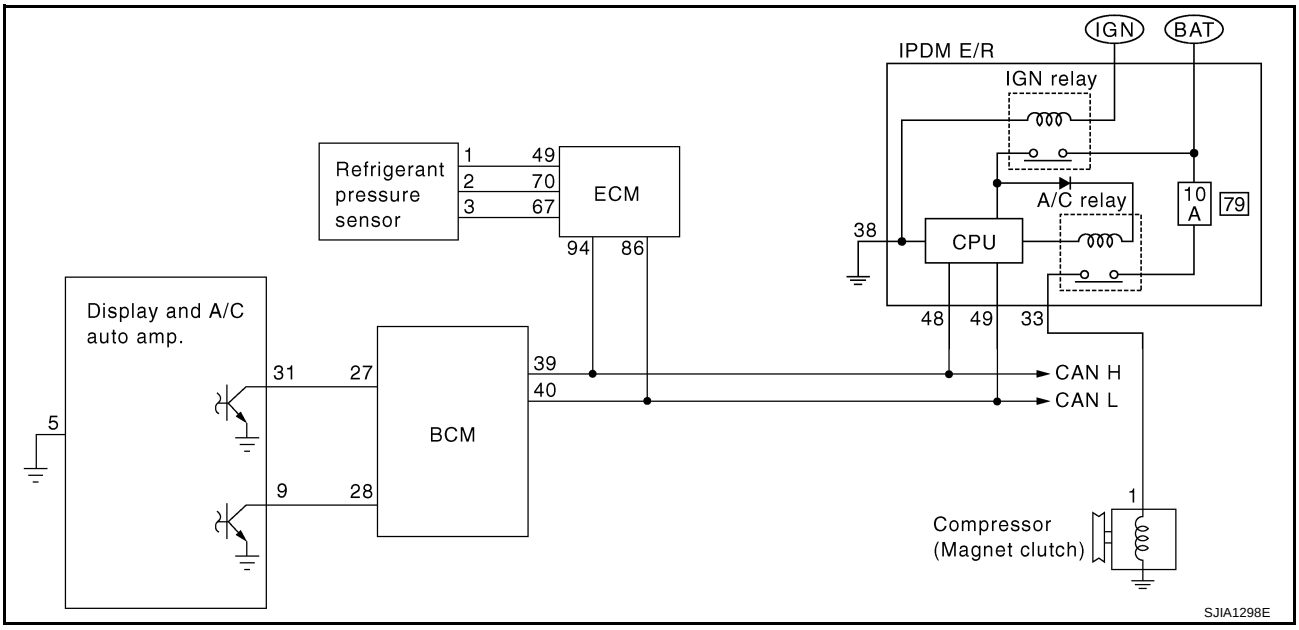


When intake air temperature is higher than 1°C (34°F), the compressor turns ON. The compressor turns OFF when intake air temperature is lower than –5°C (23°F).



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-52, "FUNCTION CONFIRMATION PROCEDURE" , see Nos. 10 and 12.

OK or NG

OK >> GO TO 2.

NG >>
- Malfunctioning ambient sensor: Refer to ATC-100, "Ambient Sensor Circuit" .
- Malfunctioning intake sensor: Refer to ATC-109, "Intake Sensor Circuit" .

2. PERFORM AUTO ACTIVE TEST

Refer to PG-21, "Auto Active Test" .

Does the magnet clutch operate?

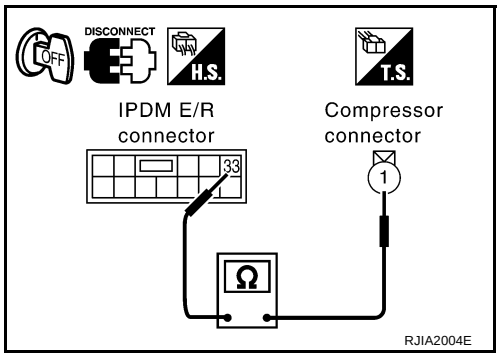
YES >>
- WITH CONSULT-II: GO TO 5.
- WITHOUT CONSULT-II: GO TO 6.

NO >> Check 10A fuse (No. 79, located in IPDM E/R), and GO TO 3. Refer to PG-24, "IPDM E/R Terminal Arrangement" .

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.



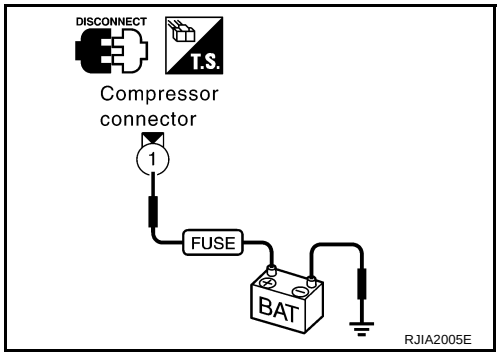
OK or NG

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

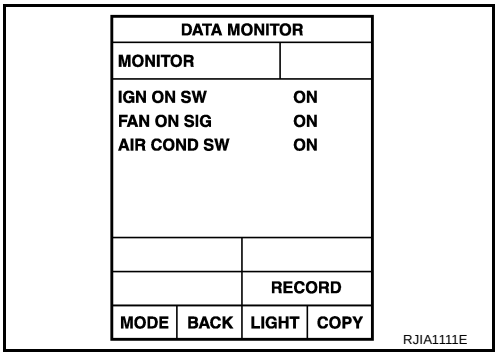
OK >> 1. Replace IPDM E/R.
2. Go to self-diagnosis procedure ATC-52, "FUNCTION CONFIRMATION PROCEDURE" and perform self-diagnosis STEP-4. Confirm that magnet clutch operation normal.

NG >> 1. Replace magnet clutch.
2. Go to self-diagnosis procedure ATC-52, "FUNCTION CONFIRMATION PROCEDURE" and perform self-diagnosis STEP-4. Confirm that magnet clutch operation normal.

5. CHECK BCM INPUT (COMPRESSOR ON) SIGNAL

Check compressor ON/OFF signal. Refer to ATC-38, "CONSULT-II Function (BCM)" .

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



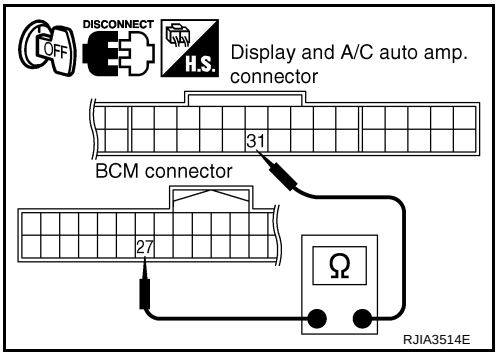
OK or NG

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

6. CHECK CIRCUIT CONTINUITY BETWEEN BCM AND DISPLAY AND A/C AUTO AMP.

1. Turn ignition switch OFF.
2. Disconnect BCM connector and display and A/C auto amp. connector.
3. Check continuity between BCM harness connector M1 terminal 27 and display and A/C auto amp. harness connector M31 terminal 31.

27 – 31 : Continuity should exist.

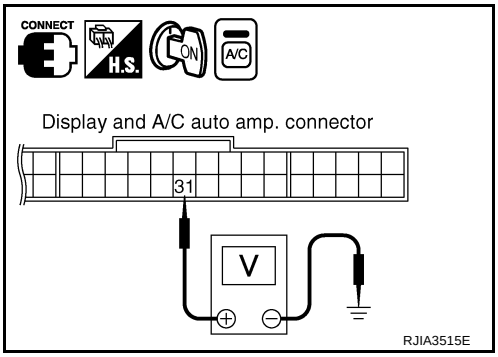


OK or NG

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

7. CHECK VOLTAGE FOR DISPLAY AND A/C AUTO AMP. (COMPRESSOR ON SIGNAL)

1. Reconnect BCM connector and display and A/C auto amp. connector.
2. Turn ignition switch ON.
3. Check voltage between display and A/C auto amp. harness connector M31 terminal 31 and ground.



Terminals			Condition	Voltage
(+)		(–)		
Display and A/C auto amp. connector	Terminal No.			
M31	31	Ground	A/C switch: ON (Blower motor operates.)	Approx. 0 V
			OFF switch: ON (A/C system: OFF)	Approx. 5 V

OK or NG

OK >> GO TO 8.
NG-1 >> If the voltage is approx. 5 V when A/C switch is ON: Replace display and A/C auto amp.
NG-2 >> If the voltage is approx. 0 V when A/C switch is OFF: Replace BCM.

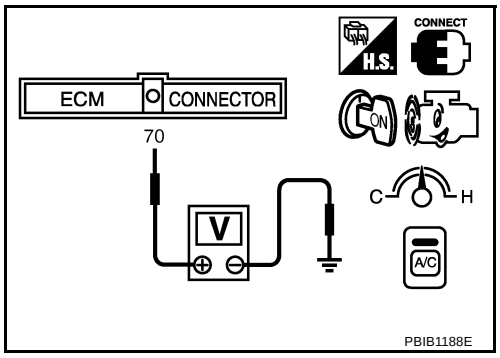
8. CHECK REFRIGERANT PRESSURE SENSOR

WITH CONSULT-II

1. Start the engine.
2. Check the voltage of refrigerant pressure sensor. Refer to EC-135, "CONSULT-II Reference Value in Data Monitor" .

WITHOUT CONSULT-II

1. Start the engine.
2. Check voltage between ECM harness connector F108 terminal 70 and ground.



Terminals			Condition	Voltage
(+)		(–)		
ECM connector	Terminal No.			
F108	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.

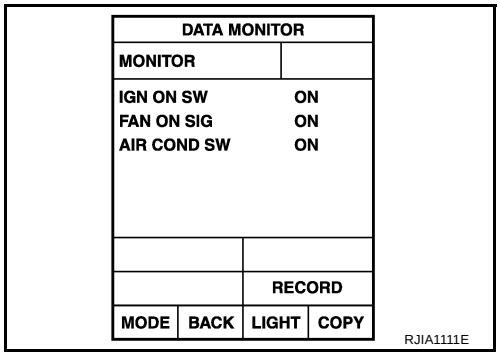
NG >> Refer to EC-678, "REFRIGERANT PRESSURE SENSOR" .

9. CHECK BCM INPUT (FAN ON) SIGNAL

Check FAN ON/OFF signal. Refer to ATC-38, "CONSULT-II Function (BCM)" .

FAN SW ON : FAN ON SIG ON

FAN SW OFF : FAN ON SIG OFF



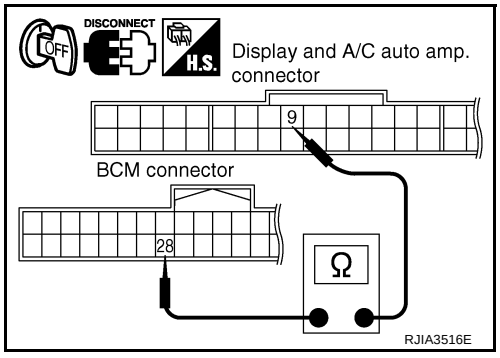
OK or NG

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

10. CHECK CIRCUIT CONTINUITY BETWEEN BCM AND DISPLAY AND A/C AUTO AMP.

1. Turn ignition switch OFF.
2. Disconnect BCM connector and display and A/C auto amp. connector.
3. Check continuity between BCM harness connector M1 terminal 28 and display and A/C auto amp. harness connector M31 terminal 9.

28 – 9 : Continuity should exist.

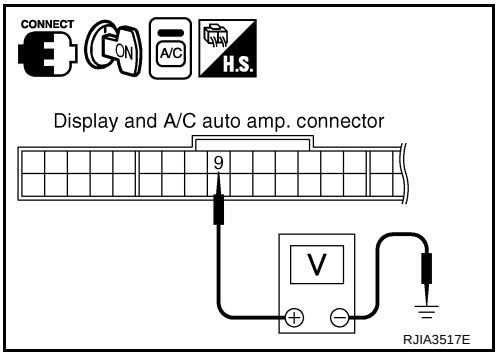


OK or NG

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

11. CHECK VOLTAGE FOR DISPLAY AND A/C AUTO AMP. (FAN ON SIGNAL)

1. Reconnect BCM connector and display and A/C auto amp. connector.
2. Turn ignition switch ON.
3. Check voltage between display and A/C auto amp. harness connector M31 terminal 9 and ground.



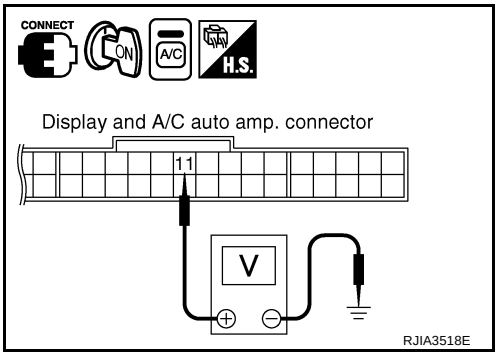
Terminals			Condition	Voltage
(+)		(–)		
Display and A/C auto amp. connector	Terminal No.			
M31	9	Ground	A/C switch: ON (Blower motor operates.)	Approx. 0 V
			OFF switch: ON (A/C system: OFF)	Approx. 5 V

OK or NG

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

12. CHECK DISPLAY AND A/C AUTO AMP. INPUT (COMPRESSOR FEEDBACK) SIGNAL

Check voltage between display and A/C auto amp. harness connector M31 terminal 11 and ground.



Terminals			Condition	Voltage
(+)		(–)		
Display and A/C auto amp. connector	Terminal No.			
M31	11	Ground	A/C switch: ON (Blower motor operates.)	Approx. 0 V
			A/C switch: ON (When refrigerant pressure sensor connector is disconnected.)	Approx. 5 V

OK or NG

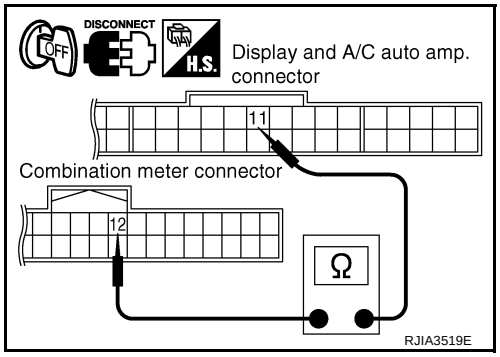
OK >> Check CAN communication. Refer to BCS-15, "CAN Communication Inspection Using CONSULT-II (Self-Diagnosis)" .
- BCM – ECM
- ECM – IPDM E/R
- ECM – Combination meter

NG-1 >> If the voltage is approx. 5 V when refrigerant pressure sensor connector is connected: GO TO 13.
NG-2 >> If the voltage is approx. 0 V when refrigerant pressure sensor connector is disconnected: Replace display and A/C auto amp.

13. CHECK CIRCUIT CONTINUITY BETWEEN COMBINATION METER AND DISPLAY AND A/C AUTO AMP.

1. Turn ignition switch OFF.
2. Disconnect display and A/C auto amp. connector and combination meter connector.
3. Check continuity between combination meter harness connector M19 terminal 12 and display and A/C auto amp. harness connector M31 terminal 11.

12 – 11 : Continuity should exist.



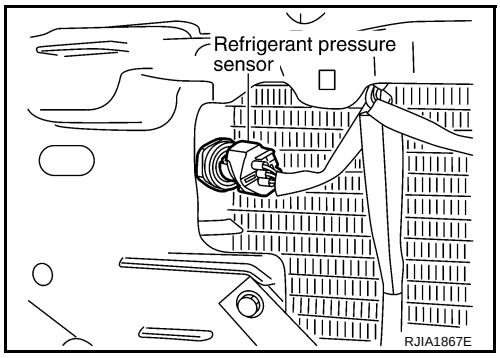
OK or NG

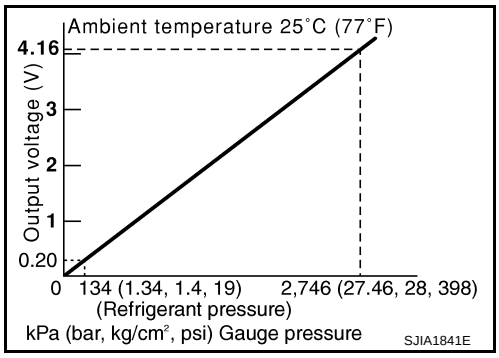
OK >> INSPECTION END
NG >> Repair harness or connector.

COMPONENT INSPECTION

Refrigerant Pressure Sensor

The refrigerant pressure sensor is attached to the condenser.
Make sure that the A/C refrigerant pressure and the sensor output voltage are within the specified range as shown in the A/C operating condition figure. Refer to EC-678, "REFRIGERANT PRESSURE SENSOR" .



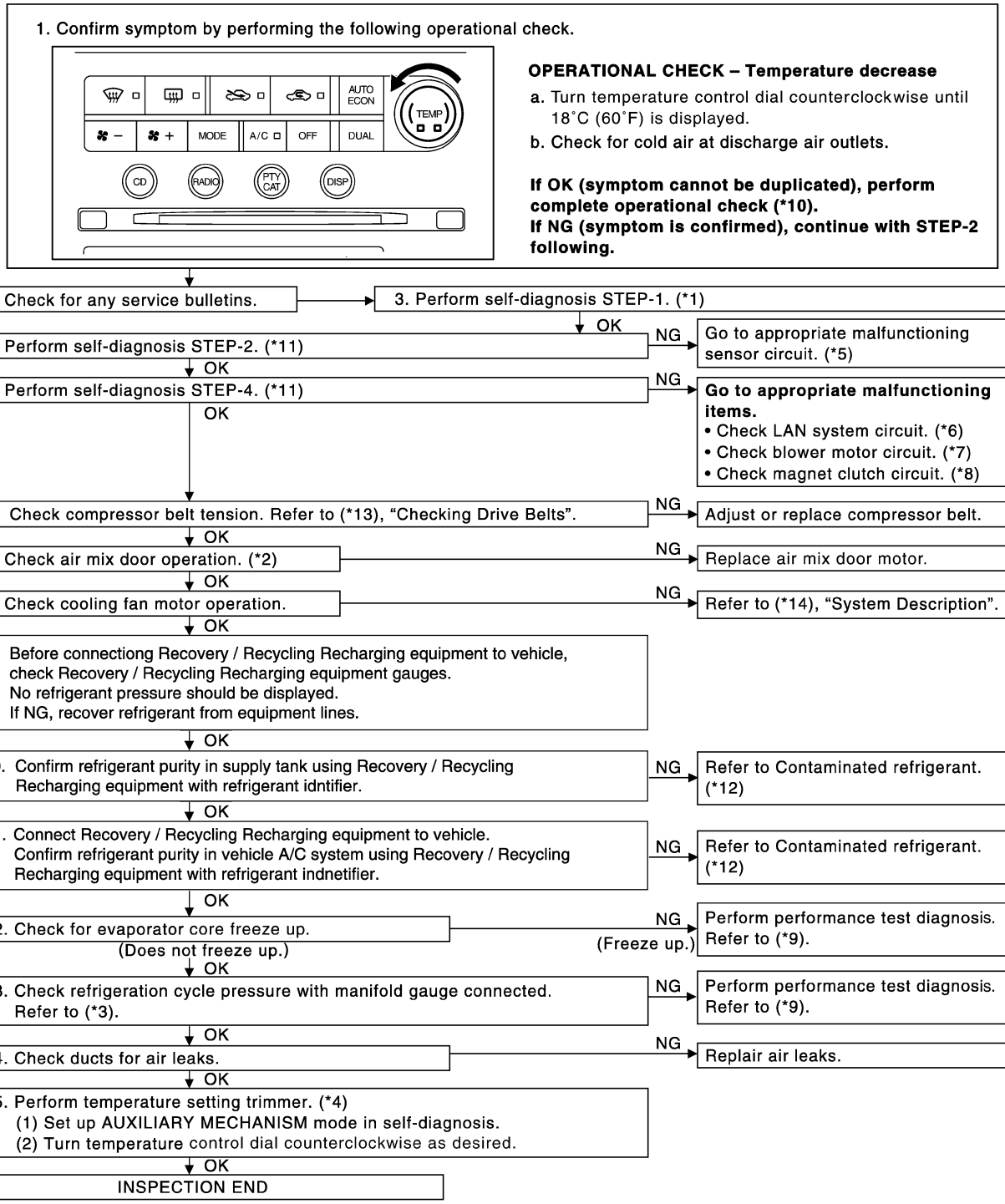


Insufficient Cooling

NJS0003L

SYMPTOM: Insufficient cooling

INSPECTION FLOW

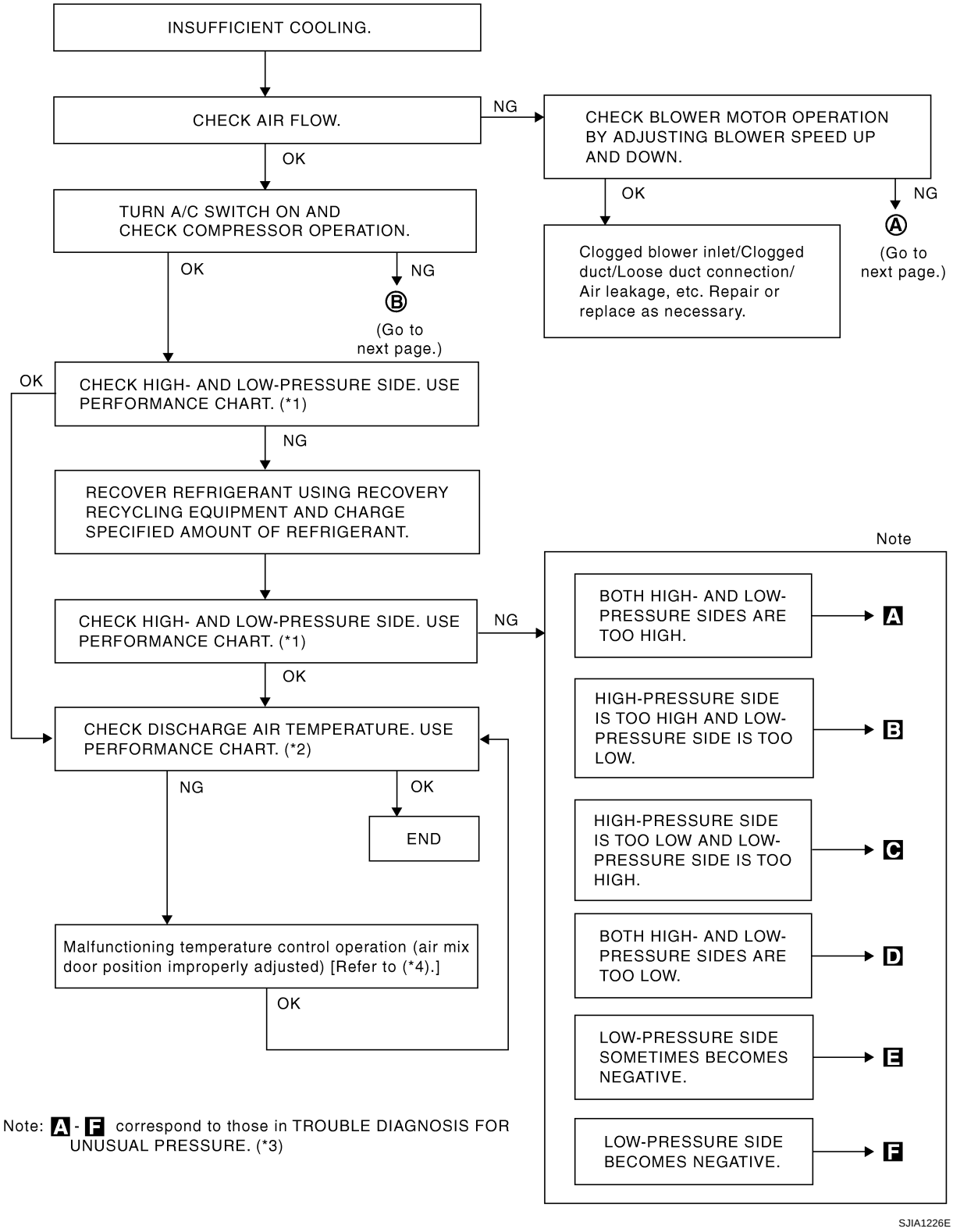


RJIA3520E

*1 ATC-52, "FUNCTION CONFIRMATION PROCEDURE", see No. 1.
*2 ATC-71, "Air Mix Door Motor Circuit"
*3 ATC-92, "Test Reading"
*4 ATC-58, "AUXILIARY MECHANISM: TEMPERATURE SETTING TRIMMER"
*5 ATC-52, "FUNCTION CONFIRMATION PROCEDURE", see No. 14.
*6 ATC-64, "LAN System Circuit"

*7 ATC-77, "Blower Motor Circuit"	*8 ATC-82, "Magnet Clutch Circuit"	*9 ATC-90, "PERFORMANCE TEST DIAGNOSIS"
*10 ATC-60, "Operational Check"	*11 ATC-52, "FUNCTION CONFIRMATION PROCEDURE", see No. 5 to 7.	*12 ATC-6, "CONTAMINATED REFRIGERANT"
*13 EM-14, "Checking Drive Belts"	*14 EC-523, "SYSTEM DESCRIPTION"	

PERFORMANCE TEST DIAGNOSIS

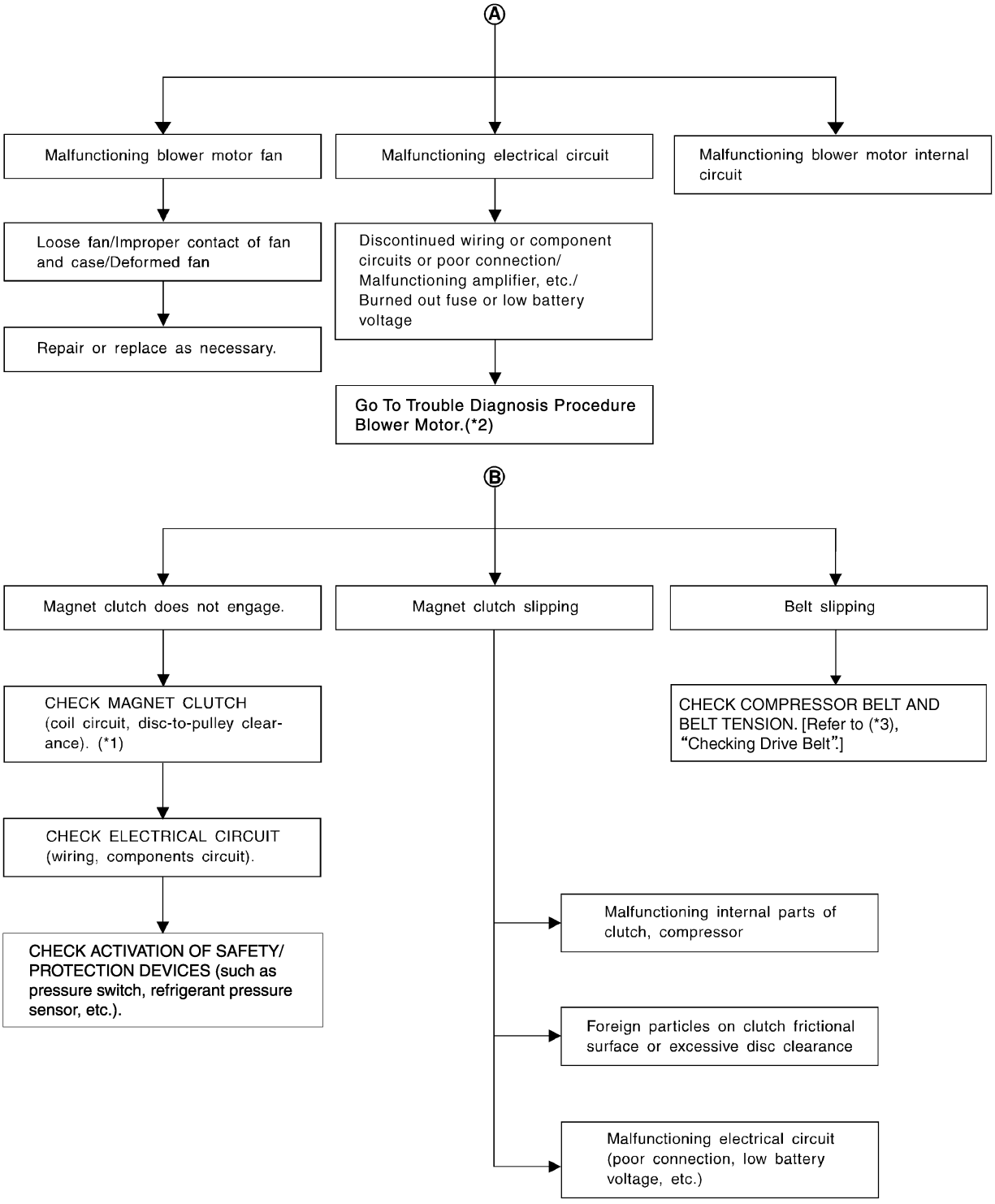


Note: A - F correspond to those in TROUBLE DIAGNOSIS FOR UNUSUAL PRESSURE. (*3)

SJIA1226E

*1 ATC-92, "PERFORMANCE CHART" *2 ATC-92, "PERFORMANCE CHART" *3 ATC-93, "TROUBLE DIAGNOSIS FOR UNUSUAL PRESSURE"

*4 ATC-71, "Air Mix Door Motor Circuit"



SJIA1642E

*1 ATC-137, "Removal and Installation of Compressor Clutch" *2 ATC-77, "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 switch	(Ventilation) set
Recirculation (REC) switch	(Recirculation) set
Fan (blower) speed	Max. speed set
Engine speed	Idle speed
Operate the air conditioning system for 10 minutes before taking measurements.	

Test Reading

Recirculating-to-discharge Air Temperature Table

Inside air (Recirculating air) at blower assembly inlet		Discharge air temperature at center ventilator °C (°F)
Relative humidity %	Air temperature °C (°F)	
50 - 60	20 (68)	9.2 - 10.4 (49 - 51)
	25 (77)	12.0 - 14.0 (54 - 57)
	30 (86)	14.4 - 17.4 (58 - 63)
	35 (95)	18.2 - 22.0 (65 - 72)
	40 (104)	23.8 - 27.4 (75 - 81)
60 - 70	20 (68)	10.4 - 11.8 (51 - 53)
	25 (77)	14.0 - 16.0 (57 - 61)
	30 (86)	17.4 - 20.8 (63 - 69)
	35 (95)	22.0 - 25.2 (72 - 77)
	40 (104)	27.4 - 31.0 (81 - 88)

Ambient Air Temperature-to-operating Pressure Table

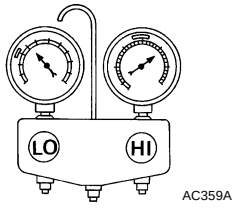
Ambient air		High-pressure (Discharge side) kPa (kg/cm^2 , psi)	Low-pressure (Suction side) kPa (kg/cm^2 , psi)
Relative humidity %	Air temperature °C (°F)		
50 - 70	20 (68)	815 - 1,000 *1 (8.3 - 10.2, 118 - 145)	220 - 260 (2.2 - 2.7, 32 - 38)
	25 (77)	960 - 1,160 *1 (9.8 - 11.8, 139 - 168)	230 - 280 (2.3 - 2.9, 33 - 41)
	30 (86)	1,230 - 1,500 *1 (12.5 - 15.3, 178 - 218)	255 - 305 (2.6 - 3.1, 37 - 44)
	35 (95)	1,200 - 1,460 *2 (12.2 - 14.9, 174 - 212)	290 - 350 (3.0 - 3.6, 42 - 51)
	40 (104)	1,330 -1,630 *2 (13.6 - 16.6, 193 - 236)	335 - 410 (3.4 - 4.2, 49 - 59)

*1: With the cooling fan motor low-speed control
*2: With the cooling fan motor high-speed control

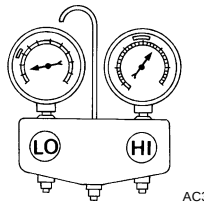
TROUBLE DIAGNOSIS FOR UNUSUAL PRESSURE

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).

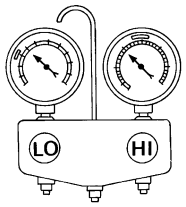
Both High- and Low-pressure Sides are Too High

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
Both high- and low-pressure sides are too high.  AC359A	The pressure return to normal 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 if 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. ● Low-pressure pipe is 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.

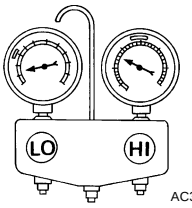
High-pressure Side is Too High and Low-pressure Side is Too Low

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.

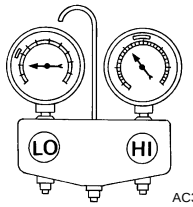
High-pressure Side is Too Low and Low-pressure Side is Too High

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.

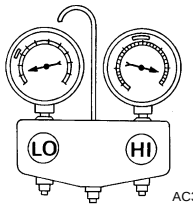
Both High- and Low-pressure Sides are Too Low

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 is 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-151, "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 expansion valve. ● Check lubricant for contamination.
	An area of the low-pressure pipe is colder than areas near the evaporator outlet.	Low-pressure pipe is clogged or crushed.	● 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-109, "Intake Sensor Circuit" . ● Replace compressor. ● Repair evaporator fins. ● Replace evaporator. ● Refer to ATC-77, "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 wet with dew.	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 malfunction, replace expansion valve. ● Replace liquid tank. ● Check lubricant for contamination.

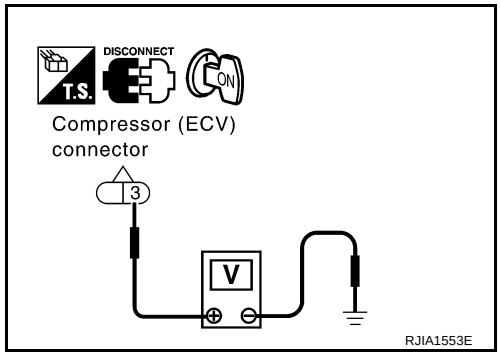
DIAGNOSIS PROCEDURE FOR INSUFFICIENT COOLING

SYMPTOM: Insufficient cooling

1. CHECK POWER SUPPLY FOR ECV (ELECTRONIC CONTROL VALVE)

1. Disconnect compressor (ECV) connector.
2. Turn ignition switch ON.
3. Check voltage between compressor (ECV) harness connector F34 terminal 3 and ground.

3 – Ground : Battery voltage



OK or NG

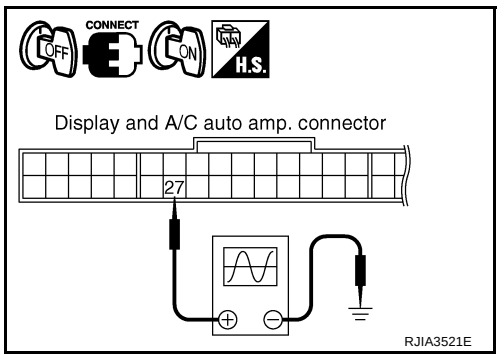
OK >> GO TO 2.

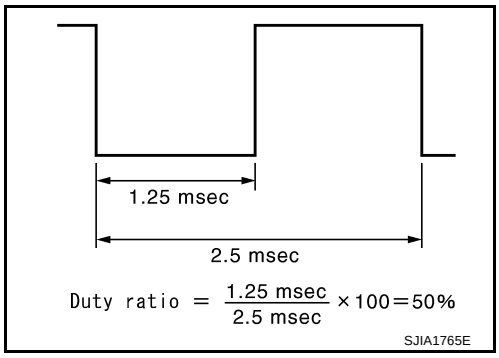
NG >> Check power supply circuit and 10A fuse [No. 12 located in the fuse block (J/B)]. Refer to PG-73, "FUSE BLOCK - JUNCTION BOX (J/B)" .

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

2. CHECK ECV CONTROL SIGNAL

1. Turn ignition switch OFF.
2. Reconnect compressor (ECV) connector.
3. Perform self-diagnosis. Refer to ATC-51, "Self-diagnosis Function" .
4. Set in self-diagnosis STEP-4 (Code No. 45). Refer to ATC-52, "FUNCTION CONFIRMATION PROCEDURE" .
5. Confirm ECV control signal between display and A/C auto amp. harness connector M31 terminal 27 and ground using an oscilloscope.





OK or NG

OK >> Replace compressor.
NG >> GO TO 3.

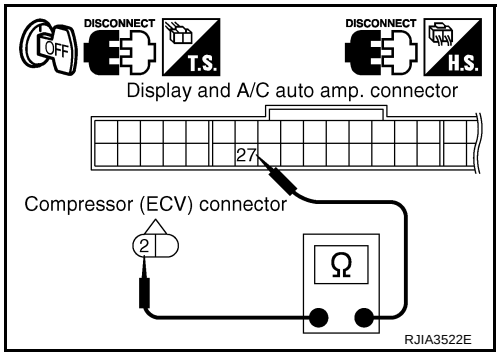
3. CHECK CIRCUIT CONTINUITY BETWEEN ECV AND DISPLAY AND A/C AUTO AMP.

1. Turn ignition switch OFF.
2. Disconnect compressor (ECV) and display and A/C auto amp. connector.
3. Check continuity between compressor (ECV) harness connector F34 terminal 2 and display and A/C auto amp. harness connector M31 terminal 27.

2 – 27 : Continuity should exist.

OK or NG

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



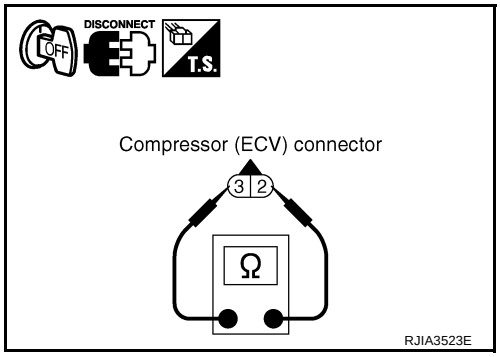
4. CHECK ECV

Check continuity between compressor (ECV) connector F34 terminals 2 and 3.

2 – 3 : Continuity should exist.

OK or NG

OK >> Replace display and A/C auto amp.
NG >> Replace compressor.

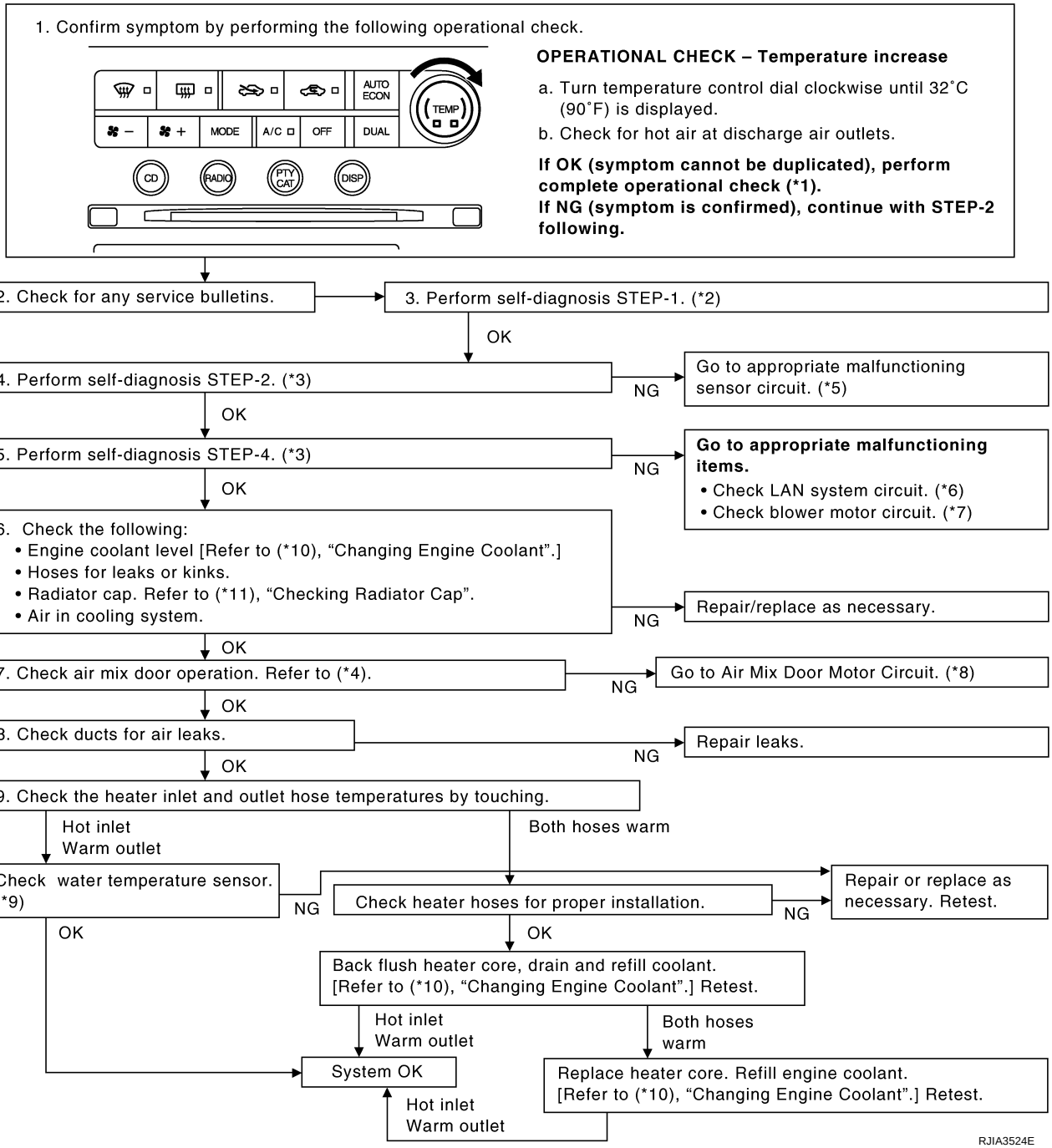


Insufficient Heating

NJS0003M

SYMPTOM: Insufficient heating

INSPECTION FLOW



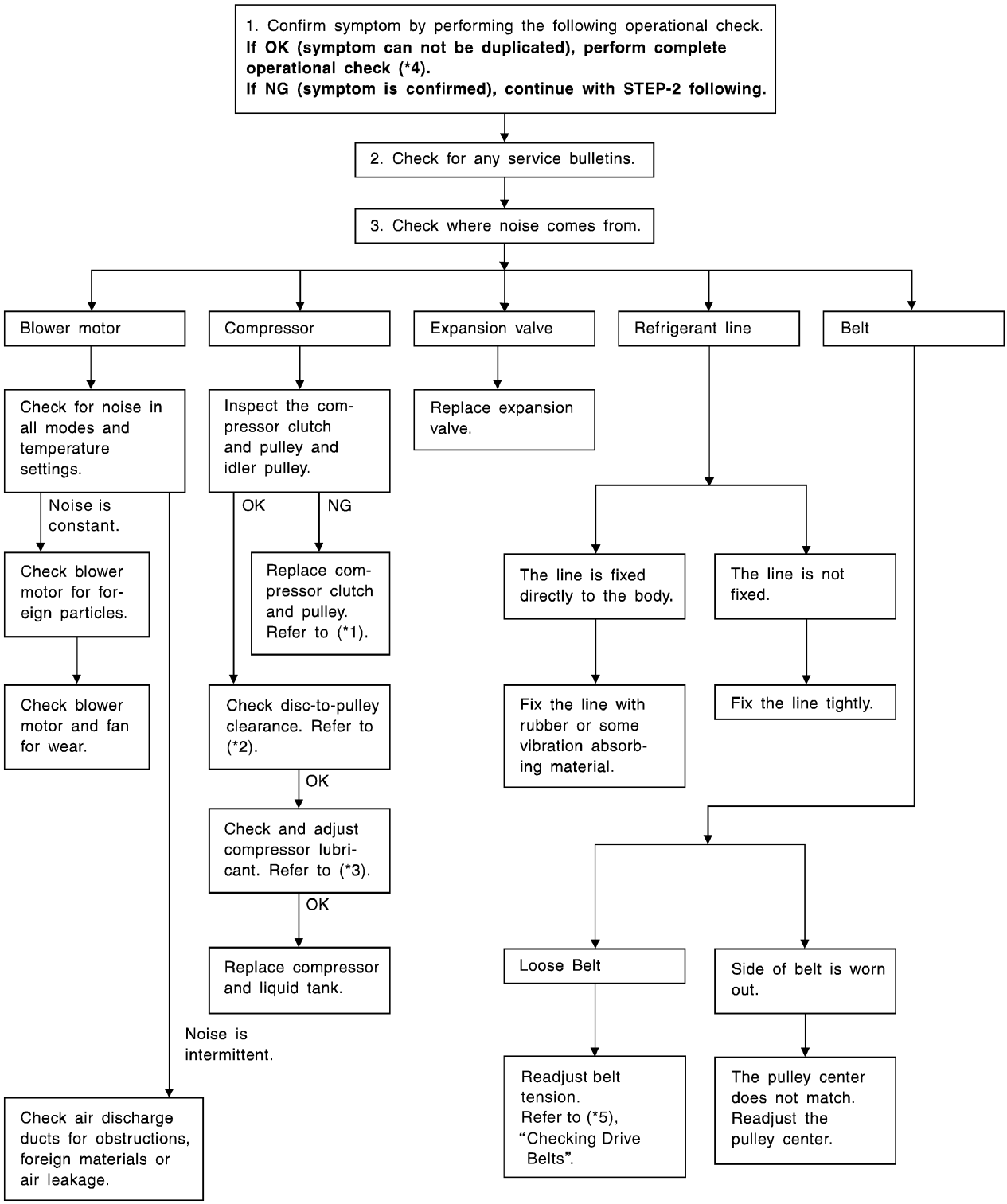
*1 ATC-60, "Operational Check"
*2 ATC-52, "FUNCTION CONFIRMATION PROCEDURE", see No. 1.
*3 ATC-52, "FUNCTION CONFIRMATION PROCEDURE", see No. 5 to 7.
*4 ATC-71, "Air Mix Door Motor Circuit"
*5 ATC-52, "FUNCTION CONFIRMATION PROCEDURE", see No. 14.
*6 ATC-64, "LAN System Circuit"
*7 ATC-77, "Blower Motor Circuit"
*8 ATC-71, "Air Mix Door Motor Circuit"
*9 EC-227, "DTC P0117, P0118 ECT SENSOR"
*10 CO-10, "Changing Engine Coolant"
*11 CO-15, "Checking Radiator Cap"

Noise

NJS0003N

SYMPTOM: Noise

INSPECTION FLOW



RJIA3108E

*1 Compressor clutch, ATC-137, "REMOVAL" .

*2 Compressor clutch, ATC-139, "INSTALLATION" .

*3 ATC-25, "Maintenance of Lubricant Quantity in Compressor"

*4 ATC-60, "Operational Check"

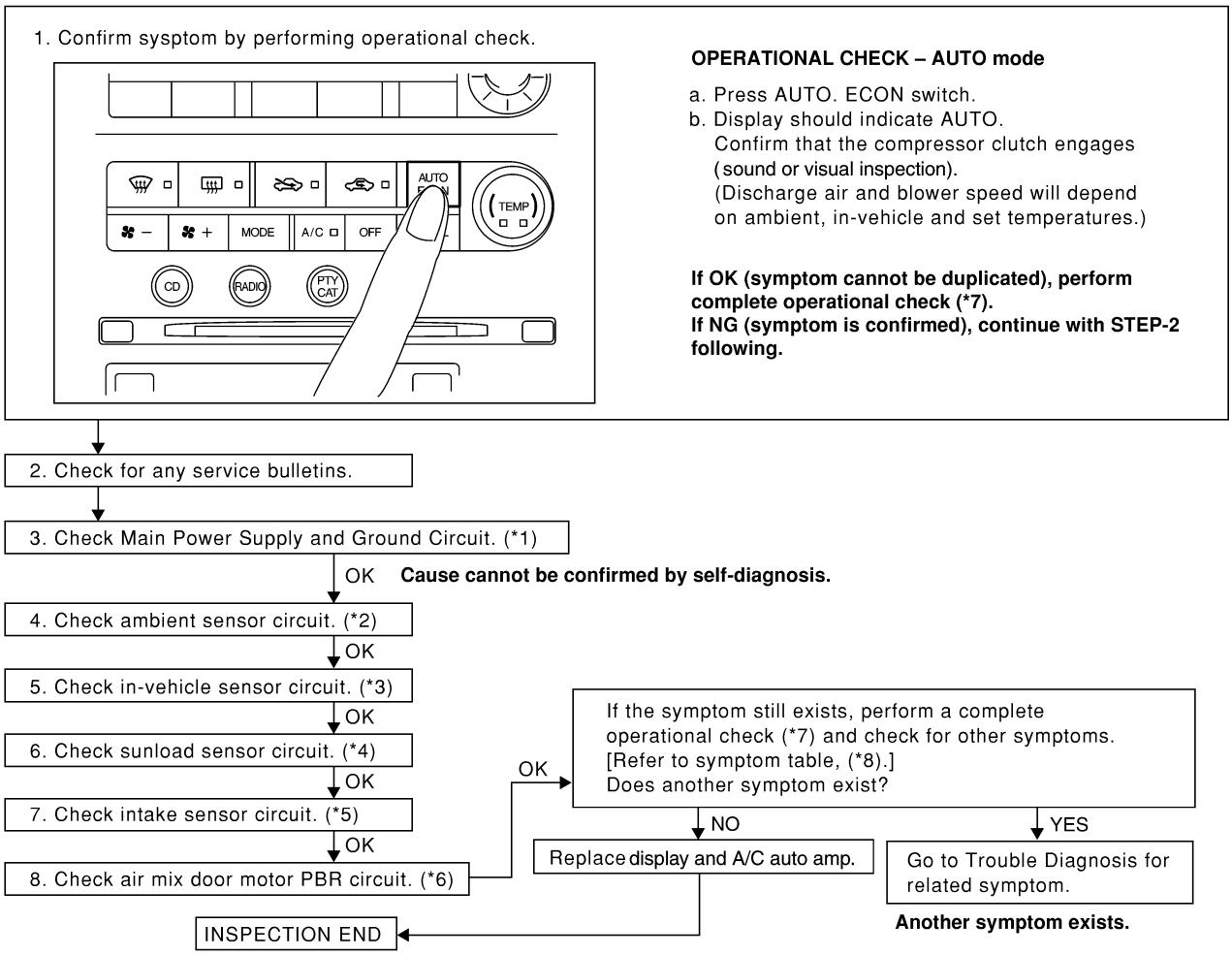
*5 EM-14, "Checking Drive Belts"

Self-diagnosis

NJS0003O

SYMPTOM: Self-diagnosis cannot be performed.

INSPECTION FLOW



*1 ATC-61, "Power Supply and Ground Circuit for Auto Amp."
*2 ATC-100, "Ambient Sensor Circuit"
*3 ATC-103, "In-vehicle Sensor Circuit"
*4 ATC-106, "Sunload Sensor Circuit"
*5 ATC-109, "Intake Sensor Circuit"
*6 ATC-73, "Air Mix Door Motor PBR Circuit"
*7 ATC-60, "Operational Check"
*8 ATC-39, "SYMPTOM TABLE"

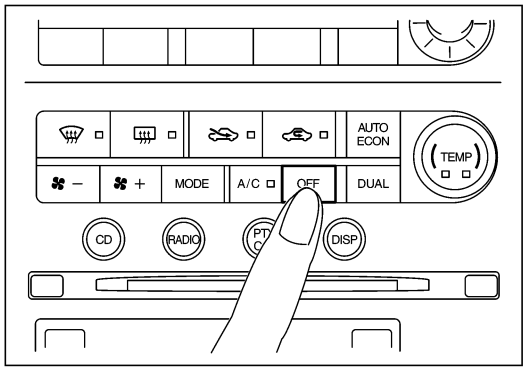
Memory Function

NJS0003P

SYMPTOM: Memory function does not operate.

INSPECTION FLOW

1. Confirm symptom by performing the following operational check.



OPERATIONAL CHECK – Memory function

a. Turn temperature control dial clockwise until 32˚C (90˚F) is displayed.
b. Press OFF switch.
c. Turn the ignition off.
d. Turn the ignition on.
e. Press the AUTO. ECON switch.
f. Confirm that the set temperature remains at previous temperature.
g. Press OFF switch.

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

2. Check for any service bulletins.

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

OK

4. Replace display and A/C auto amp.

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

RJIA3526E

*1 ATC-61, "Power Supply and Ground Circuit for Auto Amp."
*2 ATC-60, "Operational Check"
*3 ATC-52, "FUNCTION CONFIRMATION PROCEDURE"

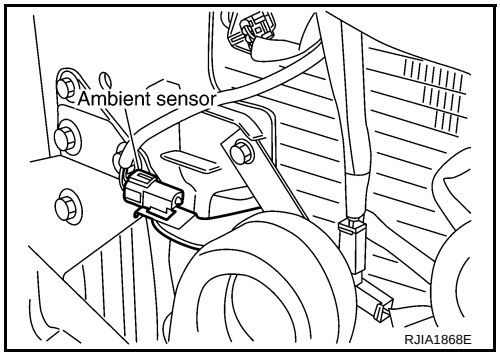
Ambient Sensor Circuit

NJS0003Q

COMPONENT DESCRIPTION

Ambient Sensor

The ambient sensor is attached on the ambient sensor bracket. It detects ambient temperature and converts it into a resistance value which is then input into the display and A/C auto amp.

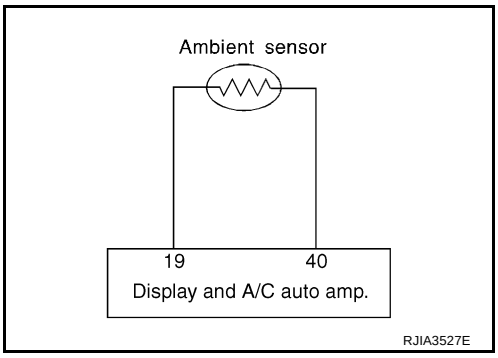


AMBIENT TEMPERATURE INPUT PROCESS

The display and A/C auto 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 display and A/C auto amp. function. It only allows the display and A/C auto amp. to recognize an ambient temperature increase of 0.33°C (0.6°F) per 100 seconds.
As an example, consider stopping for a few minutes after high speed driving. Although the actual ambient temperature has not changed, the temperature detected by the ambient sensor will increase. This is because the heat from the engine compartment can radiate to the front grille area, location of the ambient sensor.

DIAGNOSIS PROCEDURE FOR AMBIENT SENSOR

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



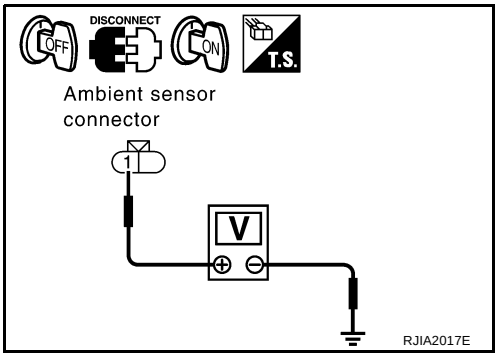
1. CHECK VOLTAGE BETWEEN AMBIENT SENSOR AND GROUND

1. Disconnect ambient sensor connector.
2. Turn ignition switch ON.
3. Check voltage between ambient sensor harness connector E34 terminal 1 and ground.

1 – Ground : Approx. 5 V

OK or NG

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



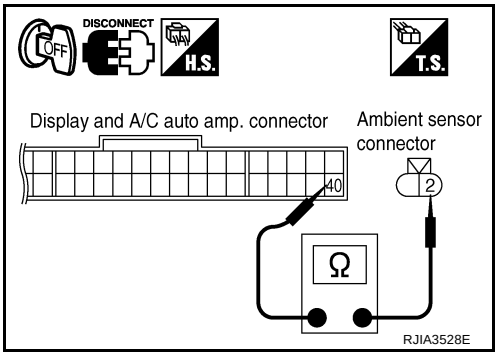
2. CHECK CIRCUIT CONTINUITY BETWEEN AMBIENT SENSOR AND DISPLAY AND A/C AUTO AMP.

1. Turn ignition switch OFF.
2. Disconnect display and A/C auto amp. connector.
3. Check continuity between ambient sensor harness connector E34 terminal 2 and display and A/C auto amp. harness connector M31 terminal 40.

2 – 40 : Continuity should exist.

OK or NG

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



3. CHECK AMBIENT SENSOR

Refer to ATC-100, "Ambient Sensor" .

OK or NG

OK >> 1. Replace display and A/C auto amp.
2. Go to self-diagnosis ATC-52, "FUNCTION CONFIRMATION PROCEDURE" and perform self-diagnosis STEP-2. Confirm that code No. 20 is displayed.

NG >> 1. Replace ambient sensor.
2. Go to self-diagnosis ATC-52, "FUNCTION CONFIRMATION PROCEDURE" and perform self-diagnosis STEP-2. Confirm that code No. 20 is displayed.

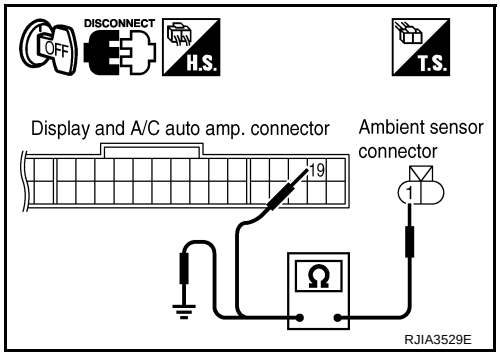
4. CHECK CIRCUIT CONTINUITY BETWEEN AMBIENT SENSOR AND DISPLAY AND A/C AUTO AMP.

1. Turn ignition switch OFF.
2. Disconnect display and A/C auto amp. connector.
3. Check continuity between ambient sensor harness connector E34 terminal 1 and display and A/C auto amp. harness connector M31 terminal 19.

1 – 19 : Continuity should exist.

4. Check continuity between ambient sensor harness connector E34 terminal1 and ground.

1 – Ground : Continuity should not exist.



OK or NG

OK >> 1. Replace display and A/C auto amp.
2. Go to self-diagnosis ATC-52, "FUNCTION CONFIRMATION PROCEDURE" and perform self-diagnosis STEP-2. Confirm that code No. 20 is displayed.

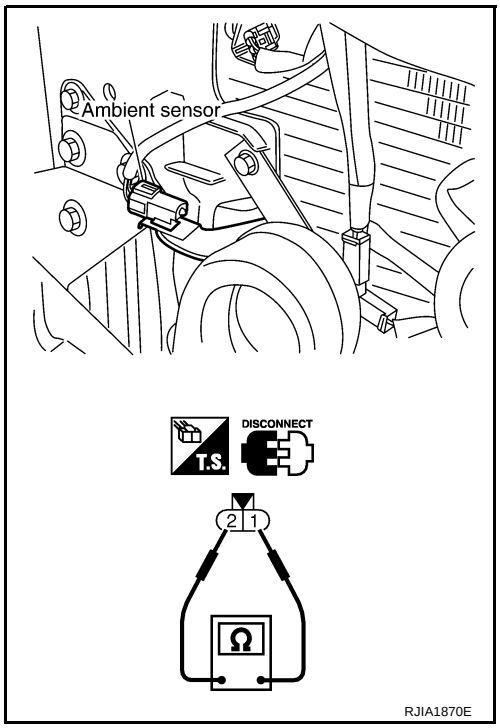
NG >> Repair harness or connector.

COMPONENT INSPECTION

Ambient Sensor

After disconnecting ambient sensor connector E34, measure resistance between terminals 1 and 2 at sensor side. Refer to the table below.

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



If NG, replace ambient sensor.

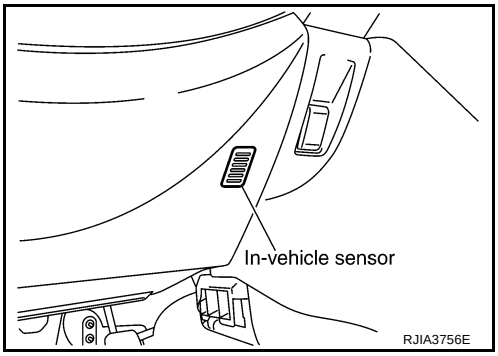
In-vehicle Sensor Circuit

NJS0003R

COMPONENT DESCRIPTION

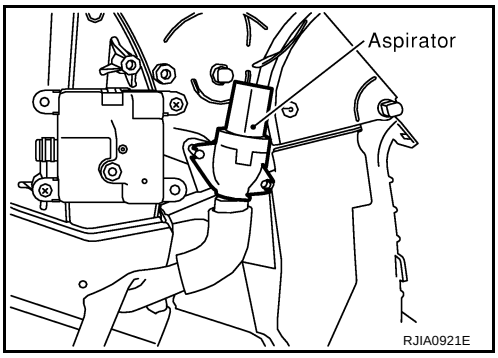
In-vehicle Sensor

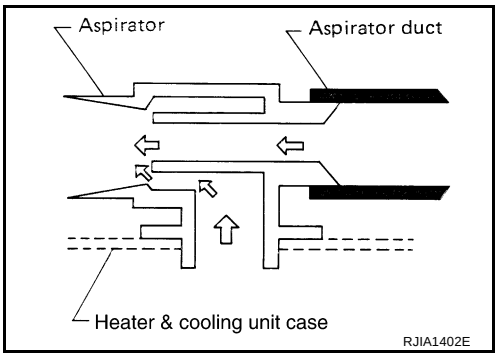
The in-vehicle sensor is located on instrument driver lower panel. It converts variations in temperature of compartment air drawn from the aspirator into a resistance value. It is then input into the display and A/C auto amp.



Aspirator

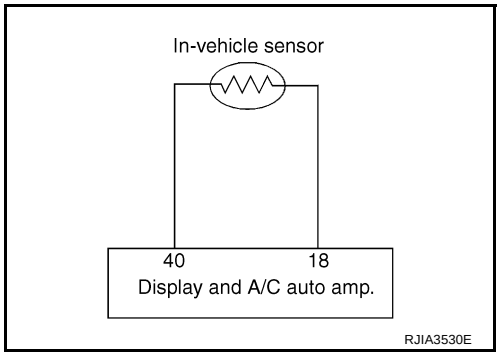
The aspirator is located on driver's side of heater & cooling unit assembly. It produces vacuum pressure due to air discharged from the heater & cooling unit, continuously taking compartment air in the aspirator.





DIAGNOSIS PROCEDURE FOR IN-VEHICLE SENSOR

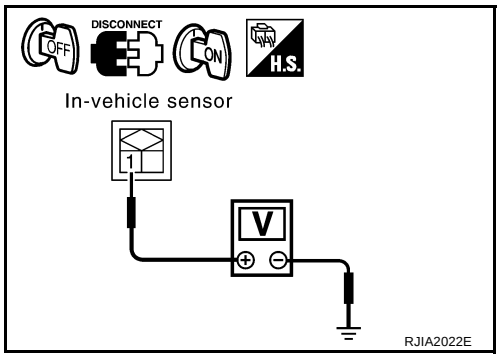
SYMPTOM: In-vehicle sensor circuit is open or shorted. (22 or –22 is indicated on display and A/C auto amp. as a result of performing self-diagnosis STEP-2.)



1. CHECK VOLTAGE BETWEEN IN-VEHICLE SENSOR AND GROUND

1. Disconnect in-vehicle sensor connector.
2. Turn ignition switch ON.
3. Check voltage between in-vehicle sensor harness connector M42 terminal 1 and ground.

1 – Ground : Approx. 5 V



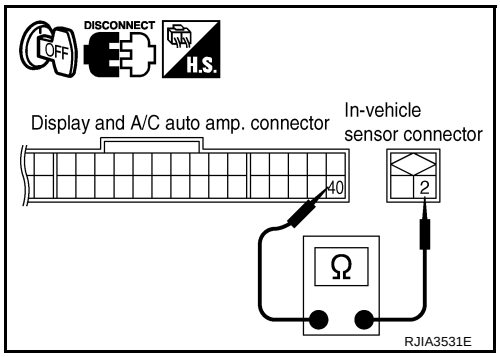
OK or NG

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

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

1. Turn ignition switch OFF.
2. Disconnect display and A/C auto amp. connector.
3. Check continuity between in-vehicle sensor harness connector M42 terminal 2 and display and A/C auto amp. harness connector M31 terminal 40.

2 – 40 : Continuity should exist.



OK or NG

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

3. CHECK IN-VEHICLE SENSOR

Refer to ATC-103, "In-vehicle Sensor" .

OK or NG

OK >> 1. Replace display and A/C auto amp.
2. Go to self-diagnosis ATC-52, "FUNCTION CONFIRMATION PROCEDURE" and perform self-diagnosis STEP-2. Confirm that code No. 20 is displayed.

NG >> 1. Replace in-vehicle sensor.
2. Go to self-diagnosis ATC-52, "FUNCTION CONFIRMATION PROCEDURE" and perform self-diagnosis STEP-2. Confirm that code No. 20 is displayed.

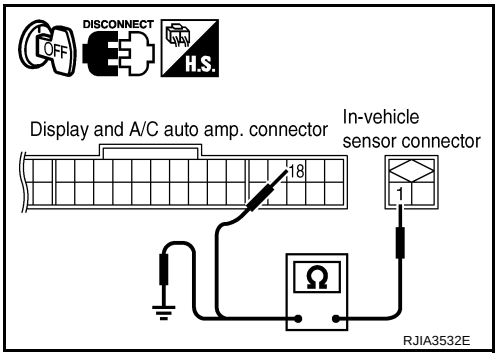
4. CHECK CIRCUIT CONTINUITY BETWEEN IN-VEHICLE SENSOR AND DISPLAY AND A/C AUTO AMP.

1. Turn ignition switch OFF.
2. Disconnect display and A/C auto amp. connector.
3. Check continuity between in-vehicle sensor harness connector M42 terminal 1 and display and A/C auto amp. harness connector M31 terminal 18.

1 – 18 : 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 display and A/C auto amp.
2. Go to self-diagnosis ATC-52, "FUNCTION CONFIRMATION PROCEDURE" and perform self-diagnosis STEP-2. Confirm that code No. 20 is displayed.

NG >> Repair harness or connector.

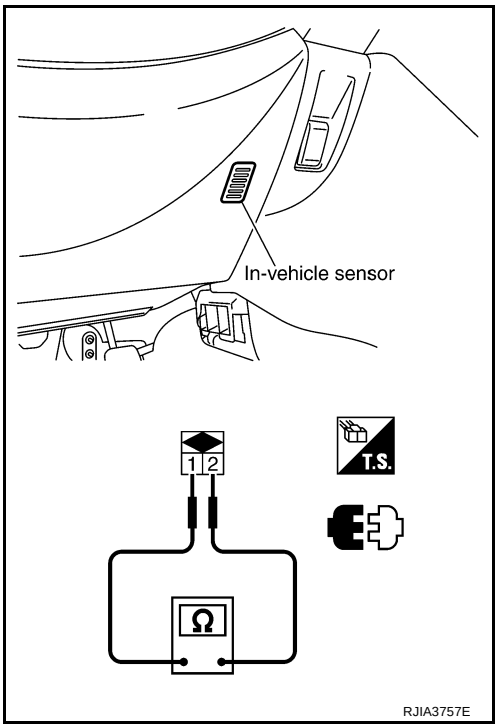
COMPONENT INSPECTION

In-vehicle Sensor

After disconnecting in-vehicle sensor connector M42, measure resistance between terminals 1 and 2 at sensor side. Refer to the table below.

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

If NG, replace in-vehicle sensor.



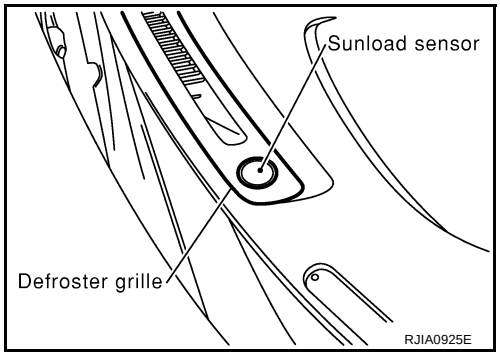
Sunload Sensor Circuit

NJS0003S

COMPONENT DESCRIPTION

Sunload Sensor

The sunload sensor is located on the driver'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 display and A/C auto amp.



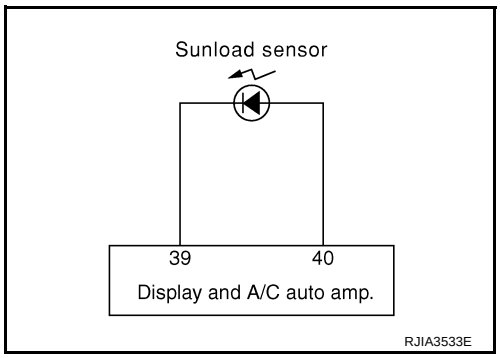
SUNLOAD INPUT PROCESS

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

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

DIAGNOSIS PROCEDURE FOR SUNLOAD SENSOR

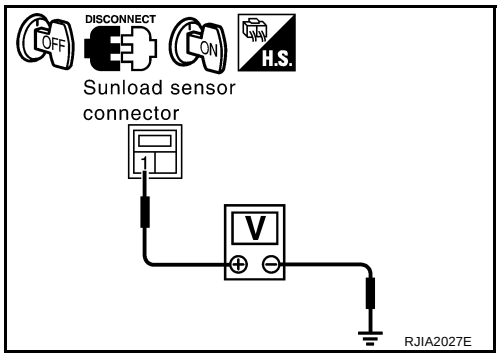
SYMPTOM: Sunload sensor circuit is open or shorted. (25 or –25 is indicated on display and A/C auto amp. as a result of performing self-diagnosis STEP-2.)



1. CHECK VOLTAGE BETWEEN SUNLOAD SENSOR AND GROUND

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

1 – Ground : Approx. 5 V



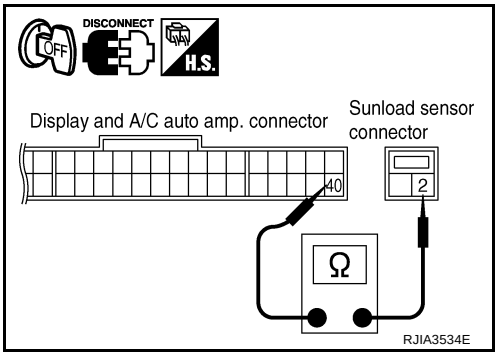
OK or NG

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

2. CHECK CIRCUIT CONTINUITY BETWEEN SUNLOAD SENSOR AND DISPLAY AND A/C AUTO AMP.

1. Turn ignition switch OFF.
2. Disconnect display and A/C auto amp. connector.
3. Check continuity between sunload sensor harness connector M18 terminal 2 and display and A/C auto amp. harness connector M31 terminal 40.

2 – 40 : 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 display and A/C auto amp. connector.
2. Refer to ATC-106, "Sunload Sensor" .

OK or NG

OK >> 1. Replace display and A/C auto amp.
2. Go to self-diagnosis ATC-52, "FUNCTION CONFIRMATION PROCEDURE" and perform self-diagnosis STEP-2. Confirm that code No. 20 is displayed.

NG >> 1. Replace sunload sensor.
2. Go to self-diagnosis ATC-52, "FUNCTION CONFIRMATION PROCEDURE" and perform self-diagnosis STEP-2. Confirm that code No. 20 is displayed.

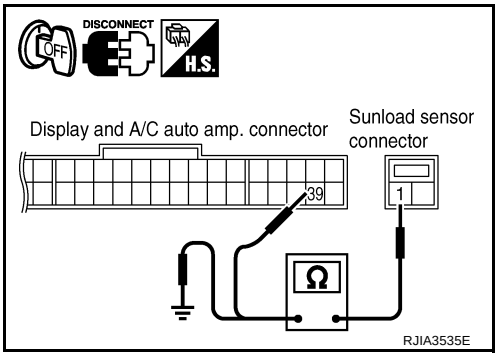
4. CHECK CIRCUIT CONTINUITY BETWEEN SUNLOAD SENSOR AND DISPLAY AND A/C AUTO AMP.

1. Turn ignition switch OFF.
2. Disconnect display and A/C auto amp. connector.
3. Check continuity between sunload sensor harness connector M18 terminal 1 and display and A/C auto amp. harness connector M31 terminal 39.

1 – 39 : 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

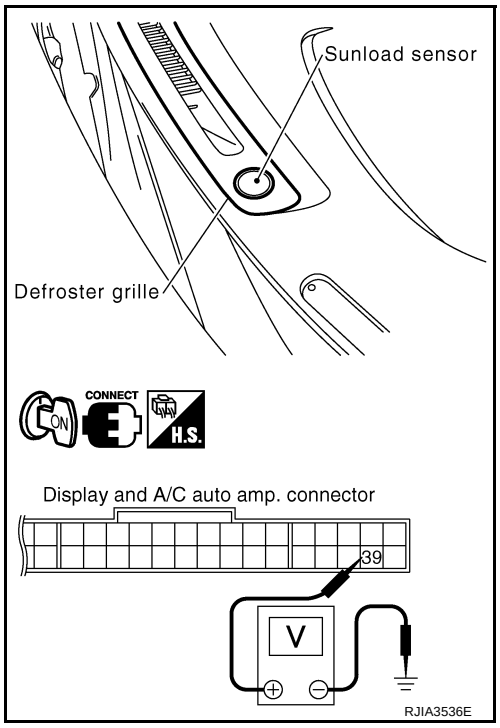
OK >> 1. Replace display and A/C auto amp.
2. Go to self-diagnosis ATC-52, "FUNCTION CONFIRMATION PROCEDURE" and perform self-diagnosis STEP-2. Confirm that code No. 20 is displayed.

NG >> Repair harness or connector.

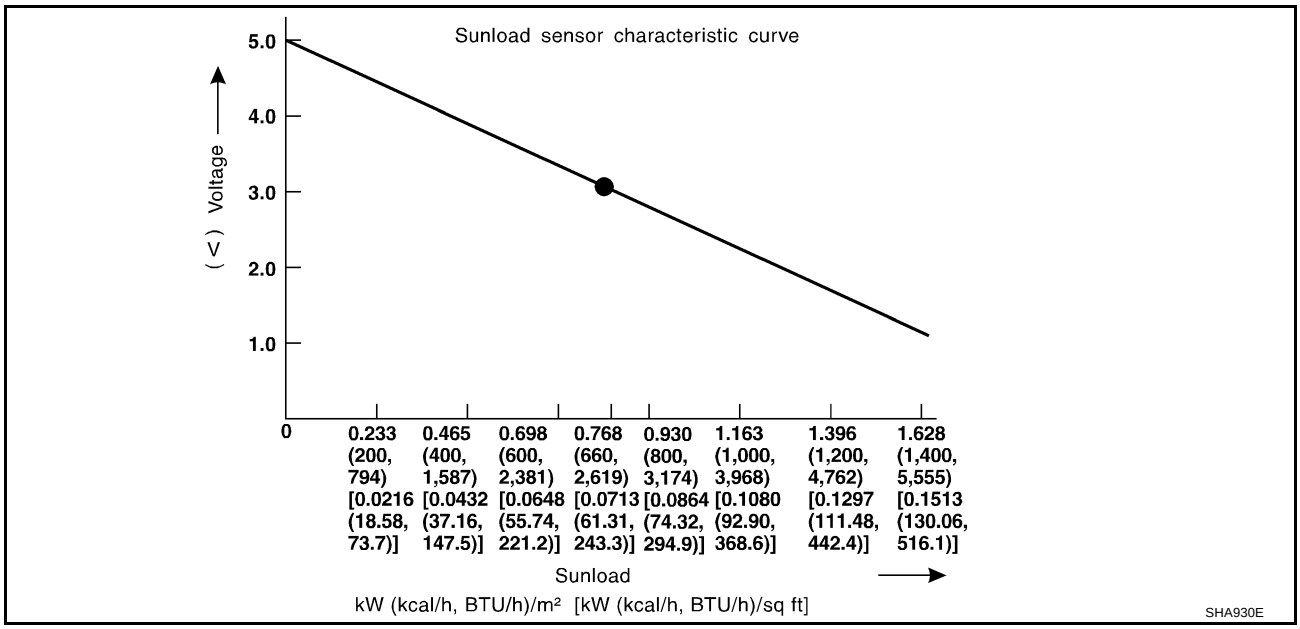
COMPONENT INSPECTION

Sunload Sensor

Measure voltage between display and A/C auto amp. harness connector M31 terminal 39 and ground.



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



If NG, replace sunload sensor.

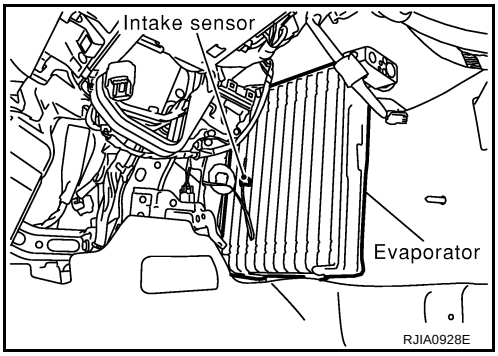
Intake Sensor Circuit

NJS0003T

COMPONENT DESCRIPTION

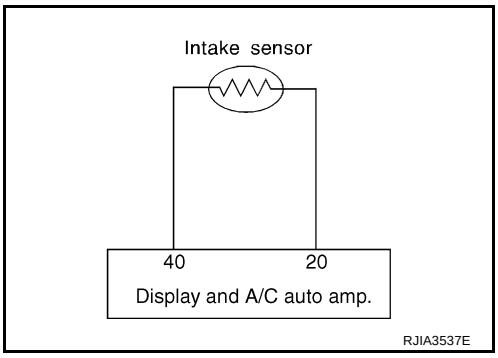
Intake Sensor

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 display and A/C auto amp.



DIAGNOSIS PROCEDURE FOR INTAKE SENSOR

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



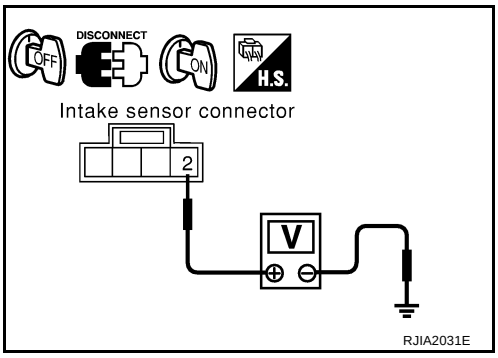
1. CHECK VOLTAGE BETWEEN INTAKE SENSOR AND GROUND

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

2 – Ground : Approx. 5 V

OK or NG

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



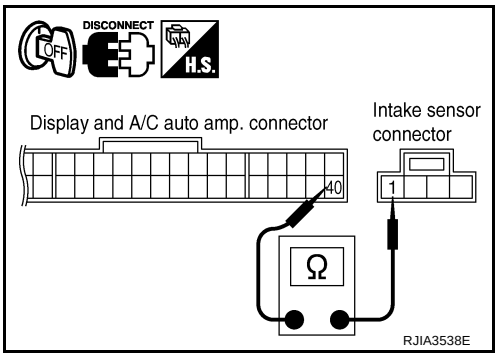
2. CHECK CIRCUIT CONTINUITY BETWEEN INTAKE SENSOR AND DISPLAY AND A/C AUTO AMP.

1. Turn ignition switch OFF.
2. Disconnect display and A/C auto amp. connector.
3. Check continuity between intake sensor harness connector M256 terminal 1 and display and A/C auto amp. harness connector M31 terminal 40.

1 – 40 : Continuity should exist.

OK or NG

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



3. CHECK INTAKE SENSOR

Refer to ATC-109, "Intake Sensor" .

OK or NG

OK >> 1. Replace display and A/C auto amp.
2. Go to self-diagnosis ATC-52, "FUNCTION CONFIRMATION PROCEDURE" and perform self-diagnosis STEP-2. Confirm that code No. 20 is displayed.

NG >> 1. Replace intake sensor.
2. Go to self-diagnosis ATC-52, "FUNCTION CONFIRMATION PROCEDURE" and perform self-diagnosis STEP-2. Confirm that code No. 20 is displayed.

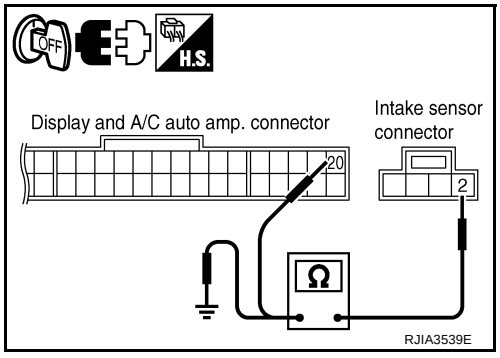
4. CHECK CIRCUIT CONTINUITY BETWEEN INTAKE SENSOR AND DISPLAY AND A/C AUTO AMP.

1. Turn ignition switch OFF.
2. Disconnect display and A/C auto amp. connector.
3. Check continuity between intake sensor harness connector M256 terminal 2 and display and A/C auto amp. harness connector M31 terminal 20.

2 – 20 : Continuity should exist.

4. Check continuity between intake sensor harness connector M256 terminal 2 and ground.

2 – Ground : Continuity should not exist.



OK or NG

OK >> 1. Replace display and A/C auto amp.
2. Go to self-diagnosis ATC-52, "FUNCTION CONFIRMATION PROCEDURE" and perform self-diagnosis STEP-2. Confirm that code No. 20 is displayed.

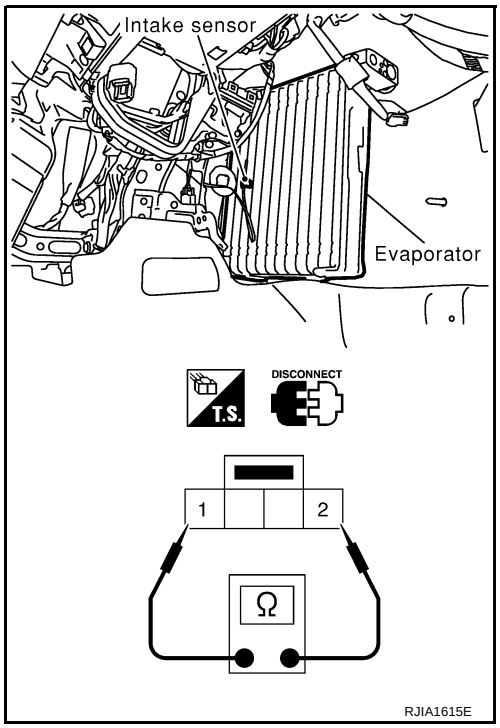
NG >> Repair harness or connector.

COMPONENT INSPECTION

Intake Sensor

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

Temperature °C (°F)	Resistance kΩ
–15 (5)	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



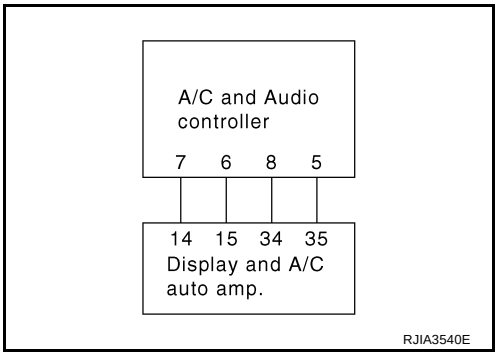
If NG, replace intake sensor.

Multiplex Communication Circuit

NJS0003U

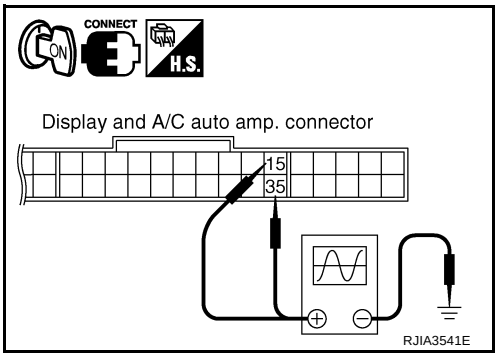
DIAGNOSIS PROCEDURE FOR MULTIPLEX COMMUNICATION

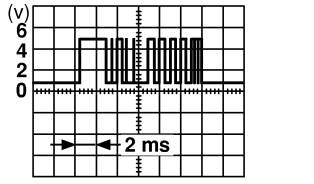
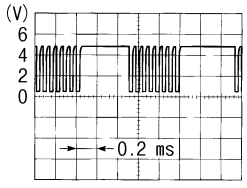
SYMPTOM: A/C system cannot be controlled.



1. CHECK DISPLAY AND A/C AUTO AMP. OUTPUT SIGNAL

1. Turn ignition switch ON.
2. Check multiplex communication signal between display and A/C auto amp. harness connector M31 terminals 15, 35 and ground using an oscilloscope.



Terminals			Voltage
(+)		(–)	
Display and A/C auto amp. connector	Terminal No.		
M31	15	Ground	 RJIA0212E
M31	35		 SJIA1479J

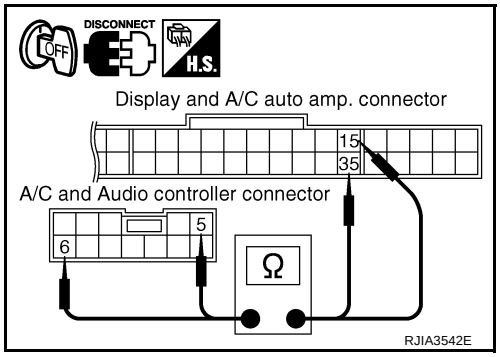
OK or NG

OK >> GO TO 2.
NG >> Replace display and A/C auto amp.

2. CHECK CIRCUIT CONTINUITY BETWEEN A/C AND AUDIO CONTROLLER AND DISPLAY AND A/C AUTO AMP.

1. Turn ignition switch OFF.
2. Disconnect A/C and audio controller connector and display and A/C auto amp. connector.
3. Check continuity between A/C and audio controller harness connector M38 terminals 6, 5 and display and A/C auto amp. harness connector M31 terminals 15, 35.

6 – 15 : Continuity should exist.
5 – 35 : Continuity should exist.

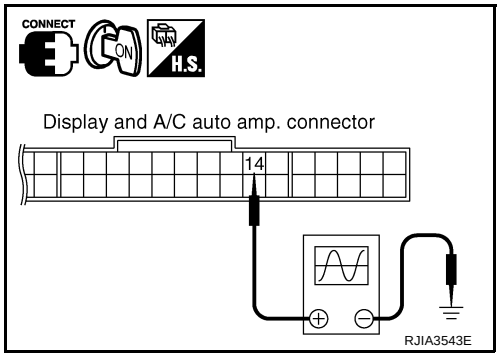


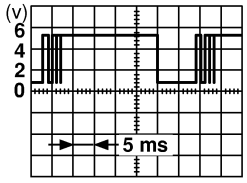
OK or NG

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

3. CHECK DISPLAY AND A/C AUTO AMP. INPUT SIGNAL

1. Reconnect A/C and audio controller connector and display and A/C auto amp. connector.
2. Turn ignition switch ON.
3. Confirm multiplex communication signal between display and A/C auto amp. harness connector M31 terminal 14 and ground using an oscilloscope.



Terminals			Voltage
(+)		(–)	
Display and A/C auto amp. connector	Terminal No.		
M31	14	Ground	

RJIA0213E

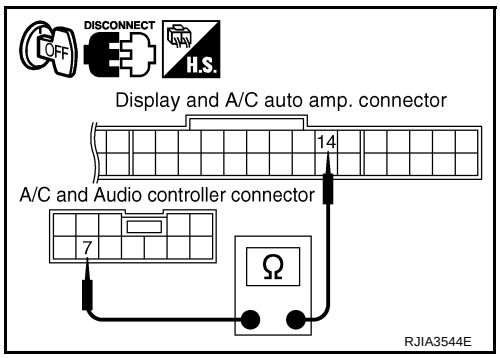
OK or NG

OK >> Replace display and A/C auto amp.
NG >> GO TO 4.

4. CHECK CIRCUIT CONTINUITY BETWEEN A/C AND AUDIO CONTROLLER AND DISPLAY AND A/C AUTO AMP.

1. Turn ignition switch OFF.
2. Disconnect A/C and audio controller connector and display and A/C auto amp. connector.
3. Check continuity between A/C and audio controller harness connector M38 terminal 7 and display and A/C auto amp. harness connector M31 terminal 14.

7 – 14 : Continuity should exist.



OK or NG

OK >> Replace A/C and audio controller.
NG >> Repair harness or connector.

A/C AND AUDIO CONTROLLER

PFP:28074

Removal and Installation

NJS0003V

REMOVAL

Refer to AV-33, "Removal and Installation for A/C and Audio Controller" .

INSTALLATION

Installation is basically the reverse order of removal.

AUTO AMP

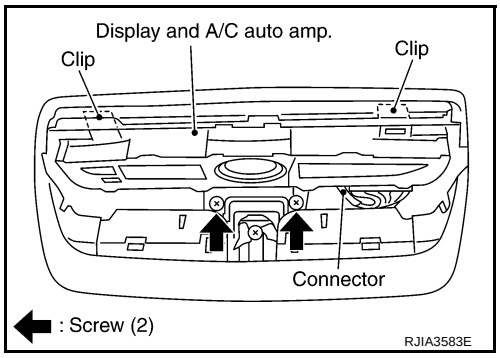
PFP:27760

Removal and Installation of Display and A/C Auto Amp.

NJS0003W

REMOVAL

1. Remove cluster lid finisher. Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
2. Remove mounting screws, and then remove display and A/C auto amp.



INSTALLATION

Installation is basically the reverse order of removal.

AMBIENT SENSOR

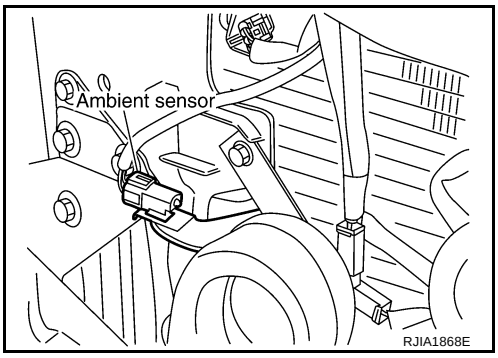
PFP:27722

Removal and Installation

NJS0003X

REMOVAL

1. Remove front grille. Refer to EI-18, "FRONT GRILLE" .
2. Disconnect ambient sensor connector, and then remove ambient sensor.



INSTALLATION

Installation is basically the reverse order of removal.

IN-VEHICLE SENSOR

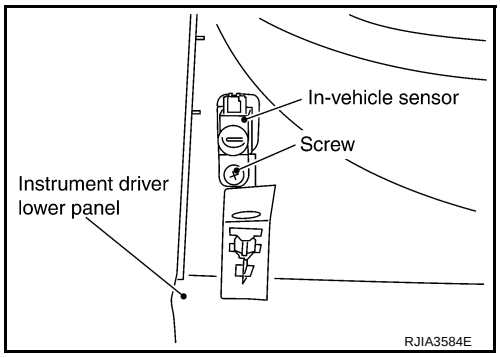
PFP:27720

Removal and Installation

NJS0003Y

REMOVAL

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



INSTALLATION

Installation is basically the reverse order of removal.

SUNLOAD SENSOR

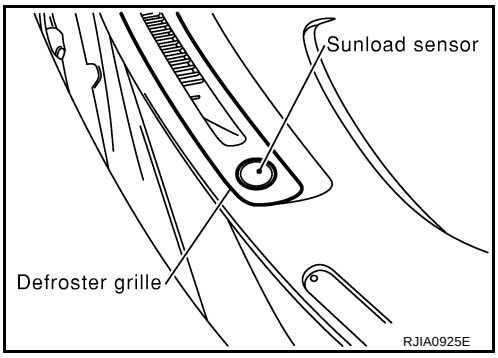
PFP:27721

Removal and Installation

NJS0003Z

REMOVAL

1. Remove front defroster grille (LH). Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
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

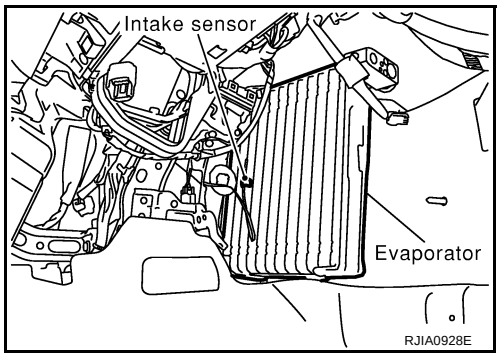
NJS00040

REMOVAL

1. Remove low-pressure pipe 2 and high-pressure pipe 2. Refer to ATC-144, "Removal and Installation of Low-pressure Pipe 2 and High-pressure Pipe 2" .

   CAUTION:
   Cap or wrap the joint of evaporator, low-pressure pipe 1 and high-pressure pipe 2 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 low-pressure pipe 1, 2 and high-pressure pipe 1, 2 with new ones, and then apply compressor oil to it when installing it.**
- **Mark the mounting position of intake sensor bracket prior to removal so that the reinstalled sensor can be located in the same position.**
- **Female-side piping connection is thin and easy to deform. Slowly insert the male-side piping straight in axial direction.**
- **Insert piping securely until a click is heard.**
- **After piping connection is completed, pull male-side piping by hand to make sure that connection does not come loose.**
- **When recharging refrigerant, check for leaks.**

BLOWER UNIT

PFP:27200

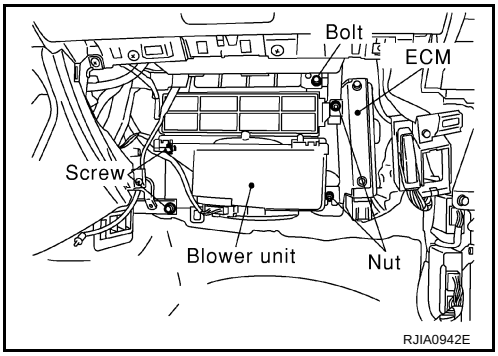
Removal and Installation

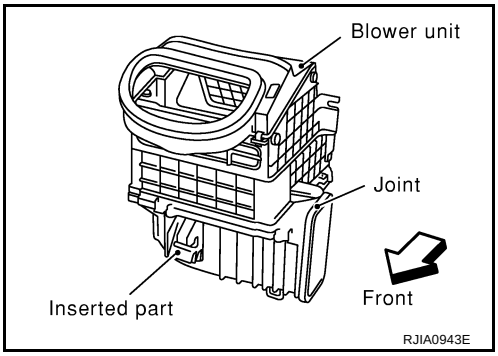
NJS00041

REMOVAL

1. Remove glove box assembly and instrument lower cover. Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
2. Remove mounting nuts, and then remove ECM with bracket attached.
3. Disconnect intake door motor connector and blower fan motor connector.
4. Remove mounting bolt and screws, and then remove blower unit.

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





INSTALLATION

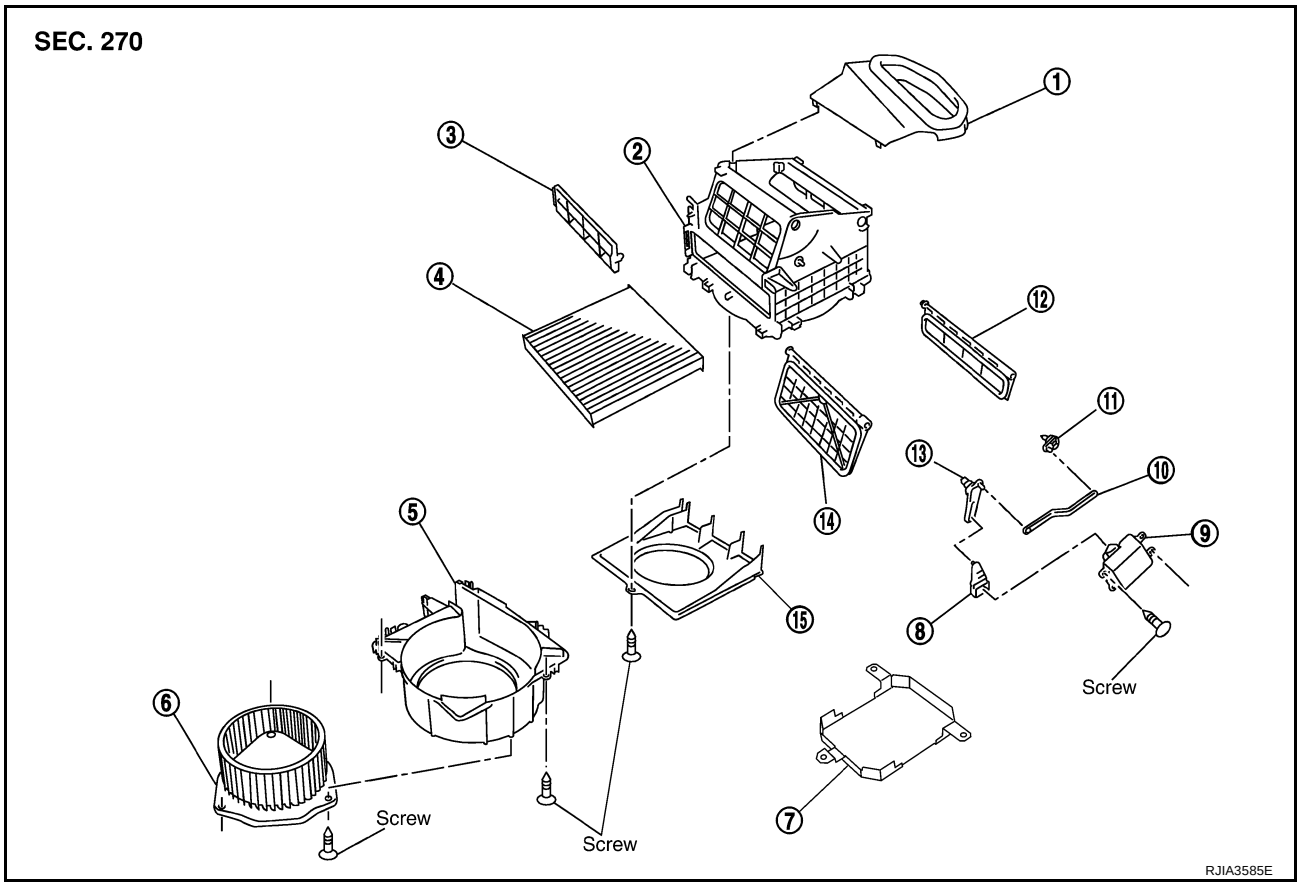
Installation is basically the reverse order of removal.

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

Disassembly and Assembly

NJS00042

SEC. 270



1. Adapter
2. Intake upper case
3. Filter cover
4. In-cabin microfilter
5. Intake lower case
6. Blower motor assembly
7. Motor cover (with intelligent key system)
8. Intake door lever 2
9. Intake door motor
10. Intake door link
11. Intake door lever 3
12. Intake door 2
13. Intake door lever 1
14. Intake door 1
15. Intake bell mouth

BLOWER MOTOR

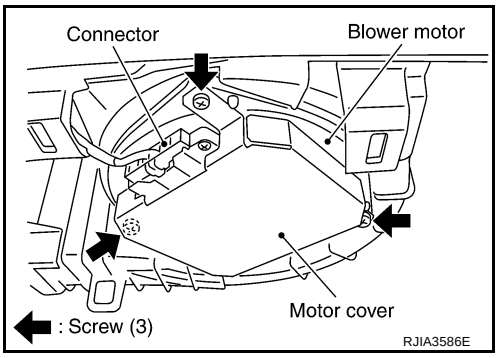
PFP:27226

Removal and Installation

NJS00043

REMOVAL

1. Remove instrument lower cover. Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
2. Disconnect blower motor connector.
3. Remove mounting screws, and then remove motor cover and blower motor.



INSTALLATION

Installation is basically the reverse order of removal.

INTAKE DOOR MOTOR

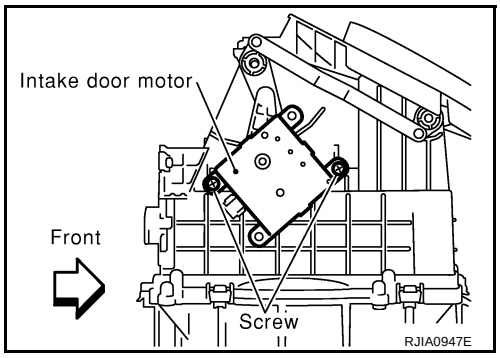
PFP:27730

Removal and Installation

NJS00044

REMOVAL

1. Remove blower unit. Refer to ATC-119, "BLOWER UNIT" .
2. Remove mounting screws, and then remove intake door motor from blower unit.



INSTALLATION

Installation is basically the reverse order of removal.

IN-CABIN MICROFILTER

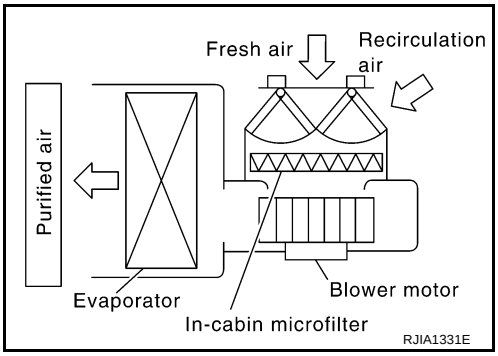
PFP:27277

Removal and Installation

NJS00045

FUNCTION

Air inside passenger compartment is kept clean at either recirculation or fresh mode by installing in-cabin microfilter into blower unit.

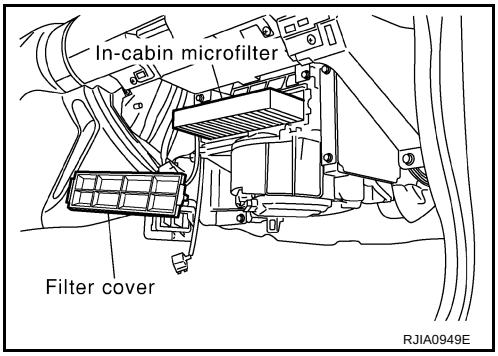


REPLACEMENT TIMING

Replace in-cabin microfilter.
Refer to MA-8, "CHASSIS AND BODY MAINTENANCE" in Schedule 1 and MA-9, "CHASSIS AND BODY MAINTENANCE" in Schedule 2.
When replacing filter, affix a caution label inside the glove box.

REPLACEMENT PROCEDURES

1. Remove glove box assembly. Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
2. Remove filter cover, and then remove in-cabin microfilter.
3. Take out in-cabin microfilter from blower unit.
4. Replace with new one and reinstall on blower unit.
5. Reinstall glove box assembly.



HEATER & COOLING UNIT ASSEMBLY

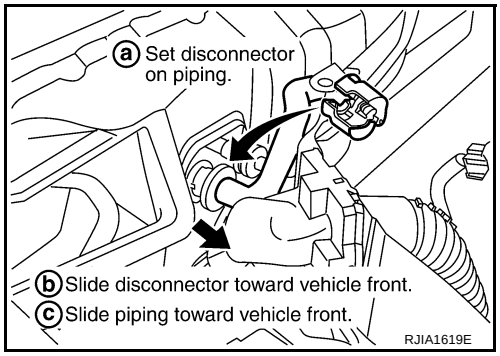
PFP:27110

Removal and Installation

NJS00046

REMOVAL

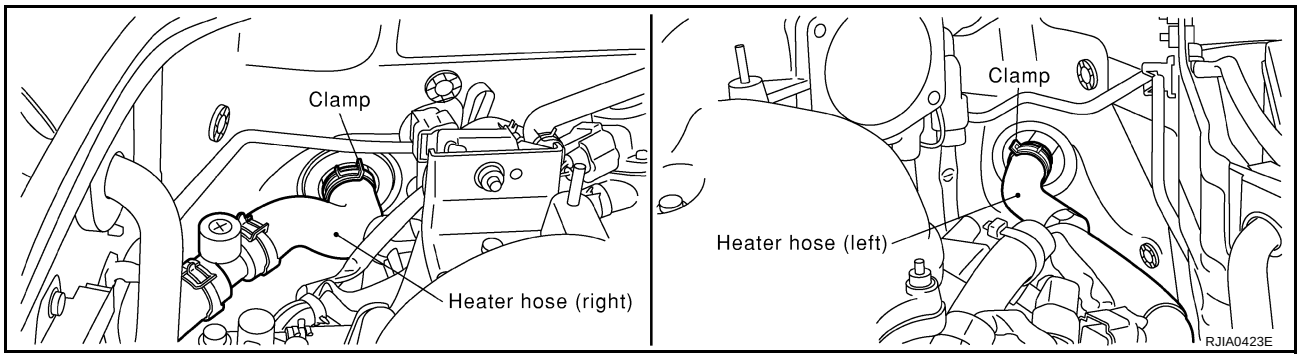
1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
2. Drain coolant from cooling system. Refer to CO-10, "Changing Engine Coolant" .
3. Remove cowl top cover. Refer to EI-19, "COWL TOP" .
4. Disconnect low-pressure pipe 1 and high-pressure pipe 1 from evaporator.



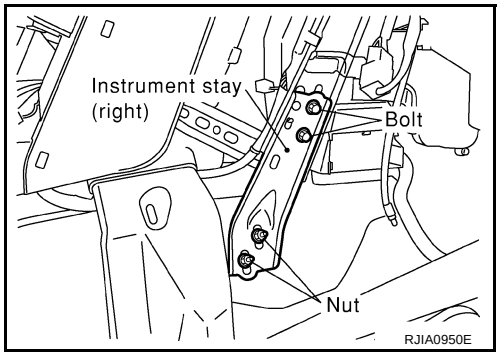
a. Set a disconnector [high-pressure side (SST: 9253089908), low-pressure side (SST: 9253089916)] on A/C piping.
b. Slide a disconnector toward vehicle front until it clicks.
c. Slide A/C piping toward vehicle front and disconnect it.

CAUTION:
Cap or wrap the joint of low-pressure pipe 1, 2 and high-pressure pipe 1, 2 with suitable material such as vinyl tape to avoid the entry of air.

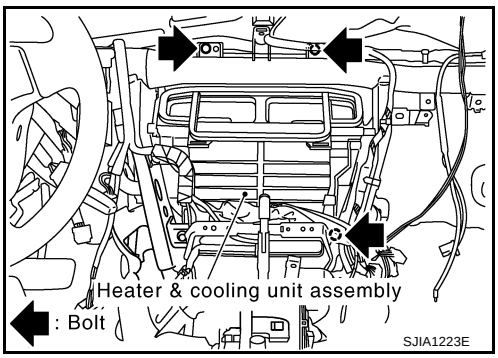
5. Remove electric throttle control actuator. Refer to EM-18, "INTAKE MANIFOLD COLLECTOR" .
6. Disconnect two heater hoses from heater core.

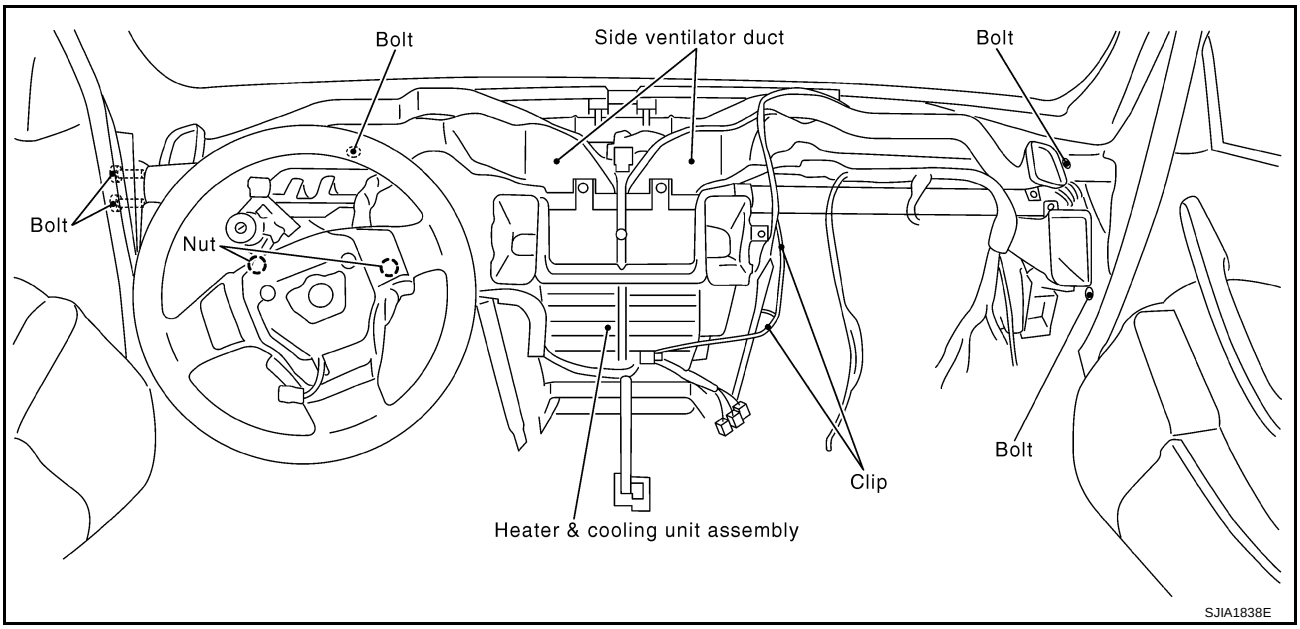


7. Remove instrument panel & pad. Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
8. Remove blower unit. Refer to ATC-119, "BLOWER UNIT" .
9. Remove clips of vehicle harness from steering member.
10. Remove mounting nuts and bolts, and then remove instrument stays (driver side and passenger side).



11. Remove heater & cooling unit assembly mounting bolts.





12. Disconnect drain hose.
13. Remove defroster nozzle and ventilator ducts.
14. Remove steering member, and then remove heater & cooling unit assembly.

INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

- **Replace O-rings of low-pressure pipe 1 and high-pressure pipe 1 with new ones, and then apply compressor oil to it when installing it.**
- **Female-side piping connection is thin and easy to deform. Slowly insert the male-side piping straight in axial direction.**
- **Insert piping securely until a click is heard.**
- **After piping connection is completed, pull male-side piping by hand to make sure that connection does not come loose.**
- **When recharging refrigerant, check for leaks.**

NOTE:

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

Heater & cooling unit assembly mounting bolt

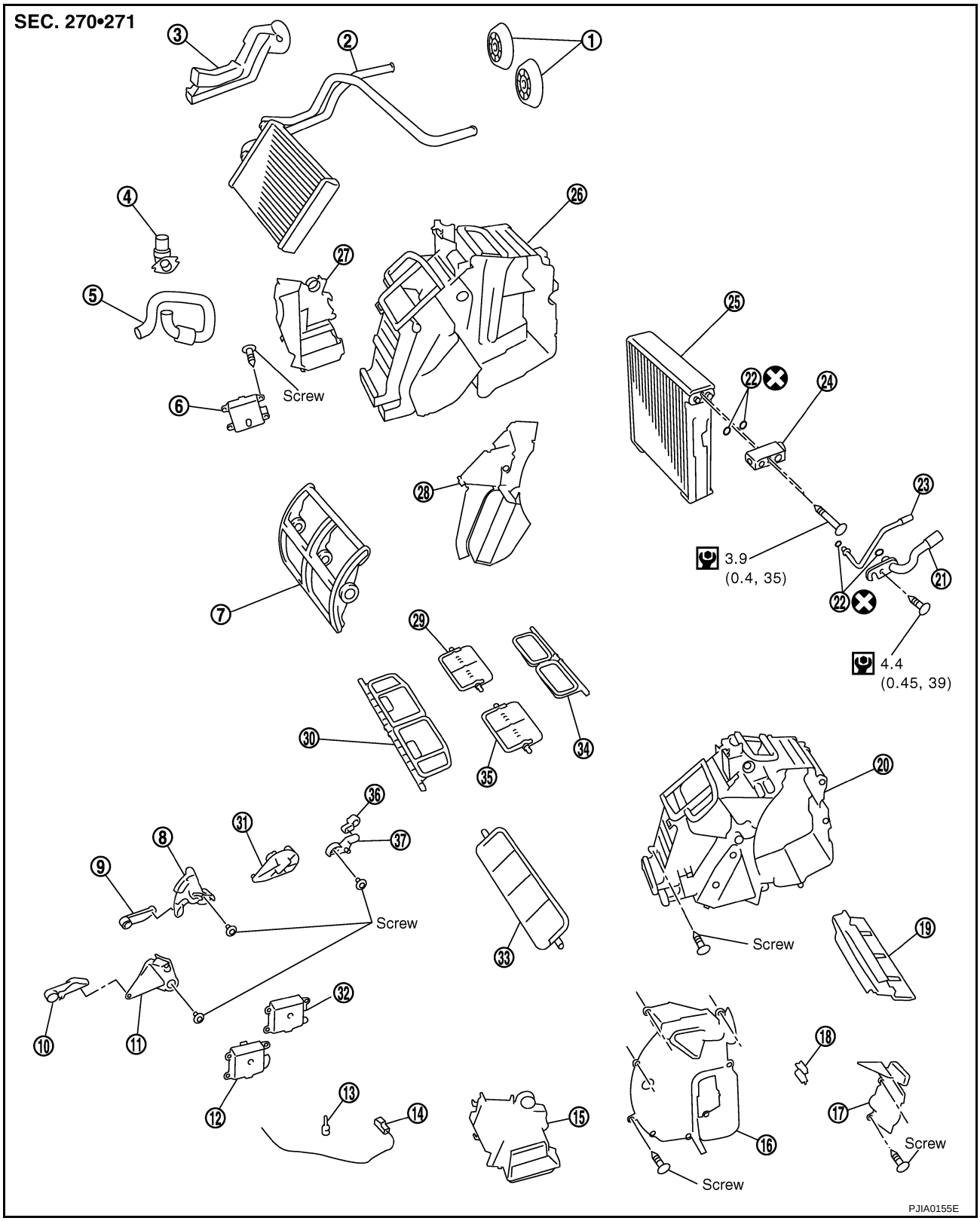
: 6.9 N·m (0.7 kg-m, 61 in-lb)

Steering member mounting nut and bolt

: 12 N·m (1.25 kg-m, 9 ft-lb)

Disassembly and Assembly

NJS00047



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

19. Insulator
20. Heater case (right)
21. Low-pressure pipe 2
22. O-ring
23. High-pressure pipe 2
24. Expansion valve
25. Evaporator
26. Heater case (left)
27. Foot duct (left)
28. Center case*
29. Max. cool door (left)*
30. Ventilator door
31. Side link
32. Mode door motor
33. Max. cool door (Without left and right ventilation temperature separately control system)
34. Defroster door
35. Max. cool door (right)*
36. Defroster door lever
37. Defroster door link

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

: N·m (kg-m, in-lb)

: Always replace after every disassembly

HEATER CORE

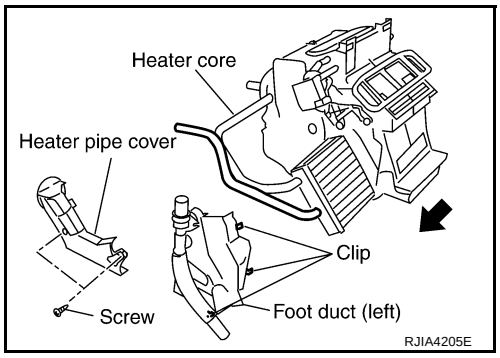
PFP:27140

Removal and Installation

NJS00048

REMOVAL

1. Remove heater & cooling unit assembly. Refer to ATC-124, "HEATER & COOLING UNIT ASSEMBLY" .
2. Remove mounting screws, and then remove heater pipe cover.
3. Remove mounting clips, and then remove foot duct (left).
4. Slide heater core to leftward.



INSTALLATION

Installation is basically the reverse order of removal.

MODE DOOR MOTOR

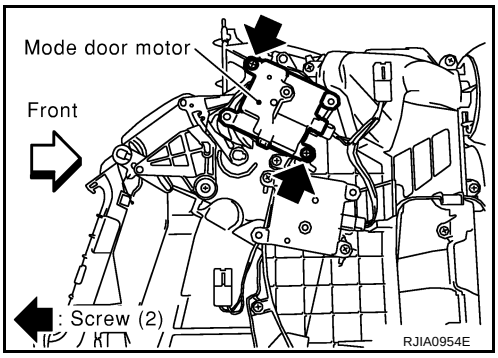
PFP:27731

Removal and Installation

NJS00049

REMOVAL

1. Remove blower unit. Refer to ATC-119, "BLOWER UNIT" .
2. Remove mounting screws, and then remove mode door motor.
3. Disconnect mode door motor connector.



INSTALLATION

Installation is basically the reverse order of removal.

AIR MIX DOOR MOTOR

PFP:27732

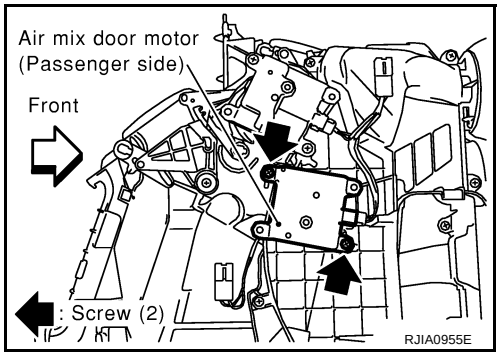
Removal and Installation

NJS0004A

REMOVAL

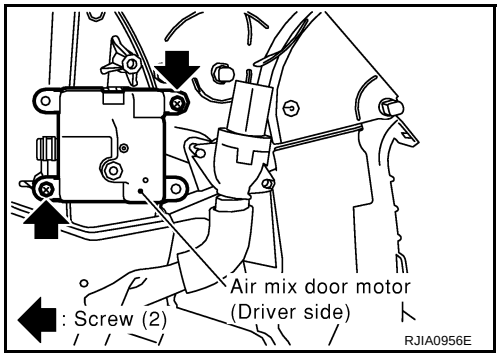
Passenger Side

1. Set the temperature control dial (passenger side) at 18°C (60°F), and then disconnect the battery cable from the negative terminal.
2. Remove blower unit. Refer to ATC-119, "BLOWER UNIT" .
3. Remove mounting screws, and then remove air mix door motor.
4. Disconnect air mix door motor connector.



Driver Side (With Left and Right Ventilation Temperature Separately Control System)

1. Set the temperature control dial (driver side) at 18°C (60°F), and then disconnect the battery cable from the negative terminal.
2. Remove instrument driver lower panel. Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
3. Disconnect accelerator pedal position sensor connector.
4. Remove mounting screws, and then remove air mix door motor.
5. Disconnect air mix door motor connector.



INSTALLATION

Installation is basically the reverse order of removal.

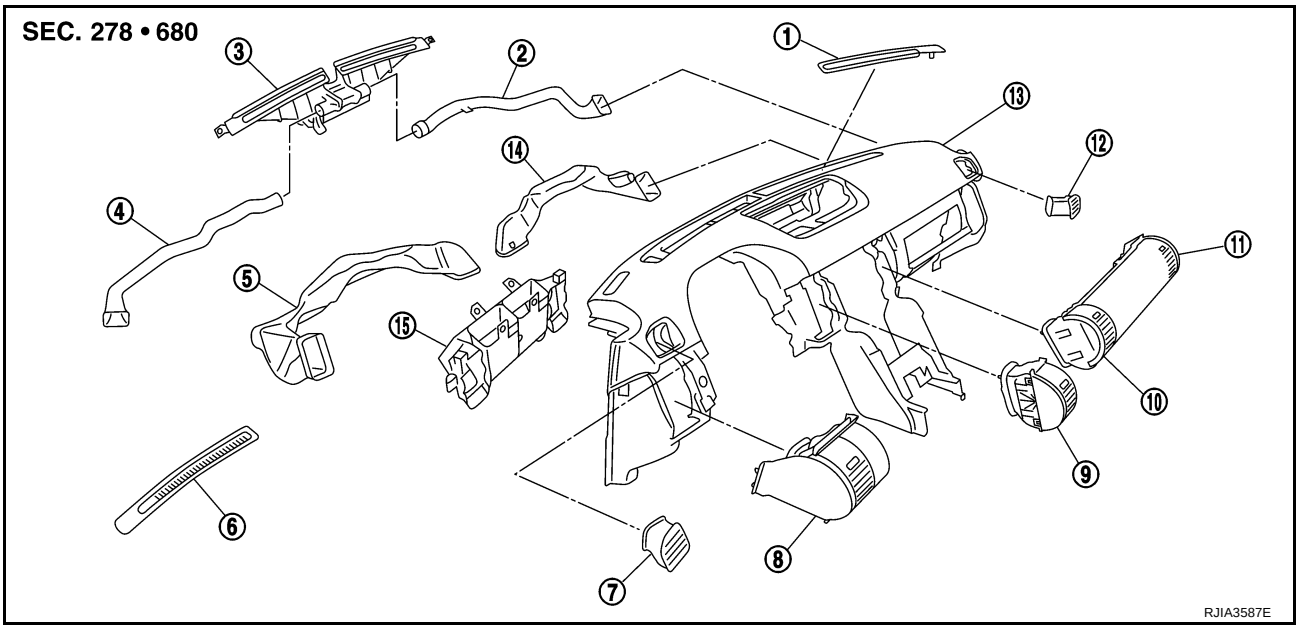
DUCTS AND GRILLES

PFP:27860

Removal and Installation

NJS0004B

COMPONENT LAYOUT

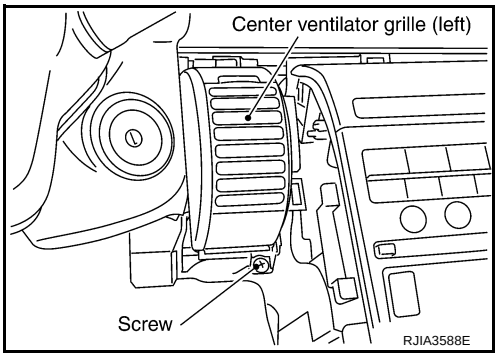


1. Defroster grille (right)
2. Side defroster duct (right)
3. Defroster nozzle
4. Side defroster duct (left)
5. Side ventilator duct (left)
6. Defroster grille (left)
7. Side defroster grille (left)
8. Side ventilator grille (left)
9. Center ventilator grille (left)
10. Center ventilator grille (right)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

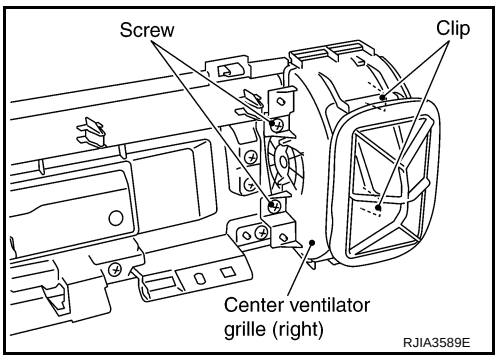
REMOVAL

Removal of Center Ventilator Grilles

1. Remove instrument driver lower panel. Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
2. Remove mounting screw, and then remove center ventilator grill (left).

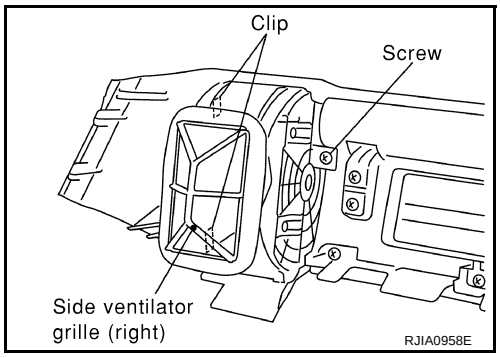


3. Remove center box assembly. Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
4. Remove mounting screws, clips, and then remove center ventilator grille (right).



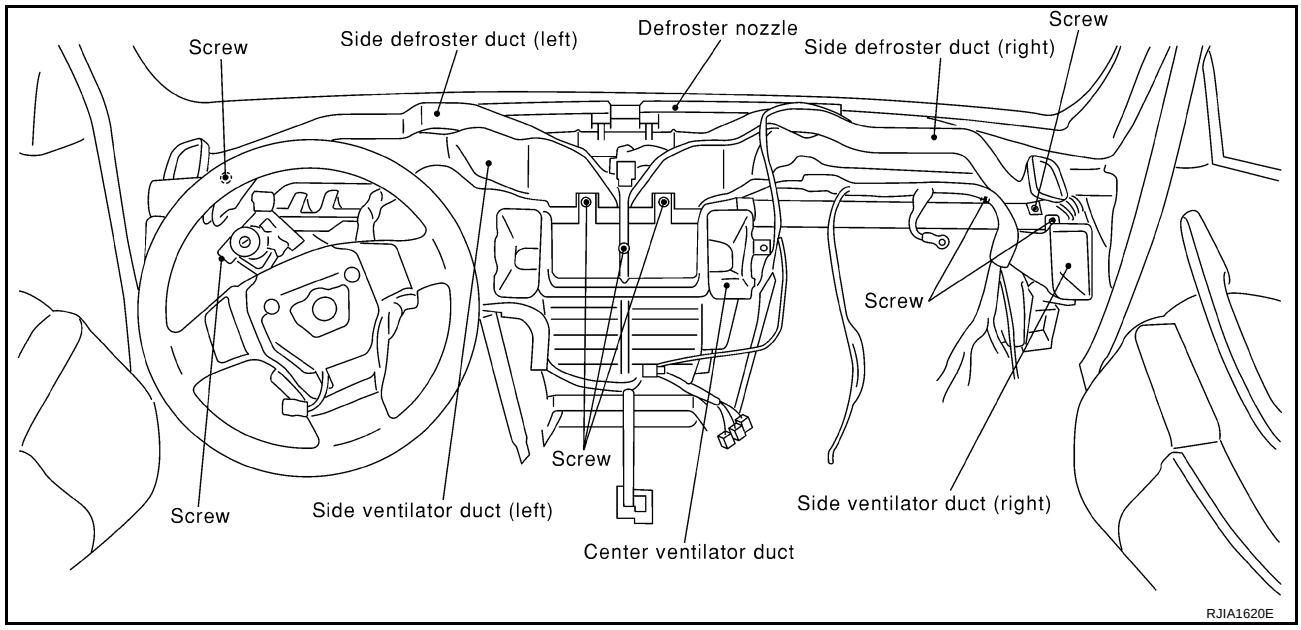
Removal of Side Ventilator Grilles

1. Remove center box assembly. Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
2. Remove mounting screw and clips, and then remove side ventilator grille (right).
3. Remove instrument driver lower panel. Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
4. Remove side ventilator grille (left).



Removal of Defroster Nozzle, Ducts and Ventilator Ducts

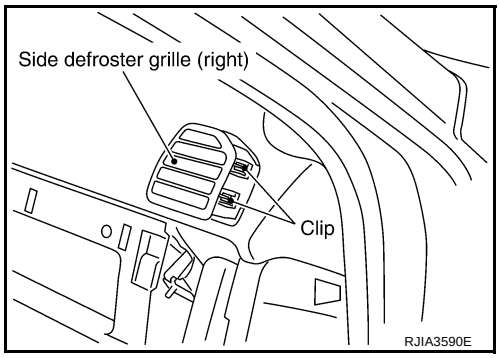
1. Remove instrument panel & pad. Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
2. Remove mounting screws, and then remove side defroster ducts.



3. Remove defroster nozzle.
4. Remove mounting screws, and then remove center ventilator duct.
5. Remove steering member, and then remove side ventilator ducts.

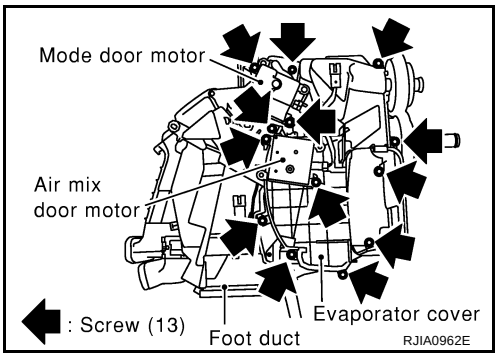
Removal of Side Defroster Grilles

Remove mounting clips, and then remove side defroster grilles.



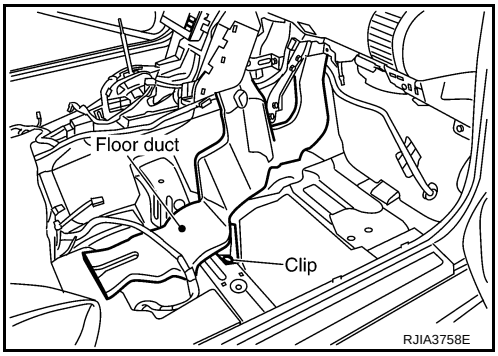
Removal of Foot Ducts

1. Remove heater & cooling unit assembly. Refer to ATC-124, "HEATER & COOLING UNIT ASSEMBLY" .
2. Remove mounting screws, and then remove evaporator cover and foot duct (passenger side).
3. Remove foot duct (driver side).

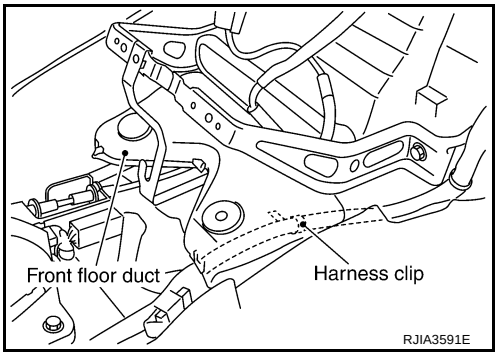


Removal of Floor Ducts

1. Remove front seats and center console. Refer to SE-134, "FRONT SEAT" and IP-10, "INSTRUMENT PANEL ASSEMBLY" .
2. Peel back floor trim to a point where floor duct is visible.
3. Remove mounting clip, and then remove floor ducts.



4. Remove instrument panel & pad. Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
5. Remove front floor duct.



INSTALLATION

Installation is basically the reverse order of removal.

REFRIGERANT LINES

PFP:92600

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

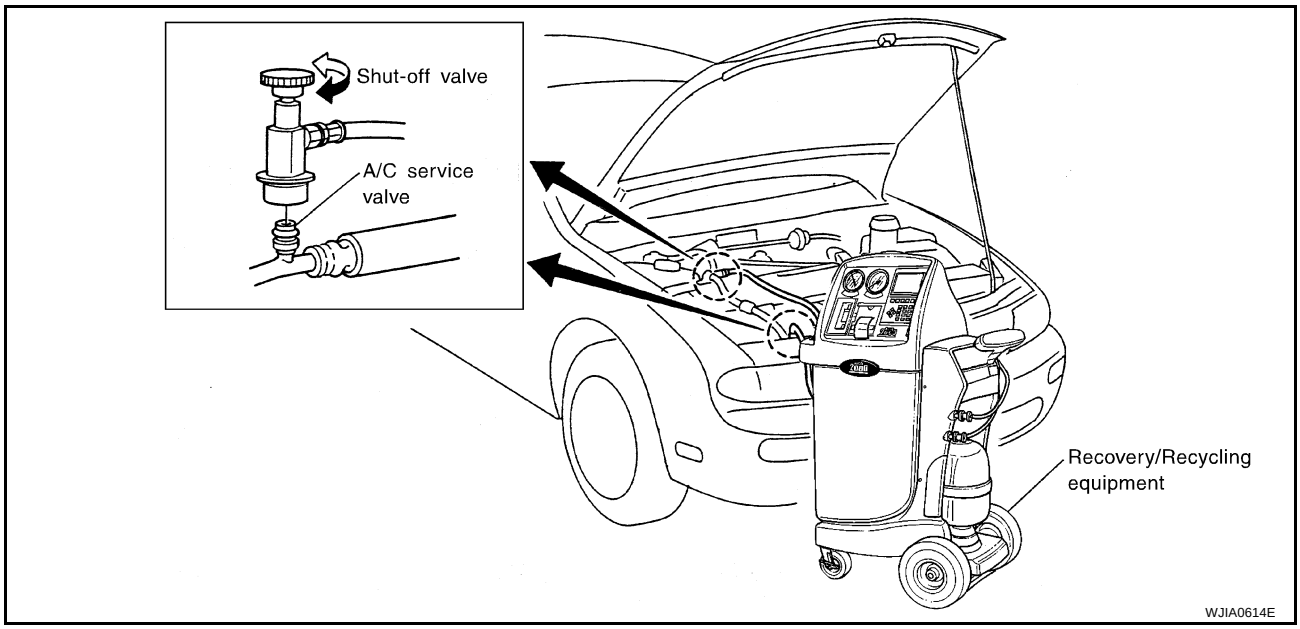
NJS0004C

SETTING OF SERVICE TOOLS AND EQUIPMENT

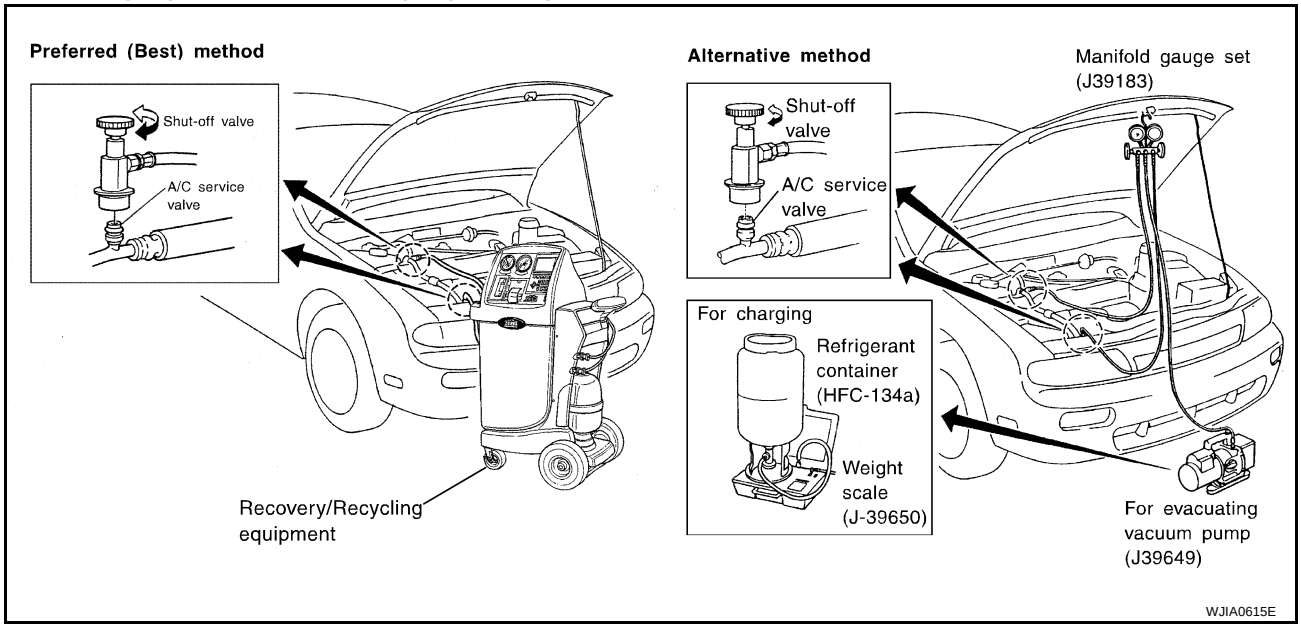
Discharging Refrigerant

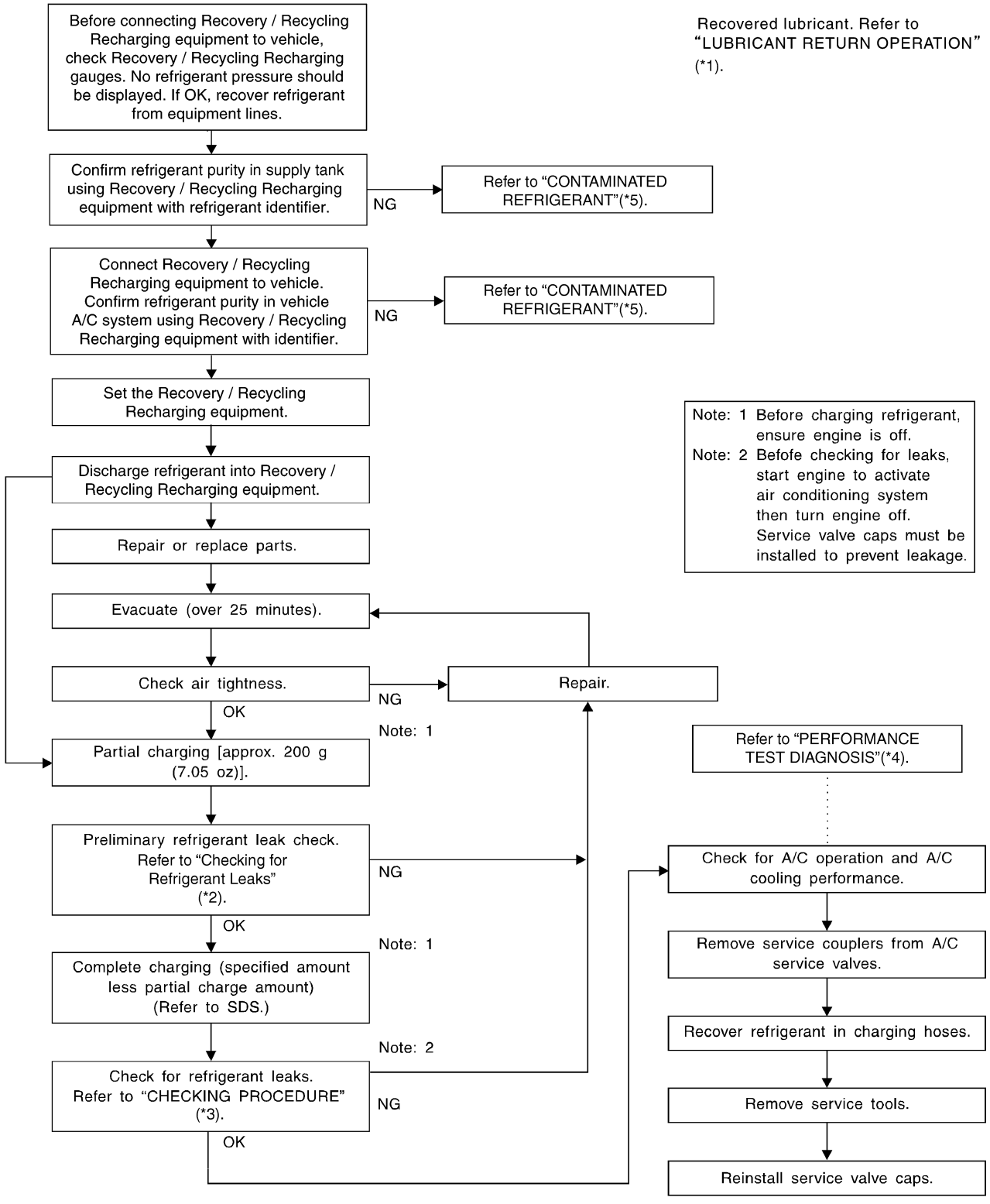
WARNING:

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





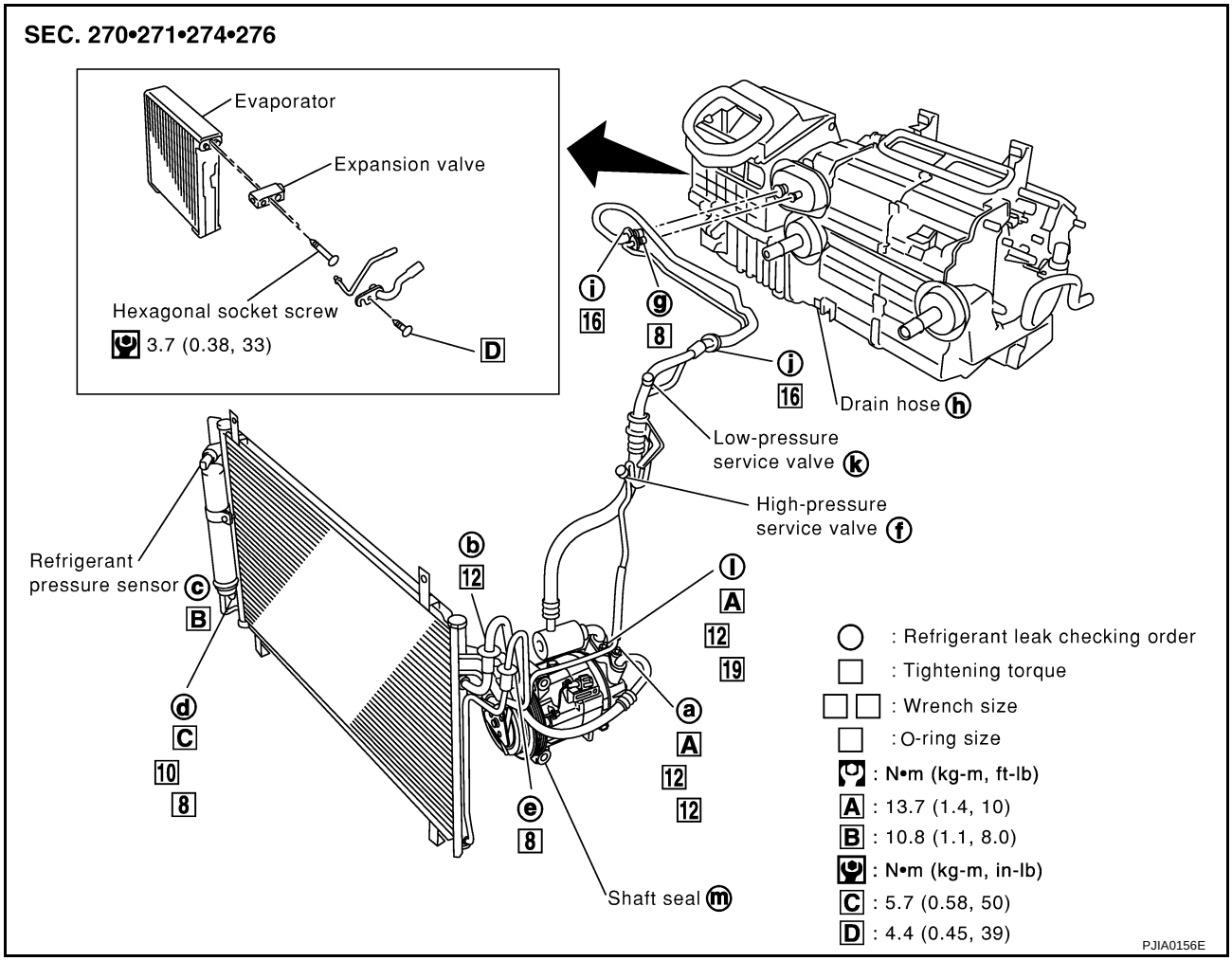
SJIA1275E

*1 ATC-25, "LUBRICANT RETURN OPERATION"
*2 ATC-151, "Checking for Refrigerant Leaks"
*3 ATC-153, "CHECKING PROCEDURE"
*4 ATC-90, "PERFORMANCE TEST DIAGNOSIS"
*5 ATC-6, "CONTAMINATED REFRIGERANT"

Components

NJS0004D

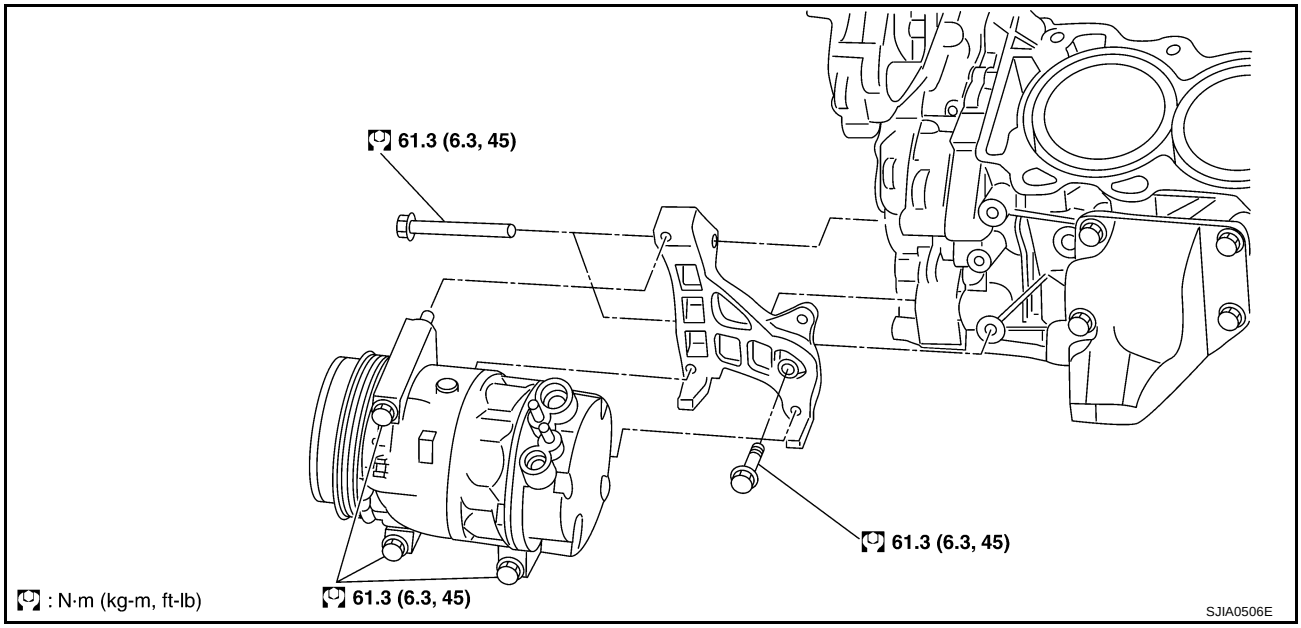
Refer to ATC-7, "Precautions for Refrigerant Connection" .



Removal and Installation of Compressor

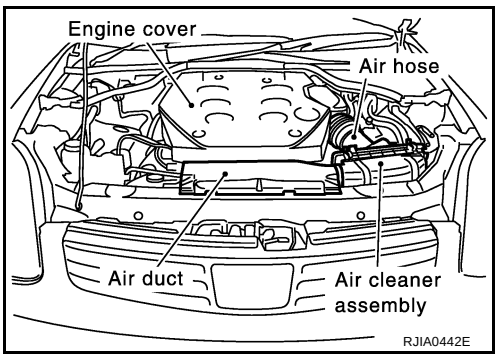
NJS0004E

REMOVAL



1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
2. Remove engine cover, using power tools. Refer to EM-18, "INTAKE MANIFOLD COLLECTOR" .

3. Remove air duct, air cleaner assembly and air hose. Refer to EM-16, "AIR CLEANER AND AIR DUCT" .
4. Remove front air spoiler.
5. Remove engine under cover, using power tools.

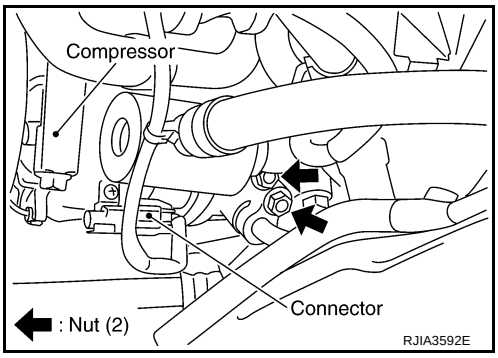


6. Remove mounting nuts from low-pressure and high-pressure flexible hose.

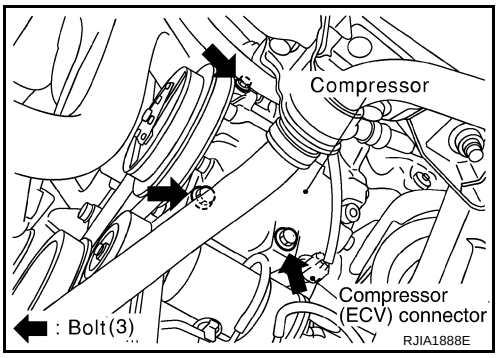
CAUTION:

Cap or wrap the joint of compressor, low-pressure flexible hose and high-pressure flexible hose with suitable material such as vinyl tape to avoid the entry of air.

7. Disconnect compressor (magnet clutch) connector.



8. Remove A/C compressor belt. Refer to EM-14, "DRIVE BELTS" .
9. Disconnect compressor (ECV) connector.
10. Remove mounting bolts from compressor, using power tools.
11. Remove compressor downward of the vehicle.



INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

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

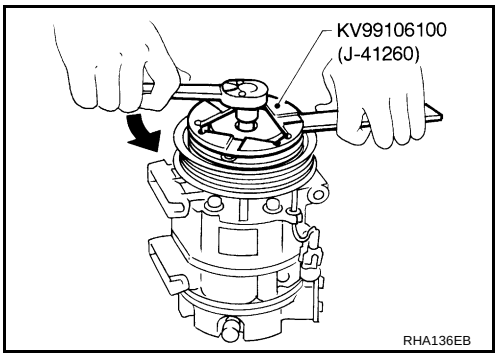
Removal and Installation of Compressor Clutch

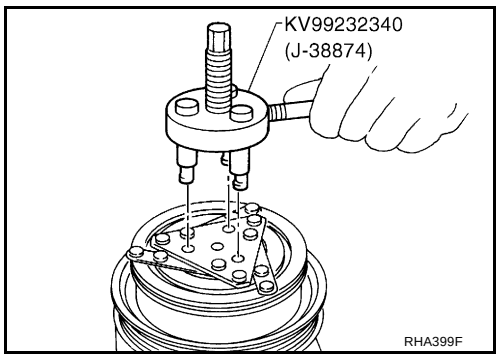
NJS0004F

REMOVAL

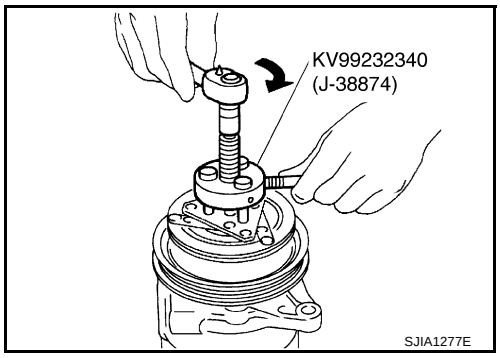
Overhaul

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

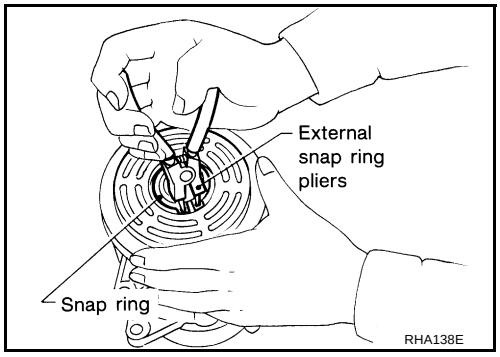




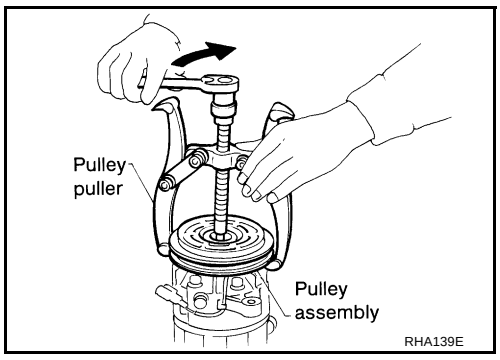
2. Remove clutch disc using a clutch disc puller (SST).



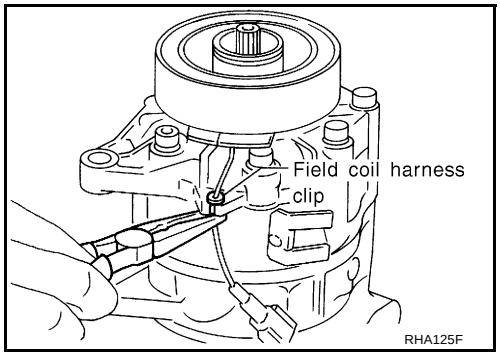
3. Remove snap ring using external snap ring pliers.



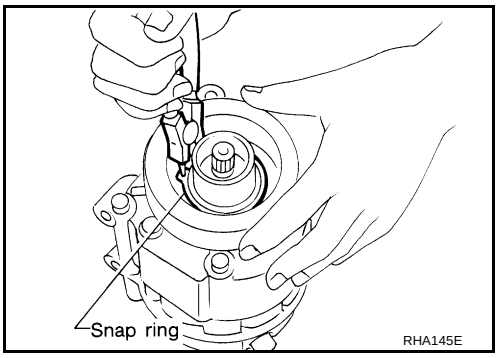
4. Position center pulley puller on the end of drive shaft, and remove pulley assembly using any commercially available pulley puller.
   To prevent pulley groove from being deformed, puller claws should be positioned into the edge of pulley assembly.



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

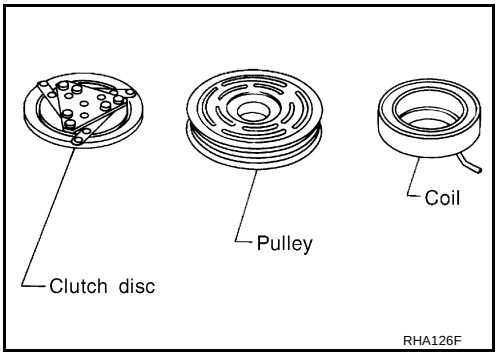


6. Remove snap ring using external snap ring pliers.



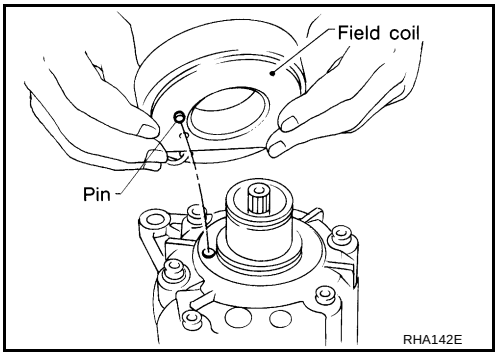
Inspection

Clutch disc
If 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. Contact surfaces of pulley assembly should be cleaned with a suitable solvent before reinstallation.
Coil
Check coil for loose connection or cracked insulation.

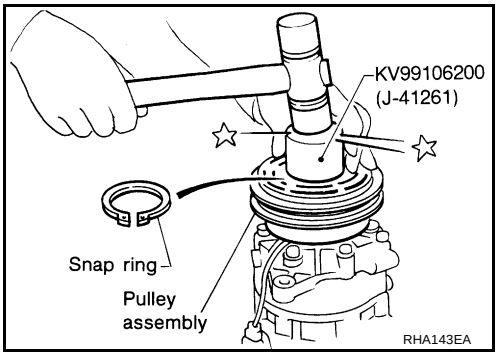


INSTALLATION

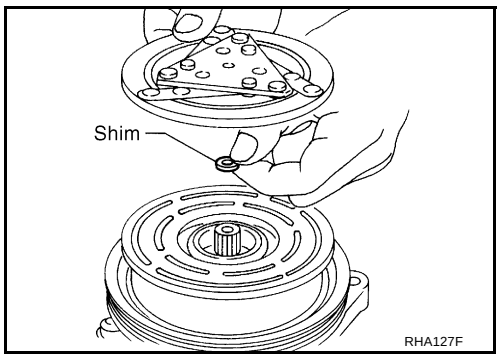
1. Install field coil.
   Be sure to align the coil's pin with hole in compressor's front head.
2. Install field coil harness clip using a screwdriver.



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



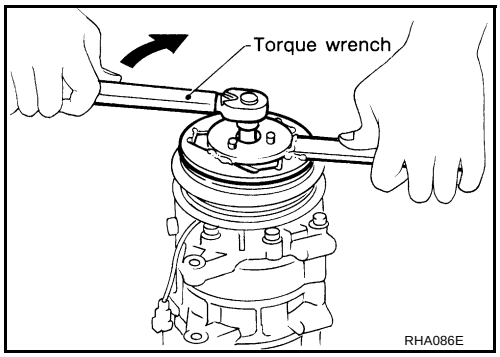
4. Install clutch disc on drive shaft, together with original shim(s). Press clutch disc down by hand.



5. Using holder to prevent clutch disc rotation.

   : 14 N·m (1.4 kg-m, 10 ft-lb)

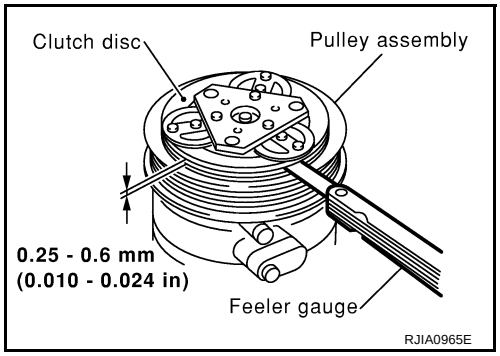
   After tightening bolt, make sure pulley rotates smoothly.



6. Check clearance around entire periphery of clutch disc.

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

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



Break-in Operation

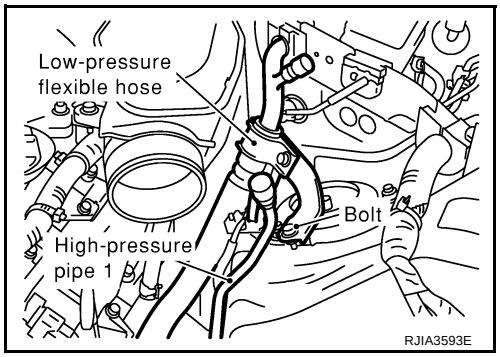
When replacing compressor clutch assembly, always carry out break-in operation. This is done by engaging and disengaging clutch about thirty-times. Break-in operation raises level of transmitted torque.

Removal and Installation of Low-pressure Flexible Hose

NJS0004G

REMOVAL

1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
2. Remove engine cover, using power tools. Refer to EM-18, "INTAKE MANIFOLD COLLECTOR" .
3. Remove air cleaner assembly, air hose and air duct. Refer to EM-16, "AIR CLEANER AND AIR DUCT" .
4. Remove mounting bolt from low-pressure flexible hose bracket.



5. Disconnect one-touch joint between low-pressure flexible hose and low-pressure pipe 1.

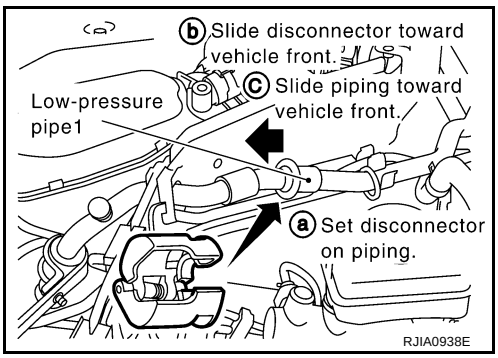
a. Set a disconnector (SST: 9253089916) on A/C piping.

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

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

CAUTION:

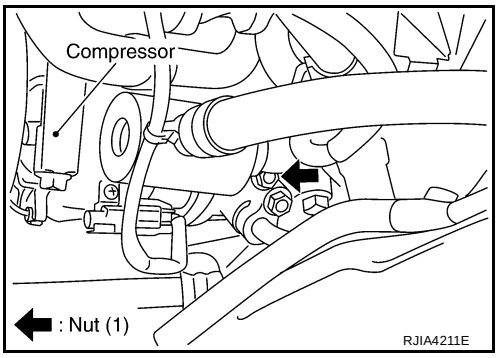
Cap or wrap the joint of low-pressure flexible hose and low-pressure pipe 1 with suitable material such as vinyl tape to avoid the entry of air.



6. Remove mounting nut, and then remove low-pressure flexible hose.

CAUTION:

Cap or wrap the joint of compressor and low-pressure flexible hose 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 low-pressure flexible hose with new ones, and then apply compressor oil to it when installing it.**
- **Female-side piping connection is thin and easy to deform. Slowly insert the male-side piping straight in axial direction.**
- **Insert piping securely until a click is heard.**
- **After piping connection is completed, pull male-side piping by hand to make sure that connection does not come loose.**
- **When recharging refrigerant, check for leaks.**

Low-pressure flexible hose bracket mounting bolt

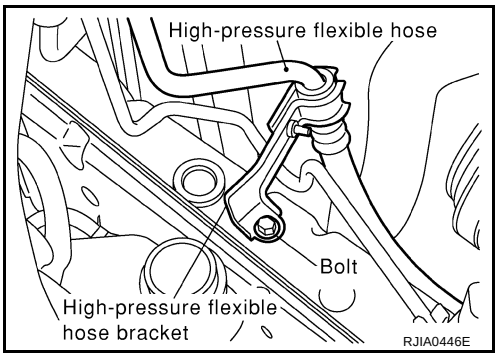
: 4.2 N·m (0.43 kg-m, 37 in-lb)

Removal and Installation of High-pressure Flexible Hose

NJS0004H

REMOVAL

1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
2. Remove engine cover, using power tools. Refer to EM-18, "INTAKE MANIFOLD COLLECTOR" .
3. Remove air cleaner assembly, air hose and air duct. Refer to EM-16, "AIR CLEANER AND AIR DUCT" .
4. Remove mounting bolt from high-pressure flexible hose bracket.



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

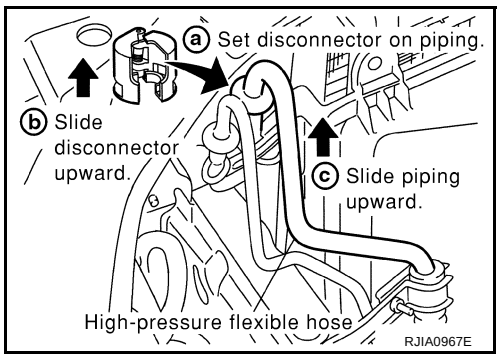
a. Set a disconnector (SST: 9253089912) on A/C piping.

b. Slide a disconnector upward until it clicks.

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

CAUTION:

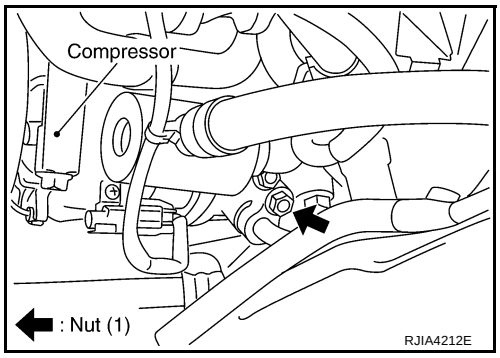
Cap or wrap the joint of condenser and high-pressure flexible hose with suitable material such as vinyl tape to avoid the entry of air.



6. Remove mounting nut, and then remove high-pressure flexible hose.

CAUTION:

Cap or wrap the joint of compressor and high-pressure flexible hose 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.**
- **Female-side piping connection is thin and easy to deform. Slowly insert the male-side piping straight in axial direction.**
- **Insert piping securely until a click is heard.**
- **After piping connection is completed, pull male-side piping by hand to make sure that connection does not come loose.**
- **When recharging refrigerant, check for leaks.**

High-pressure flexible hose bracket mounting bolt

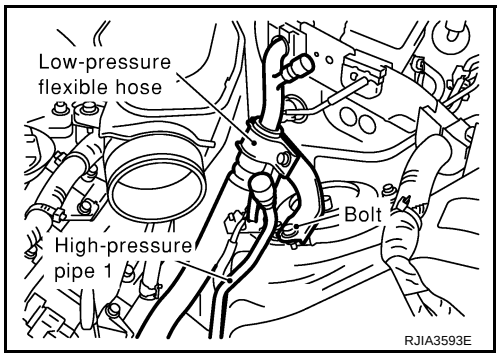
: 4.2 N·m (0.43 kg-m, 37 in-lb)

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

NJS0004I

REMOVAL

1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
2. Remove cowl top cover. Refer to EI-19, "COWL TOP" .
3. Remove mounting bolt from low-pressure flexible hose bracket.



4. Disconnect one-touch joints.

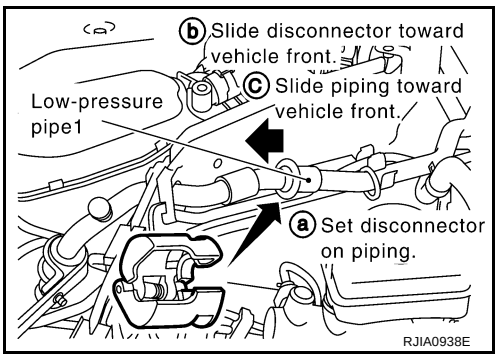
a. Set a disconnector (SST: 9253089916) on A/C piping.

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

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

CAUTION:

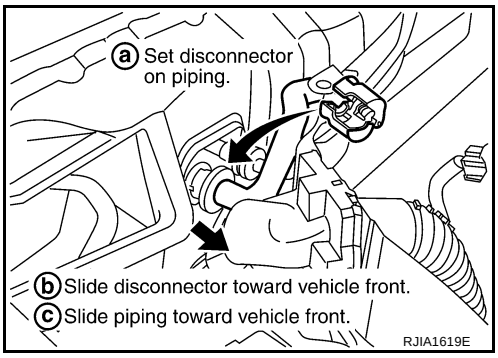
Cap or wrap the joint of low-pressure pipe 1 and low-pressure flexible hose with suitable material such as vinyl tape to avoid the entry of air.



5. Remove low-pressure pipe 1.

CAUTION:

Cap or wrap the joint of low-pressure pipe 1 and 2 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 low-pressure pipe 1 with new ones, and then apply compressor oil to it when installing it.**
- **Female-side piping connection is thin and easy to deform. Slowly insert the male-side piping straight in axial direction.**
- **Insert piping securely until a click is heard.**
- **After piping connection is completed, pull male-side piping by hand to make sure that connection does not come loose.**
- **When recharging refrigerant, check for leaks.**

Low-pressure flexible hose bracket mounting bolt

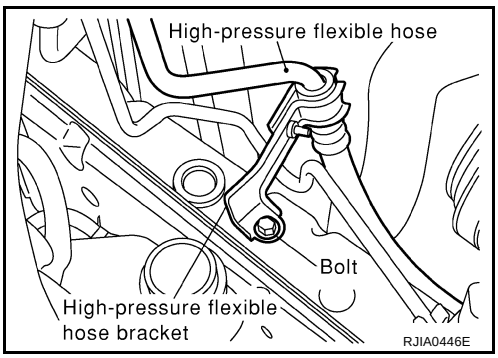
: 4.2 N·m (0.43 kg-m, 37 in-lb)

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

NJS0004J

REMOVAL

1. Remove low-pressure flexible hose and pipe 1. Refer to ATC-140, "Removal and Installation of Low-pressure Flexible Hose" and ATC-142, "Removal and Installation of Low-pressure Pipe 1 (Engine Compartment)" .
2. Remove mounting bolt from high-pressure flexible hose bracket.
3. Remove high-pressure pipe 1 from vehicle clips.



4. Disconnect one-touch joints of high-pressure pipe 1.

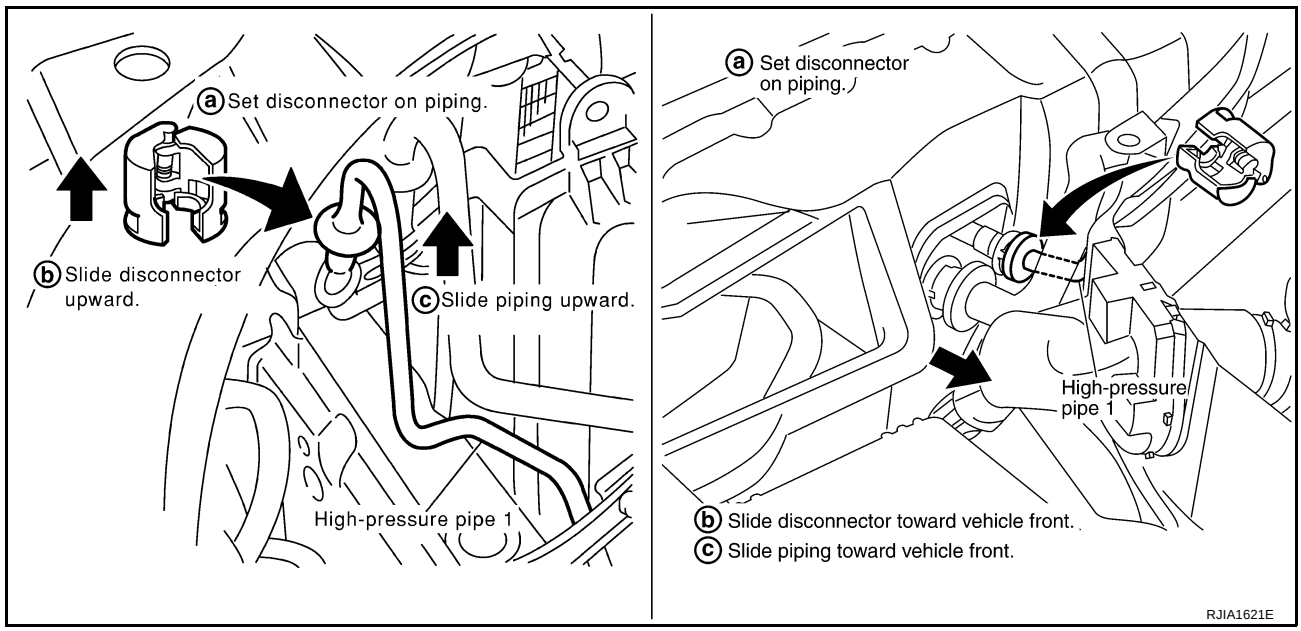
a. Set a disconnector (SST: 9253089908) on A/C piping.

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

c. Slide A/C piping toward (or upward) vehicle front and disconnect it.

CAUTION:

Cap or wrap the joint of condenser and high-pressure pipe with suitable material such as vinyl tape to avoid the entry of air.



5. Remove high-pressure pipe 1.

INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

- **Replace O-rings of high-pressure pipe 1 with new ones, and then apply compressor oil to it when installing it.**
- **Female-side piping connection is thin and easy to deform. Slowly insert the male-side piping straight in axial direction.**
- **Insert piping securely until a click is heard.**
- **After piping connection is completed, pull male-side piping by hand to make sure that connection does not come loose.**
- **When recharging refrigerant, check for leaks.**

High-pressure flexible hose bracket mounting bolt

: 4.2 N·m (0.43 kg-m, 37 in-lb)

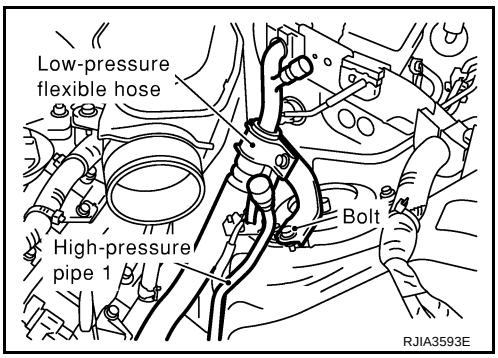
Removal and Installation of Low-pressure Pipe 2 and High-pressure Pipe 2

NJS0004K

REMOVAL

1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
2. Set the temperature control dial (passenger side) at 18°C (60°F), and then disconnect the battery cable from the negative terminal.
3. Remove cowl top cover. Refer to EI-19, "COWL TOP" .

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



6. Disconnect one-touch joints.

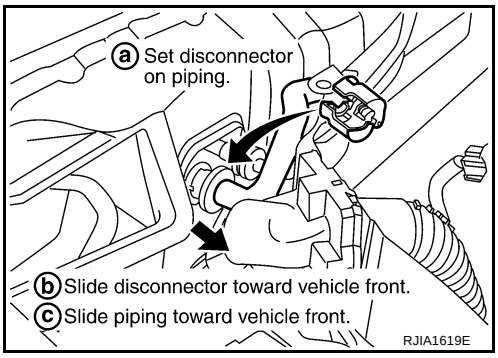
a. Set a disconnector [high-pressure side (SST: 9253089908), low-pressure side (SST: 9253089916)] on A/C piping.

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

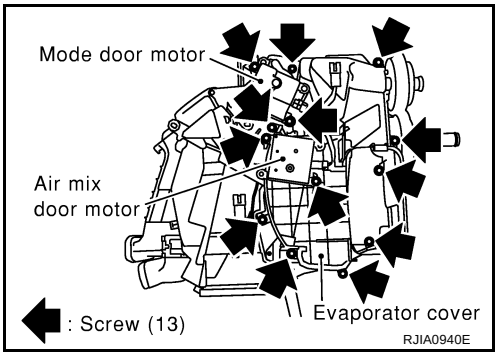
c. Slide A/C piping toward vehicle front and disconnect it.

CAUTION:

Cap or wrap the joint of low-pressure pipe 1 and high-pressure pipe 1 with suitable material such as vinyl tape to avoid the entry of air.



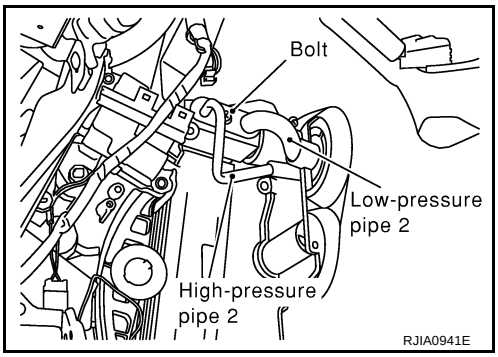
7. Remove instrument passenger lower panel and glove box. Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
8. Remove blower unit. Refer to ATC-119, "BLOWER UNIT" .
9. Remove mounting screws, and then remove air mix door motor (passenger side) and mode door motor.
10. Remove mounting screws, and then remove evaporator cover.



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

CAUTION:

Cap or wrap the joint of expansion valve 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 low-pressure pipe 1, 2 and high-pressure pipe 1, 2 with new ones, and then apply compressor oil to it when installing it.**
- **Female-side piping connection is thin and easy to deform. Slowly insert the male-side piping straight in axial direction.**
- **Insert piping securely until a click is heard.**

- **After piping connection is completed, pull male-side piping by hand to make sure that connection does not come loose.**
- **When recharging refrigerant, check for leaks.**

Low-pressure flexible hose bracket mounting bolt

: 4.2 N·m (0.43 kg-m, 37 in-lb)

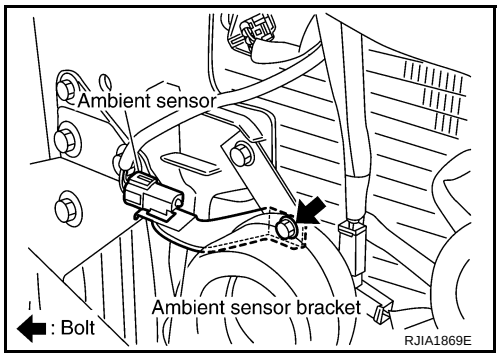
Removal and Installation of Liquid Tank

NJS0004L

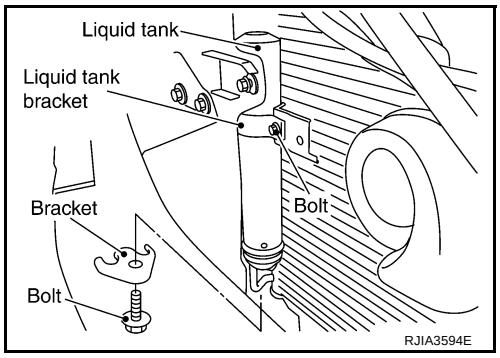
REMOVAL

1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
2. Remove front grille. Refer to EI-18, "FRONT GRILLE" .
3. Clean liquid tank and its surrounding area, and remove dust and rust from liquid tank.

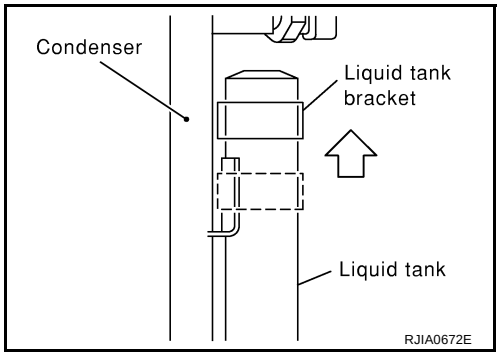
   CAUTION:
   Be sure to clean carefully.
4. Remove ambient sensor bracket after removing horn (right side). Refer to WW-44, "HORN" .



5. Remove mounting bolts from liquid tank.

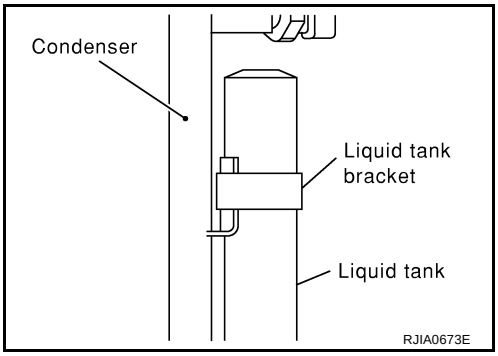


6. Lift liquid tank bracket upward. Remove liquid tank bracket from protruding part of condenser.
7. Slide liquid tank upward, and then remove liquid tank.



INSTALLATION

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



CAUTION:

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

Liquid tank bracket mounting bolt (upper side)

: 3.4 N·m (0.34 kg-m, 30 in-lb)

Liquid tank bracket mounting bolt (lower side)

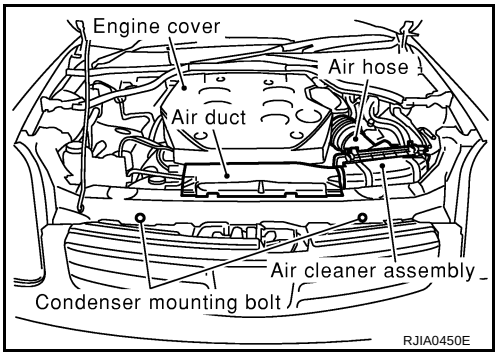
: 5.7 N·m (0.58 kg-m, 50 in-lb)

Removal and Installation of Condenser

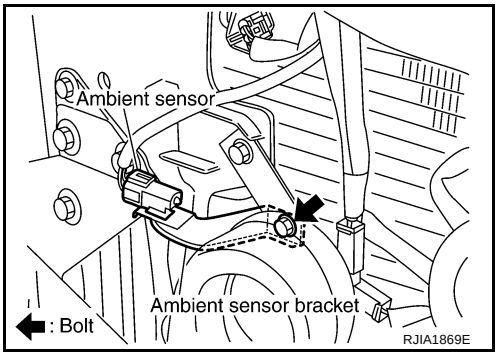
NJS0004M

REMOVAL

1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
2. Remove engine cover, using power tools. Refer to EM-18, "INTAKE MANIFOLD COLLECTOR" .
3. Remove air cleaner assembly, air hose and air duct. Refer to EM-16, "AIR CLEANER AND AIR DUCT" .
4. Remove engine under cover, using power tools.
5. Drain engine coolant. Refer to CO-10, "Changing Engine Coolant" .
6. Remove radiator fan shroud with cooling fan after removing radiator upper hose. Refer to CO-13, "RADIATOR" .
7. Remove radiator reservoir tank and radiator reservoir tank bracket. Refer to CO-13, "RADIATOR" .



8. Remove ambient sensor bracket after removing horn (right side). Refer to WW-44, "HORN" .



9. 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.

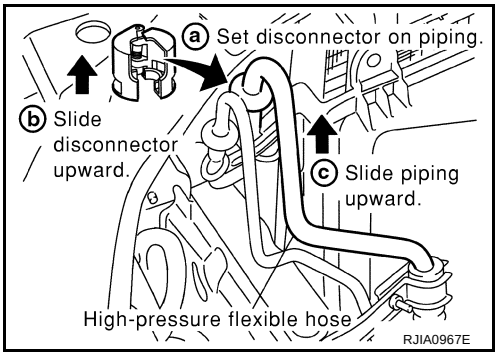
b. Slide a disconnector upward until it clicks.

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

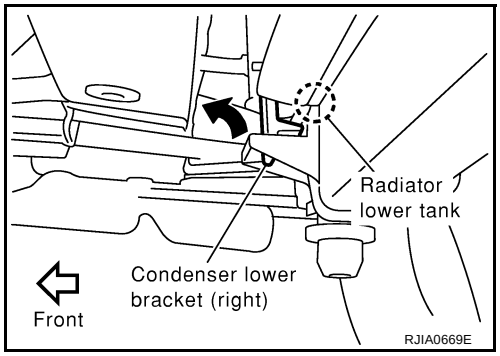
CAUTION:

Cap or wrap the joint of condenser, high-pressure flexible hose and high-pressure pipe 1 with suitable material such as vinyl tape to avoid the entry of air.

10. Remove mounting bolts from condenser.

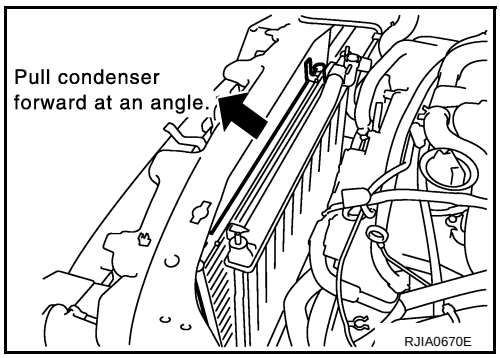


11. Remove radiator upper mount, move radiator and condenser to the engine side.
12. Lift condenser up slightly and tilt it toward front of vehicle. (This is because condenser lower bracket is on bottom of radiator tank.)



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

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



INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

- **Replace O-rings of high-pressure flexible hose and high-pressure pipe 1 with new ones, and then apply compressor oil to it when installing it.**
- **Female-side piping connection is thin and easy to deform. Slowly insert the male-side piping straight in axial direction.**
- **Insert piping securely until a click is heard.**
- **After piping connection is completed, pull male-side piping by hand to make sure that connection does not come loose.**
- **When recharging refrigerant, check for leaks.**

Condenser mounting bolt

: 6.1 N·m (0.62 kg-m, 54 in-lb)

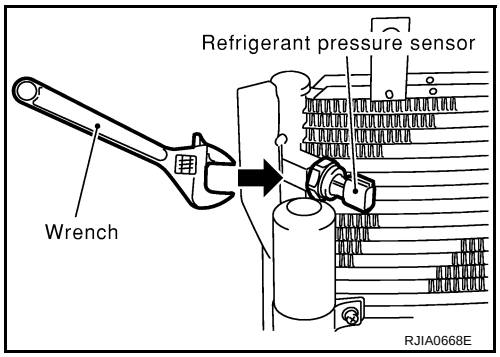
Removal and Installation of Refrigerant Pressure Sensor

NJS0004N

REMOVAL

1. Remove condenser. Refer to ATC-147, "Removal and Installation of Condenser" .
2. Remove refrigerant pressure sensor from condenser.

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



INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

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

Refrigerant pressure sensor

: 10.8 N·m (1.1 kg-m, 8.0 ft-lb)

Removal and Installation of Evaporator

NJS0004O

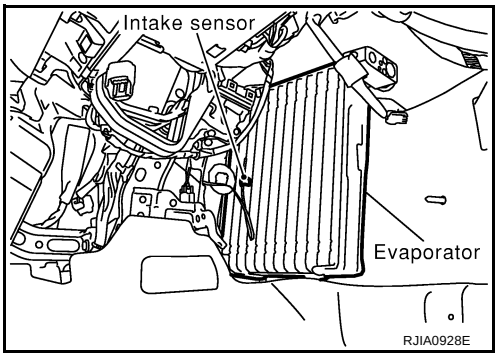
REMOVAL

1. Remove low-pressure pipe 2 and high-pressure pipe 2. Refer to ATC-144, "Removal and Installation of Low-pressure Pipe 2 and High-pressure Pipe 2" .

   CAUTION:

   Cap or wrap the joint of evaporator, low-pressure pipe 1, 2 and high-pressure pipe 1, 2 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 evaporator, low-pressure pipe 1, 2 and high-pressure pipe 1, 2 with new ones, and then apply compressor oil to it when installing it.**
- **Female-side piping connection is thin and easy to deform. Slowly insert the male-side piping straight in axial direction.**
- **Insert piping securely until a click is heard.**
- **After piping connection is completed, pull male-side piping by hand to make sure that connection does not come loose.**
- **O-rings are different from low-pressure pipe 1 (high-pressure pipe 1) and low-pressure pipe 2 (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)

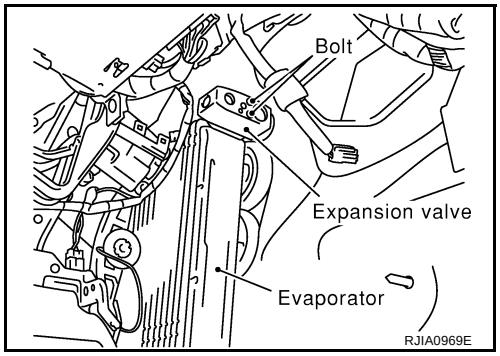
Removal and Installation of Expansion Valve

NJS0004P

REMOVAL

1. Remove evaporator. Refer to ATC-149, "Removal and Installation of Evaporator" .
2. Remove mounting bolts, and then remove expansion valve.

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



INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

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

Checking for Refrigerant Leaks

NJS0004Q

Perform a visual inspection of all refrigeration parts, fittings, hoses and components for signs of A/C lubricant leakage, damage and corrosion. A/C lubricant leakage may indicate an area of refrigerant leakage. Allow extra inspection time in these areas when using either an electrical leak detector or fluorescent dye leak detector (SST: J-42220).
If dye is observed, confirm the leak with an electrical leak detector. It is possible a prior leak was repaired and not properly cleaned.
When searching for leaks, do not stop when one leak is found but continue to check for additional leaks at all system components and connections.
When searching for refrigerant leaks using an electrical leak detector, move the probe along the suspected leak area at 1 to 2 inches per second and no further than 1/4 inch from the component.

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

Checking System for Leaks Using the Fluorescent Leak Detector

NJS0004R

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

NOTE:
Other gases in the work area or substances on the A/C components, for example, anti-freeze, windshield washer fluid, solvents and lubricants, may falsely trigger the leak detector. Make sure the surfaces to be checked are clean.
Clean with a dry cloth or blow off with shop air.
Do not allow the sensor tip of the detector to contact with any substance. This can also cause false readings and may damage the detector.

Dye Injection

NJS0004S

(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 (3.52 kg/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 valve.
4. Start the engine and switch A/C ON.
5. When the A/C operating (compressor running), inject one bottle (1/4 ounce / 7.4 cc) of fluorescent dye through the low-pressure service valve using dye injector tool (SST: J-41459) (refer to the manufacture's operating instructions).
6. With the engine still running, disconnect the injector tool from the service valve.

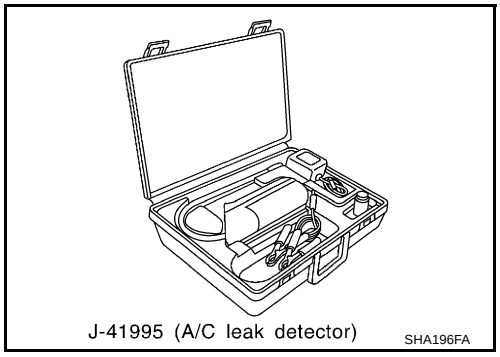
   CAUTION:
   Be careful the A/C system or replacing a component, pour the dye directly into the open system connection and proceed with the service procedures.
7. Operate the A/C system for a minimum of 20 minutes to mix the dye with the system oil. Depending on the leak size, operating conditions and location of the leak, it may take from minutes to days for the dye to penetrate a leak and become visible.
8. Attach a blue label as necessary.

Electrical Leak Detector

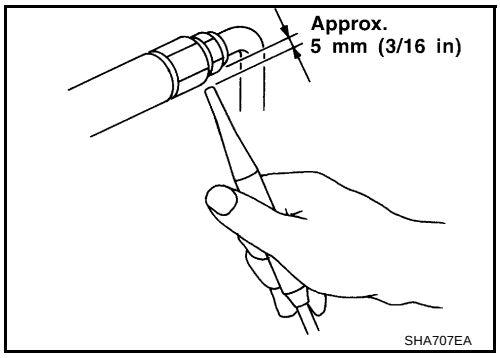
NJS0004T

PRECAUTIONS FOR HANDLING LEAK DETECTOR

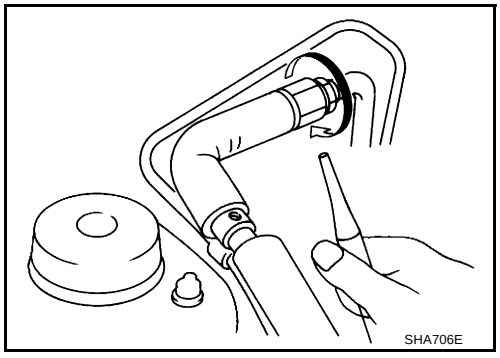
When performing a refrigerant leak check, use an A/C electrical leak detector (SST) or equivalent. Ensure that the instrument is calibrated and set properly per the operating instructions.
The leak detector is a delicate device. In order to use the leak detector properly, read the operating instructions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



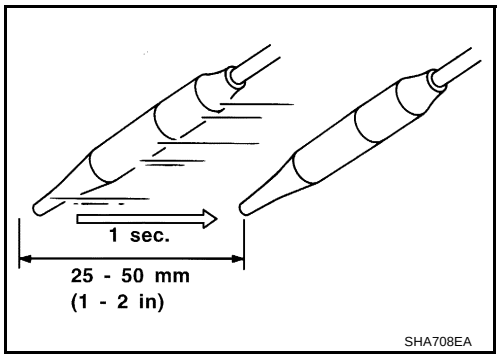
1. Position probe approximately 5 mm (3/16 in) away from point to be checked.



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 the engine.
2. Connect a suitable A/C manifold gauge set (SST: J-39183) 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.

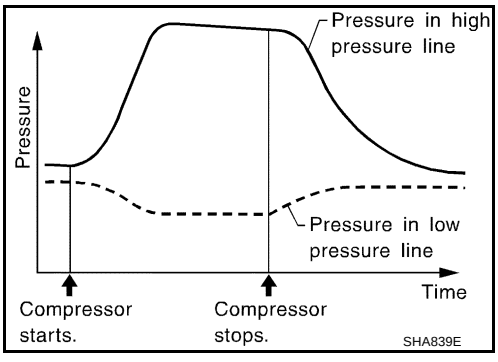
   NOTE:
   At temperatures below 16°C (61°F), leaks may not be detected since the system may not reach 345 kPa (3.52 kg/cm^2 , 50 psi).
4. Perform the leak test from the high-pressure side (compressor discharge a to evaporator inlet g) to the low-pressure side (evaporator drain hose h to shaft seal m). Refer to ATC-136, "Components" . Perform a leak check for the following areas carefully. Clean the component to be checked and move the leak detected probe completely around the connection/component.

   Compressor
   Check the fitting of high- and low- pressure flexible hoses, relief valve and shaft seal.
   Condenser
   Check the fitting of high-pressure flexible hose and pipe, refrigerant pressure sensor.
   Liquid tank
   Check the fitting of refrigerant connection.
   Service valves
   Check all around the service valves. Ensure service valve caps are secured on the service valves (to prevent leaks).

   NOTE:
   After removing A/C manifold gauge set from service valves, wipe any residue from valves to prevent any false readings by leak detector.
   Cooling unit (Evaporator)
   With engine OFF, turn blower fan on “High” for at least 15 seconds to dissipate any refrigerant trace in the cooling unit. Wait a minimum of 10 minutes accumulation time (refer to the manufacturer’s recommended procedure for actual wait time) before inserting the leak detector probe into the drain hose.
   Keep the probe inserted for at least 10 seconds. Use caution not to contaminate the probe tip with water or dirt that may be in the drain hose.
5. If a leak detector detects a leak, verify at least once by blowing compressed air into area of suspected leak, then repeat check as outlined above.
6. Do not stop when one leak is found. Continue to check for additional leaks at all system components.
   If no leaks are found, perform steps 7 - 10.
7. Start the engine.
8. Set the A/C control as follows;

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

9. Run engine at 1,500 rpm for at least 2 minutes.
10. Stop the engine and perform leak check again following steps 4 through 6 above.
    Refrigerant leaks should be checked immediately after stopping the engine. Begin with the leak detector at the compressor. The pressure on the high-pressure side will gradually drop after refrigerant circulation stops and pressure on the low-pressure side will gradually rise, as shown in the graph. Some leaks are more easily detected when pressure is high.



11. Before connecting 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 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

NJS0004U

Model		Calsonic Kansei make CWE-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 - 28.6 (0.091 - 1.126)]
Direction of rotation		Clockwise (viewed from drive end)
Drive belt		Poly V

Lubricant

NJS0004V

Model		Calsonic Kansei make CWE-615M
Name		Nissan A/C System Oil Type S (DH-PS)
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

NJS0004W

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

Engine Idling Speed

NJS0004X

Refer to EC-685, "Idle Speed and Ignition Timing" .

Belt Tension

NJS0004Y

Refer to EM-168, "DRIVE BELT" .