SECTION HA

HEATER & AIR CONDITIONING SYSTEM

CONTENTS

BASIC INSPECTION

DIAGNOSIS AND REPAIR WORKFLOW

Work Flow

INFOID:0000000001183091

DETAILED FLOW

1.LISTEN TO CUSTOMER COMPLAINT

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

>> GO TO 2.

2.VERIFY THE SYMPTOM WITH OPERATIONAL CHECK

Verify the symptom with operational check. Refer to HAC-6, "Description & Inspection".

>> GO TO 3.

3.GO TO APPROPRIATE TROUBLE DIAGNOSIS

Go to appropriate trouble diagnosis (Refer to HAC-122, "Diagnosis Chart By Symptom").

>> GO TO 4.

4.REPAIR OR REPLACE

Repair or replace the specific parts

>> GO TO 5.

5.FINAL CHECK

Final check.

Is the inspection result normal?

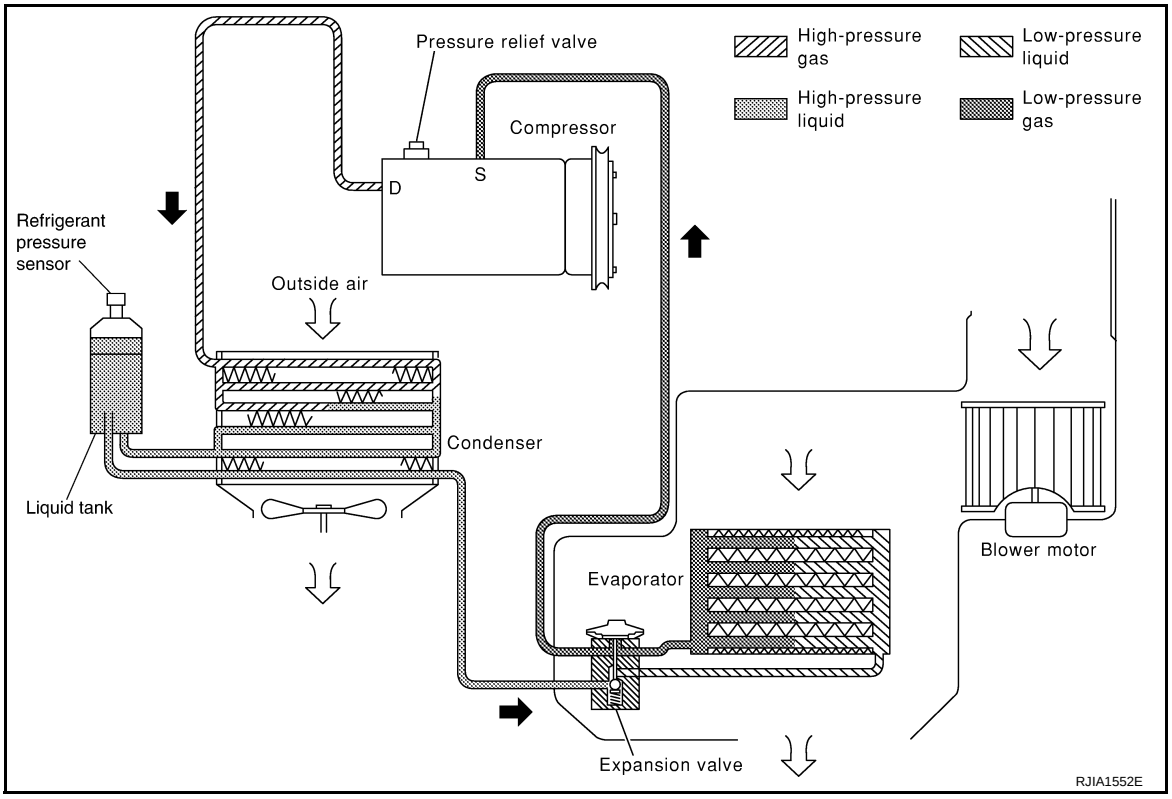
YES >> CHECK OUT
NO >> GO TO 3.

FUNCTION DIAGNOSIS

REFRIGERATION SYSTEM

System Diagram

INFOID:0000000001183092



System Description

INFOID:0000000001183093

REFRIGERANT CYCLE

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

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 3,628 kPa (37 kg/cm^2, 526 psi)], the release port on the pressure relief valve automatically opens and releases refrigerant into the atmosphere.

LUBRICANT

Maintenance of Lubricant Quantity in Compressor

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:

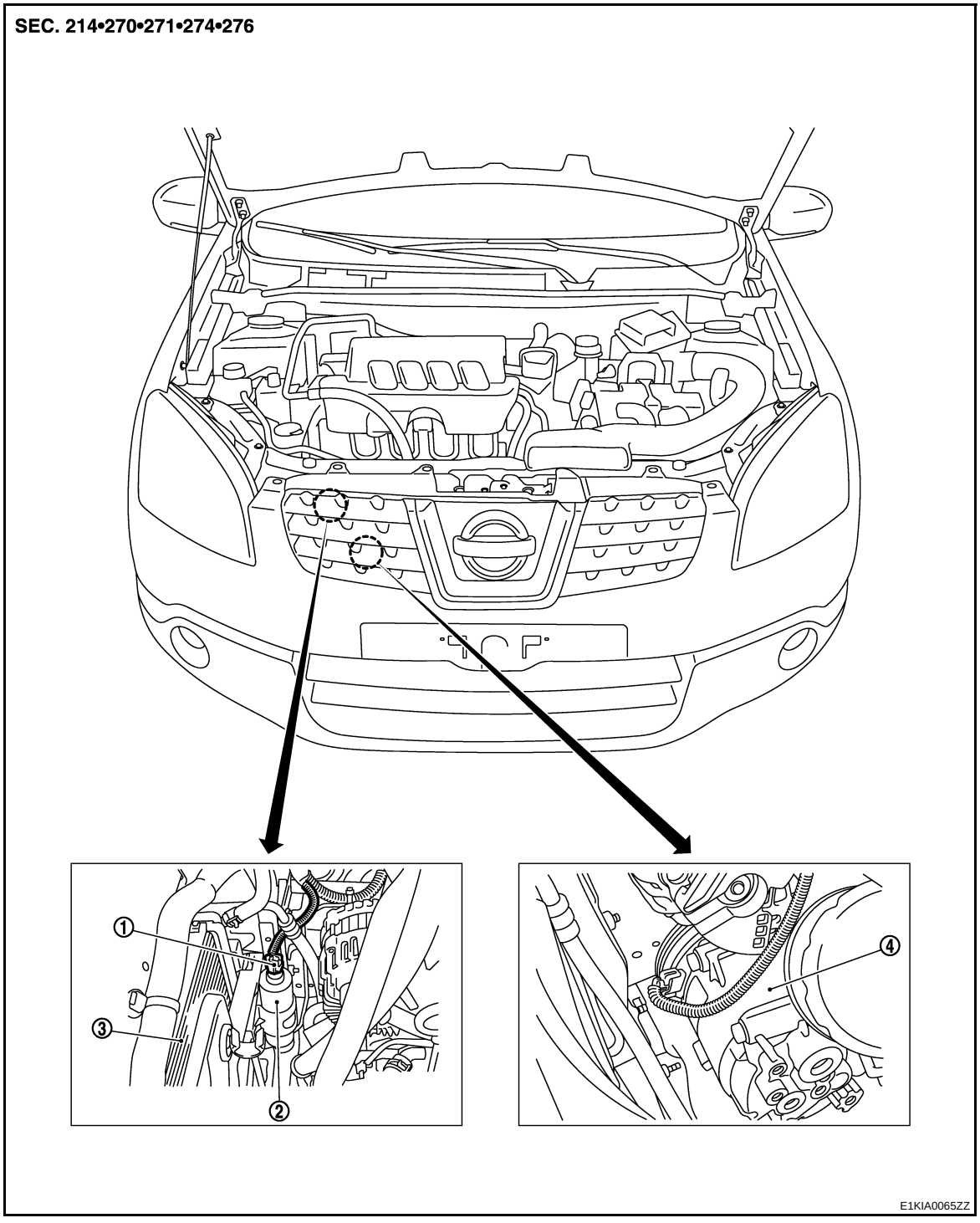
- Lack of lubricant: May lead to a seized compressor.
- Excessive lubricant: Inadequate cooling (thermal exchange interference)

Lubricant

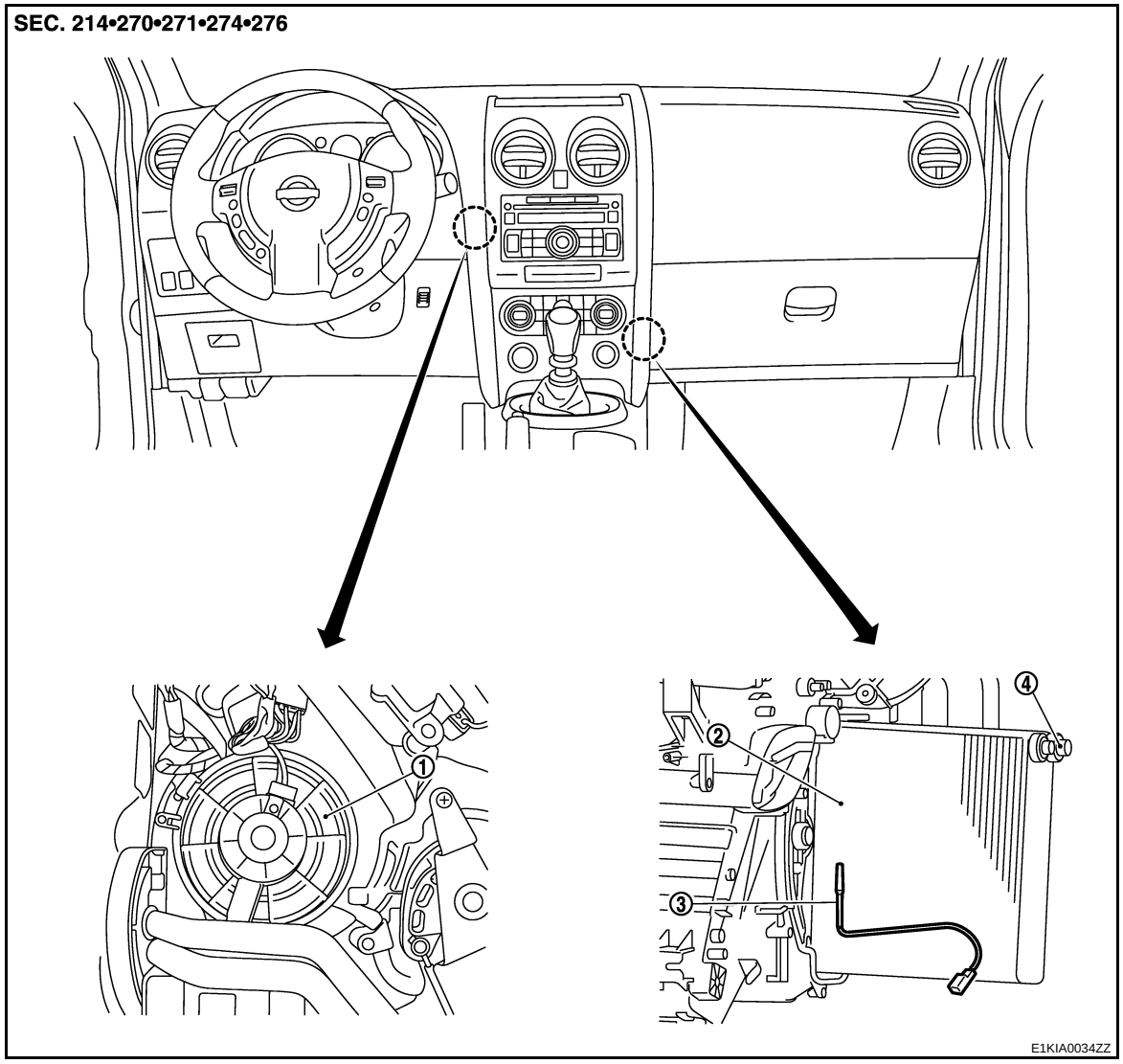
Name	**: Nissan A/C System Oil Type S**

Component Parts Location

INFOID:0000000001183094



1. Refrigerant pressure sensor
2. Liquid tank
3. Radiator
4. Compressor



1. Blower motor assembly
2. Evaporator
3. Intake sensor (AT only)
4. Expansion valve

Component Description

INFOID:0000000001183095

Component	Description
Compressor	Intakes, compresses, and discharges refrigerant, then conveys it to condenser.
Condenser	Condenses refrigerant, and then conveys it to liquid tank.
Liquid tank	Drives moisture out of refrigerant, eliminates foreign matter, then conveys refrigerant to expansion valve.
Refrigerant pressure sensor	Refer to HAC-70, "Component Inspection".
Expansion valve	Vaporizes refrigerant, controls the amount of flow, then conveys refrigerant to evaporator.
Evaporator	Cools passing air, and then conveys it to compressor.
Blower motor	Takes in air in the vehicle or fresh outside air, and then adjusts room temperature by air conditioning.

SYMPTOM DIAGNOSIS

REFRIGERATION SYSTEM SYMPTOMS

SYMPTOM DIAGNOSIS PROCEDURE

SYMPTOM DIAGNOSIS PROCEDURE : Trouble Diagnosis For Unusual Pressure

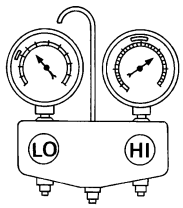
INFOID:0000000001183096

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

BOTH HIGH- AND LOW-PRESSURE SIDES ARE TOO HIGH : Symptom Table

INFOID:0000000001183097

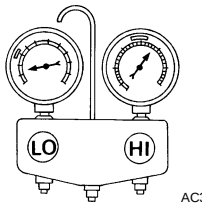
Gauge indication	Refrigerant cycle	Probable cause	Corrective action
Both high- and low-pressure sides are too high.  AC359A	The pressure returns to normal is reduced soon after water is splashed on condenser.	Excessive refrigerant charge in refrigeration cycle.	Reduce refrigerant until specified pressure is obtained.
	Air suction by cooling fan is insufficient.	Insufficient condenser cooling performance. ↓ 1. Condenser fins are clogged. 2. Improper fan rotation of cooling fan.	• Clean condenser. • Check and repair cooling fan as necessary.
	• Low-pressure pipe is not cold. • When compressor is stopped high-pressure value quickly drops by approximately 196 kPa (2 kg/cm^2, 28 psi). It then decreases gradually thereafter.	Poor heat exchange in condenser (After compressor operation stops, high-pressure decreases too slowly.). ↓ Air in refrigeration cycle.	Evacuate repeatedly and recharge system.
	Engine tends to overheat.	Engine cooling systems malfunction.	Check and repair each engine cooling system.
	• An area of the low-pressure pipe is colder than areas near the evaporator outlet. • 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

HIGH-PRESSURE SIDE IS TOO HIGH AND LOW-PRESSURE SIDE IS TOO LOW :

Symptom Table

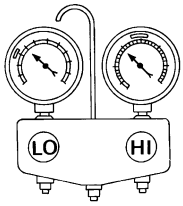
INFOID:0000000001183098

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

HIGH-PRESSURE SIDE IS TOO LOW AND LOW-PRESSURE SIDE IS TOO HIGH : Symptom Table

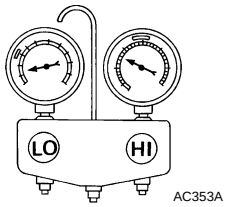
INFOID:0000000001183099

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

BOTH HIGH- AND LOW-PRESSURE SIDES ARE TOO LOW : Symptom Table

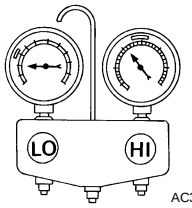
INFOID:0000000001183100

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 HA-34, "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 HAC-59, "Diagnosis Procedure". • Replace compressor. • Repair evaporator fins. • Replace evaporator. • Refer to HAC-62, "Diagnosis Procedure".

LOW-PRESSURE SIDE SOMETIMES BECOMES NEGATIVE

LOW-PRESSURE SIDE SOMETIMES BECOMES NEGATIVE : Symptom Table

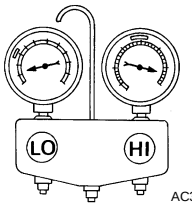
INFOID:0000000001183101

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

LOW-PRESSURE SIDE BECOMES NEGATIVE : Symptom Table

INFOID:0000000001183102

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.

PRECAUTION

PRECAUTIONS

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

INFOID:0000000001183103

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 AIRBAG” and “SEAT BELT” of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision 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 AIRBAG”.**
- **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.**

Precaution Necessary for Steering Wheel Rotation After Battery Disconnect

INFOID:0000000001183104

NOTE:

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

For models equipped with the Intelligent Key system and NATS, an electrically controlled steering lock mechanism is adopted on the key cylinder.
For this reason, if the battery is disconnected or if the battery is discharged, the steering wheel will lock and steering wheel rotation will become impossible.
If steering wheel rotation is required when battery power is interrupted, follow the procedure below before starting the repair operation.

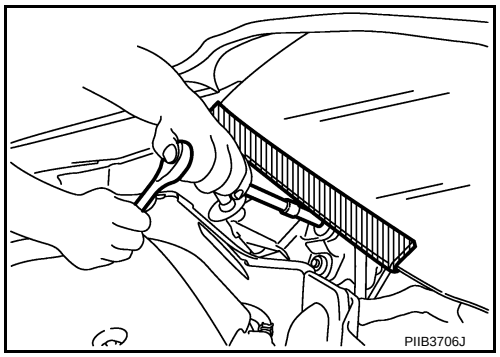
OPERATION PROCEDURE

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

Precaution for Procedure without Cowl Top Cover

INFOID:0000000001183105

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



Precautions For Xenon Headlamp Service

INFOID:0000000001183106

WARNING:

Comply with the following warnings to prevent any serious accident.

- **Disconnect the battery cable (negative terminal) or the power supply fuse before installing, removing, or touching the xenon headlamp (bulb included). The xenon headlamp contains high-voltage generated parts.**
- **Never work with wet hands.**
- **Check the xenon headlamp ON-OFF status after assembling it to the vehicle. Never turn the xenon headlamp ON in other conditions. Connect the power supply to the vehicle-side connector. (Turning it ON outside the lamp case may cause fire or visual impairments.)**
- **Never touch the bulb glass immediately after turning it OFF. It is extremely hot.**

CAUTION:

Comply with the following cautions to prevent any error and malfunction.

- **Install the xenon bulb securely. (Insufficient bulb socket installation may melt the bulb, the connector, the housing, etc. by high-voltage leakage or corona discharge.)**
- **Never perform HID circuit inspection with a tester.**
- **Never touch the xenon bulb glass with hands. Never put oil and grease on it.**
- **Dispose of the used xenon bulb after packing it in thick vinyl without breaking it.**
- **Never wipe out dirt and contamination with organic solvent (thinner, gasoline, etc.).**

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

INFOID:0000000001183107

CAUTION:

- **CFC-12 (R-12) refrigerant and HFC-134a (R-134a) refrigerant are not compatible. These refrigerants must never be mixed, even in the smallest amounts. If the refrigerants are mixed and compressor malfunction is likely occur.**
- **Use only specified lubricant for the HFC-134a (R-134a) A/C system and HFC-134a (R-134a) components. If lubricant other than that specified is used, compressor malfunction is likely to occur.**
- **The specified HFC-134a (R-134a) lubricant rapidly absorbs moisture from the atmosphere. The following handling precautions must be observed:**
- **When removing refrigerant components from a vehicle, immediately cap (seal) the component to minimize the entry of moisture from the atmosphere.**
- **When installing refrigerant components to a vehicle, never remove the caps (unseal) until just before connecting the components. Connect all refrigerant loop components as quickly as possible to minimize the entry of moisture into system.**
- **Only use the specified lubricant from a sealed container. Immediately reseal containers of lubricant. Without proper sealing, lubricant will become moisture saturated and should not be used.**
- **Never allow lubricant (Nissan A/C System Oil Type S) to come in contact with styrene foam parts. Damage may result.**

General Refrigerant Precaution

INFOID:0000000001183108

WARNING:

- **Avoid breathing A/C refrigerant and lubricant vapor or mist. Exposure may irritate eyes, nose and throat. Use only approved recovery/recycling equipment to discharge HFC-134a (R-134a) refrigerant.**

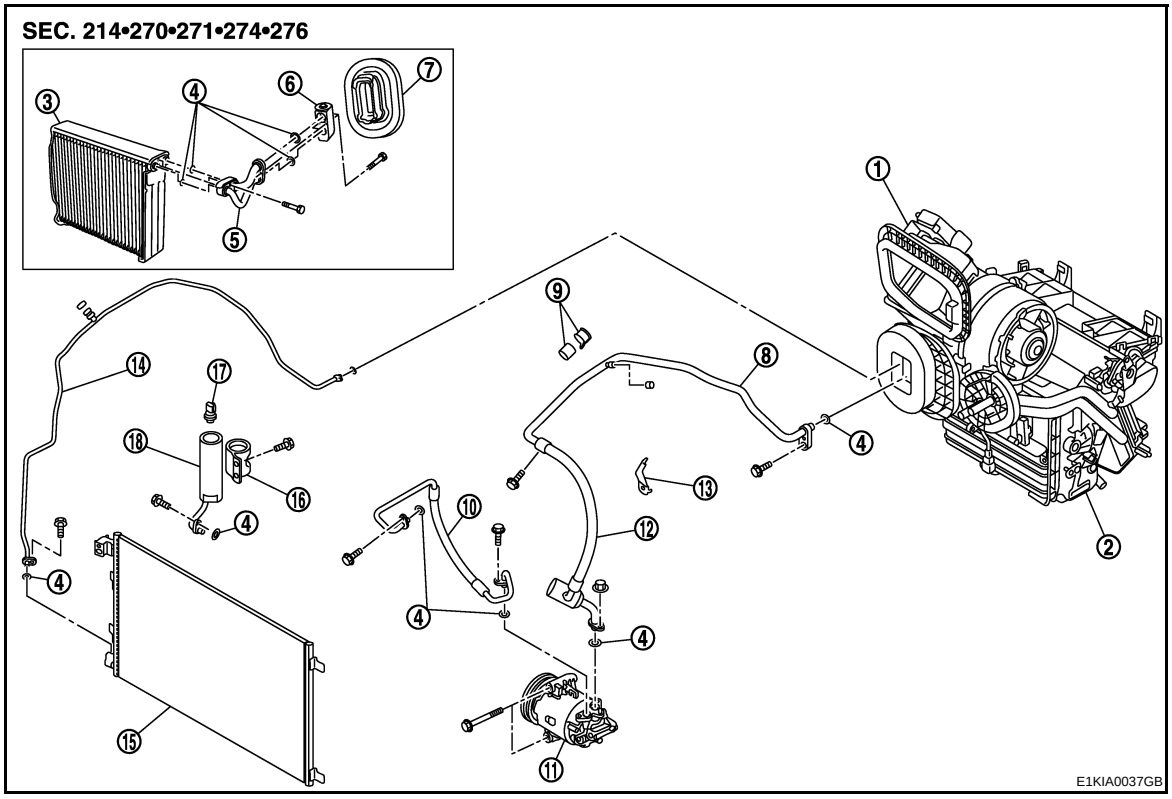
If accidental system discharge occurs, ventilate work area before resuming service. Additional health and safety information may be obtained from refrigerant and lubricant manufacturers.
- **Never release refrigerant into the air. Use approved recovery/recycling equipment to capture the refrigerant every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

Refrigerant Connection

INFOID:0000000001183109

A new type refrigerant connection has been introduced to all refrigerant lines except the following location.
- Expansion valve to evaporator
- Refrigerant pressure sensor to liquid tank

O-RING AND REFRIGERANT CONNECTION



1. Heater & blower unit assembly	2. Heater and cooling unit assembly	3. Evaporator
4. O-ring	5. Low pressure pipe 1 and high pressure pipe 2 assembly	6. Expansion valve
7. Heater sealing	8. Low pressure flexible hose and pipe 2	9. Low pressure pipe 2 fixing clamp assembly
10. High pressure flexible hose	11. Compressor	12. Low pressure flexible hose

13. Low & high pipe bracket support
14. High pressure pipe 1
15. Condenser assembly
16. Liquid tank fixing bracket
17. Refrigerant pressure sensor
18. Liquid tank

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

O-Ring Part Numbers and Specifications

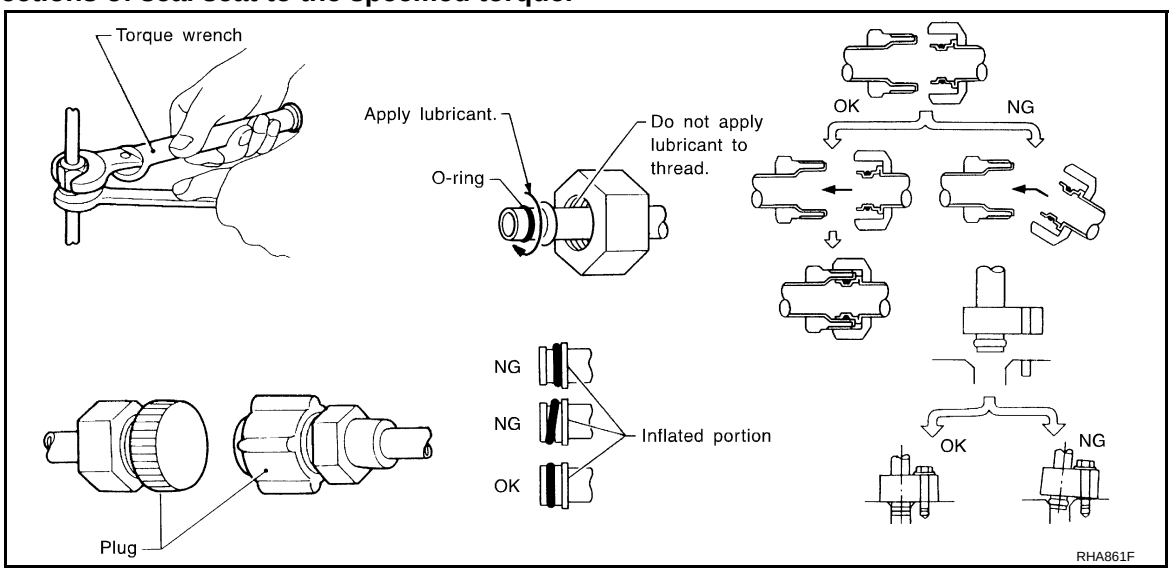
Connection type	Piping connection point		Part number	QTY	O-ring size
New	Low pressure pipe 2 to expansion valve		92473 N8210	1	16
	High pressure flexible pipe 1 to condenser		92472 N8210	1	12
	High pressure pipe 1 to expansion valve		92471 N8210	1	8
	Low pressure pipe 1 and high pressure pipe 2 assembly to expansion valve	Inlet	92475 71L00	1	12
		Outlet	92475 72L00	1	16
	Low pressure pipe 1 and high pressure pipe 2 assembly to evaporator	Inlet	92475 71L00	1	12
		Outlet	92475 72L00	1	16
	High pressure pipe 1 to liquid tank		92471 N8210	1	8
	Compressor to low pressure flexible hose		92474 N8210	1	16
	Compressor to high pressure flexible hose		92472 N8210	1	12
	Liquid tank to condenser		92473 N8210	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 tube, 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 portion of tube.**
- **When replacing the O-ring, be careful not to damage O-ring and tube.**
- **Connect tube until a click can be heard, then tighten the nut or bolt by hand. 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.**



Service Equipment

INFOID:0000000001183110

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.

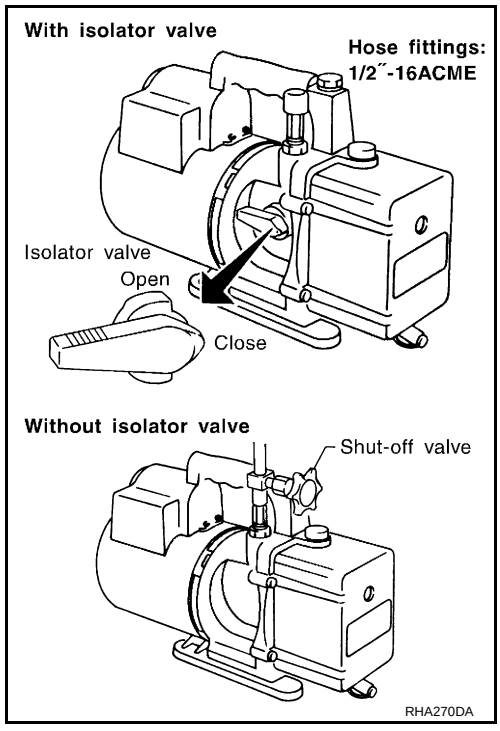
VACUUM PUMP

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.

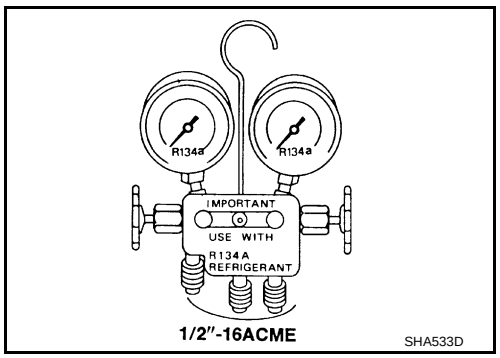
- Usually vacuum pumps have a manual isolator valve as part of the pump. Close this valve to isolate the service hose from the pump.
- For pumps without an isolator, use a hose equipped with a manual shut-off valve near the pump end. Close the valve to isolate the hose from the pump.
- If the hose has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



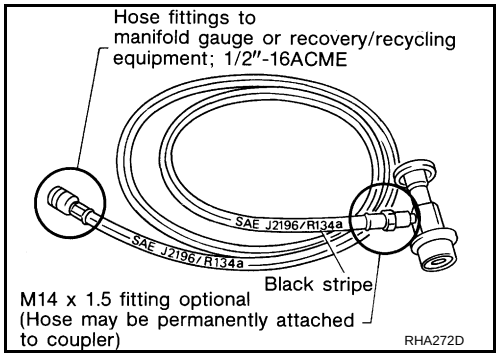
MANIFOLD GAUGE SET

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

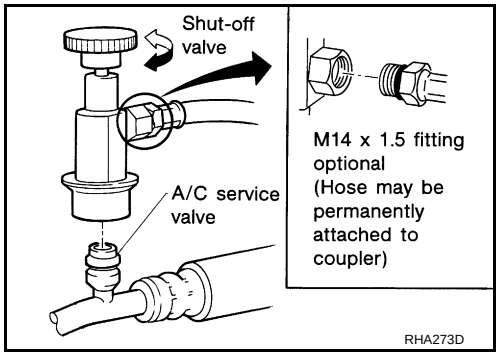
Be certain that the service hoses display the markings described (colored hose with black stripe). All hoses must include positive shut-off devices (either manual or automatic) near the end of the hoses opposite to the manifold gauge.



SERVICE COUPLERS

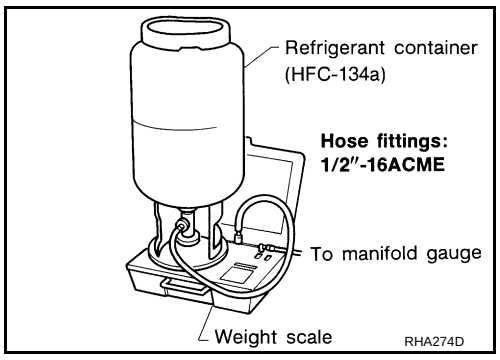
Never attempt to connect HFC-134a (R-134a) service couplers to a CFC-12 (R-12) A/C system. The HFC-134a (R-134a) couplers will not properly connect to the CFC-12 (R-12) system. However, if an improper connection is attempted, discharging and contamination may occur.

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 electronic scale or of quality recycle/recharge equipment.

COMPRESSOR

General Precautions

INFOID:0000000001183111

CAUTION:

- **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 HA-29, "Adjustment".**
- **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.**

LEAK DETECTION DYE

General Precautions

INFOID:0000000001183112

CAUTION:

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

IDENTIFICATION

NOTE:

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

IDENTIFICATION LABEL FOR VEHICLE

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

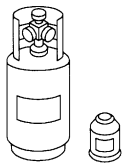
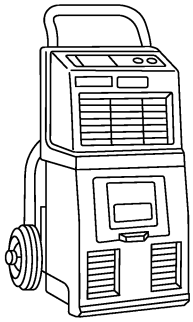
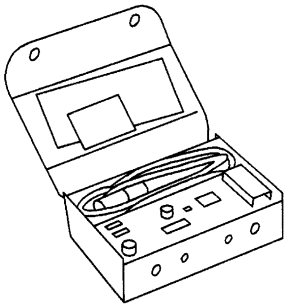
PREPARATION

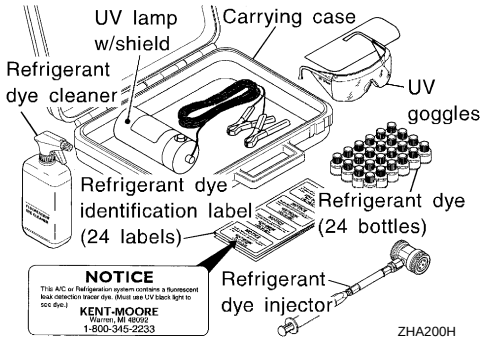
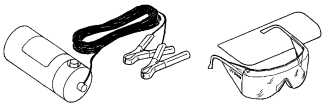
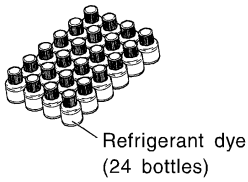
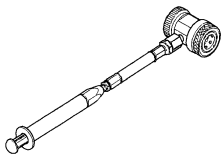
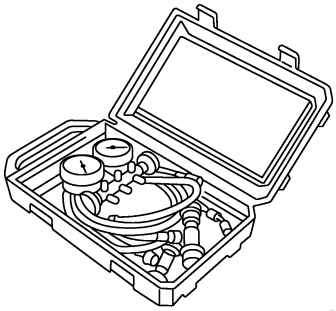
PREPARATION

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

INFOID:0000000001183113

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.
Adapters that convert one size fitting to another must never be used: refrigerant/lubricant contamination will occur and compressor malfunction will result.

Tool number Tool name		Description
HFC-134a (R-134a) refrigerant	 S-NT196	Container color: Light blue Container marking: HFC-134a (R-134a) Fitting size: Thread size • Large container 1/2″-16 ACME
KLH00-PAGS0 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) Lubricity: 40 m ℓ (1.4 Imp fl oz.)
Recovery/Recycling/ Recharging equipment (ACR4)	 RJIA0195E	Function: Refrigerant recovery and recycling and recharging
Electrical leak detector	 A/C leak detector SHA705EB	Power supply: DC 12V (Cigarette lighter)

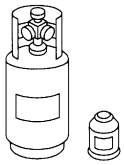
Tool number Tool name		Description
(J-43926) Refrigerant dye leak detection kit Kit includes: (J-42220) UV lamp and UV safety goggles (J-41459) HFC-134a (R-134a) dye injector Use with J-41447, 1/4 ounce bottle (J-41447) HFC-134a (R-134a) fluorescent leak detection dye (Box of 24, 1/4 ounce bottles) (J-43872) Refrigerant dye cleaner	 ZHA200H	Power supply: DC 12V (Battery terminal)
(J-42220) UV lamp and UV safety goggles	 SHA438F	Power supply: DC 12V (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.
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

Sealant or/and Lubricant

INFOID:0000000001183114

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

- 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 name	Description
HFC-134a (R-134a) refrigerant  S-NT196	Container color: Light blue Container marking: HFC-134a (R-134a) Fitting size: Thread size • Large container 1/2″-16 ACME
Nissan A/C System Oil Type S (DH-PS)  S-NT197	Type: Polyalkylene glycol oil (PAG), type S (DH-PS) Application: HFC-134a (R-134a) swash plate compressors (Nissan only) Capacity: 40 m ℓ (1.4 US fl oz., 1.4 Imp fl oz.)

ON-VEHICLE MAINTENANCE

LUBRICANT

Adjustment

INFOID:0000000001183115

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.

Is it successful?

YES >> GO TO 2.
NO >> 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 >> Refer to "LUBRICANT ADJUSTING PROCEDURE FOR COMPRESSOR REPLACEMENT".
NO >> Refer to "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:

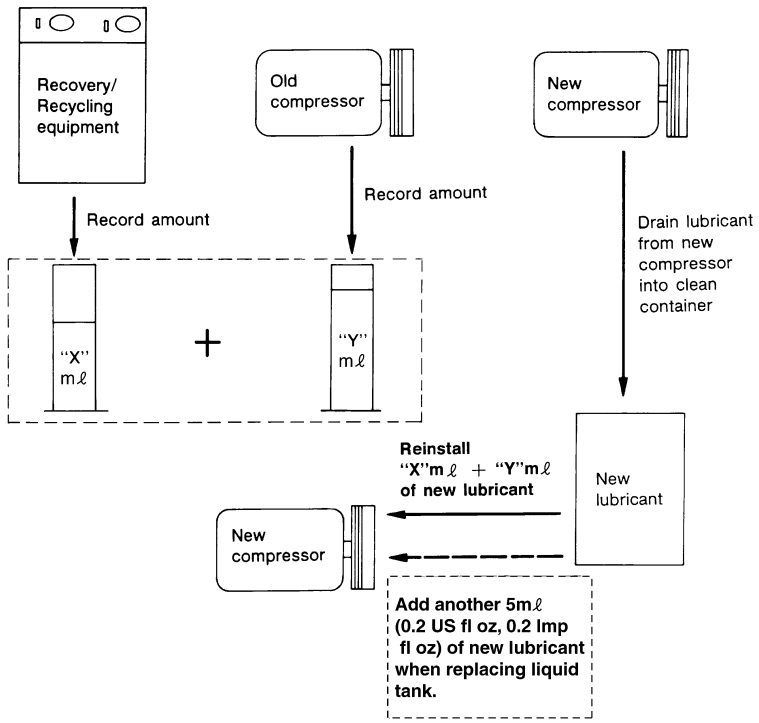
Part replaced	Lubricant to be added to system	Remarks
	Amount of lubricant mℓ (US fl oz., Imp fl oz.)	
Evaporator	75 (2.5, 2.6)	—
Condenser	35 (1.2, 1.2)	—
Liquid tank	10 (0.3, 0.4)	—
In case of refrigerant leak	30 (1.0, 1.1)	Large leak
	—	Small leak *1

*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 HA-19, "Working with HFC-134a (R-134a)".
3. Confirm refrigerant purity in vehicle A/C system using recovery/recycling recharging equipment and refrigerant identifier. If NG, refer to HA-19, "Working with HFC-134a (R-134a)".
4. Discharge refrigerant into the refrigerant recovery/recycling equipment. Measure lubricant discharged into the recovery/recycling equipment.
5. Drain the lubricant from the old (removed) compressor into a graduated container and recover the amount of lubricant drained.
6. Drain the lubricant from the new compressor into a separate, clean container.
7. Measure an amount of new lubricant installed equal to amount drained from old compressor. Add this lubricant to new compressor through the suction port opening.
8. Measure an amount of new lubricant equal to the amount recovered during discharging. Add this lubricant to new compressor through the suction port opening.
9. If the liquid tank also needs to be replaced, add another 5 m ℓ (0.2 US fl oz., 0.2 Imp fl oz.) of lubricant at this time.
   Do not add this 5 m ℓ (0.2 US fl oz., 0.2 Imp fl oz.) of lubricant when replaces the compressor only.

Lubricant adjusting procedure for compressor replacement

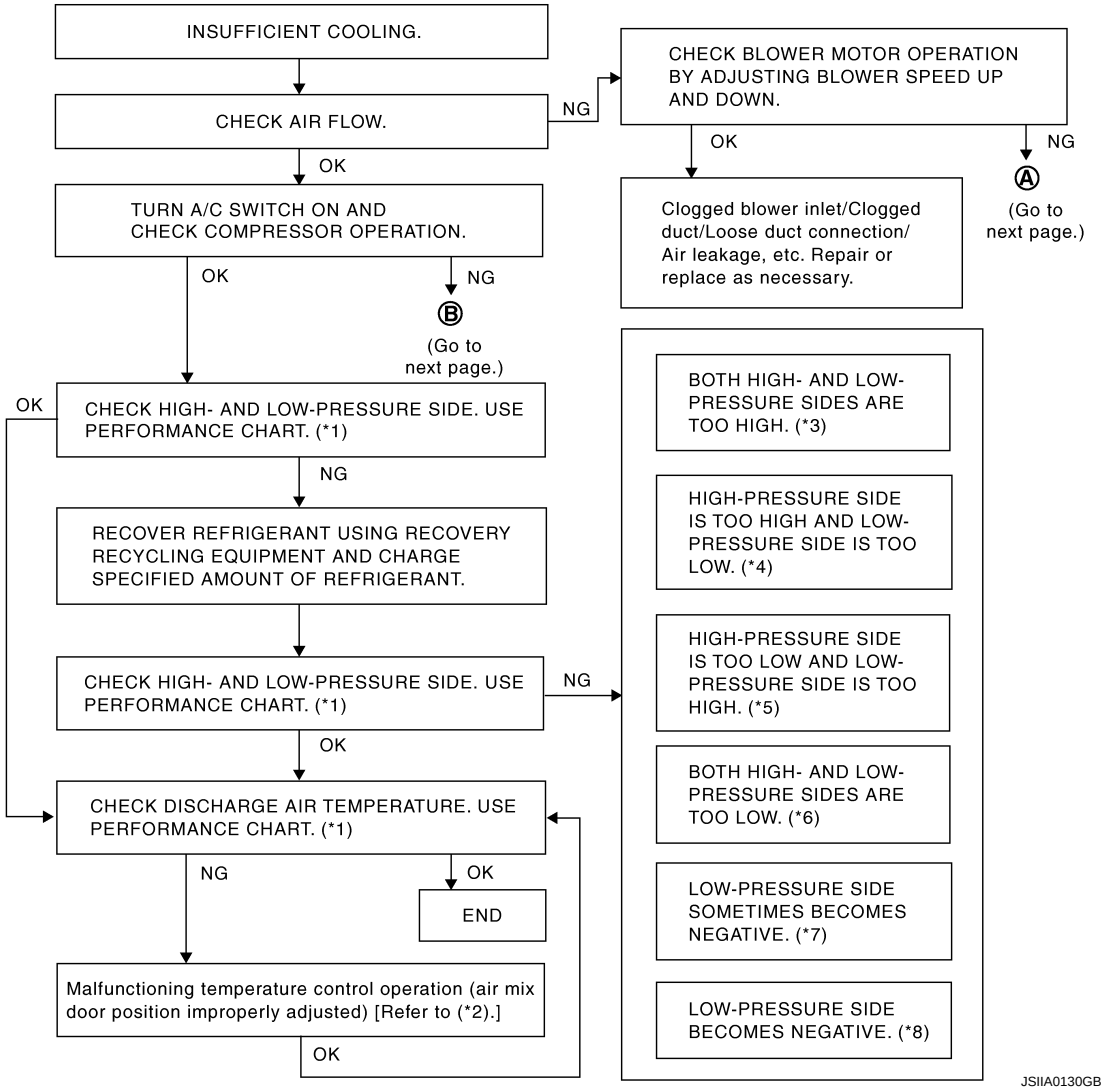


REFRIGERATION SYSTEM

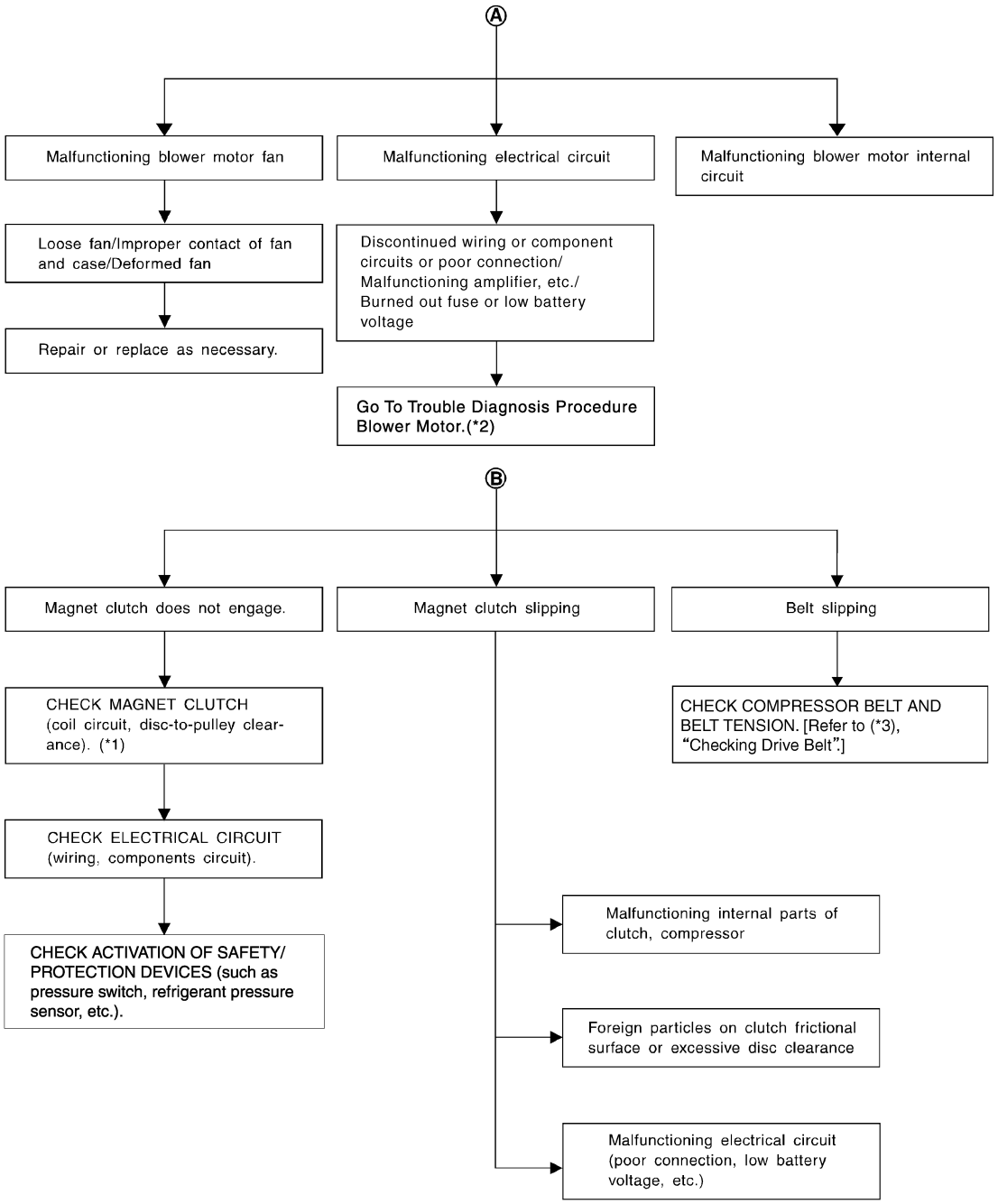
Inspection

INFOID:0000000001183116

PERFORMANCE TEST DIAGNOSIS



*1 HA-32, "Performance Chart"
*2 HAC-54, "Diagnosis Procedure"
*3 HA-14, "BOTH HIGH- AND LOW-PRESSURE SIDES ARE TOO HIGH : Symptom Table"
*4 HA-14, "HIGH-PRESSURE SIDE IS TOO HIGH AND LOW-PRESSURE SIDE IS TOO LOW : Symptom Table"
*5 HA-15, "HIGH-PRESSURE SIDE IS TOO LOW AND LOW-PRESSURE SIDE IS TOO HIGH : Symptom Table"
*6 HA-16, "BOTH HIGH- AND LOW-PRESSURE SIDES ARE TOO LOW : Symptom Table"
*7 HA-17, "LOW-PRESSURE SIDE SOMETIMES BECOMES NEGATIVE : Symptom Table"
*8 HA-17, "LOW-PRESSURE SIDE BECOMES NEGATIVE : Symptom Table"



SJIA1642E

*1 HA-31, "Inspection"

*2 HAC-62, "Diagnosis Procedure"

*3 EM-16, "Checking" (HR engine models) or EM-135, "Checking" (MR engine models)

Performance Chart

INFOID:0000000001550840

TEST CONDITION

Testing must be performed as follows:

Vehicle condition	Indoors or in the shade (in a well-ventilated place)
Doors	Closed
Door windows	Open
Hood	Open
TEMP.	Max. COLD
Mode switch	(Ventilation) set
Intake switch	(Recirculation) set
Fan (blower) speed	Max. speed set
Engine speed	Idle speed
Operate the air conditioning system for 10 minutes before taking measurements.	

TEST READING

Recirculating-to-discharge Air Temperature Table

Inside air (Recirculating air) at blower assembly inlet		Discharge air temperature at center ventilator °C (°F)
Relative humidity %	Air temperature °C (°F)	
50 - 60	20 (68)	7.0 - 7.3 (44.6 - 45.1)
	25 (77)	8.9 - 10.0 (48.0 - 50.0)
	30 (86)	10.9 - 13.1 (51.6 - 55.6)
	35 (95)	17.8 - 19.3 (64.0 - 66.7)
60 - 70	20 (68)	7.3 - 7.6 (45.1 - 45.7)
	25 (77)	10.0 - 11.0 (50.0 - 51.8)
	30 (86)	13.1 - 15.2 (55.6 - 59.4)
	35 (95)	19.3 - 20.8 (66.7 - 69.4)

Ambient Air Temperature-to-operating Pressure Table

Ambient air		High-pressure (Discharge side)							
Relative humidity %	Air temperature °C (°F)	Bar		kPa		kg/cm^2		psi	
		From	to	From	to	From	to	From	to
50 - 70	20 (68)	9.3	11.2	930.0	1120.0	9.5	11.4	134.9	162.4
	25 (77)	12.7	14.4	1270.0	1440.0	13.0	14.7	184.2	208.8
	30 (86)	14.5	17.8	1450.0	1780.0	14.8	18.2	210.3	258.1
	35 (95)	17.3	19.5	1730.0	1950.0	17.6	19.9	250.9	282.8
	40 (104)	17.5	19.4	1750.0	1940.0	17.8	19.8	253.8	281.3

Ambient Air Temperature-to-operating Pressure Table

Ambient air		Low pressure (Suction side)							
Relative humidity %	Air temperature °C (°F)	Bar		kPa		kg/cm^2		psi	
		From	to	From	to	From	to	From	to
50 - 70	20 (68)	2.1	2.2	210.0	220.0	2.1	2.2	30.5	31.9
	25 (77)	2.5	2.5	250.0	250.0	2.5	2.5	36.3	36.3
	30 (86)	2.5	3.1	250.0	310.0	2.5	3.2	36.3	45.0
	35 (95)	3.2	3.6	320.0	360.0	3.3	3.7	46.4	52.2
	40 (104)	3.6	4.0	360.0	400.0	3.7	4.1	52.2	58.0

Refrigerant Leaks

INFOID:0000000001183117

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.

FLUORESCENT LEAK DETECTOR

Inspection

INFOID:0000000001183118

CHECKING SYSTEM FOR LEAKS USING THE FLUORESCENT LEAK DETECTOR

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

(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.

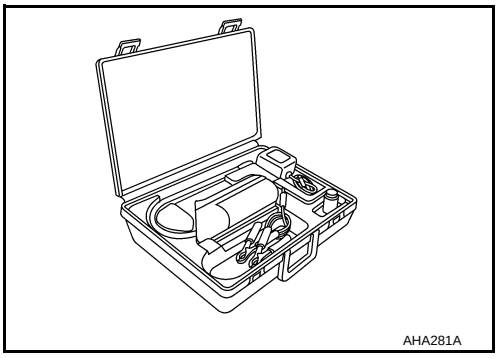
ELECTRICAL LEAK DETECTOR

Inspection

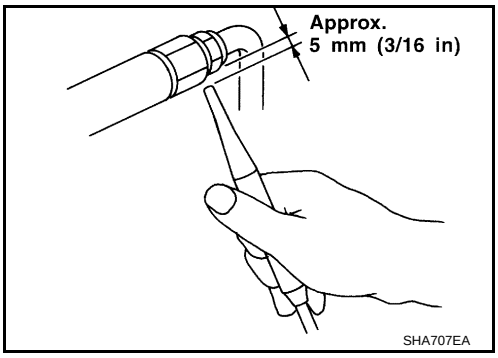
INFOID:0000000001183119

PRECAUTIONS FOR HANDLING LEAK DETECTOR

When performing a refrigerant leak check, use an electrical leak detector (SST: J-41995) 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.

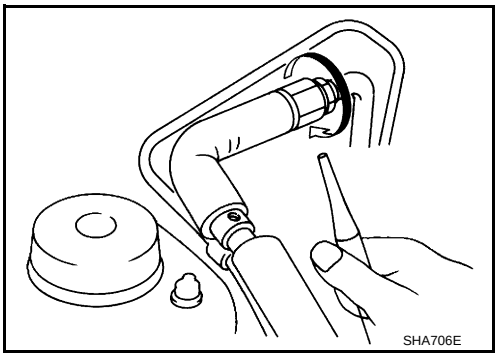

AHA281A

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

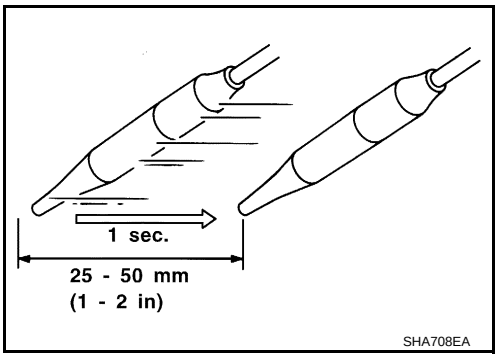


SHA707EA

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


SHA706E

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



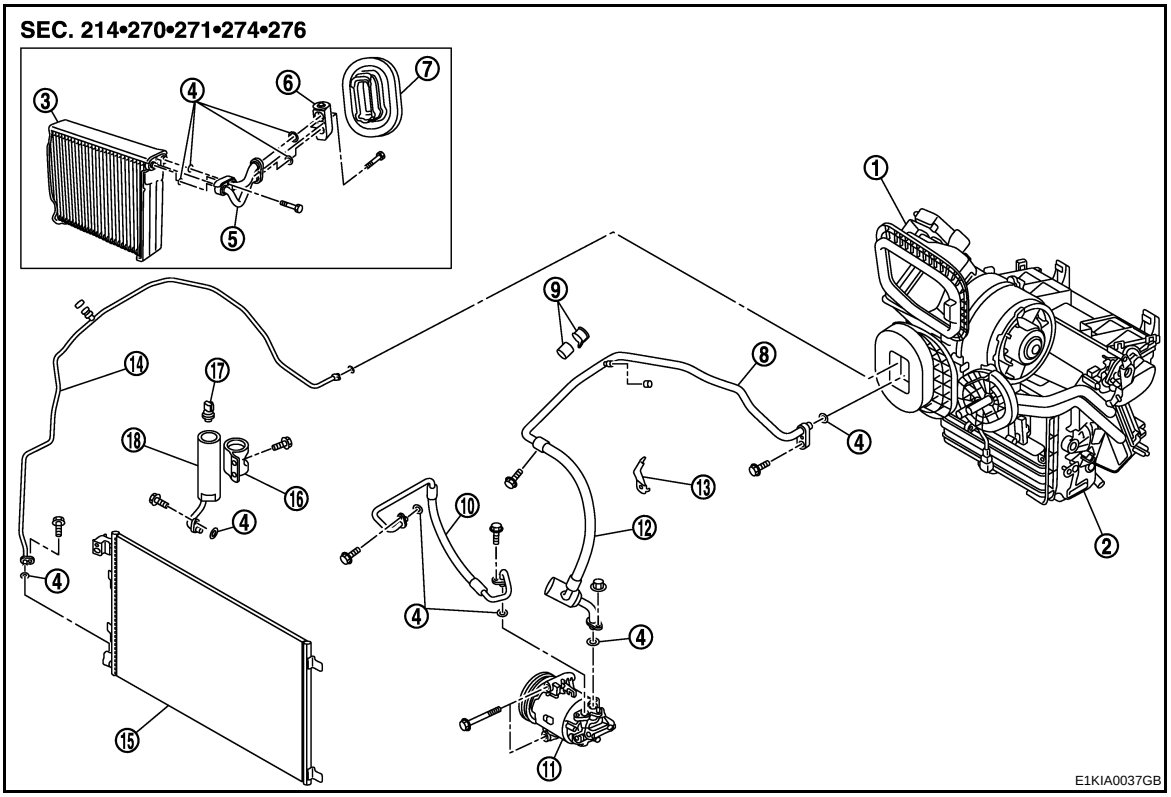
SHA708EA

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 j) to the low-pressure side (evaporator drain hose k to shaft seal p). 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.



1. Heater & blower unit assembly	2. Heater & cooling unit assembly	3. Evaporator
4. O-ring	5. Low pressure pipe 1 and high pressure pipe 2 assembly	6. Expansion valve
7. Heater sealing	8. Low pressure flexible hose and pipe 2	9. Low pressure pipe 2 fixing clamp assembly
10. High pressure flexible hose	11. Compressor	12. Low pressure flexible hose
13. Low & high pipe bracket support	14. High pressure pipe 1	15. Condenser assembly
16. Liquid tank fixing bracket	17. Refrigerant pressure sensor	18. Liquid tank

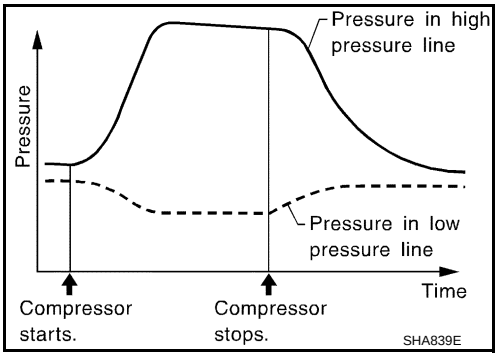
Compressor
Check the fitting of high- and low-pressure flexible hoses, relief valve and shaft seal.
Condenser
Check the fitting of condenser pipe assembly, high-pressure flexible hose and pipe.
Liquid tank
Check the fitting of radiator & condenser assembly and refrigerant pressure sensor.
Service valves
Check all around the service valves. Ensure service valve caps are secured on the service valves (to prevent leaks).
NOTE:
After removing A/C manifold gauge set from service valves, wipe any residue from valves to prevent any false readings by leak detector.
Cooling unit (Evaporator)

With engine OFF, turn blower fan on “High” for at least 15 seconds to dissipate any refrigerant trace in the cooling unit. Wait a minimum of 10 minutes accumulation time (refer to the manufacturer’s recommended procedure for actual wait time) before inserting the leak detector probe into the drain hose.
Keep the probe inserted for at least 10 seconds. Use caution not to contaminate the probe tip with water or dirt that may be in the drain hose.

5. If a leak detector detects a leak, verify at least once by blowing compressed air into area of suspected leak, then repeat check as outlined above.
6. Do not stop when one leak is found. Continue to check for additional leaks at all system components.
If no leaks are found, perform steps 7 - 10.
7. Start 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.

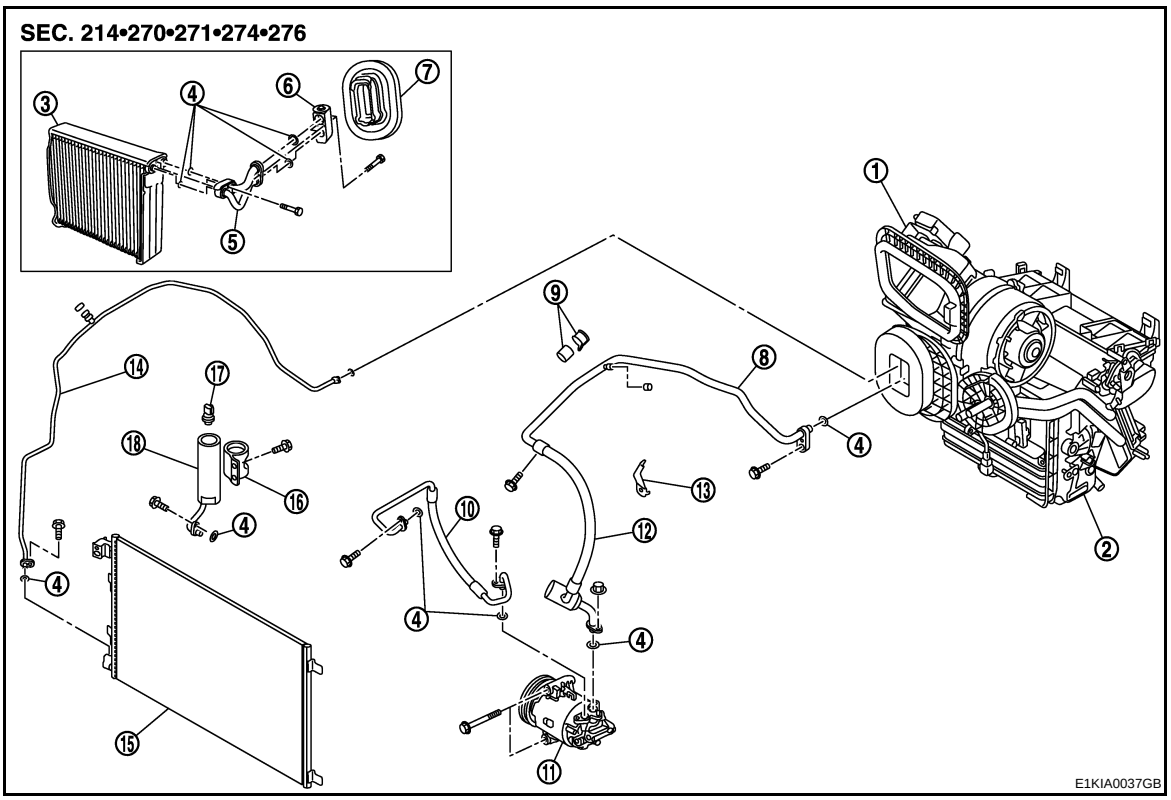
ON-VEHICLE REPAIR

REFRIGERATION SYSTEM

Exploded View

INFOID:0000000001183120

Refer to HA-20, "Refrigerant Connection".



1. Heater & blower unit assembly	2. Heater & cooling unit assembly	3. Evaporator
4. O-ring	5. Low pressure pipe 1 and high pressure pipe 2 assembly	6. Expansion valve
7. Heater sealing	8. Low pressure flexible hose and pipe 2	9. Low pressure pipe 2 fixing clamp assembly
10. High pressure flexible hose	11. Compressor	12. Low pressure flexible hose
13. Low & high pipe bracket support	14. High pressure pipe 1	15. Condenser assembly
16. Liquid tank fixing bracket	17. Refrigerant pressure sensor	18. Liquid tank

Inspection After Installation

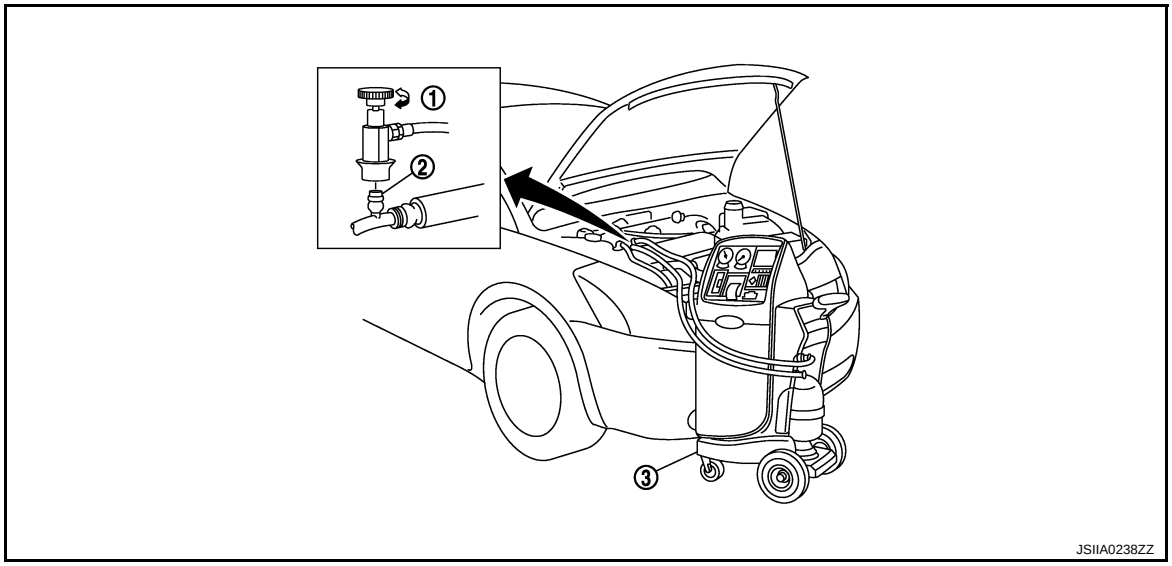
INFOID:0000000001183121

SETTING OF SERVICE TOOLS AND EQUIPMENT

Discharging Refrigerant

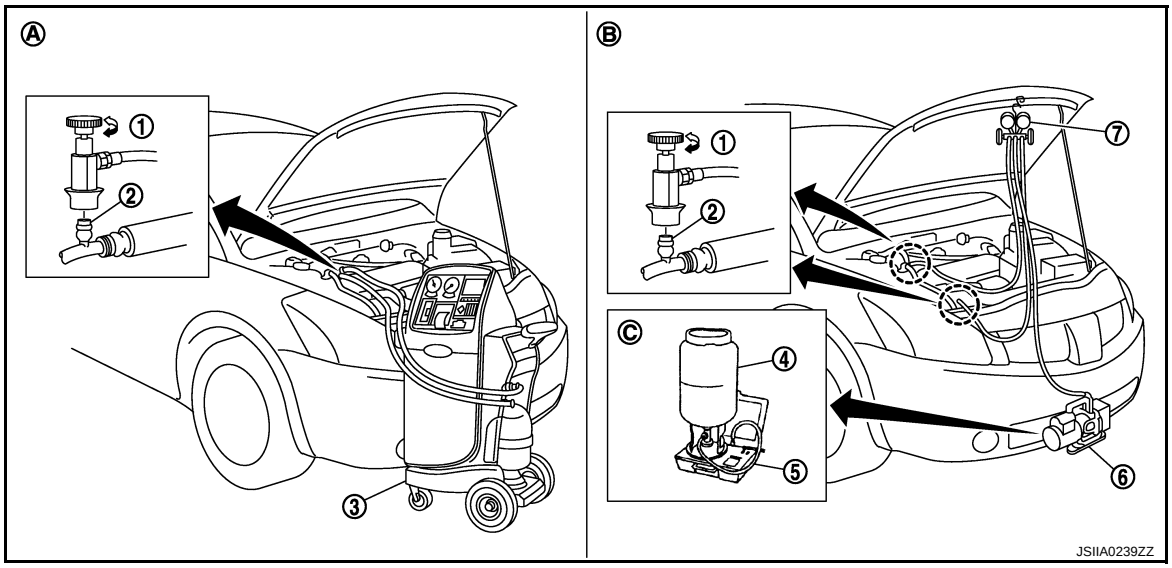
WARNING:

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.



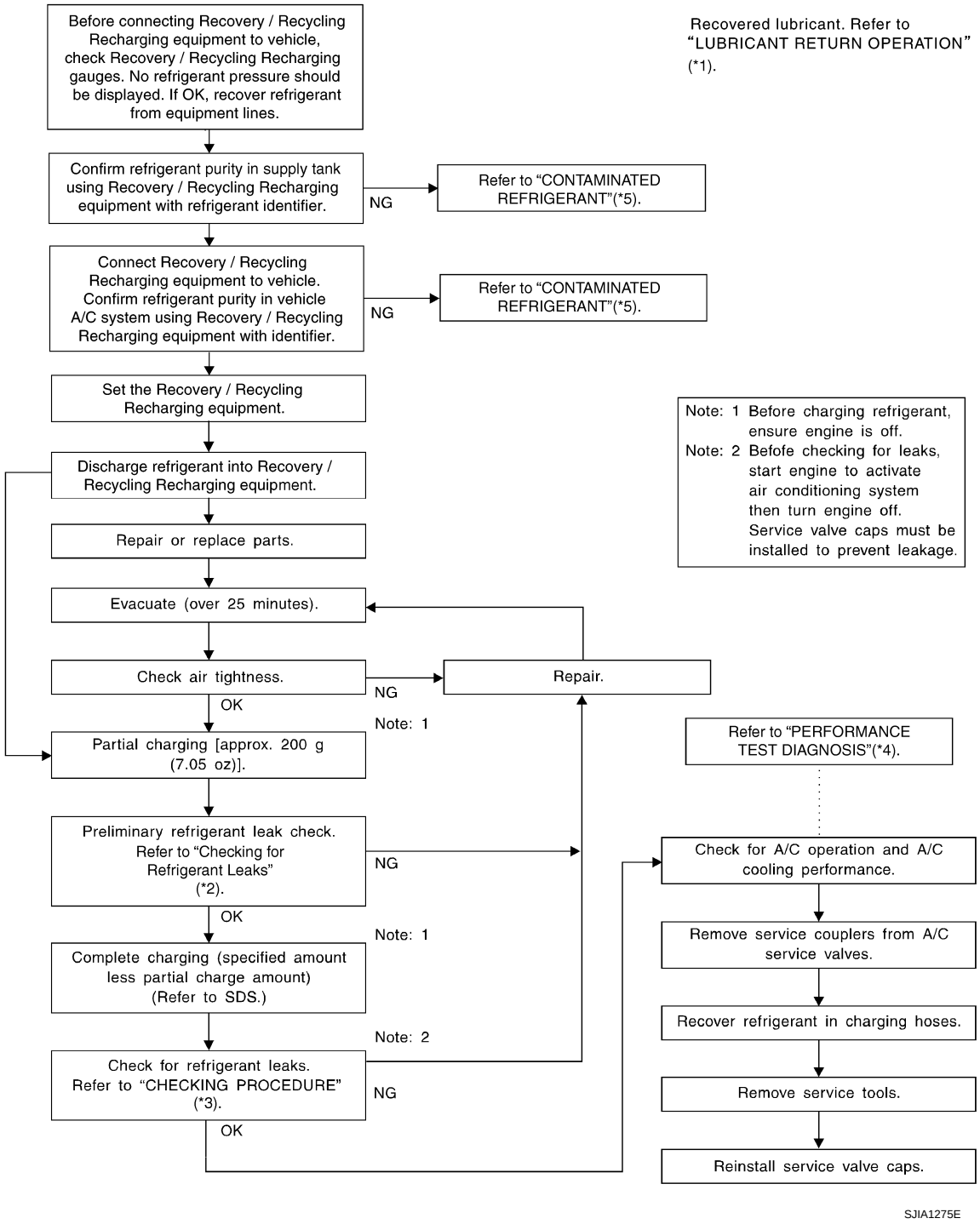
1. Shut-off valve
2. A/C service valve
3. Recovery/Recycling/Recharging equipment

Evacuating System and Charging Refrigerant



1. Shut-off valve
2. A/C service valve
3. Recovery/Recycling/Recharging equipment
4. Refrigerant container (HFC-134a)
5. Weight scale (J-39650)
6. Vacuum pump (J-39649)
7. Manifold gauge set (J-39183)

A. Preferred (best) method
B. Alternative method
C. For charging



*1 HA-29, "Adjustment"

*2 "REFRIGERANT LEAKS" in HA-34, "Refrigerant Leaks".

*3 "CHECKING PROCEDURE" in HA-31, "Inspection".

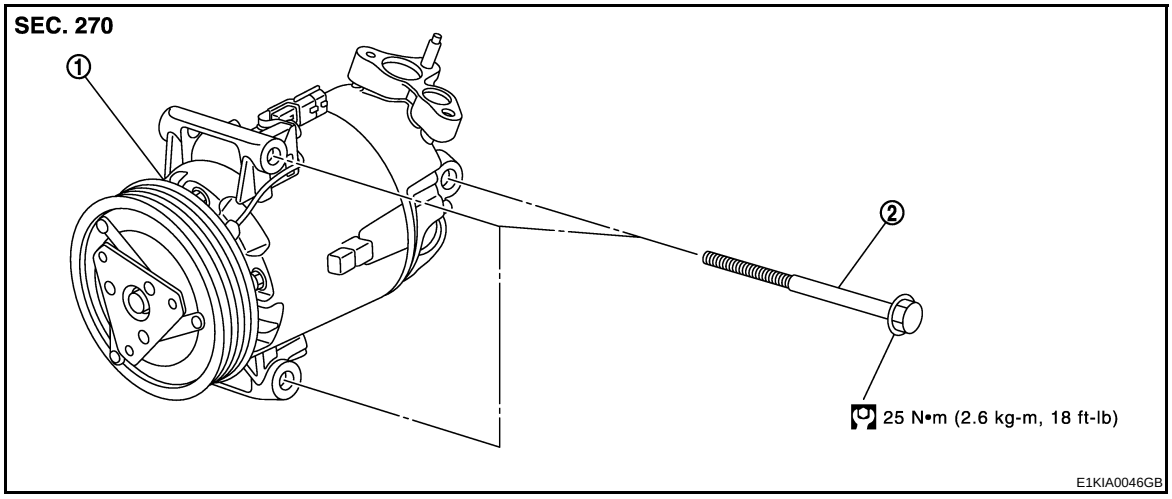
*4 "PERFORMANCE TEST DIAGNOSIS" in HA-31, "Inspection".

*5 "CONTAMINATED REFRIGERANT" in HAC-132, "Working with HFC-134a (R-134a)".

COMPRESSOR

Exploded View

INFOID:0000000001183122



1. Compressor
2. Compressor fixing bolt

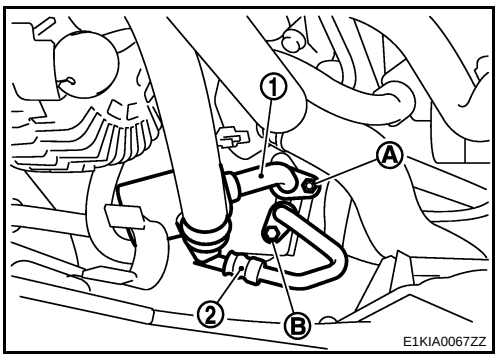
Refer to GI-4, "Components" for symbols in the figure.

Removal and Installation

INFOID:0000000001183123

REMOVAL

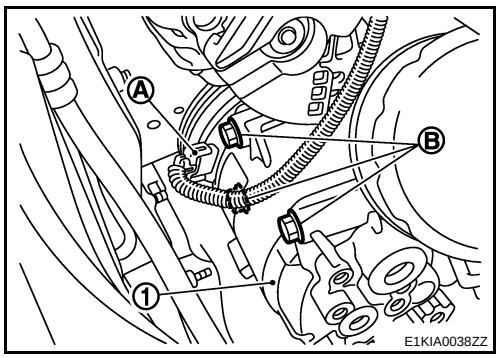
1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
2. Remove engine cover ornament.
3. Remove air intake hoses (RH) and air duct (LH). Refer to EM-28, "Removal and Installation" (HR engine models) or EM-145, "Removal and Installation" (MR engine models).
4. Remove engine undercover, using power tools.
5. Drain engine coolant from radiator. Refer to CO-9, "Draining" (HR engine models) or CO-30, "Draining" (MR engine models).
6. Remove drive belt. Refer to EM-17, "Removal and Installation" (HR engine models) or EM-135, "Removal and Installation" (MR engine models).
7. Remove lower radiator hose from engine. Refer to CO-13, "Exploded View" (HR engine models) or CO-34, "Exploded View" (MR engine models).
8. Remove mounting nuts (A) from low-pressure flexible hose (1) and mounting bolt (B) from high-pressure flexible hose (2).
9. Remove low-pressure flexible hose, and, high-pressure flexible hose from compressor.



CAUTION:

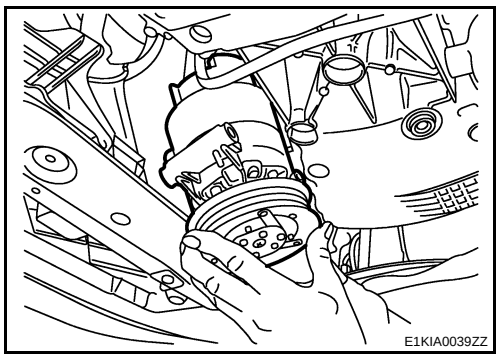
Cap or wrap the joint of compressor, low-pressure flexible hose and high-pressure flexible hose with suitable material such as vinyl tape to avoid the entry of air.

10. Remove compressor harness connector (A), then remove mounting bolts (B) from compressor (1), using power tools.



11. Remove the compressor from the vehicle.

Compressor fixing bolt to engine
: 25 N·m (2.6 kg-m, 18.5 ft-lb)



INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

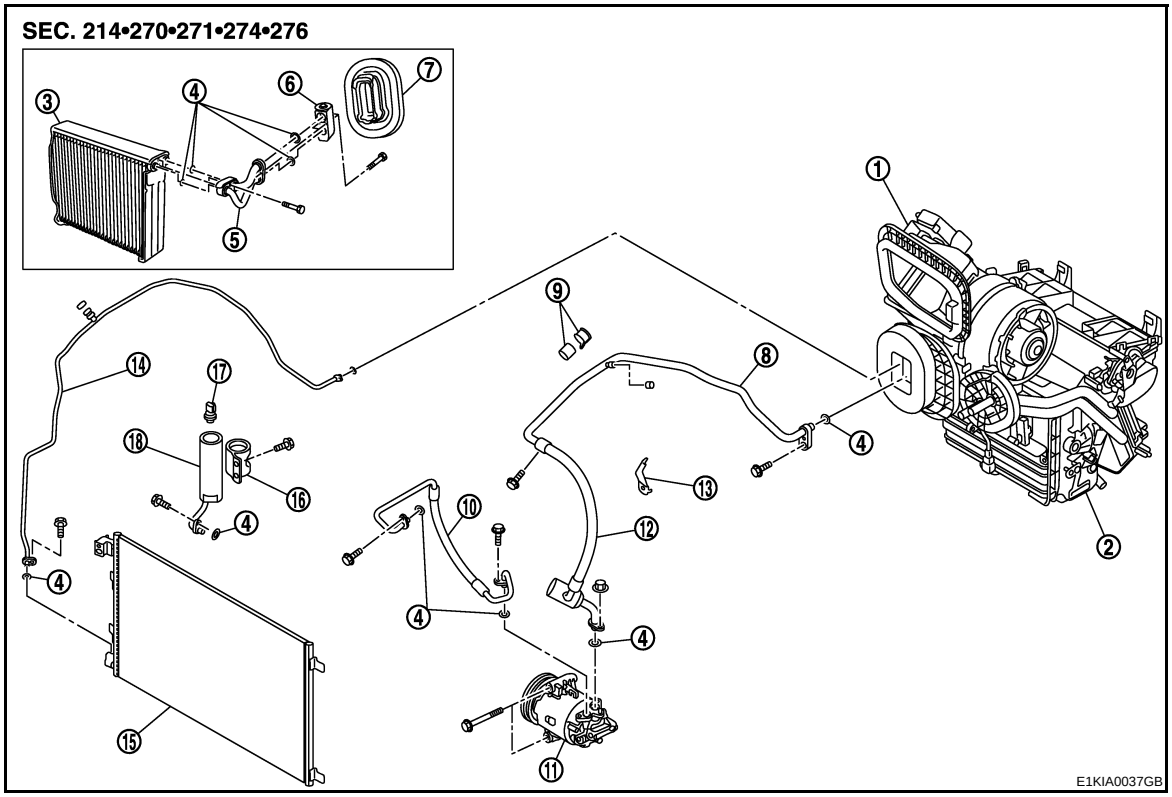
- **Replace O-rings of low-pressure flexible hose and high-pressure flexible hose with new ones, and then apply compressor oil to it when installing it.**
- **When recharging refrigerant, check for leaks.**

LOW-PRESSURE FLEXIBLE HOSE AND PIPE 2

Exploded View

INFOID:0000000001183124

Refer to HA-20, "Refrigerant Connection".



1. Heater & blower unit assembly	2. Heater & cooling unit assembly	3. Evaporator
4. O-ring	5. Low pressure pipe 1 and high pressure pipe 2 assembly	6. Expansion valve
7. Heater sealing	8. Low pressure flexible hose and pipe 2	9. Low pressure pipe 2 fixing clamp assembly
10. High pressure flexible hose	11. Compressor	12. Low pressure flexible hose
13. Low & high pipe bracket support	14. High pressure pipe 1	15. Condenser assembly
16. Liquid tank fixing bracket	17. Refrigerant pressure sensor	18. Liquid tank

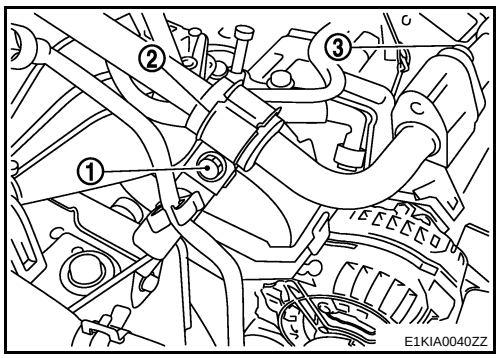
Removal and Installation

INFOID:0000000001183125

REMOVAL

1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
2. Remove air intake hose (RH side), and air duct (LH). Refer to EM-36, "Removal and Installation" (HR engine), EM-156, "Removal and Installation" (ER engine).

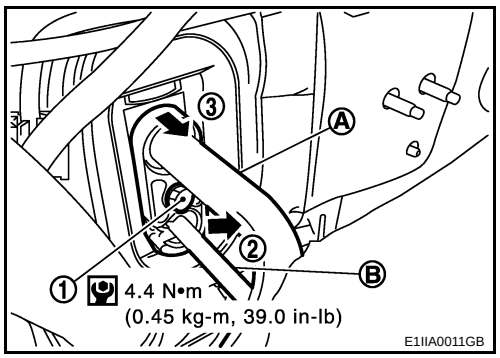
3. Remove mounting bolt (1) and clamp (2), from low pressure pipe bracket support.
4. Remove low and high-pressure maintaining clip, from both pipes, then remove fixing bolt (3).
5. Remove engine room insulator fixing clip from cowl top.



6. Pull engine room insulator, then remove pipes bracket fixing bolt (1), from expansion valve, and release pipes fixing bracket, as shown in order (1) to (3), from high pressure pipe (B), to remove low pressure flexible hose and pipe2 (A) from expansion valve.

CAUTION:

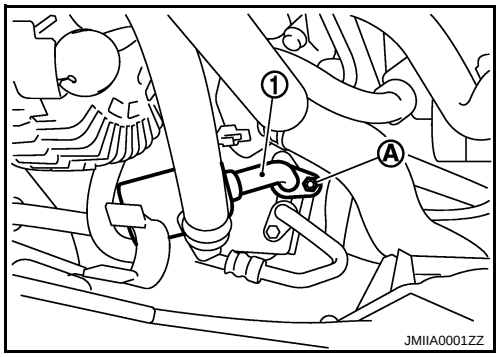
Cap or wrap the joint of the low pressure flexible hose and pipe 2, and expansion valve exit with suitable material such as vinyl tape to avoid the entry of air.



7. Remove low pressure flexible hose fixing nut (A), from air conditioner compressor, and remove low pressure flexible hose (1).

CAUTION:

Cap or wrap the joint of 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:

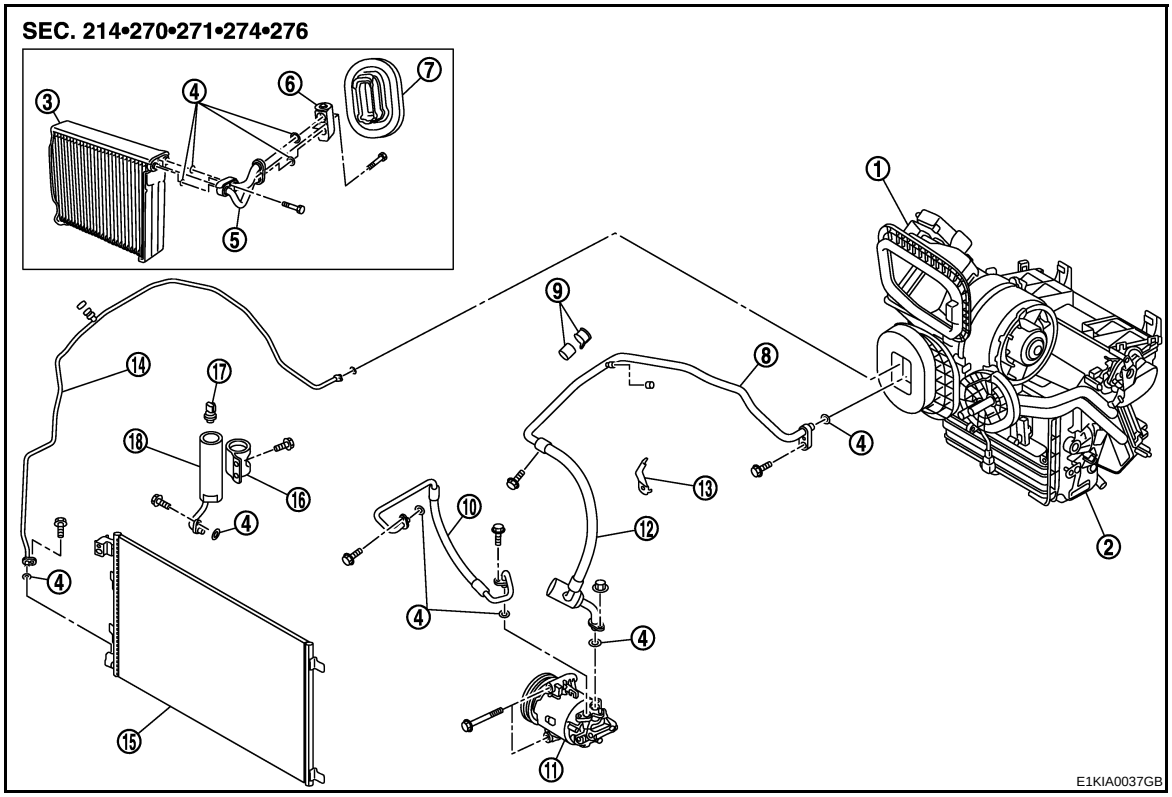
- **Replace O-rings of low-pressure flexible hose and low-pressure pipe 2 with new ones, and then apply compressor oil to it when installing it.**
- **Female-side piping connection is thin and easy to deform. Slowly insert the male-side piping straight in axial direction.**
- **Insert piping securely 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.**

HIGH-PRESSURE FLEXIBLE HOSE

Exploded View

INFOID:0000000001183126

Refer to HA-20, "Refrigerant Connection".



1. Heater & blower unit assembly
2. Heater & cooling unit assembly
3. Evaporator
4. O-ring
5. Low pressure pipe 1 and high pressure pipe 2 assembly
6. Expansion valve
7. Heater sealing
8. Low pressure flexible hose and pipe 2
9. Low pressure pipe 2 fixing clamp assembly
10. High pressure flexible hose
11. Compressor
12. Low pressure flexible hose
13. Low & high pipe bracket support
14. High pressure pipe 1
15. Condenser assembly
16. Liquid tank fixing bracket
17. Refrigerant pressure sensor
18. Liquid tank

Removal and Installation

INFOID:0000000001183127

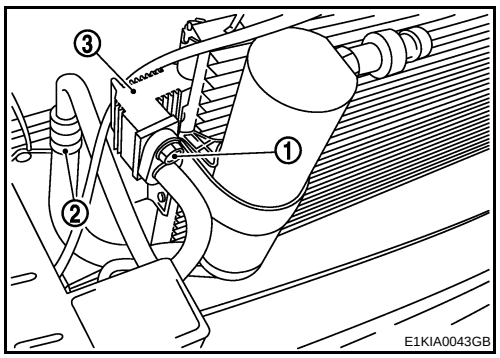
REMOVAL

1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
2. Remove engine cover ornament. Refer to EM-147, "Exploded View" (MR engine models).
3. Remove air intake hose (RH) and air duct (LH). Refer to EM-28, "Exploded View" (HR engine models) or EM-145, "Exploded View" (MR engine models).
4. Remove front grille. Refer to EXT-17, "Removal and Installation".

5. Remove high pressure flexible hose fixing bolt (1) from condenser (3), then pull high pressure flexible hose (2) to remove it from condenser.

CAUTION:

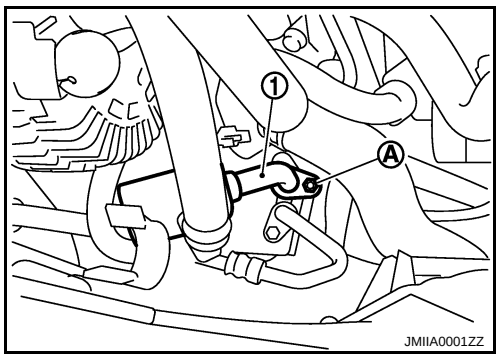
Cap or wrap the joint of high-pressure flexible hose and condenser assembly with suitable material such as vinyl tape to avoid the entry of air.



6. Remove high pressure flexible hose fixing bolt (A) from compressor, then pull high pressure flexible hose (1) to remove it from compressor. 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.



High pressure fixing bolt to condenser

: 4.4 N·m (0.45 kg-m, 39 in-lb)

High pressure fixing bolt to compressor

: 4.4 N·m (0.45 kg-m, 39 in-lb)

INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

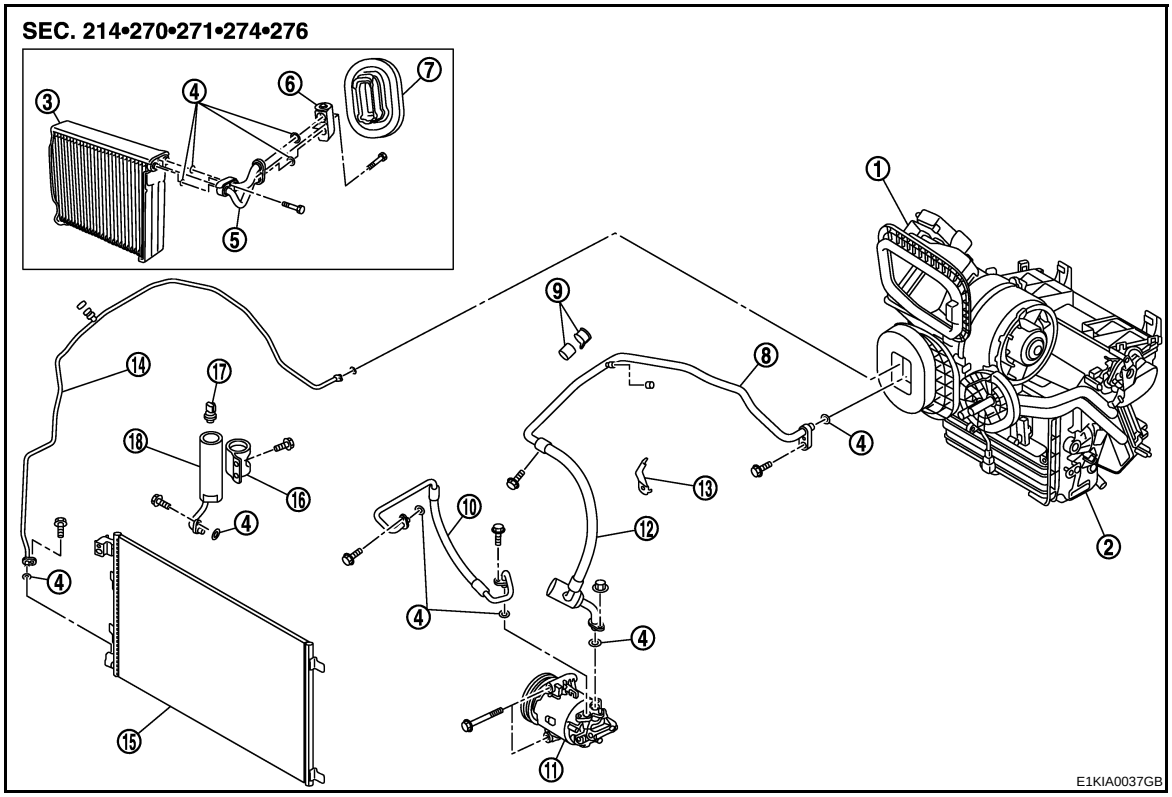
- **Replace O-rings of high-pressure flexible hose with new ones, and then apply compressor oil to it when installing it.**
- **Female-side piping connection is thin and easy to deform. Slowly insert the male-side piping straight in axial direction.**
- **Insert piping securely until a click is heard.**
- **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 PIPE 1 (ENGINE COMPARTMENT)

Exploded View

INFOID:0000000001183128

Refer to HA-20, "Refrigerant Connection".



1. Heater & blower unit assembly
2. Heater & cooling unit assembly
3. Evaporator
4. O-ring
5. Low pressure pipe 1 and high pressure pipe 2 assembly
6. Expansion valve
7. Heater sealing
8. Low pressure flexible hose and pipe 2
9. Low pressure pipe 2 fixing clamp assembly
10. High pressure flexible hose
11. Compressor
12. Low pressure flexible hose
13. Low & high pipe bracket support
14. High pressure pipe 1
15. Condenser assembly
16. Liquid tank fixing bracket
17. Refrigerant pressure sensor
18. Liquid tank

Removal and Installation

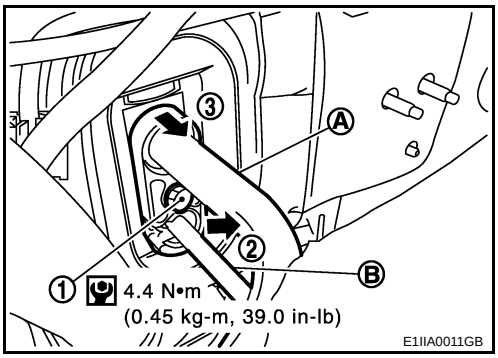
INFOID:0000000001183129

REMOVAL

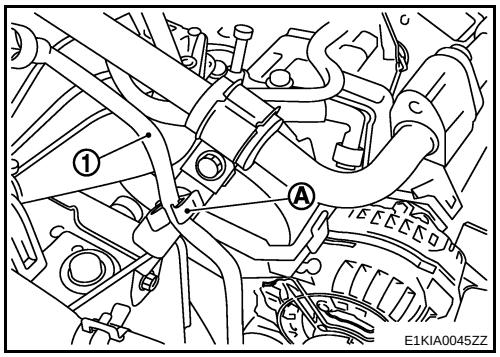
1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
2. Remove intake hose (RH) and air duct (LH). Refer to EM-36, "Removal and Installation""EM-156, "Removal and Installation" (MR engine).
3. Pull engine room insulator, then remove pipes bracket fixing bolt (1), from expansion valve, then release pipe fixing bracket as shown in order (1) to (3) from high pressure pipe 1 (B), to disconnect it from expansion valve.

   CAUTION:

   Cap or wrap the joint of the high pressure pipe 1, and expansion valve in, with suitable material such as vinyl tape to avoid the entry of air.



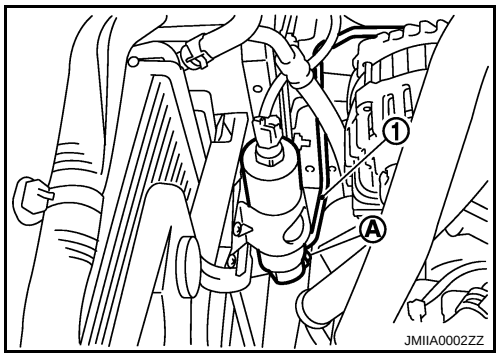
4. Remove high pressure pipe 1 (1) from clip (A).



Remove high-pressure pipe 1 mounting bolt (A) from liquid tank, then remove high-pressure pipe 1 (1).

CAUTION:

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



INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

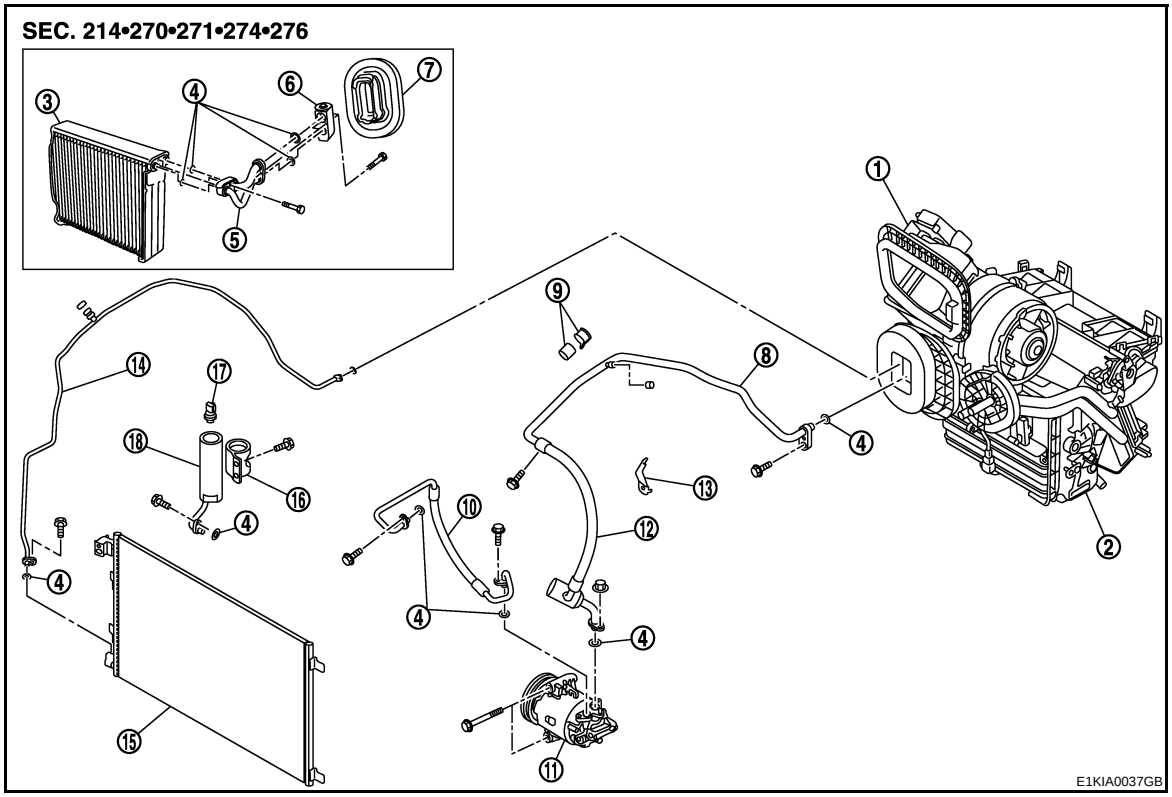
- **Replace O-rings of high-pressure pipe 1 with new ones, and then apply compressor oil to it when installing it.**
- **Female-side piping connection is thin and easy to deform. Slowly insert the male-side piping straight in axial direction.**
- **Insert piping securely until a click is heard.**
- **After 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 PIPE 1 AND HIGH-PRESSURE PIPE 2

Exploded View

INFOID:0000000001183130

Refer to HA-20, "Refrigerant Connection".



1. Heater & blower unit assembly
2. Heater & cooling unit assembly
3. Evaporator
4. O-ring
5. Low pressure pipe 1 and high pressure pipe 2 assembly
6. Expansion valve
7. Heater sealing
8. Low pressure flexible hose and pipe 2
9. Low pressure pipe 2 fixing clamp assembly
10. High pressure flexible hose
11. Compressor
12. Low pressure flexible hose
13. Low & high pipe bracket support
14. High pressure pipe 1
15. Condenser assembly
16. Liquid tank fixing bracket
17. Refrigerant pressure sensor
18. Liquid tank

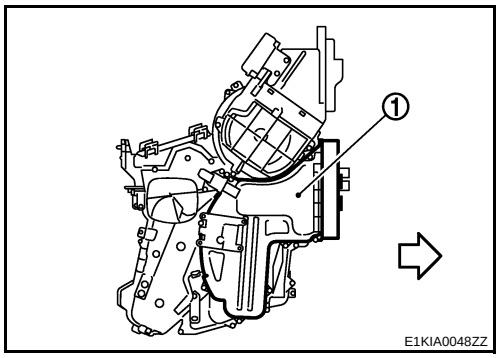
Removal and Installation

INFOID:0000000001183131

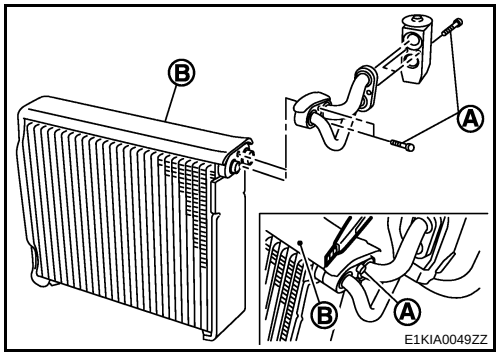
REMOVAL

1. Set the temperature at 18°C (60°F), and then disconnect the battery cable from the negative terminal.
2. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
3. Remove high-pressure pipe 1 and low pressure pipe 2 from expansion valve. Refer to HA-48, "Removal and Installation" and HA-44, "Removal and Installation".
   CAUTION:
   Cap or wrap the joint of the, high-pressure pipe 1, low-pressure pipe 2, and the expansion valve with suitable material such as vinyl tape to avoid the entry of air.
4. Remove heater cooling fixing clamp, and heater hoses. Refer to CO-13, "Exploded View" (HR engine models) or CO-34, "Exploded View" (MR engine models).
5. Remove instrument panel.Refer to IP-12, "Removal and Installation".
6. Remove foot duct (RH / LH). Refer to VTL-56, "FOOT DUCT : Removal and Installation".
7. Remove steering column. Refer to ST-10, "Removal and Installation".
8. Disconnect Heater and cooling unit harness connectors from steering member main harness.

9. Remove steering member. Refer to ST-15, "Removal and Installation".
10. Remove heater and cooling assembly. Refer to VTL-33, "Removal and Installation".
11. Remove mounting screws, and then remove evaporator cover (1).



12. Using a thin cutter, cut the evaporator insulator (B), and then remove fixing bolt (A), and low-pressure pipe 1 and high-pressure pipe 2 assembly.
CAUTION:
Cap or wrap the joint of expansion valve, high-pressure pipe 2 and low-pressure pipe 1 with suitable material such as vinyl tape to avoid the entry of air.



INSTALLATION

Installation is basically the reverse order of removal.

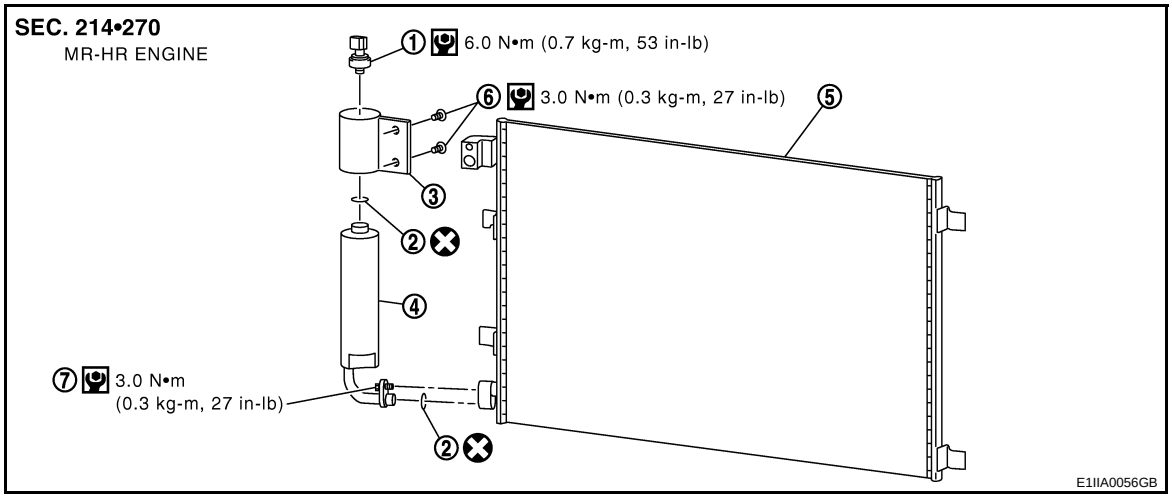
CAUTION:

- **Replace O-rings of high-pressure pipe 1, 2 and low-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.**

CONDENSER

Exploded View

INFOID:0000000001183132



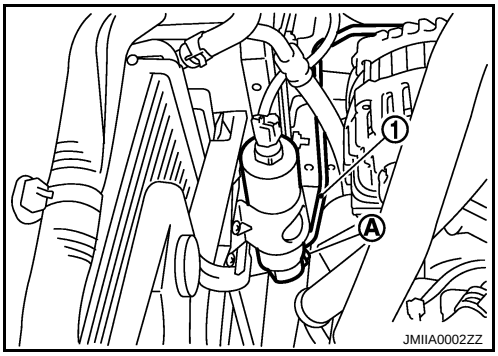
1. Refrigerant pressure sensor
2. O-ring
3. Liquid tank bracket
4. Liquid tank
5. Condenser
6. Liquid tank fixing screw
7. Liquid tank pipe fixing bolt

Removal and Installation

INFOID:0000000001183133

REMOVAL

1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
2. Remove engine cover ornament. Refer to EM-147, "Exploded View" (MR engine models).
3. Remove front grille. Refer to EXT-17, "Removal and Installation".
4. Remove radiator hose, and drain coolant. Refer to CO-9, "Draining" (HR engine models) or CO-30, "Draining" (MR engine models).
5. Remove upper radiator fixing bracket. Refer to CO-13, "Exploded View" (HR engine models) or CO-34, "Exploded View" (MR engine models).
6. Remove radiator air-guide duct (RH). Refer to Refer to CO-13, "Exploded View" (HR engine models) or CO-34, "Exploded View" (MR engine models).
7. Remove high-pressure pipe 1 (1) fixing bolt (A) and high pressure pipe from liquid tank. Refer to HA-50, "Removal and Installation".



8. Remove high-pressure flexible pipe 1 from condenser. Refer to HA-46, "Removal and Installation".
   CAUTION:
   Cap or wrap the joint of low and high-pressure pipe 1 and condenser with suitable material such as vinyl tape to avoid the entry of air.
9. Remove harness connector from refrigerant pressure sensor.
10. Remove liquid tank pipes and liquid tank from condenser and radiator. Refer to HA-54, "Removal and Installation", Refer to CO-13, "Removal and Installation" (HR engine models) or CO-35, "Removal and Installation" (MR engine models).
    CAUTION:
    Cap or wrap the joint of liquid tank pipes and condenser with suitable material such as vinyl tape to avoid the entry of air.
11. Remove radiator fixing brackets. Refer to CO-13, "Exploded View" (HR engine models) or CO-34, "Exploded View" (MR engine models).

12. Release radiator maintaining pawls, then pull-up the condenser assembly to release it from radiator. Refer to CO-13, "Removal and Installation" (HR engine models) or CO-35, "Removal and Installation" (MR engine models).
13. Maintain radiator pushing back.
14. Pull upward to remove condenser.
    CAUTION:
    Take care do not damaged condenser or radiator.

INSTALLATION

Installation is basically the reverse order of removal.

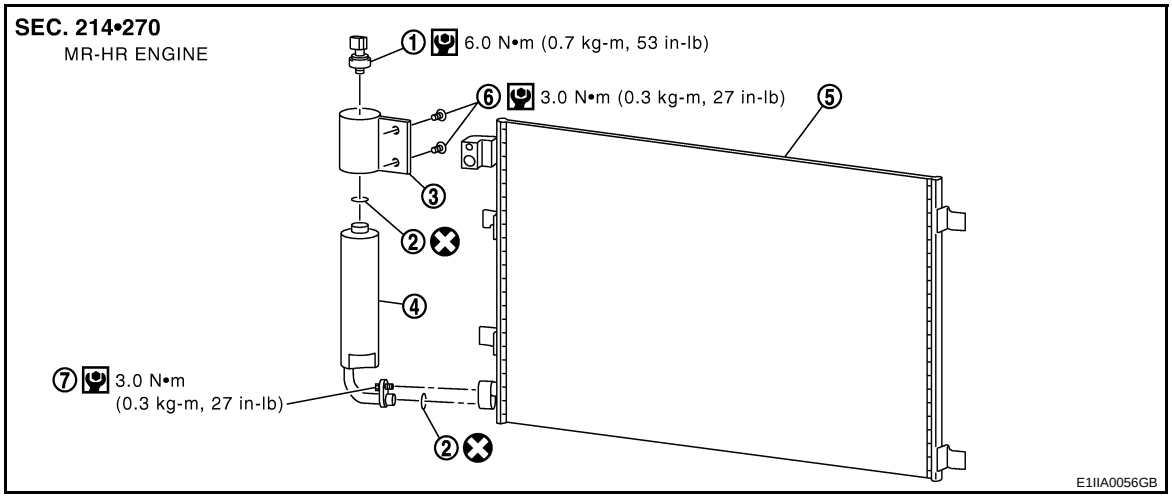
CAUTION:

- **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.**

LIQUID TANK

Exploded View

INFOID:0000000001183134



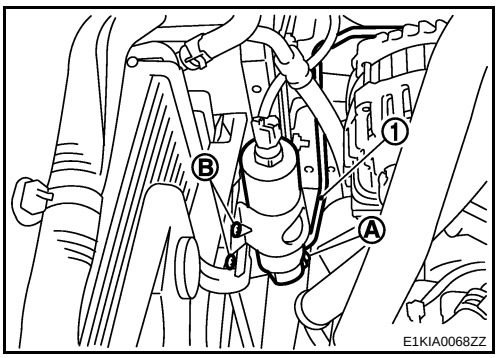
1. Refrigerant pressure sensor
2. O-ring
3. Liquid tank bracket
4. Liquid tank
5. Condenser
6. Liquid tank fixing screw
7. Liquid tank pipe fixing bolt

Removal and Installation

INFOID:0000000001183135

REMOVAL

1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
2. Remove engine cover ornament. Refer to EM-147, "Exploded View" (MR engine models).
3. Clean liquid tank and its surrounding area, and remove dust and rust from liquid tank.
   CAUTION:
   Be sure to clean carefully.
4. Disconnect refrigerant sensor harness connector. Refer to HA-55, "Removal and Installation".
5. Remove liquid tank bracket support mounting screws (B).
6. Remove high pressure pipe 1 (1) mounting bolt (A) from liquid tank. Refer to HA-48, "Removal and Installation".
7. Remove liquid tank high pressure pipe mounting bolt (A) from condenser.
8. Remove liquid tank pipe bracket fixing screw.
   CAUTION:
   Cap or wrap the joint of high pressure pipe, liquid tank pipes and condenser with suitable material such as vinyl tape to avoid the entry of air.
9. Remove liquid tank assembly.



INSTALLATION

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

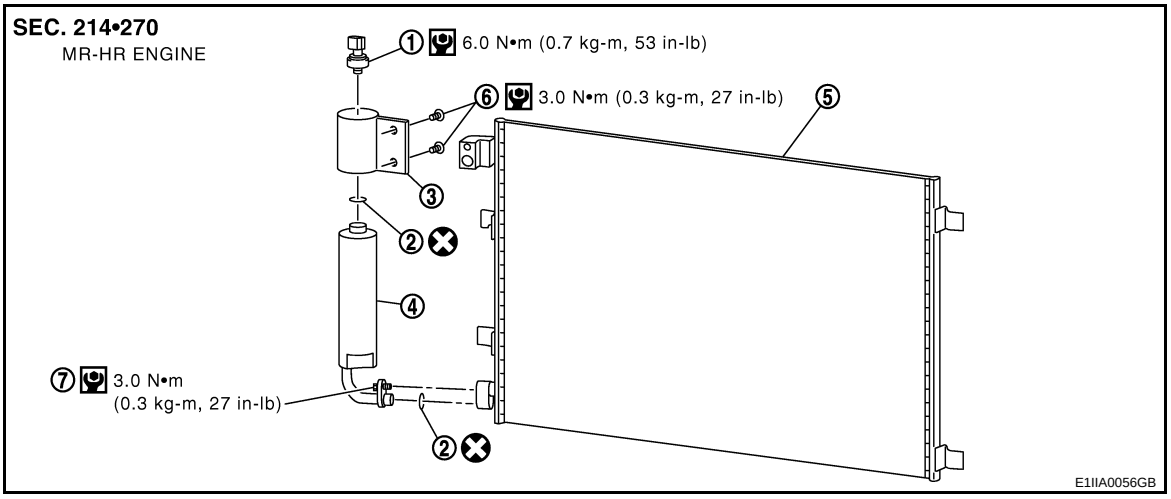
CAUTION:

- **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.**

REFRIGERANT PRESSURE SENSOR

Exploded View

INFOID:0000000001183136



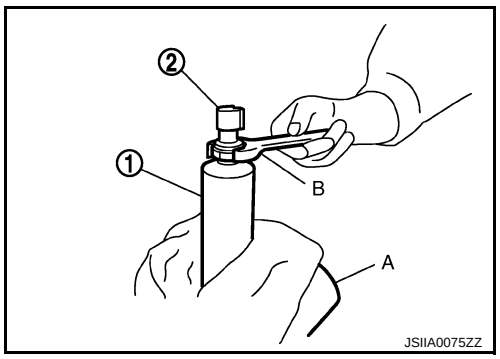
1. Refrigerant pressure sensor
2. O-ring
3. Liquid tank bracket
4. Liquid tank
5. Condenser
6. Liquid tank fixing screw
7. Liquid tank pipe fixing bolt

Removal and Installation

INFOID:0000000001183137

REMOVAL

1. Remove liquid tank. Refer to HA-54, "Exploded View".
2. Fix the liquid tank (1) with a vise (A). Remove the refrigerant pressure sensor (2) with a wrench (B).
   CAUTION:
   Be careful not to damage liquid tank.



INSTALLATION

Installation is basically the reverse order of removal.

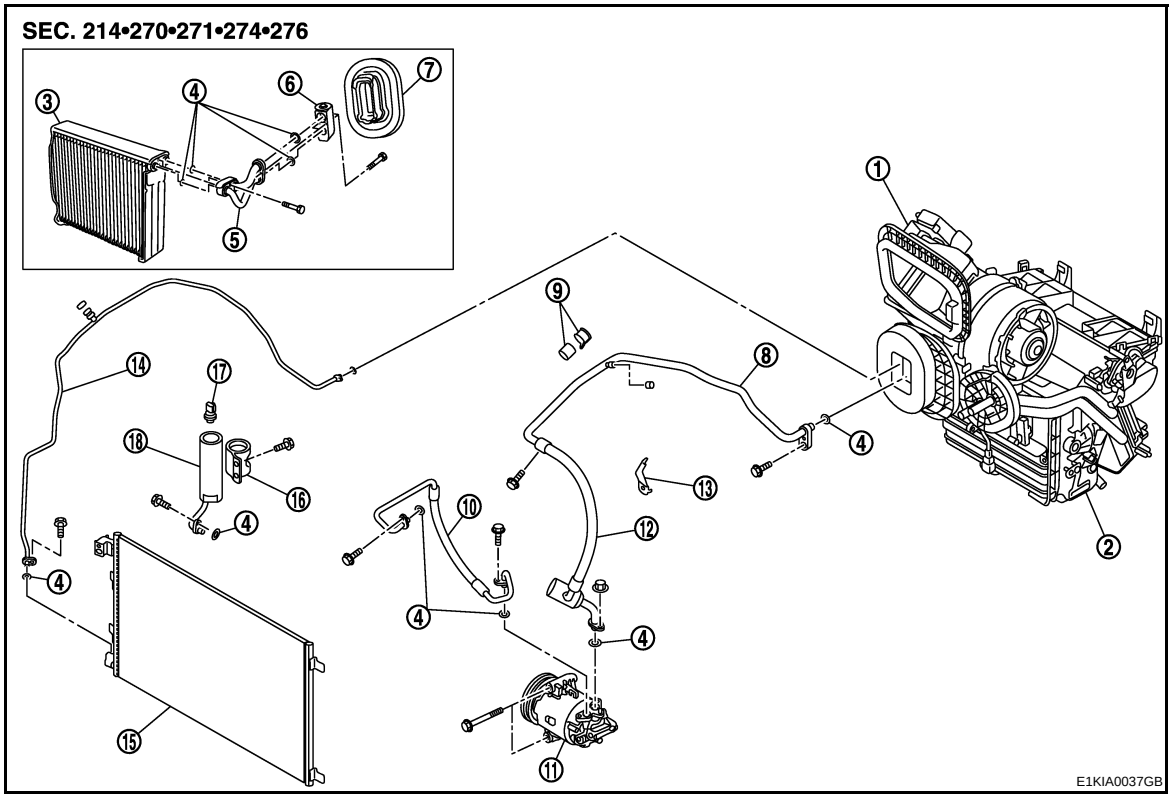
CAUTION:

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

EVAPORATOR

Exploded View

INFOID:0000000001183138



1. Heater & blower unit assembly
2. Heater & cooling unit assembly
3. Evaporator
4. O-ring
5. Low pressure pipe 1 and high pressure pipe 2 assembly
6. Expansion valve
7. Heater sealing
8. Low pressure flexible hose and pipe 2
9. Low pressure pipe 2 fixing clamp assembly
10. High pressure flexible hose
11. Compressor
12. Low pressure flexible hose
13. Low & high pipe bracket support
14. High pressure pipe 1
15. Condenser assembly
16. Liquid tank fixing bracket
17. Refrigerant pressure sensor
18. Liquid tank

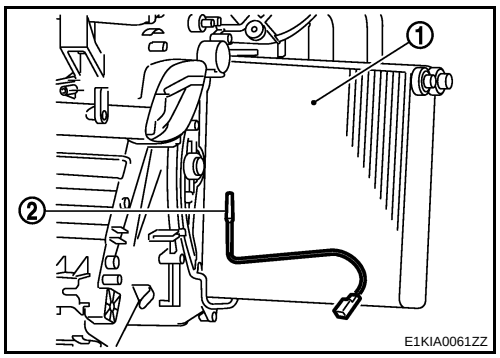
Removal and Installation

INFOID:0000000001183139

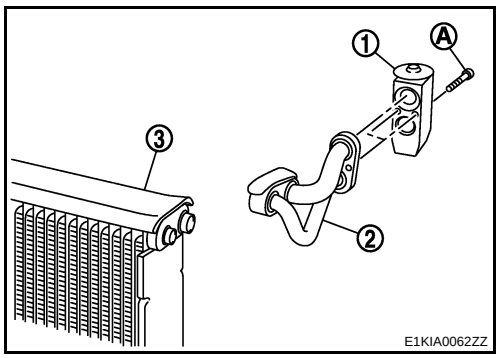
REMOVAL

1. Remove low-pressure pipe 2 and high-pressure pipe 1 from expansion valve. Refer to HA-44, "Removal and Installation". Refer to HA-48, "Removal and Installation".
   CAUTION:
   Cap or wrap the joint of expansion valve, low-pressure pipe 2 and high-pressure pipe 1 with suitable material such as vinyl tape to avoid the entry of air.
2. Remove heater and cooling fixing clamp and hoses. Refer to VTL-33, "Removal and Installation", Refer to CO-13, "Removal and Installation" (HR engine models) or CO-35, "Removal and Installation" (MR engine models).
3. Remove heater and cooling unit assembly. Refer to VTL-33, "Removal and Installation".
4. Remove evaporator cover fixing screws and cover. Refer to HA-56, "Removal and Installation".

5. Slide evaporator (1) and intake sensor (2) from heater and cooling unit assembly.
6. Remove evaporator assembly.



7. Cut upper insulator (3) and remove mounting bolt (A), expansion valve (1) and pressure pipe assembly(2), from evaporator.



INSTALLATION

Installation is basically the reverse order of removal.

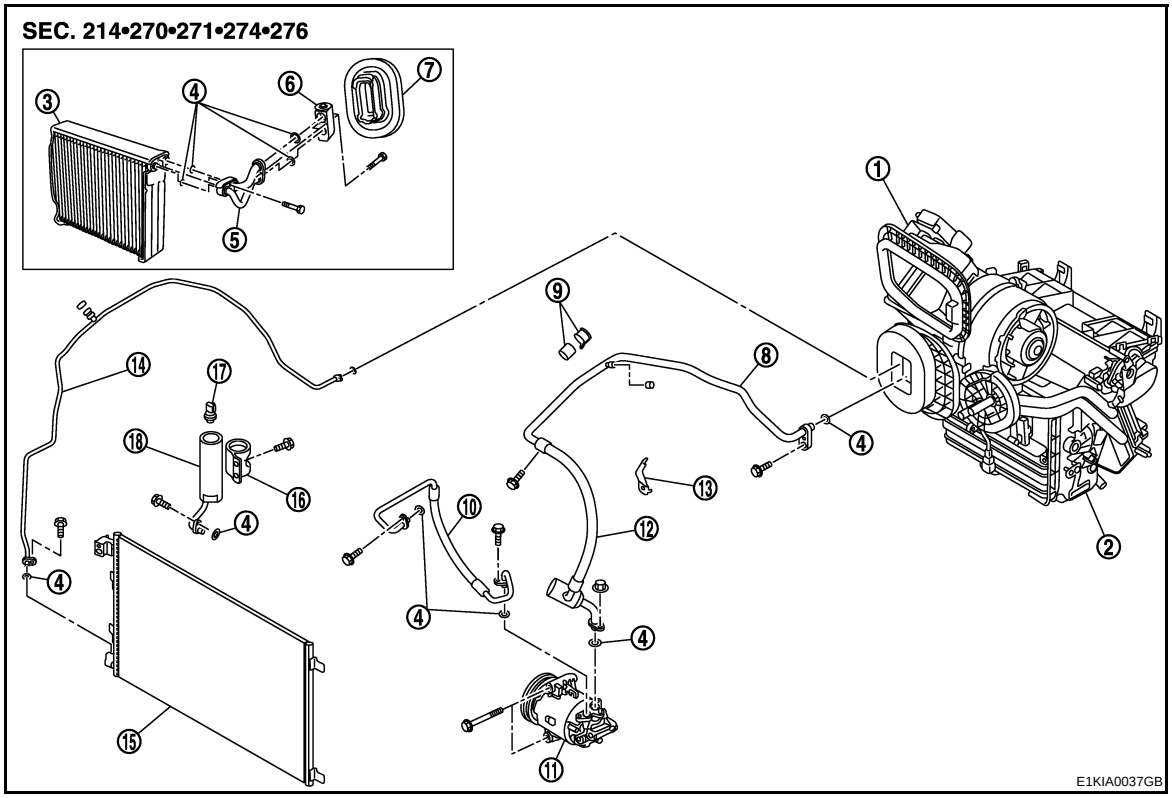
CAUTION:

- **Replace O-rings of low-pressure pipe 1 and high-pressure pipe 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 flexible hose (high-pressure pipe 1) and low-pressure pipe 1 (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.**

EXPANSION VALVE

Exploded View

INFOID:0000000001183140



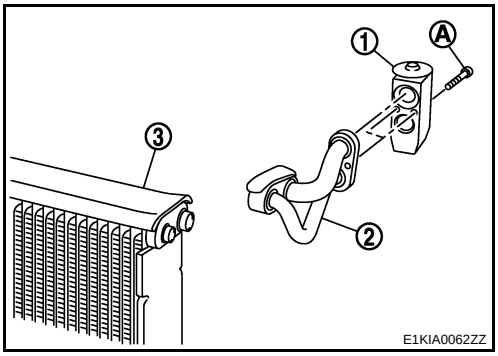
1. Heater & blower unit assembly
2. Heater & cooling unit assembly
3. Evaporator
4. O-ring
5. Low pressure pipe 1 and high pressure pipe 2 assembly
6. Expansion valve
7. Heater sealing
8. Low pressure flexible hose and pipe 2
9. Low pressure pipe 2 fixing clamp assembly
10. High pressure flexible hose
11. Compressor
12. Low pressure flexible hose
13. Low & high pipe bracket support
14. High pressure pipe 1
15. Condenser assembly
16. Liquid tank fixing bracket
17. Refrigerant pressure sensor
18. Liquid tank

Removal and Installation

INFOID:0000000001183141

REMOVAL

1. Remove evaporator. Refer to HA-56, "Removal and Installation".
2. Remove low pressure pipe 1 and high pressure pipe 2 assembly (2). Refer to HA-50, "Removal and Installation".
3. Remove mounting bolts (A), and then remove expansion valve (1) from low and high, pressure pipe assembly (2).
   CAUTION:
   Cap or wrap the joint of expansion valve, low and high pressure pipe assembly, evaporator and 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 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.**

SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

Compressor

INFOID:0000000001183142

Model		CALSONICKANSEI
Type		Variable displacement swash plate
Displacement cm^3 (cu in)/rev	Max.	120 (7.32)
	Min.	6 (0.37)
Cylinder bore × stroke (Max.) mm (in.)		32 × 29 (1.26 × 1.14)
Direction of rotation		Clockwise (viewed from clutch)
Drive belt		Poly V 7 groove (HR engine), Poly V 6 groove (MR engine)

Lubricant

INFOID:0000000001183143

Model		CALSONICKANSEI
Name		Nissan A/C System Oil Type S (DH-PS)
Capacity m ℓ (US fl oz, Imp fl oz)	Total in system	150 (5.03, 5.3)
	Compressor (Service part) charging amount	150 (5.03, 5.3)

Refrigerant

INFOID:0000000001183144

Type	HFC-134a (R-134a)
Capacity kg (lb)	0.45 ± 0.025 (0.99 ± 0.055)

Engine Idling Speed

INFOID:0000000001183145

Refer to ECH-348, "Idle Speed" (HR engine models with EURO-OBD), ECH-625, "Idle Speed" (HR engine models without EURO-OBD), ECM-352, "Idle Speed" (MR engine models with EURO-OBD) or ECM-627, "Idle Speed" (MR engine models without EURO-OBD).

Belt Tension

INFOID:0000000001183146

Refer to EM-16, "Tension Adjustment" (HR engine models) or EM-135, "Tension Adjustment" (MR engine models).

BASIC INSPECTION

DIAGNOSIS AND REPAIR WORKFLOW

Work Flow

INFOID:0000000001183147

DETAILED FLOW

1. LISTEN TO CUSTOMER COMPLAINT

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

>> GO TO 2.

2. VERIFY THE SYMPTOM WITH OPERATIONAL CHECK

Verify the symptom with operational check. Refer to HAC-6, "Description & Inspection".

>> GO TO 3.

3. GO TO APPROPRIATE TROUBLE DIAGNOSIS

Go to appropriate trouble diagnosis (Refer to HAC-122, "Diagnosis Chart By Symptom").

>> GO TO 4.

4. REPAIR OR REPLACE

Repair or replace the specific parts

>> GO TO 5.

5. FINAL CHECK

Final check.

Is the inspection result normal?

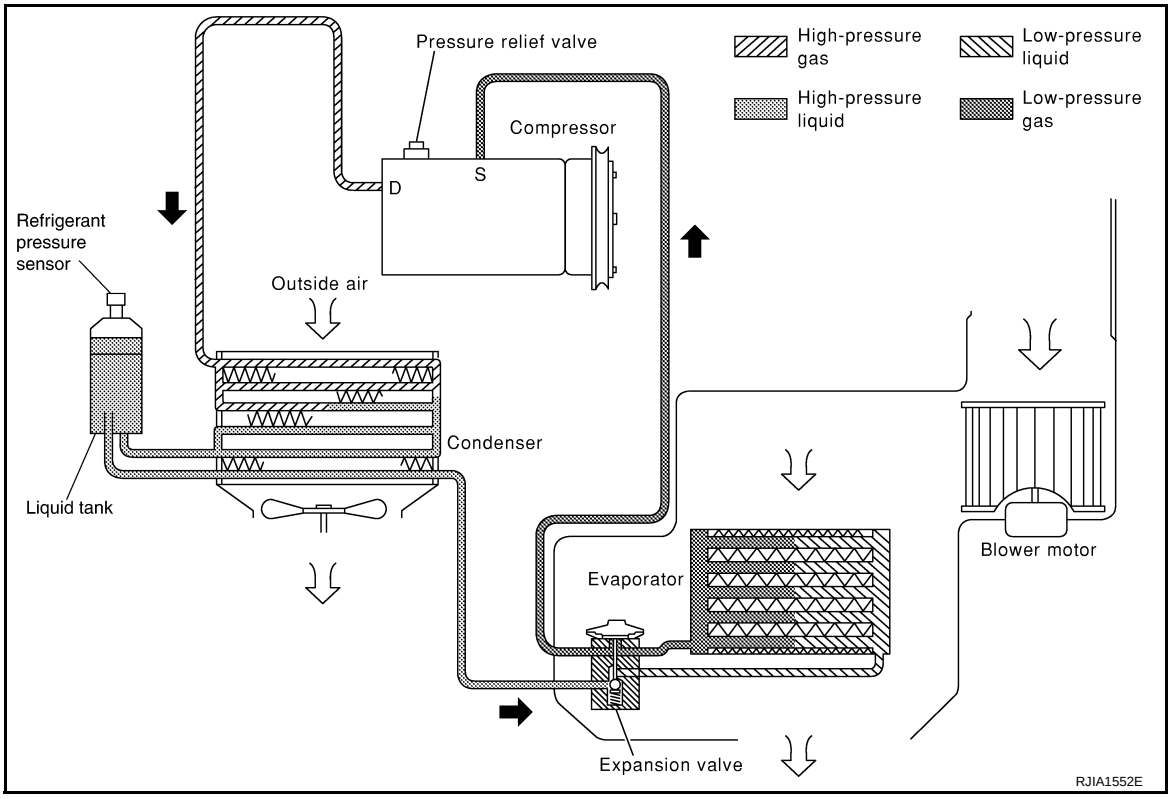
YES >> CHECK OUT
NO >> GO TO 3.

FUNCTION DIAGNOSIS

REFRIGERATION SYSTEM

System Diagram

INFOID:0000000001183148



System Description

INFOID:0000000001183149

REFRIGERANT CYCLE

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

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 2,800 kPa (28.5 kg/cm^2, 406.1 psi), or below about 200 kPa (2.04 kg/cm^2, 29 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 3,628 kPa (37 kg/cm^2, 526 psi)], the release port on the pressure relief valve automatically opens and releases refrigerant into the atmosphere.

LUBRICANT

Maintenance of Lubricant Quantity in Compressor

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:

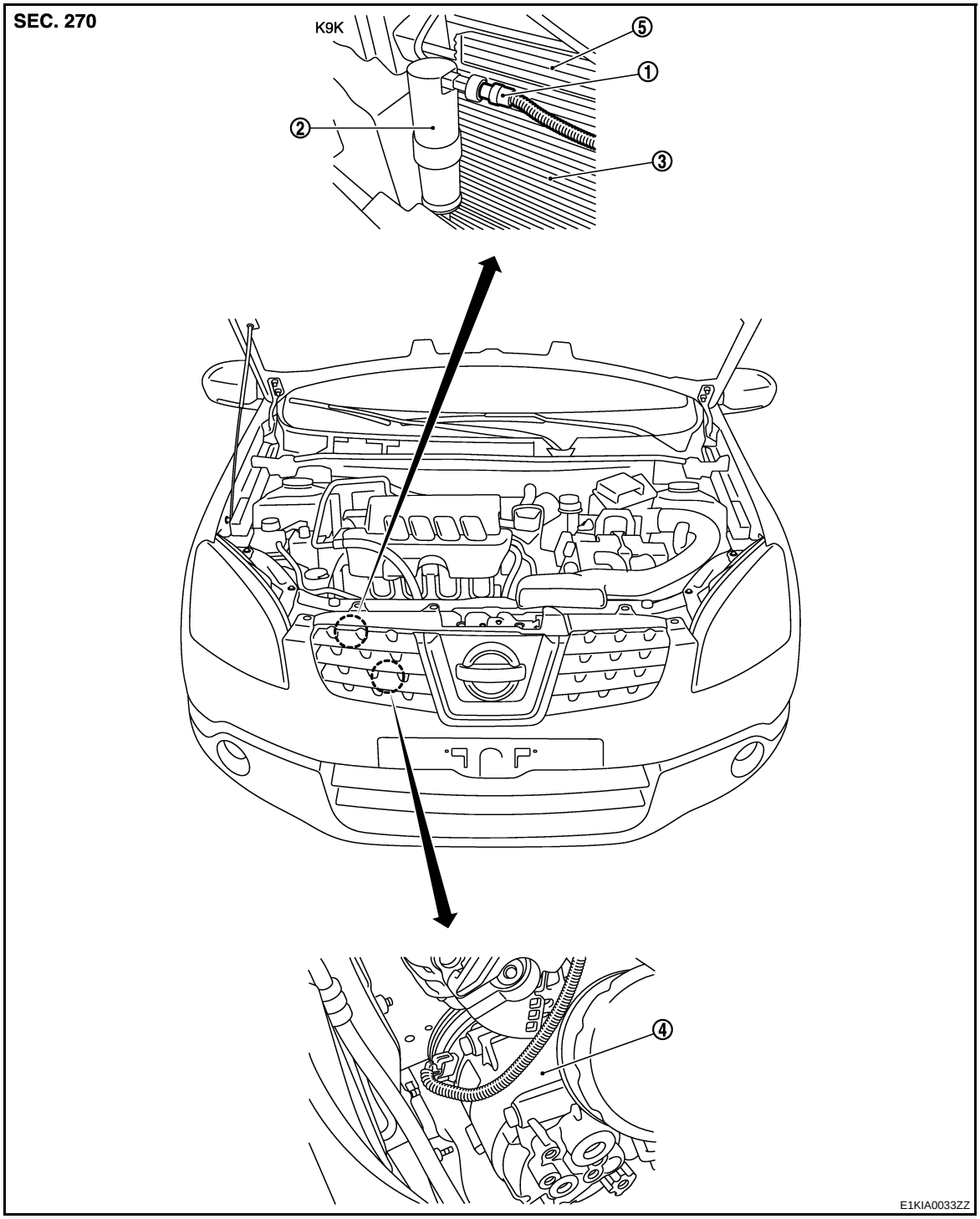
- Lack of lubricant: May lead to a seized compressor.
- Excessive lubricant: Inadequate cooling (thermal exchange interference)

Lubricant

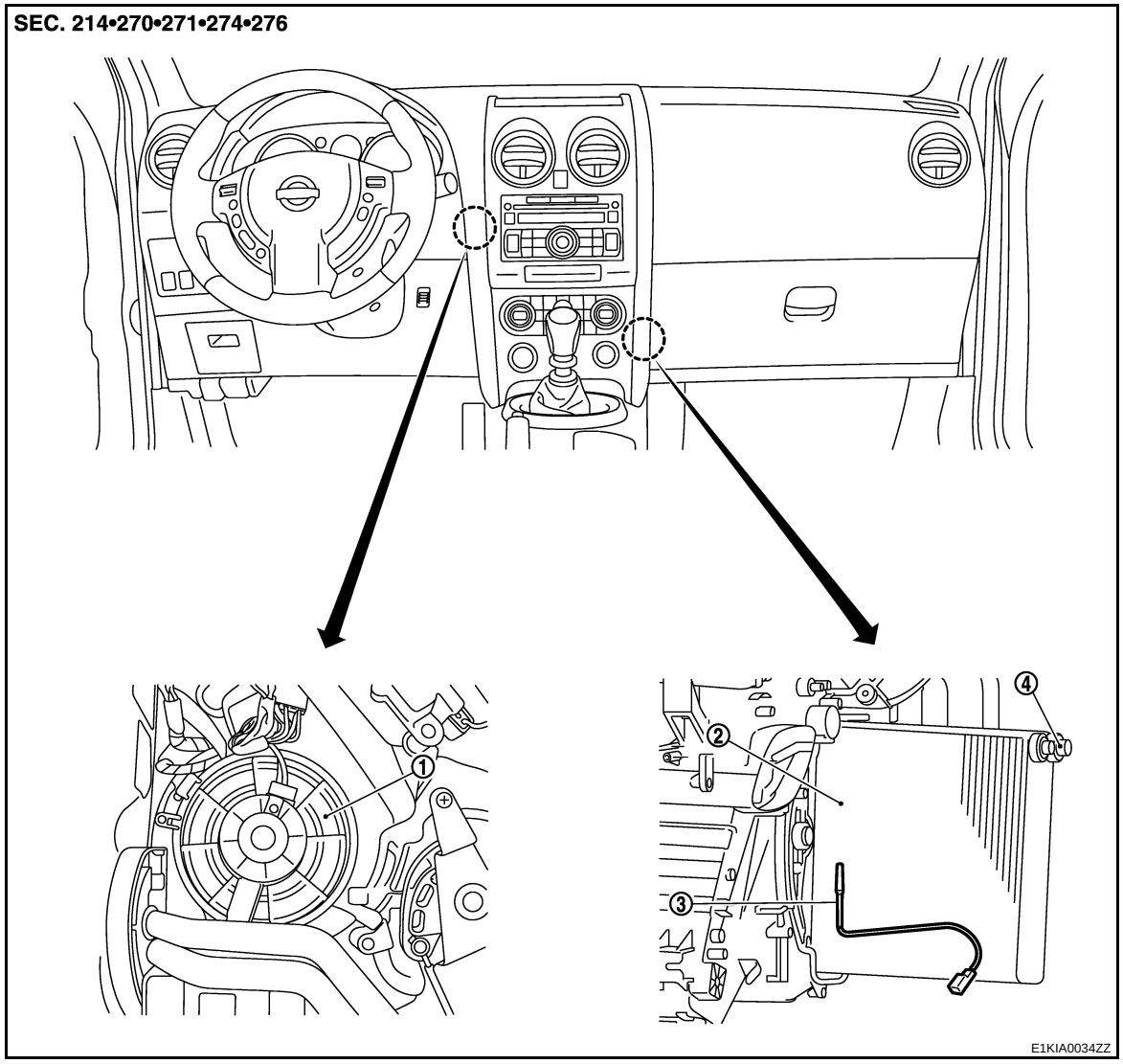
Name : Nissan A/C System Oil Type S

Component Parts Location

INFOID:0000000001183150



1. Refrigerant pressure sensor
2. Liquid tank
3. Condenser
4. Compressor
5. Radiator



1. Blower motor assembly
2. Evaporator
3. Intake sensor (AT only)
4. Expansion valve

Component Description

INFOID:0000000001183151

Component	Description
Compressor	Intakes, compresses, and discharges refrigerant, then conveys it to condenser.
Condenser	Condenses refrigerant, and then conveys it to liquid tank.
Liquid tank	Drives moisture out of refrigerant, eliminates foreign matter, then conveys refrigerant to expansion valve.
Refrigerant pressure sensor	Refer to HAC-70, "Component Inspection".
Expansion valve	Vaporizes refrigerant, controls the amount of flow, then conveys refrigerant to evaporator.
Evaporator	Cools passing air, and then conveys it to compressor.
Blower motor	Takes in air in the vehicle or fresh outside air, and then adjusts room temperature by air conditioning.

SYMPTOM DIAGNOSIS

REFRIGERATION SYSTEM SYMPTOMS

SYMPTOM DIAGNOSIS PROCEDURE

SYMPTOM DIAGNOSIS PROCEDURE : Trouble Diagnosis For Unusual Pressure

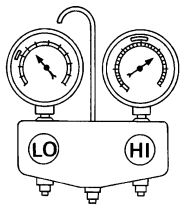
INFOID:0000000001183152

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

BOTH HIGH- AND LOW-PRESSURE SIDES ARE TOO HIGH : Symptom Table

INFOID:0000000001183153

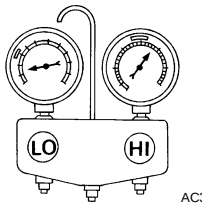
Gauge indication	Refrigerant cycle	Probable cause	Corrective action
Both high- and low-pressure sides are too high.  AC359A	The pressure returns to normal is reduced soon after water is splashed on condenser.	Excessive refrigerant charge in refrigeration cycle.	Reduce refrigerant until specified pressure is obtained.
	Air suction by cooling fan is insufficient.	Insufficient condenser cooling performance. ↓ 1. Condenser fins are clogged. 2. Improper fan rotation of cooling fan.	• Clean condenser. • Check and repair cooling fan as necessary.
	• Low-pressure pipe is not cold. • When compressor is stopped high-pressure value quickly drops by approximately 196 kPa (2 kg/cm^2, 28 psi). It then decreases gradually thereafter.	Poor heat exchange in condenser (After compressor operation stops, high-pressure decreases too slowly.). ↓ Air in refrigeration cycle.	Evacuate repeatedly and recharge system.
	Engine tends to overheat.	Engine cooling systems malfunction.	Check and repair each engine cooling system.
	• An area of the low-pressure pipe is colder than areas near the evaporator outlet. • 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

HIGH-PRESSURE SIDE IS TOO HIGH AND LOW-PRESSURE SIDE IS TOO LOW :

Symptom Table

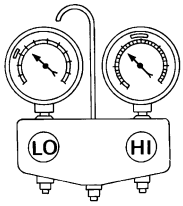
INFOID:0000000001183154

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

HIGH-PRESSURE SIDE IS TOO LOW AND LOW-PRESSURE SIDE IS TOO HIGH : Symptom Table

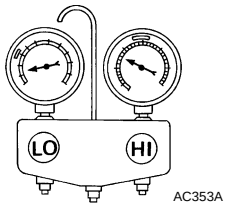
INFOID:0000000001183155

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

BOTH HIGH- AND LOW-PRESSURE SIDES ARE TOO LOW : Symptom Table

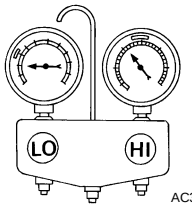
INFOID:0000000001183156

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 HA-85, "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 HAC-86, "Diagnosis Procedure". • Replace compressor. • Repair evaporator fins. • Replace evaporator. • Refer to HAC-62, "Diagnosis Procedure".

LOW-PRESSURE SIDE SOMETIMES BECOMES NEGATIVE

LOW-PRESSURE SIDE SOMETIMES BECOMES NEGATIVE : Symptom Table

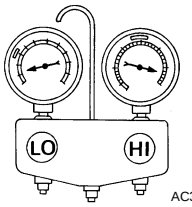
INFOID:0000000001183157

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

LOW-PRESSURE SIDE BECOMES NEGATIVE : Symptom Table

INFOID:0000000001183158

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.

PRECAUTION

PRECAUTIONS

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

INFOID:0000000001183159

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 AIRBAG” and “SEAT BELT” of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision 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 AIRBAG”.**
- **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.**

Precaution Necessary for Steering Wheel Rotation After Battery Disconnect

INFOID:0000000001183160

NOTE:

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

For models equipped with the Intelligent Key system and NATS, an electrically controlled steering lock mechanism is adopted on the key cylinder.
For this reason, if the battery is disconnected or if the battery is discharged, the steering wheel will lock and steering wheel rotation will become impossible.
If steering wheel rotation is required when battery power is interrupted, follow the procedure below before starting the repair operation.

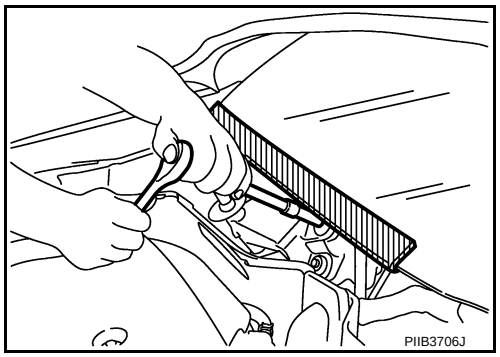
OPERATION PROCEDURE

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

Precaution for Procedure without Cowl Top Cover

INFOID:0000000001183161

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



Precautions For Xenon Headlamp Service

INFOID:0000000001183162

WARNING:

Comply with the following warnings to prevent any serious accident.

- **Disconnect the battery cable (negative terminal) or the power supply fuse before installing, removing, or touching the xenon headlamp (bulb included). The xenon headlamp contains high-voltage generated parts.**
- **Never work with wet hands.**
- **Check the xenon headlamp ON-OFF status after assembling it to the vehicle. Never turn the xenon headlamp ON in other conditions. Connect the power supply to the vehicle-side connector. (Turning it ON outside the lamp case may cause fire or visual impairments.)**
- **Never touch the bulb glass immediately after turning it OFF. It is extremely hot.**

CAUTION:

Comply with the following cautions to prevent any error and malfunction.

- **Install the xenon bulb securely. (Insufficient bulb socket installation may melt the bulb, the connector, the housing, etc. by high-voltage leakage or corona discharge.)**
- **Never perform HID circuit inspection with a tester.**
- **Never touch the xenon bulb glass with hands. Never put oil and grease on it.**
- **Dispose of the used xenon bulb after packing it in thick vinyl without breaking it.**
- **Never wipe out dirt and contamination with organic solvent (thinner, gasoline, etc.).**

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

INFOID:0000000001183163

CAUTION:

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

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

General Refrigerant Precaution

INFOID:0000000001183164

WARNING:

- **Avoid breathing A/C refrigerant and lubricant vapor or mist. Exposure may irritate eyes, nose and throat. Use only approved recovery/recycling equipment to discharge HFC-134a (R-134a) refrigerant.**

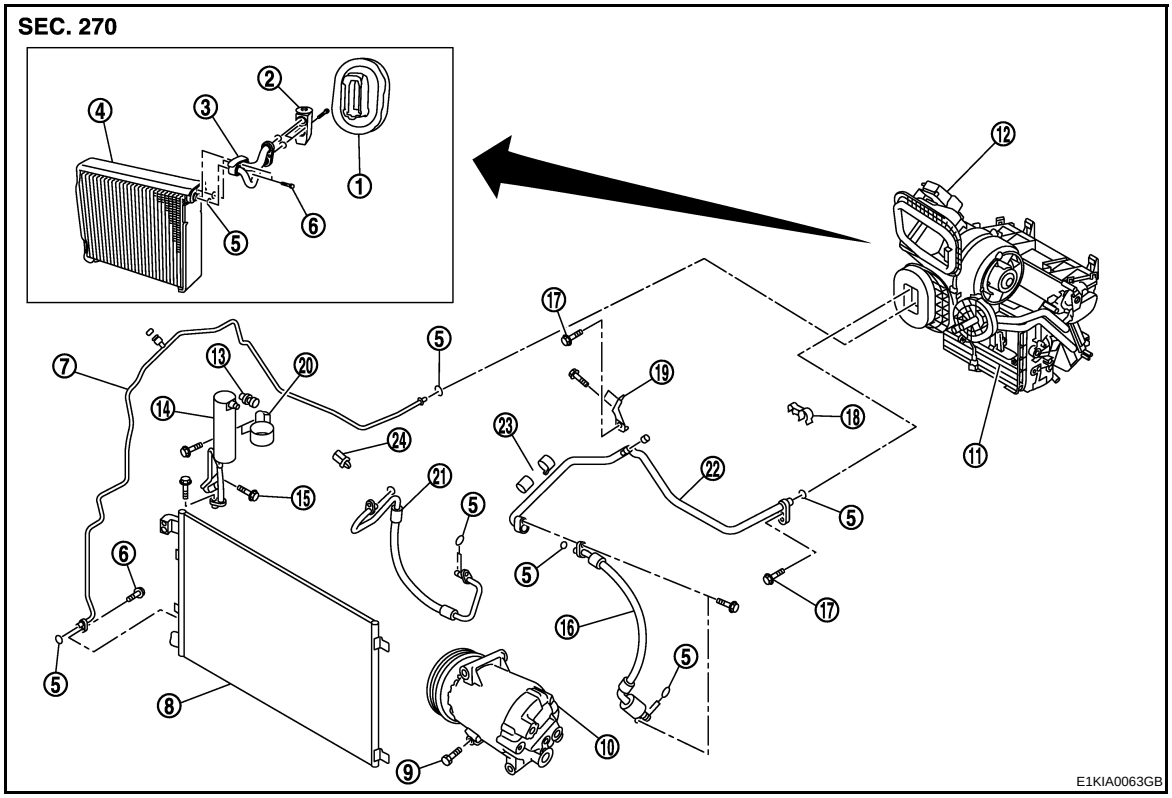
If accidental system discharge occurs, ventilate work area before resuming service. Additional health and safety information may be obtained from refrigerant and lubricant manufacturers.
- **Never release refrigerant into the air. Use approved recovery/recycling equipment to capture the refrigerant every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

Refrigerant Connection

INFOID:0000000001183165

A new type refrigerant connection has been introduced to all refrigerant lines except the following location.
- Expansion valve to evaporator
- Refrigerant pressure sensor to liquid tank

O-RING AND REFRIGERANT CONNECTION



1. Heater sealing
2. Expansion valve
3. Low pressure pipe 1 and high pressure pipe 2 assembly
4. Evaporator
5. O-ring
6. Connector pipe fixing bolt
7. High pressure pipe 1
8. Condenser assembly
9. Fixing bolt
10. Compressor
11. Heater & cooling unit assembly
12. Heater & blower unit assembly
13. Refrigerant pressure sensor
14. Liquid tank
15. Liquid tank fixing screw
16. Low pressure flexible hose
17. Fixing bolt
18. Pipes fixing clip

19. Low & high pressure pipe bracket
20. Liquid tank fixing bracket
21. High pressure flexible hose
22. Low pressure pipe 2
23. Low pressure pipe fixing clamp assembly
24. Pipe mantening clip

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

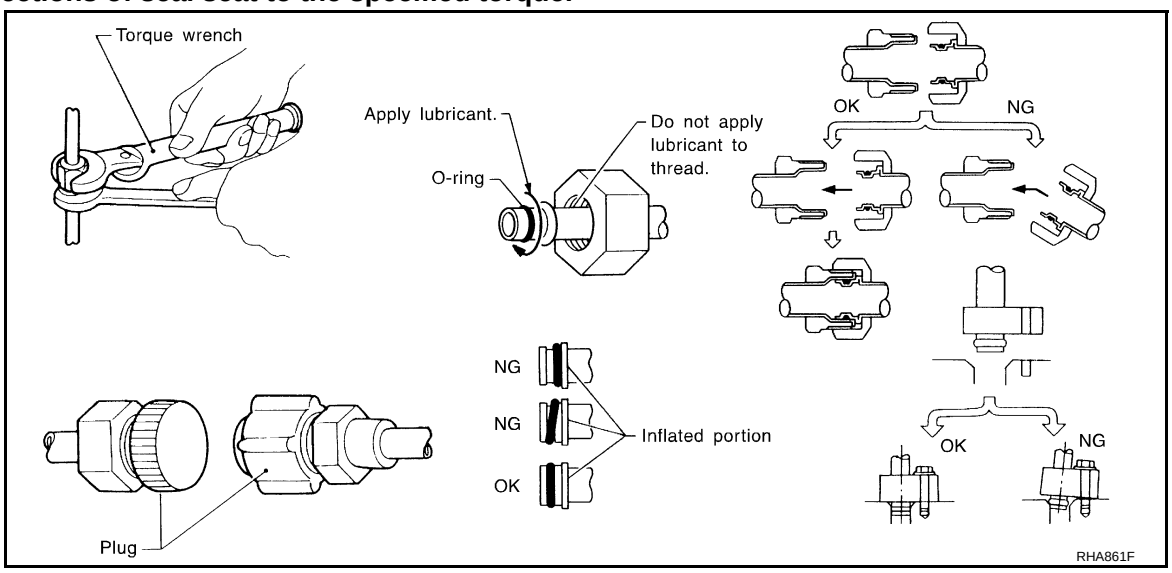
Connection type	Piping connection point		Part number	QTY	O-ring size
New	Low pressure flexible hose to Low pressure pipe 2		92473 N8210	1	16
	Low pressure pipe 2 to expansion valve		92473 N8210	1	16
	High pressure flexible pipe 1 to condenser		92472 N8210	1	12
	High pressure pipe 1 to expansion valve		92471 N8210	1	8
	Low pressure pipe 1 and high pressure pipe 2 assembly to expansion valve	Inlet	92475 71L00	1	12
		Outlet	92475 72L00	1	16
	Low pressure pipe 1 and high pressure pipe 2 assembly to evaporator	Inlet	92475 71L00	1	12
		Outlet	92475 72L00	1	16
	High pressure pipe 1 to liquid tank		92471 N8210	1	8
	Compressor to low pressure flexible hose		77030 65315	2	16
	Compressor to high pressure flexible hose		77030 65316	2	12
	Liquid tank to condenser		92473 N8210	2	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 tube, 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 portion of tube.**
- **When replacing the O-ring, be careful not to damage O-ring and tube.**
- **Connect tube until a click can be heard, then tighten the nut or bolt by hand. 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.**



Service Equipment

INFOID:0000000001183166

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.

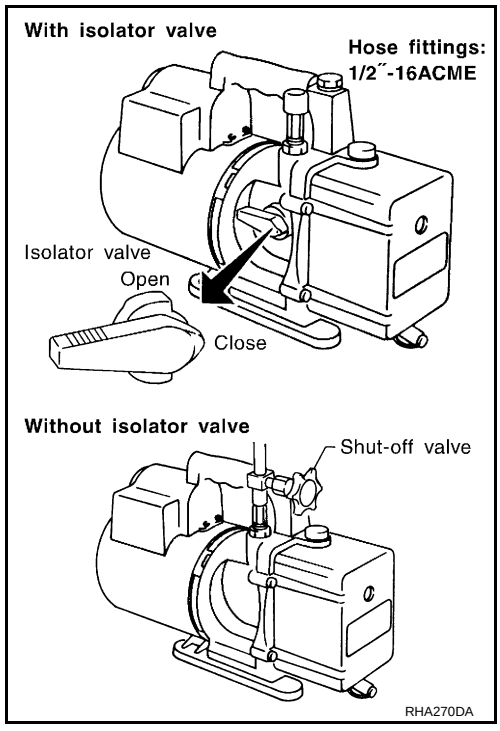
VACUUM PUMP

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.

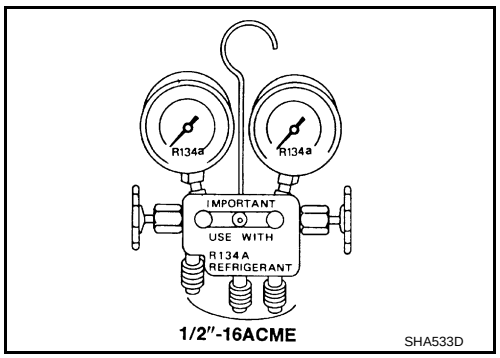
- Usually vacuum pumps have a manual isolator valve as part of the pump. Close this valve to isolate the service hose from the pump.
- For pumps without an isolator, use a hose equipped with a manual shut-off valve near the pump end. Close the valve to isolate the hose from the pump.
- If the hose has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



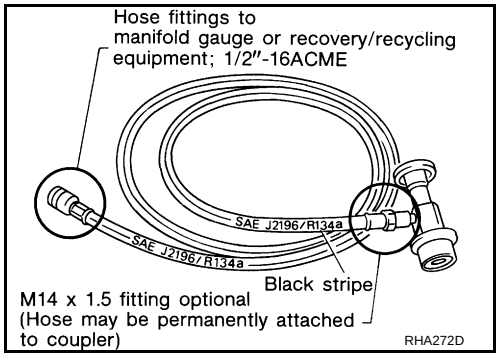
MANIFOLD GAUGE SET

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

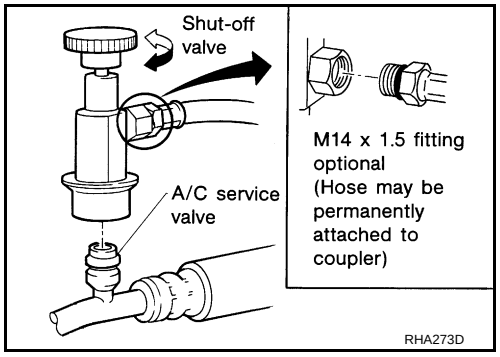
Be certain that the service hoses display the markings described (colored hose with black stripe). All hoses must include positive shut-off devices (either manual or automatic) near the end of the hoses opposite to the manifold gauge.



SERVICE COUPLERS

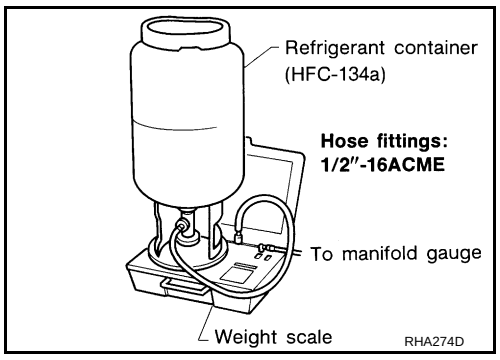
Never attempt to connect HFC-134a (R-134a) service couplers to a CFC-12 (R-12) A/C system. The HFC-134a (R-134a) couplers will not properly connect to the CFC-12 (R-12) system. However, if an improper connection is attempted, discharging and contamination may occur.

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 electronic scale or of quality recycle/recharge equipment.

COMPRESSOR

General Precautions

INFOID:0000000001183167

CAUTION:

- **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 HA-81, "Adjustment".**
- **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.**

LEAK DETECTION DYE

General Precautions

INFOID:0000000001183168

CAUTION:

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

IDENTIFICATION

NOTE:

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

IDENTIFICATION LABEL FOR VEHICLE

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

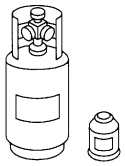
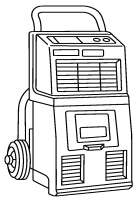
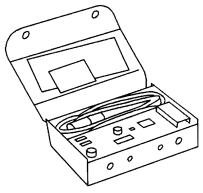
PREPARATION

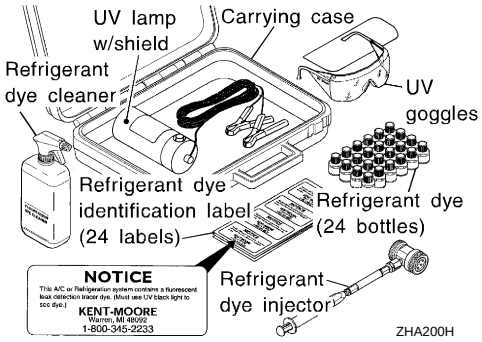
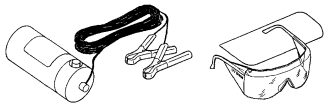
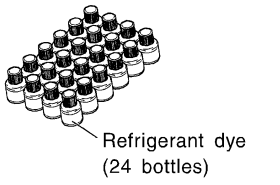
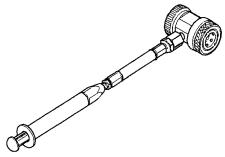
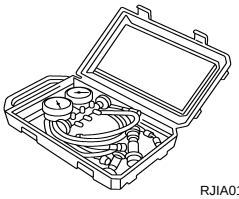
PREPARATION

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

INFOID:0000000001183169

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.
Adapters that convert one size fitting to another must never be used: refrigerant/lubricant contamination will occur and compressor malfunction will result.

Tool number Tool name		Description
HFC-134a (R-134a) refrigerant	 S-NT196	Container color: Light blue Container marking: HFC-134a (R-134a) Fitting size: Thread size • Large container 1/2 ″ -16 ACME
KLH00-PAGS0 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) Lubricity: 40 m ℓ (1.4 Imp fl oz.)
Recovery/Recycling/ Recharging equipment (ACR4)	 RJIA0195E	Function: Refrigerant recovery and recycling and recharging
Electrical leak detector	 A/C leak detector SHA705EB	Power supply: DC 12V (Cigarette lighter)

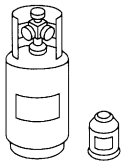
Tool number Tool name		Description
(J-43926) Refrigerant dye leak detection kit Kit includes: (J-42220) UV lamp and UV safety goggles (J-41459) HFC-134a (R-134a)dye injector Use with J-41447, 1/4 ounce bottle (J-41447) HFC-134a (R-134a) fluorescent leak detection dye (Box of 24, 1/4 ounce bottles) (J-43872) Refrigerant dye cleaner		Power supply: DC 12V (Battery terminal)
(J-42220) UV lamp and UV safety goggles		Power supply: DC 12V (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)		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		For injecting 1/4 ounce of fluorescent leak detection dye into A/C system.
(J-43872) Refrigerant dye cleaner		For cleaning dye spills.
Manifold gauge set (with hoses and couplers)		Identification: • The gauge face indicates HFC-134a (R-134a). Fitting size: Thread size • 1/2″-16 ACME

Sealant or/and Lubricant

INFOID:0000000001183170

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

- 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 name	Description
HFC-134a (R-134a) refrigerant  S-NT196	Container color: Light blue Container marking: HFC-134a (R-134a) Fitting size: Thread size • Large container 1/2″-16 ACME
Nissan A/C System Oil Type S (DH-PS)  S-NT197	Type: Polyalkylene glycol oil (PAG), type S (DH-PS) Application: HFC-134a (R-134a) swash plate compressors (Nissan only) Capacity: 40 m ℓ (1.4 US fl oz., 1.4 Imp fl oz.)

ON-VEHICLE MAINTENANCE

LUBRICANT

Adjustment

INFOID:0000000001183171

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.

Is it successful?

YES >> GO TO 2.
NO >> 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 >> Refer to "LUBRICANT ADJUSTING PROCEDURE FOR COMPRESSOR REPLACEMENT".
NO >> Refer to "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:

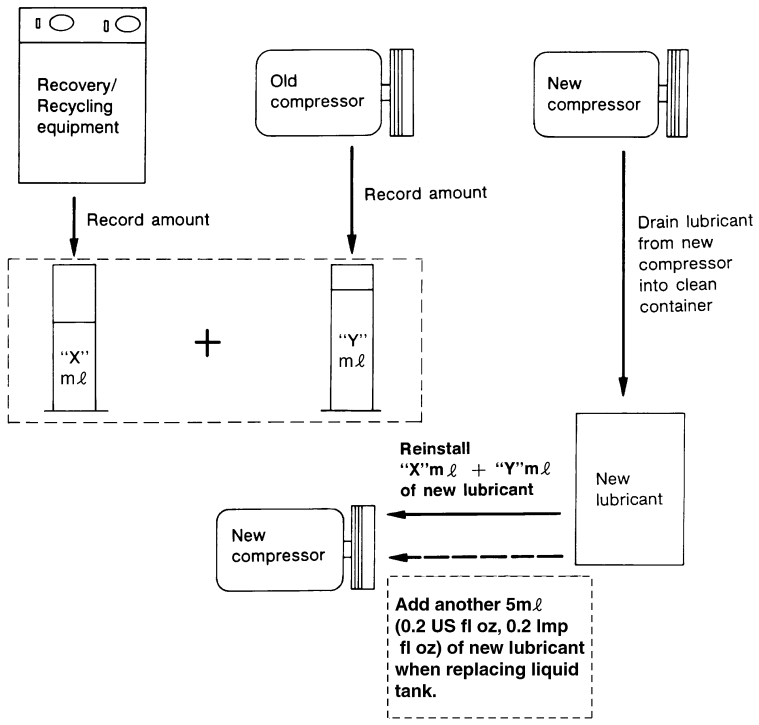
Part replaced	Lubricant to be added to system	Remarks
	Amount of lubricant mℓ (US fl oz., Imp fl oz.)	
Evaporator	75 (2.5, 2.6)	—
Condenser	35 (1.2, 1.2)	—
Liquid tank	10 (0.3, 0.4)	—
In case of refrigerant leak	30 (1.0, 1.1)	Large leak
	—	Small leak *1

*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 HA-71, "Working with HFC-134a (R-134a)".
3. Confirm refrigerant purity in vehicle A/C system using recovery/recycling recharging equipment and refrigerant identifier. If NG, refer to HA-71, "Working with HFC-134a (R-134a)".
4. Discharge refrigerant into the refrigerant recovery/recycling equipment. Measure lubricant discharged into the recovery/recycling equipment.
5. Drain the lubricant from the old (removed) compressor into a graduated container and recover the amount of lubricant drained.
6. Drain the lubricant from the new compressor into a separate, clean container.
7. Measure an amount of new lubricant installed equal to amount drained from old compressor. Add this lubricant to new compressor through the suction port opening.
8. Measure an amount of new lubricant equal to the amount recovered during discharging. Add this lubricant to new compressor through the suction port opening.
9. If the liquid tank also needs to be replaced, add another 5 m ℓ (0.2 US fl oz., 0.2 Imp fl oz.) of lubricant at this time.
   Do not add this 5 m ℓ (0.2 US fl oz., 0.2 Imp fl oz.) of lubricant when replaces the compressor only.

Lubricant adjusting procedure for compressor replacement

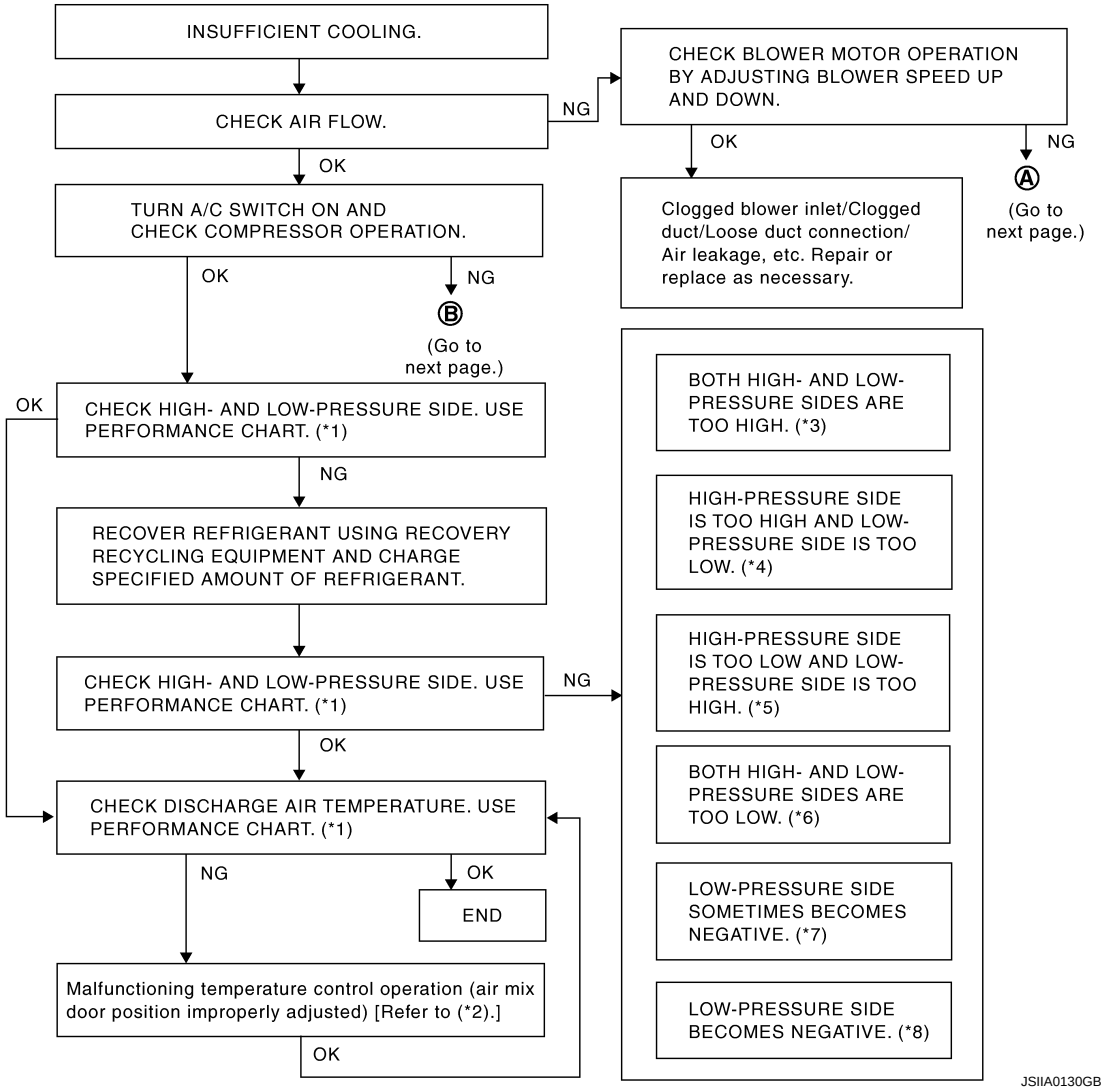


REFRIGERATION SYSTEM

Inspection

INFOID:0000000001183172

PERFORMANCE TEST DIAGNOSIS



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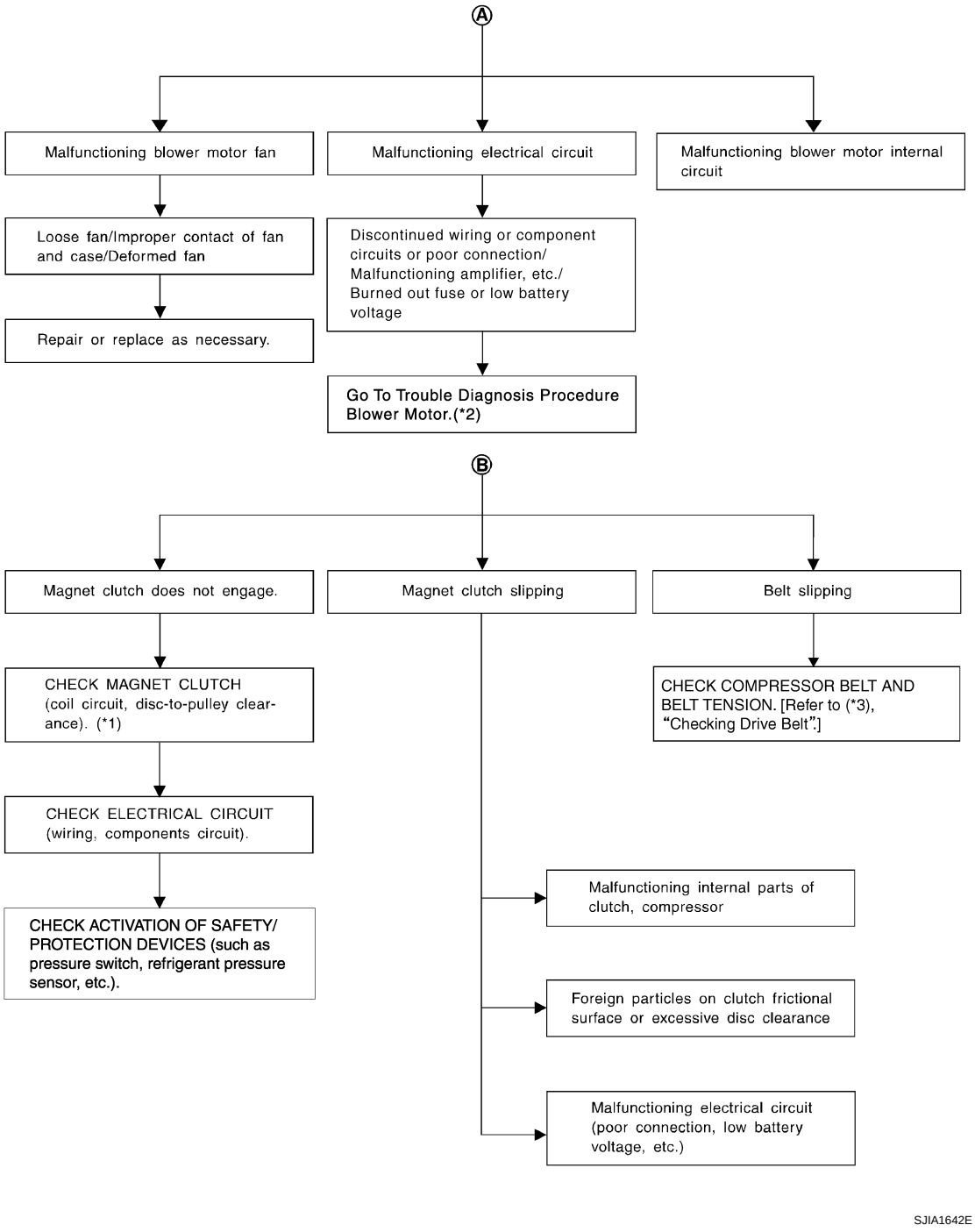
*1 HA-84, "Performance Chart"
*2 HAC-54, "Diagnosis Procedure"
*3 HA-66, "BOTH HIGH- AND LOW-PRESSURE SIDES ARE TOO HIGH : Symptom Table"
*4 HA-66, "HIGH-PRESSURE SIDE IS TOO HIGH AND LOW-PRESSURE SIDE IS TOO LOW : Symptom Table"
*5 HA-67, "HIGH-PRESSURE SIDE IS TOO LOW AND LOW-PRESSURE SIDE IS TOO HIGH : Symptom Table"
*6 HA-68, "BOTH HIGH- AND LOW-PRESSURE SIDES ARE TOO LOW : Symptom Table"
*7 HA-69, "LOW-PRESSURE SIDE SOMETIMES BECOMES NEGATIVE : Symptom Table"
*8 HA-69, "LOW-PRESSURE SIDE BECOMES NEGATIVE : Symptom Table"



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*1 HA-83, "Inspection" *2 HAC-62, "Diagnosis Procedure" *3 EM-260, "Inspection and Adjustment"

Performance Chart

INFOID:0000000001555634

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

Vehicle condition	Indoors or in the shade (in a well-ventilated place)
Hood	Open
TEMP.	Max. COLD
Mode switch	(Ventilation) set
Intake switch	(Recirculation) set
Fan (blower) speed	Max. speed set
Engine speed	Idle speed
Operate the air conditioning system for 10 minutes before taking measurements.	

TEST READING

Recirculating-to-discharge Air Temperature Table

Inside air (Recirculating air) at blower assembly inlet		Discharge air temperature at center ventilator °C (°F)
Relative humidity %	Air temperature °C (°F)	
50 - 60	20 (68)	7.0 - 7.3 (44.6 - 45.1)
	25 (77)	8.9 - 10.0 (48.0 - 50.0)
	30 (86)	10.9 - 13.1 (51.6 - 55.6)
	35 (95)	17.8 - 19.3 (64.0 - 66.7)
60 - 70	20 (68)	7.3 - 7.6 (45.1 - 45.7)
	25 (77)	10.0 - 11.0 (50.0 - 51.8)
	30 (86)	13.1 - 15.2 (55.6 - 59.4)
	35 (95)	19.3 - 20.8 (66.7 - 69.4)

Ambient Air Temperature-to-operating Pressure Table

Ambient air		High-pressure (Discharge side)							
Relative humidity %	Air temperature °C (°F)	Bar		kPa		kg/cm^2		psi	
		From	to	From	to	From	to	From	to
50 - 70	20 (68)	9.3	11.2	930.0	1120.0	9.5	11.4	134.9	162.4
	25 (77)	12.7	14.4	1270.0	1440.0	13.0	14.7	184.2	208.8
	30 (86)	14.5	17.8	1450.0	1780.0	14.8	18.2	210.3	258.1
	35 (95)	17.3	19.5	1730.0	1950.0	17.6	19.9	250.9	282.8
	40 (104)	17.5	19.4	1750.0	1940.0	17.8	19.8	253.8	281.3

Ambient Air Temperature-to-operating Pressure Table

Ambient air		Low pressure (Suction side)							
Relative humidity %	Air temperature °C (°F)	Bar		kPa		kg/cm^2		psi	
		From	to	From	to	From	to	From	to
50 - 70	20 (68)	2.1	2.2	210.0	220.0	2.1	2.2	30.5	31.9
	25 (77)	2.5	2.5	250.0	250.0	2.5	2.5	36.3	36.3
	30 (86)	2.5	3.1	250.0	310.0	2.5	3.2	36.3	45.0
	35 (95)	3.2	3.6	320.0	360.0	3.3	3.7	46.4	52.2
	40 (104)	3.6	4.0	360.0	400.0	3.7	4.1	52.2	58.0

Refrigerant Leaks

INFOID:0000000001183173

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.

FLUORESCENT LEAK DETECTOR

Inspection

INFOID:0000000001183174

CHECKING SYSTEM FOR LEAKS USING THE FLUORESCENT LEAK DETECTOR

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

(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.

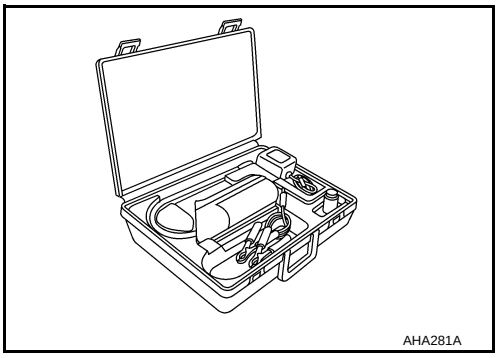
ELECTRICAL LEAK DETECTOR

Inspection

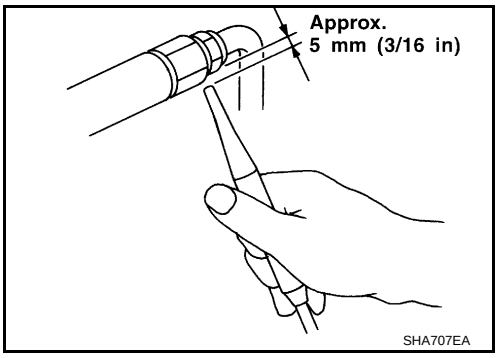
INFOID:0000000001183175

PRECAUTIONS FOR HANDLING LEAK DETECTOR

When performing a refrigerant leak check, use an electrical leak detector (SST: J-41995) 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.

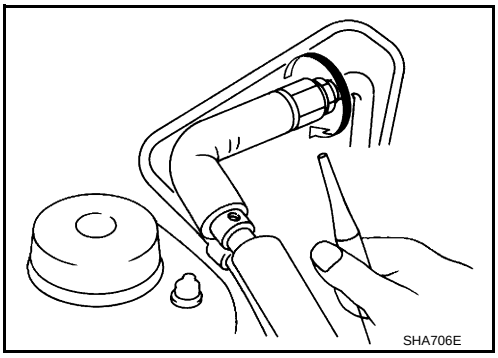

AHA281A

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



SHA707EA

2. When testing, circle each fitting completely with probe.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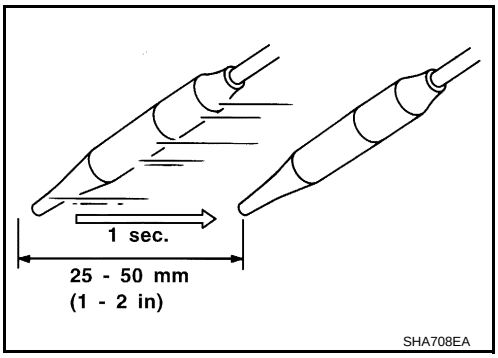
3. Move probe along component approximately 25 to 50 mm (1 to 2 in)/sec.



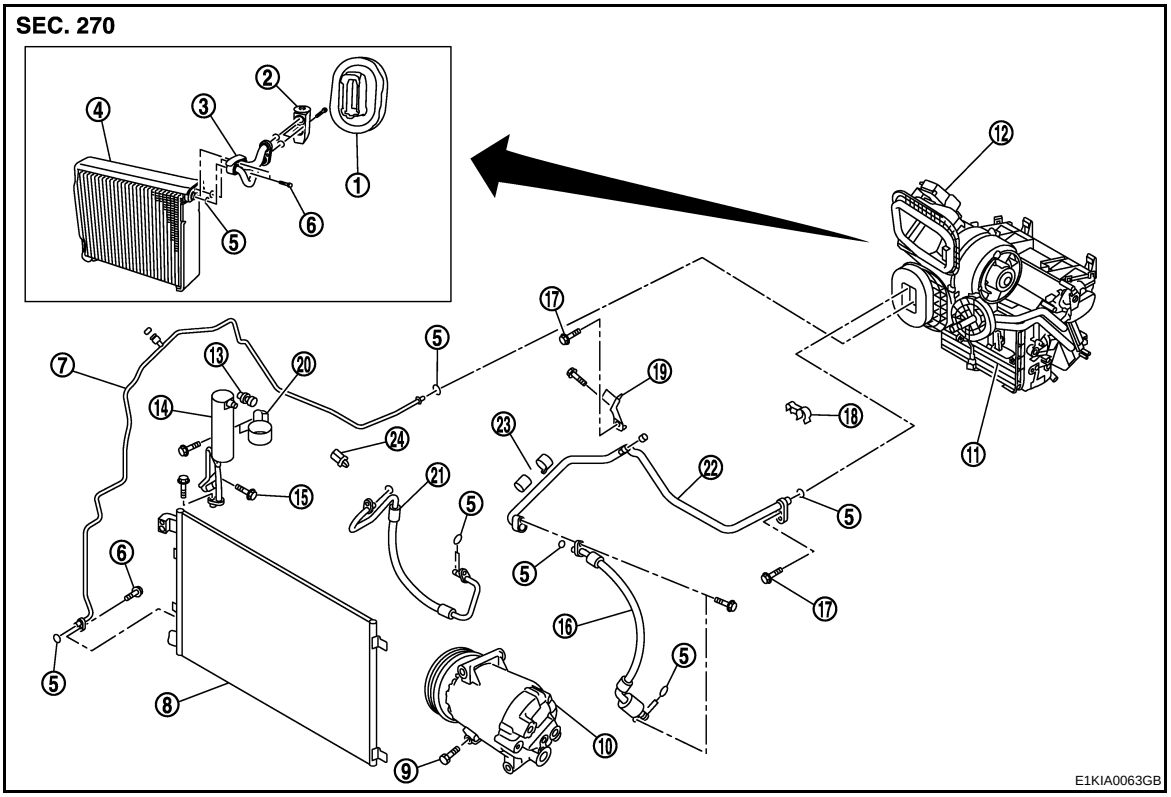
SHA708EA

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 j) to the low-pressure side (evaporator drain hose k to shaft seal p). 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.



1. Heater sealing	2. Expansion valve	3. Low pressure pipe 1 and high pressure pipe 2 assembly
4. Evaporator	5. O-ring	6. Connector pipe fixing bolt
7. High pressure pipe 1	8. Condenser assembly	9. Fixing bolt
10. Compressor	11. Heater & cooling unit assembly	12. Heater & blower unit assembly
13. Refrigerant pressure sensor	14. Liquid tank	15. Liquid tank fixing screw
16. Low pressure flexible hose	17. Fixing bolt	18. Pipes fixing clip
19. Low & high pressure pipe bracket	20. Liquid tank fixing bracket	21. High pressure flexible hose
22. Low pressure pipe 2	23. Low pressure pipe fixing clamp assembly	24. Pipe mantening clip

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

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

Cooling unit (Evaporator)

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

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

5. If a leak detector detects a leak, verify at least once by blowing compressed air into area of suspected leak, then repeat check as outlined above.
6. Do not stop when one leak is found. Continue to check for additional leaks at all system components. If no leaks are found, perform steps 7 - 10.
7. Start the engine.
8. Set the A/C control as follows;

a. A/C switch: ON

b. MODE door position: VENT (Ventilation)

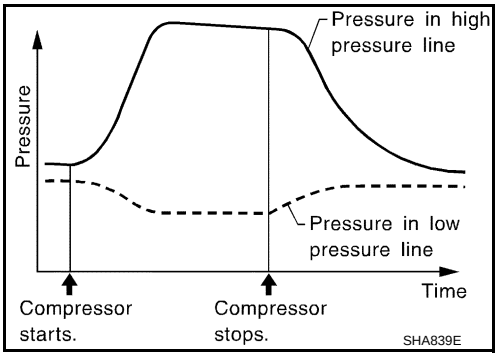
c. Intake door position: Recirculation

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.

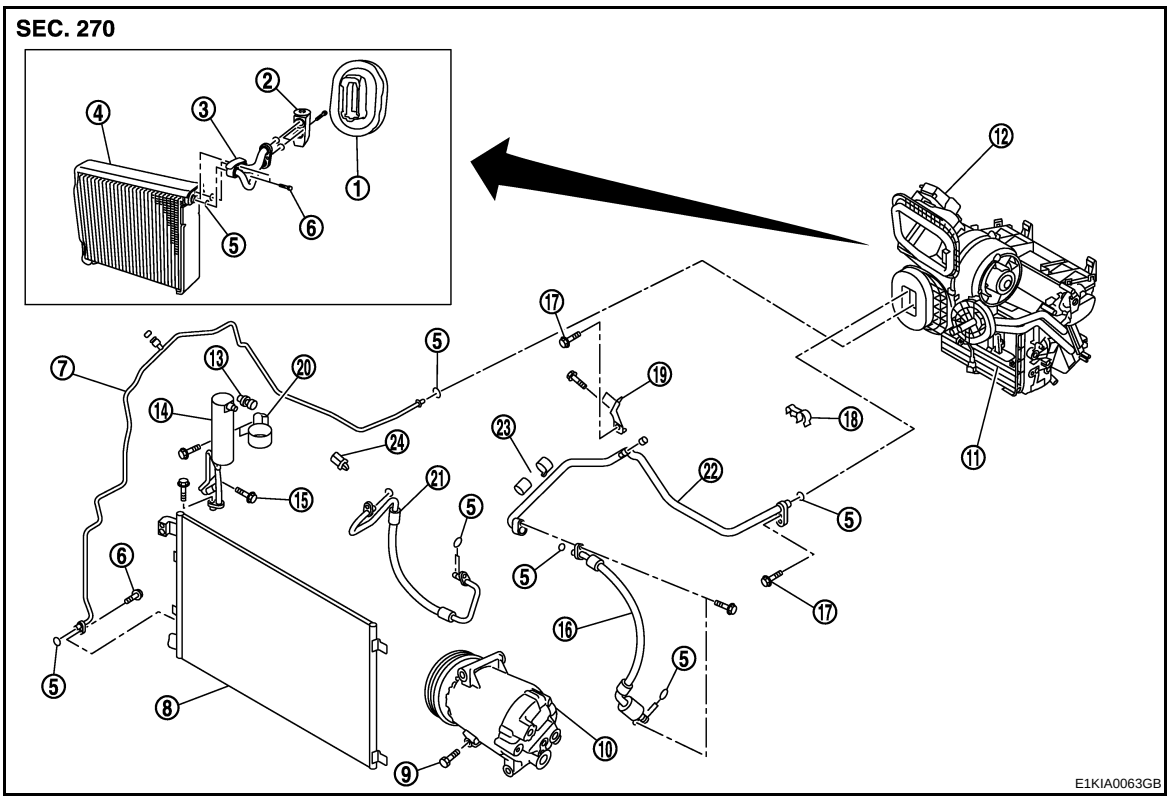
ON-VEHICLE REPAIR

REFRIGERATION SYSTEM

Exploded View

INFOID:0000000001183176

Refer to HA-72, "Refrigerant Connection".



1. Heater sealing	2. Expansion valve	3. Low pressure pipe 1 and high pressure pipe 2 assembly
4. Evaporator	5. O-ring	6. Connector pipe fixing bolt
7. High pressure pipe 1	8. Condenser assembly	9. Fixing bolt
10. Compressor	11. Heater & cooling unit assembly	12. Heater & blower unit assembly
13. Refrigerant pressure sensor	14. Liquid tank	15. Liquid tank fixing screw
16. Low pressure flexible hose	17. Fixing bolt	18. Pipes fixing clip
19. Low & high pressure pipe bracket	20. Liquid tank fixing bracket	21. High pressure flexible hose
22. Low pressure pipe 2	23. Low pressure pipe fixing clamp assembly	24. Pipe mantening clip

Inspection After Installation

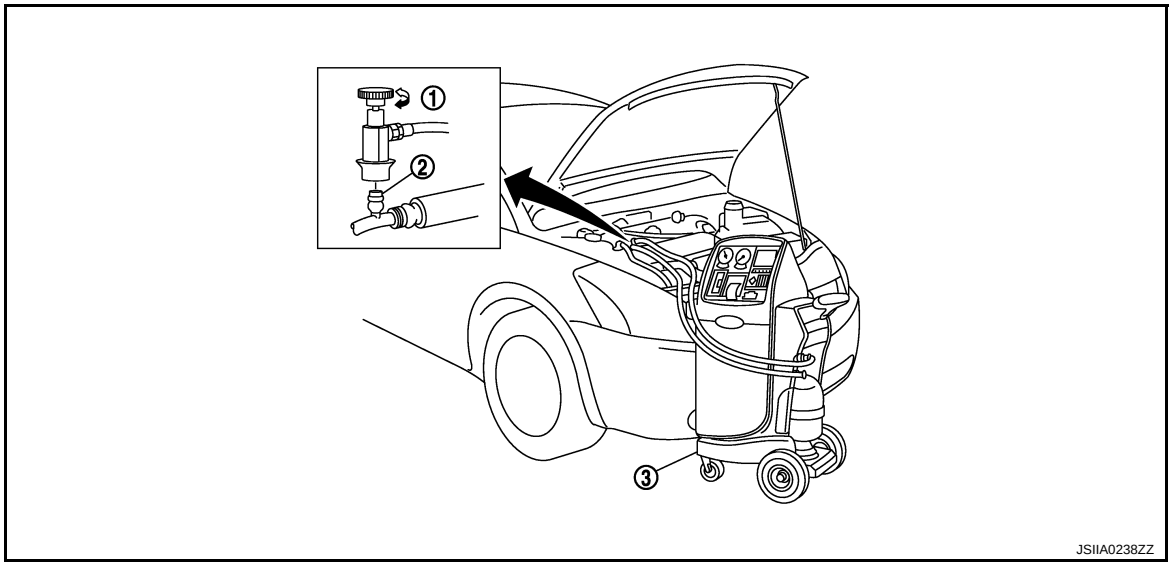
INFOID:0000000001183177

SETTING OF SERVICE TOOLS AND EQUIPMENT

Discharging Refrigerant

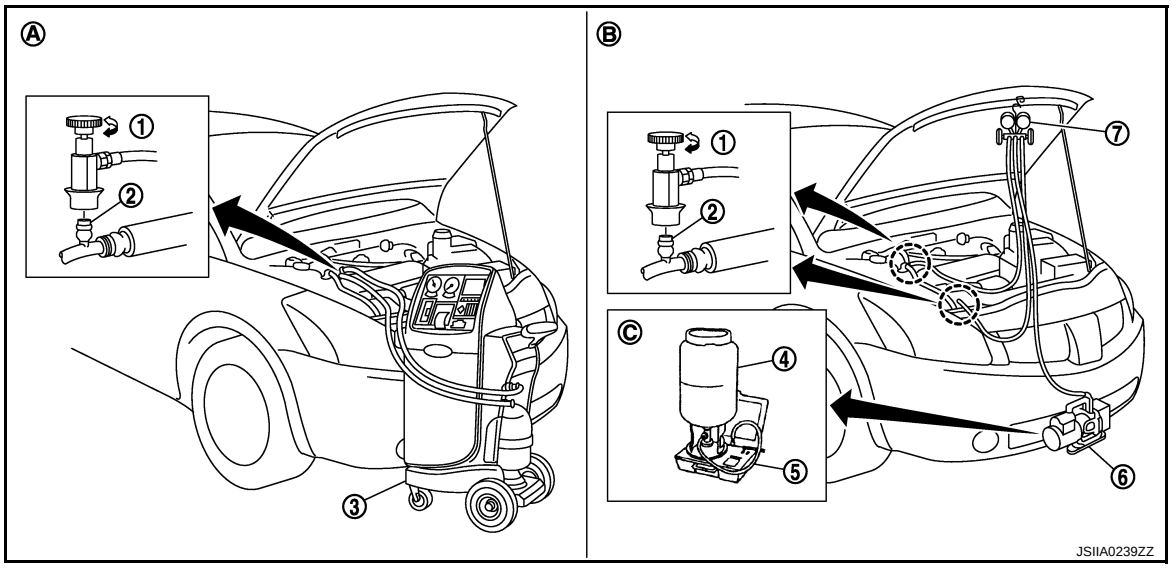
WARNING:

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.



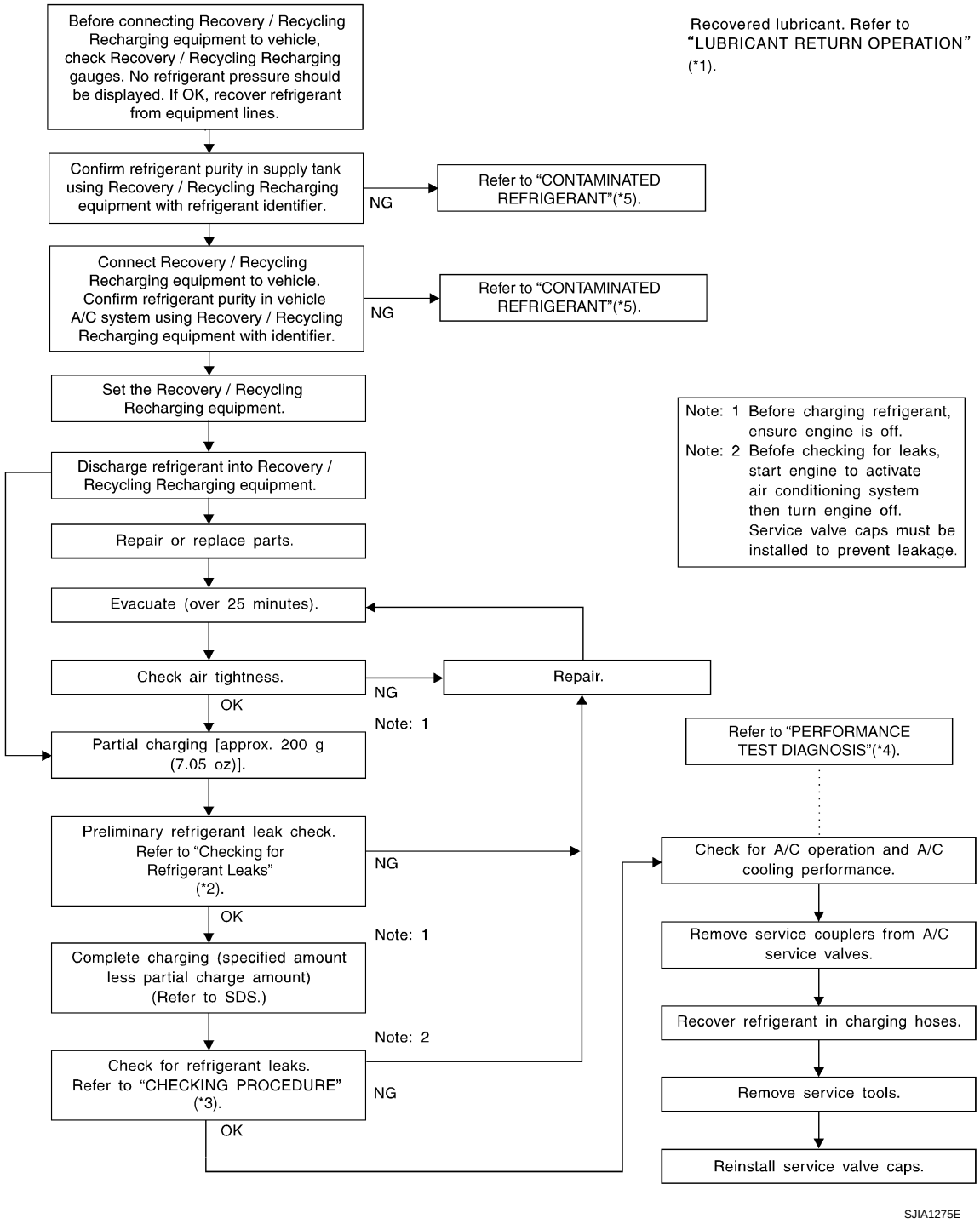
1. Shut-off valve
2. A/C service valve
3. Recovery/Recycling/Recharging equipment

Evacuating System and Charging Refrigerant



1. Shut-off valve
2. A/C service valve
3. Recovery/Recycling/Recharging equipment
4. Refrigerant container (HFC-134a)
5. Weight scale (J-39650)
6. Vacuum pump (J-39649)
7. Manifold gauge set (J-39183)

A. Preferred (best) method
B. Alternative method
C. For charging



*1 HA-81, "Adjustment"

*2 "REFRIGERANT LEAKS" in HA-85, "Refrigerant Leaks".

*3 "CHECKING PROCEDURE" in HA-83, "Inspection".

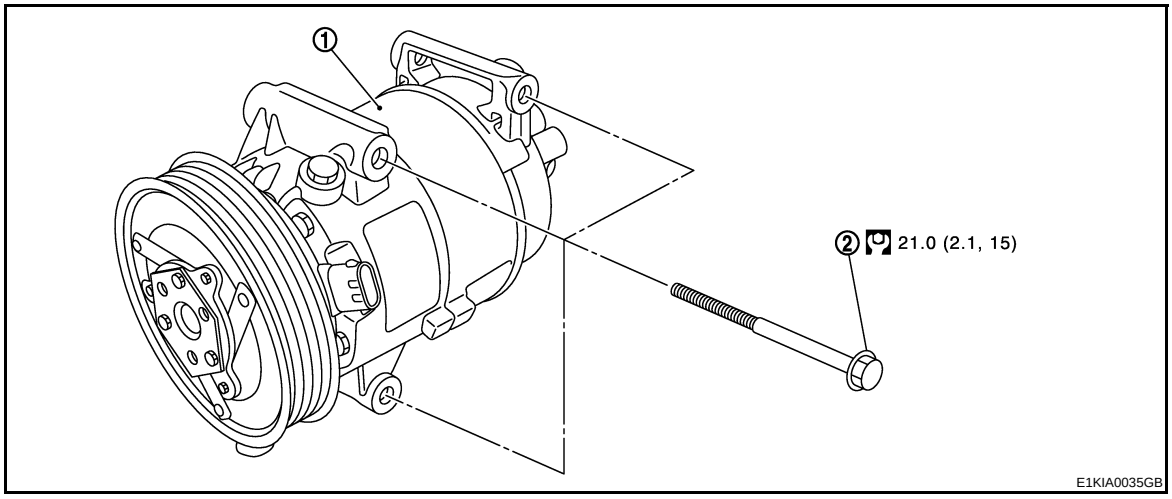
*4 "PERFORMANCE TEST DIAGNOSIS" in HA-83, "Inspection".

*5 "CONTAMINATED REFRIGERANT" in HAC-132, "Working with HFC-134a (R-134a)".

COMPRESSOR

Exploded View

INFOID:0000000001183178



1. Compressor
2. Compressor fixing bolt

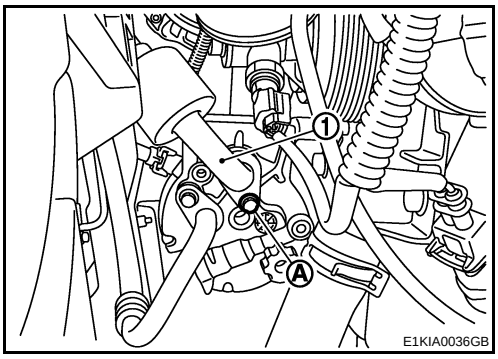
Refer to GI-4, "Components" for symbols in the figure.

Removal and Installation

INFOID:0000000001183179

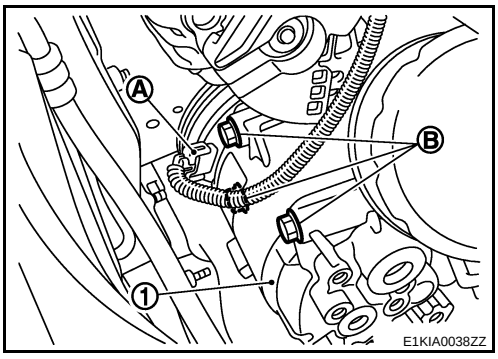
REMOVAL

1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
2. Remove engine cover ornament.
3. Remove air intake hoses (RH) and air duct (LH). Refer to EM-266, "Exploded View".
4. Remove engine undercover, using power tools.
5. Drain engine coolant from radiator. Refer to CO-52, "Draining".
6. Remove drive belt. Refer to EM-260, "Removal and Installation".
7. Remove lower radiator hose from engine. Refer to CO-56, "Exploded View".
8. Remove compressor fixing bolt (B) from low-pressure flexible hose (1) and compressor fixing bolt (A) from high-pressure flexible hose (2).
9. Remove low-pressure flexible hose, and, high-pressure flexible hose from compressor.



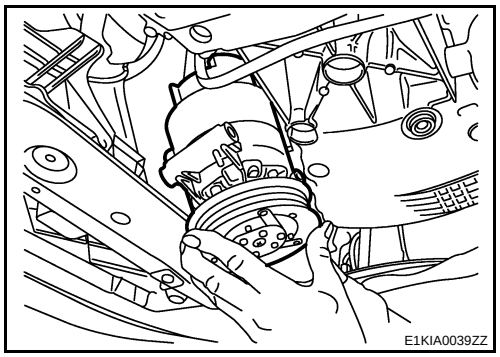
CAUTION:
Cap or wrap the joint of compressor, low-pressure flexible hose and high-pressure flexible hose with suitable material such as vinyl tape to avoid the entry of air.

10. Remove compressor harness connector (A), then remove mounting bolts (B) from compressor (1), using power tools.



11. Remove the compressor from the vehicle.

Compressor fixing bolt to engine : 21 N·m (2.2 kg-m, 15.5 ft-lb)



INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

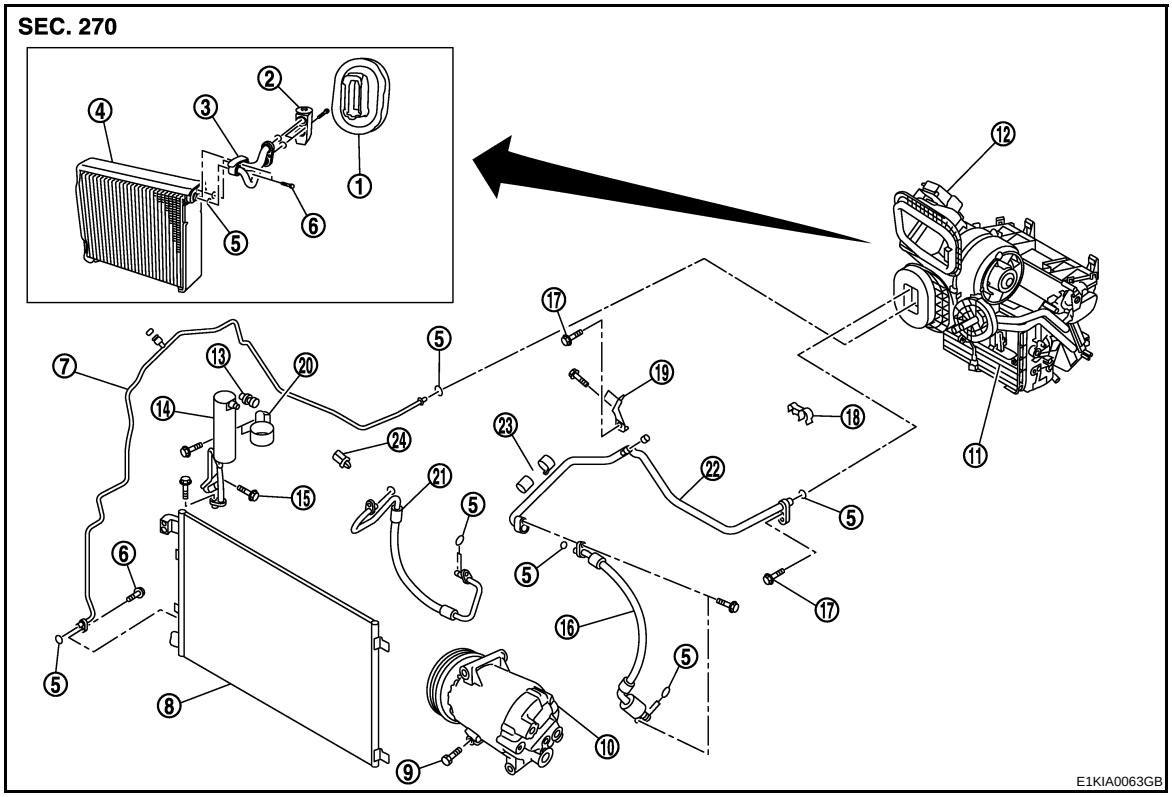
- **Replace O-rings of low-pressure flexible hose and high-pressure flexible hose with new ones, and then apply compressor oil to it when installing it.**
- **When recharging refrigerant, check for leaks.**

LOW-PRESSURE FLEXIBLE HOSE AND PIPE 2

Exploded View

INFOID:0000000001183180

Refer to HA-72, "Refrigerant Connection".



1. Heater sealing
2. Expansion valve
3. Low pressure pipe 1 and high pressure pipe 2 assembly
4. Evaporator
5. O-ring
6. Connector pipe fixing bolt
7. High pressure pipe 1
8. Condenser assembly
9. Fixing bolt
10. Compressor
11. Heater & cooling unit assembly
12. Heater & blower unit assembly
13. Refrigerant pressure sensor
14. Liquid tank
15. Liquid tank fixing screw
16. Low pressure flexible hose
17. Fixing bolt
18. Pipes fixing clip
19. Low & high pressure pipe bracket
20. Liquid tank fixing bracket
21. High pressure flexible hose
22. Low pressure pipe 2
23. Low pressure pipe fixing clamp assembly
24. Pipe mantening clip

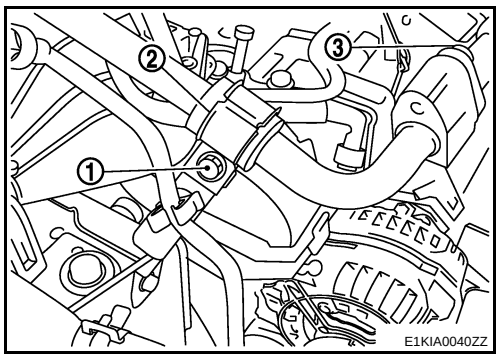
Removal and Installation

INFOID:0000000001183181

REMOVAL

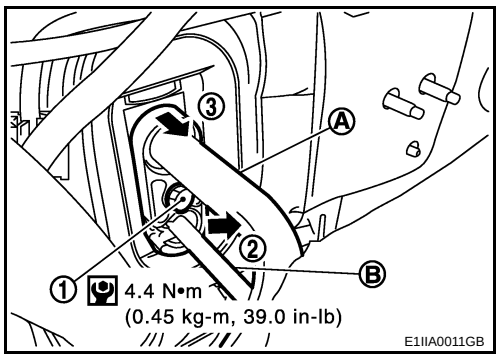
1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
2. Remove upper engine cover ornament. Refer to EM-267, "Removal and Installation".
3. Remove air intake hose (RH side), and air duct (LH). Refer to EM-266, "Removal and Installation".

4. Remove mounting bolt (1) and clamp (2), from low pressure pipe bracket support.
5. Remove low and high-pressure maintaining clip, from both pipes, then remove fixing bolt (3) from low-pressure flexible hose and low-pressure pipe 2.
6. Remove engine room insulator fixing clip from cowl top.



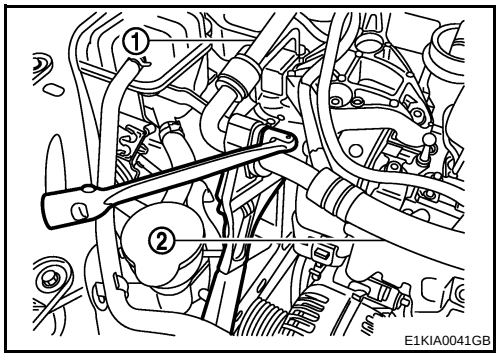
7. Pull engine room insulator, then remove pipes bracket fixing bolt (1), from expansion valve, and release pipes fixing bracket, as shown in order (1) to (3), from high pressure pipe 1 (B), to remove low pressure pipe 2 (A) from expansion valve.

CAUTION:
Cap or wrap the joint of the low-pressure flexible hose and pipe 2, and expansion valve exit with suitable material such as vinyl tape to avoid the entry of air.



8. Remove low pressure pipe 2 (1) connector fixing bolt, with suitable tools, then remove low pressure pipe 2 from low pressure flexible hose.

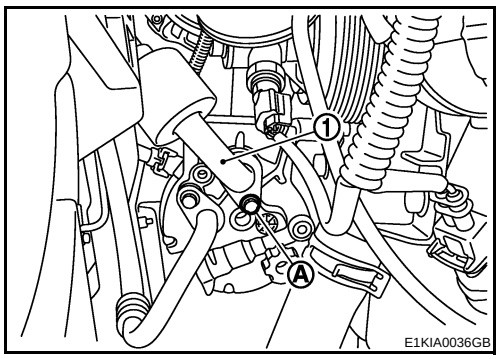
CAUTION:
Cap or wrap the joint of the low pressure pipe 2 connector, and low pressure flexible hose, with suitable material such as vinyl tape to avoid the entry of air.



9. Remove low pressure flexible hose fixing bolt (A), from air conditioner compressor, and remove low pressure flexible hose (1).

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

Pipe bracket fixing bolt to expansion valve	**: 4.4 N·m (0.45 kg-m, 39.0 in-lb)**
Low pressure flexible pipe fixing bolt to compressor	**: 4.4 N·m (0.45 kg-m, 39.0 in-lb)**



INSTALLATION

Installation is basically the reverse order of removal.

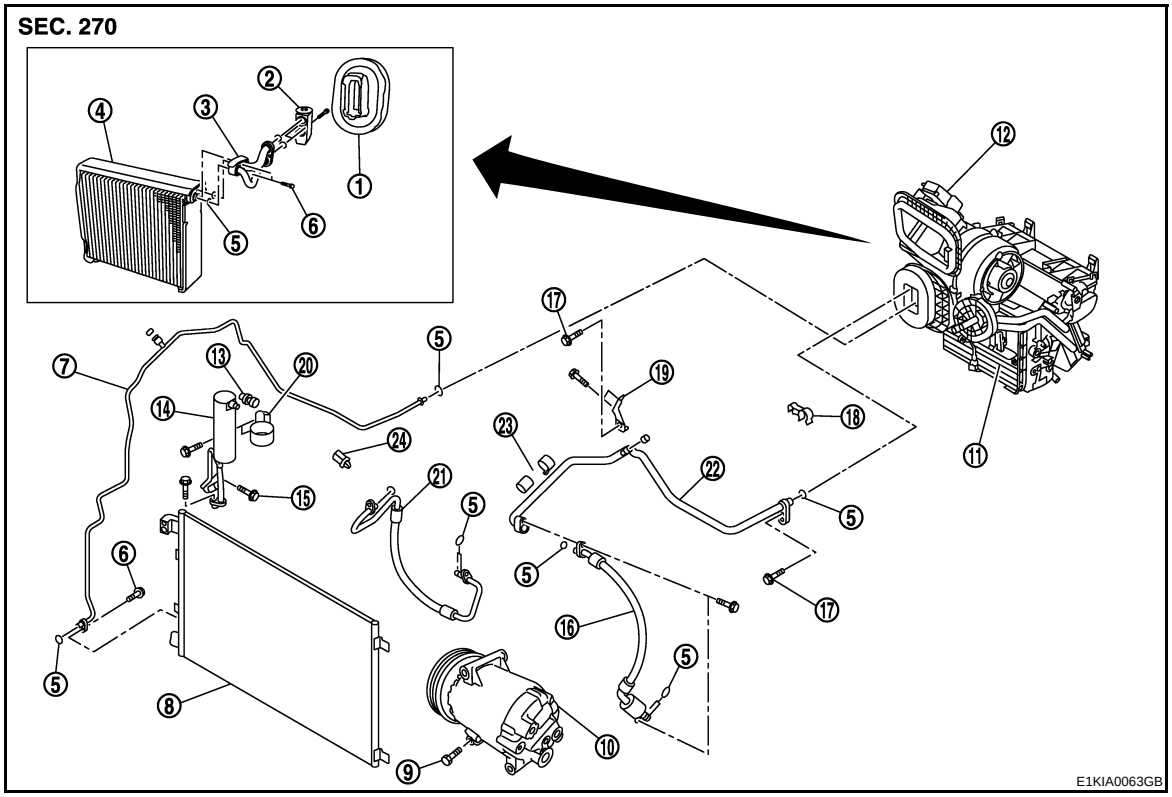
CAUTION:
- **Replace O-rings of low-pressure flexible hose and low-pressure pipe 2 with new ones, and then apply compressor oil to it when installing it.**
- **Female-side piping connection is thin and easy to deform. Slowly insert the male-side piping straight in axial direction.**
- **Insert piping 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.**

HIGH-PRESSURE FLEXIBLE HOSE

Exploded View

INFOID:0000000001183182

Refer to HA-72, "Refrigerant Connection".



1. Heater sealing
2. Expansion valve
3. Low pressure pipe 1 and high pressure pipe 2 assembly
4. Evaporator
5. O-ring
6. Connector pipe fixing bolt
7. High pressure pipe 1
8. Condenser assembly
9. Fixing bolt
10. Compressor
11. Heater & cooling unit assembly
12. Heater & blower unit assembly
13. Refrigerant pressure sensor
14. Liquid tank
15. Liquid tank fixing screw
16. Low pressure flexible hose
17. Fixing bolt
18. Pipes fixing clip
19. Low & high pressure pipe bracket
20. Liquid tank fixing bracket
21. High pressure flexible hose
22. Low pressure pipe 2
23. Low pressure pipe fixing clamp assembly
24. Pipe mantening clip

Removal and Installation

INFOID:0000000001183183

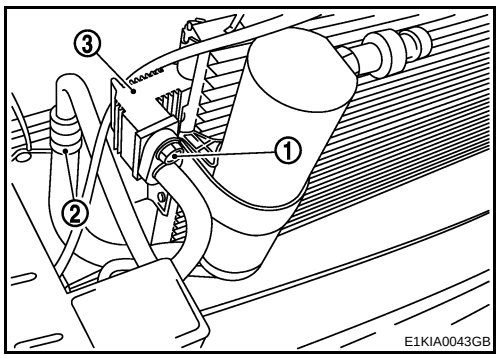
REMOVAL

1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
2. Remove engine cover ornament. Refer to EM-267, "Removal and Installation".
3. Remove air intake hose (RH) and air duct (LH). Refer to EM-266, "Exploded View".
4. Remove front grille. Refer to EXT-17, "Removal and Installation".
5. Remove radiator air guide (RH). Refer to CO-56, "Removal and Installation".

6. Remove high pressure flexible hose fixing bolt (1) from condenser (3), then pull high pressure flexible hose (2) to remove it from condenser.

CAUTION:

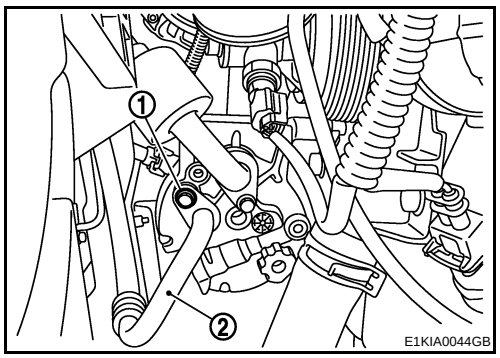
Cap or wrap the joint of high-pressure flexible hose and condenser assembly with suitable material such as vinyl tape to avoid the entry of air.



7. Remove high pressure flexible hose fixing bolt (1) from compressor, then pull high pressure flexible hose (2) to remove it from compressor.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.



High pressure fixing bolt to condenser

: 4.4 N·m (0.45 kg-m, 39 in-lb)

High pressure fixing bolt to compressor

: 4.4 N·m (0.45 kg-m, 39 in-lb)

INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

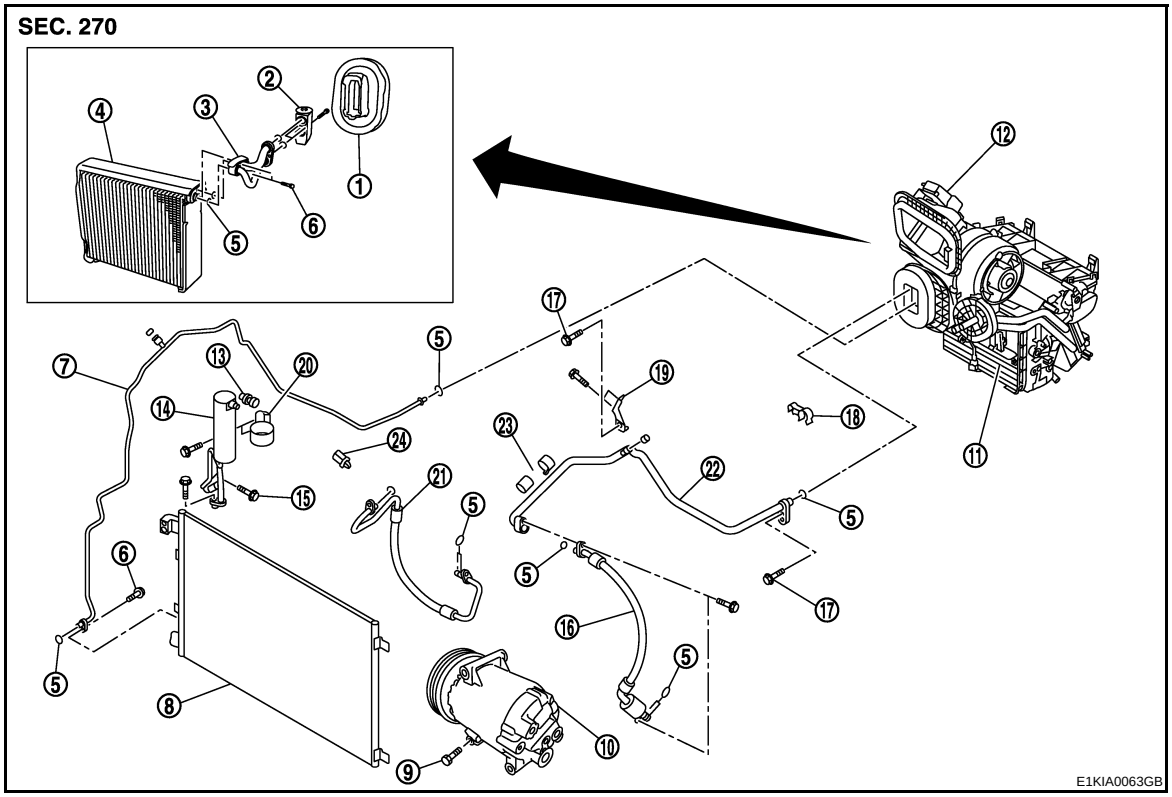
- **Replace O-rings of high-pressure flexible hose with new ones, and then apply compressor oil to it when installing it.**
- **Female-side piping connection is thin and easy to deform. Slowly insert the male-side piping straight in axial direction.**
- **Insert piping securely until a click is heard.**
- **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 PIPE 1 (ENGINE COMPARTMENT)

Exploded View

INFOID:0000000001183184

Refer to HA-72, "Refrigerant Connection".



1. Heater sealing
2. Expansion valve
3. Low pressure pipe 1 and high pressure pipe 2 assembly
4. Evaporator
5. O-ring
6. Connector pipe fixing bolt
7. High pressure pipe 1
8. Condenser assembly
9. Fixing bolt
10. Compressor
11. Heater & cooling unit assembly
12. Heater & blower unit assembly
13. Refrigerant pressure sensor
14. Liquid tank
15. Liquid tank fixing screw
16. Low pressure flexible hose
17. Fixing bolt
18. Pipes fixing clip
19. Low & high pressure pipe bracket
20. Liquid tank fixing bracket
21. High pressure flexible hose
22. Low pressure pipe 2
23. Low pressure pipe fixing clamp assembly
24. Pipe mantening clip

Removal and Installation

INFOID:0000000001183185

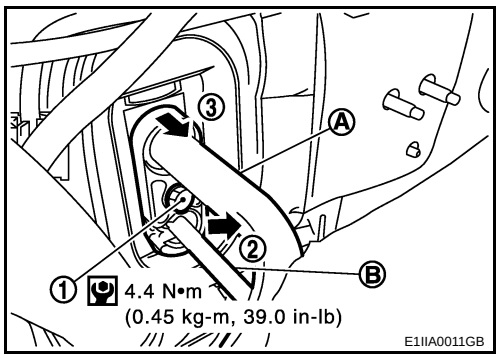
REMOVAL

1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
2. Remove engine cover ornament. Refer to EM-267, "Removal and Installation".
3. Remove intake hose (RH) and air duct (LH). Refer to EM-266, "Removal and Installation".

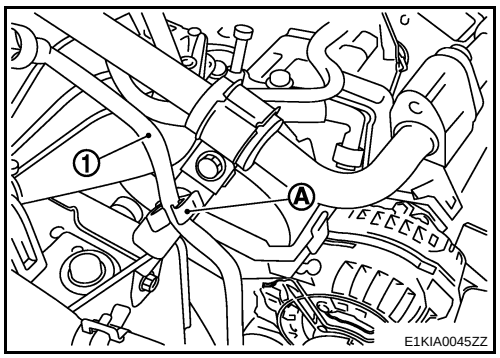
4. Pull engine room insulator, then remove pipes bracket fixing bolt (1), from expansion valve, then release pipe fixing bracket from high pressure pipe 1 (B), as shown in order (1) to (3), to disconnect it from expansion valve.

CAUTION:

Cap or wrap the joint of the high pressure pipe 1, and expansion valve in, with suitable material such as vinyl tape to avoid the entry of air.



5. Remove high pressure pipe 1 (1) from clip (A).

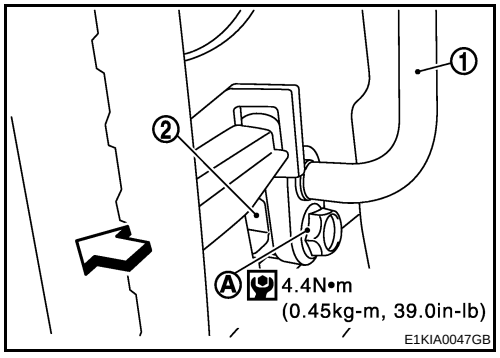


Remove high-pressure pipe 1 mounting bolt (A) from condenser (2).

CAUTION:

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

Remove high pressure pipe 1 (1).



INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

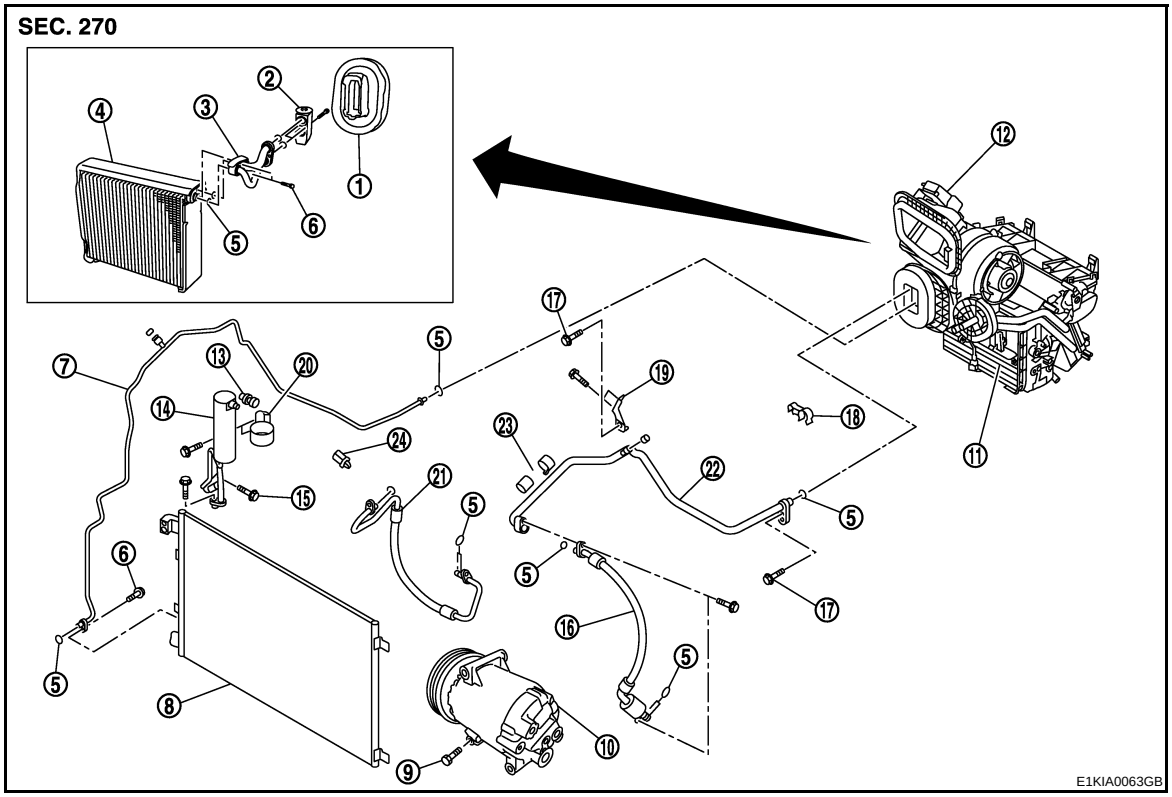
- **Replace O-rings of high-pressure pipe 1 with new ones, and then apply compressor oil to it when installing it.**
- **Female-side piping connection is thin and easy to deform. Slowly insert the male-side piping straight in axial direction.**
- **Insert piping securely until a click is heard.**
- **After 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.**

LOW-PRESSURE PIPE 1 AND HIGH-PRESSURE PIPE 2

Exploded View

INFOID:0000000001183186

Refer to HA-72, "Refrigerant Connection".



1. Heater sealing
2. Expansion valve
3. Low pressure pipe 1 and high pressure pipe 2 assembly
4. Evaporator
5. O-ring
6. Connector pipe fixing bolt
7. High pressure pipe 1
8. Condenser assembly
9. Fixing bolt
10. Compressor
11. Heater & cooling unit assembly
12. Heater & blower unit assembly
13. Refrigerant pressure sensor
14. Liquid tank
15. Liquid tank fixing screw
16. Low pressure flexible hose
17. Fixing bolt
18. Pipes fixing clip
19. Low & high pressure pipe bracket
20. Liquid tank fixing bracket
21. High pressure flexible hose
22. Low pressure pipe 2
23. Low pressure pipe fixing clamp assembly
24. Pipe mantening clip

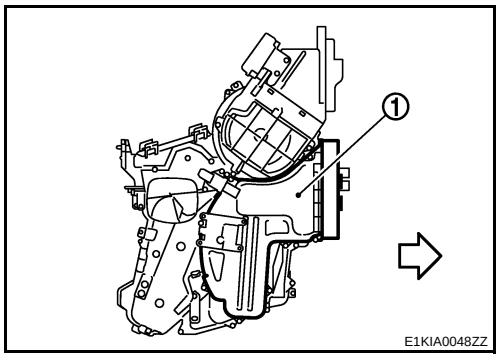
Removal and Installation

INFOID:0000000001183187

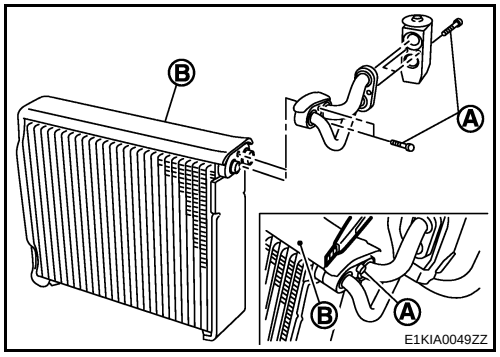
REMOVAL

1. Set the temperature at 18°C (60°F), and then disconnect the battery cable from the negative terminal.
2. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
3. Remove engine cover ornament. Refer to EM-267, "Removal and Installation".
4. Remove high-pressure pipe 1 and low pressure pipe 2 from expansion valve. Refer to HA-96, "Removal and Installation" and HA-100, "Removal and Installation".
   CAUTION:
   Cap or wrap the joint of the, high-pressure pipe 1, low-pressure pipe 2, and the expansion valve with suitable material such as vinyl tape to avoid the entry of air.
5. Remove instrument panel. Refer to IP-12, "Removal and Installation".
6. Remove foot duct (RH / LH). Refer to VTL-56, "FOOT DUCT : Removal and Installation".
7. Remove steering column. Refer to ST-10, "Removal and Installation".

8. Remove steering member. Refer to ST-15, "Removal and Installation".
9. Remove heater and cooling assembly. Refer to VTL-33, "Removal and Installation".
10. Remove mounting screws, and then remove evaporator cover (1).



11. Using a thin cutter, cut the evaporator insulator (B), and remove fixing bolt (A) then remove low-pressure pipe 1 and high-pressure pipe 2 assembly.
CAUTION:
Cap or wrap the joint of expansion valve, high-pressure pipe 2 and low-pressure pipe 1 with suitable material such as vinyl tape to avoid the entry of air.



INSTALLATION

Installation is basically the reverse order of removal.

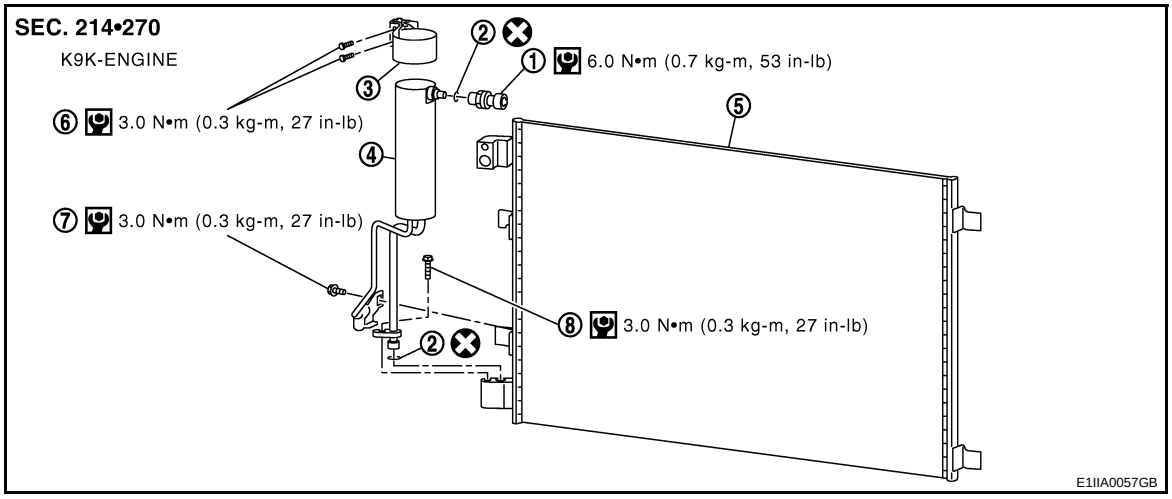
CAUTION:

- **Replace O-rings of high-pressure pipe 1, 2 and low-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.**

CONDENSER

Exploded View

INFOID:0000000001183188



1. Refrigerant pressure sensor
2. O-ring
3. Liquid tank bracket
4. Liquid tank
5. Condensor
6. Liquid tank fixing screw
7. Liquid tank pipe fixing screw
8. Liquid tank pipe fixing bolt

Removal and Installation

INFOID:0000000001183189

REMOVAL

1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
2. Remove engine cover ornament. Refer to EM-267, "Removal and Installation".
3. Remove front grille. Refer to EXT-17, "Removal and Installation".
4. Remove radiator hose, and drain coolant. Refer to CO-56, "Removal and Installation".
5. Remove upper radiator fixing bracket. Refer to CO-56, "Removal and Installation".
6. Remove radiator air-guide duct (RH). Refer to CO-56, "Removal and Installation".
7. Remove high-pressure pipe 1 from condenser. Refer to HA-100, "Removal and Installation".
8. Remove high-pressure flexible pipe 1 from condenser. Refer to HA-98, "Removal and Installation".
   CAUTION:
   Cap or wrap the joint of low and high-pressure pipe 1 and condenser with suitable material such as vinyl tape to avoid the entry of air.
9. Remove harness connector from refrigerant pressure sensor.
10. Remove liquid tank pipes and liquid tank from condenser and radiator. Refer to HA-106, "Removal and Installation", Refer to CO-56, "Removal and Installation".
    CAUTION:
    Cap or wrap the joint of liquid tank pipes and condenser with suitable material such as vinyl tape to avoid the entry of air.
11. Remove radiator fixing brackets. Refer to CO-56, "Removal and Installation".
12. Release radiator maintaining pawls, then pull-up the condenser assembly to release it from radiator. Refer to CO-56, "Removal and Installation".
13. Maintain radiator pushing back.
14. Pull upward to remove condenser.
    CAUTION:
    Take care do not damaged condenser or radiator.

INSTALLATION

Installation is basically the reverse order of removal.

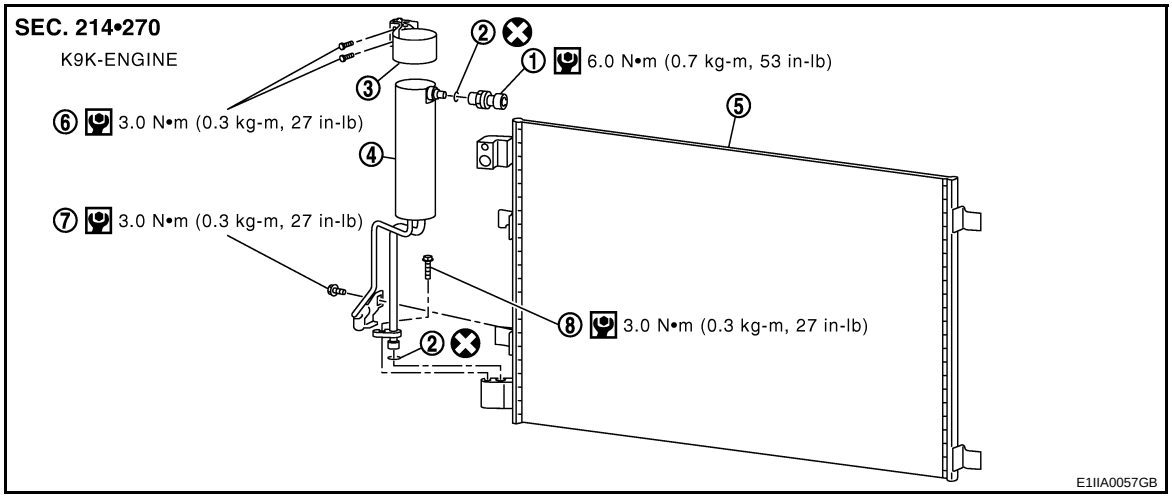
CAUTION:

- **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.**

LIQUID TANK

Exploded View

INFOID:0000000001183190



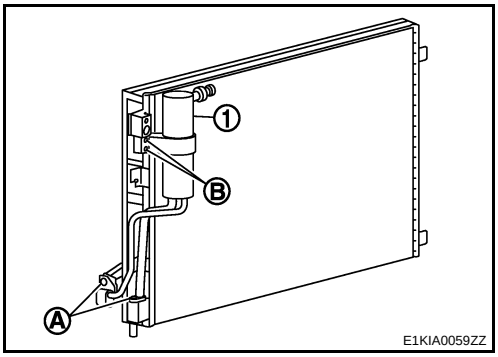
1. Refrigerant pressure sensor
2. O-ring
3. Liquid tank bracket
4. Liquid tank
5. Condensor
6. Liquid tank fixing screw
7. Liquid tank pipe fixing screw
8. Liquid tank pipe fixing bolt

Removal and Installation

INFOID:0000000001183191

REMOVAL

1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
2. Remove engine cover ornament. Refer to EM-267, "Removal and Installation".
3. Remove front grille. Refer to EXT-17, "Removal and Installation".
4. Clean liquid tank and its surrounding area, and remove dust and rust from liquid tank.
   CAUTION:
   Be sure to clean carefully.
5. Disconnect refrigerant sensor harness connector. Refer to HA-107, "Removal and Installation".
6. Remove air inlet tube and hose from change air cooler. Refer to EM-267, "Removal and Installation".
7. Remove radiator air-guide duct (RH) fixing clip to move air-guide duct. Refer to CO-56, "Removal and Installation".
8. Remove liquid tank bracket support mounting screws (B).
9. Remove high pressure pipe 1 mounting bolt (A). Refer to HA-100, "Removal and Installation".
10. Remove liquid tank high pressure pipe mounting bolt (A).
11. Remove liquid tank pipe bracket fixing screw (B).
    CAUTION:
    Cap or wrap the joint of high pressure pipe, liquid tank pipes and condenser with suitable material such as vinyl tape to avoid the entry of air.
12. Remove liquid tank assembly (1).



INSTALLATION

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

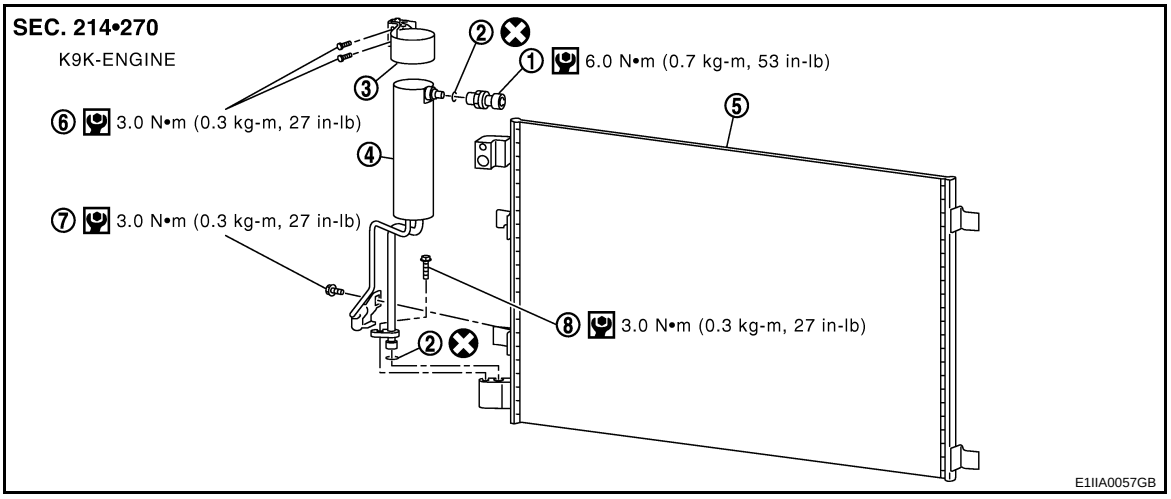
CAUTION:

- **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.**

REFRIGERANT PRESSURE SENSOR

Exploded View

INFOID:0000000001183192



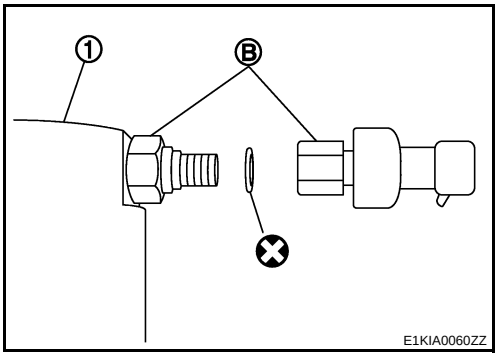
1. Refrigerant pressure sensor
2. O-ring
3. Liquid tank bracket
4. Liquid tank
5. Condensor
6. Liquid tank fixing screw
7. Liquid tank pipe fixing screw
8. Liquid tank pipe fixing bolt

Removal and Installation

INFOID:0000000001183193

REMOVAL

1. Remove liquid tank. Refer to HA-263, "Exploded View".
2. Fix the liquid tank (1) with a vise. Remove the refrigerant pressure sensor from liquid tank adaptator (B) with a wrench.
   CAUTION:
   Be careful not to damage liquid tank.



INSTALLATION

Installation is basically the reverse order of removal.

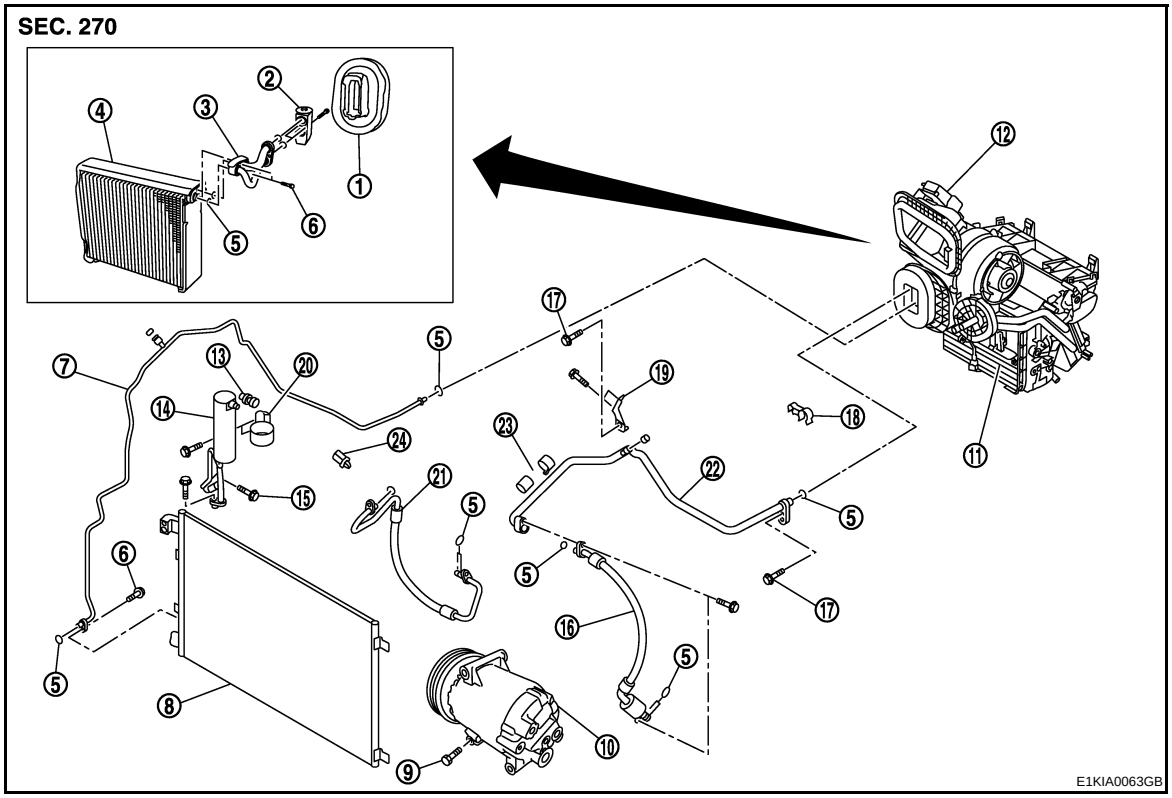
CAUTION:

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

EVAPORATOR

Exploded View

INFOID:0000000001183194



1. Heater sealing
2. Expansion valve
3. Low pressure pipe 1 and high pressure pipe 2 assembly
4. Evaporator
5. O-ring
6. Connector pipe fixing bolt
7. High pressure pipe 1
8. Condenser assembly
9. Fixing bolt
10. Compressor
11. Heater & cooling unit assembly
12. Heater & blower unit assembly
13. Refrigerant pressure sensor
14. Liquid tank
15. Liquid tank fixing screw
16. Low pressure flexible hose
17. Fixing bolt
18. Pipes fixing clip
19. Low & high pressure pipe bracket
20. Liquid tank fixing bracket
21. High pressure flexible hose
22. Low pressure pipe 2
23. Low pressure pipe fixing clamp assembly
24. Pipe mantening clip

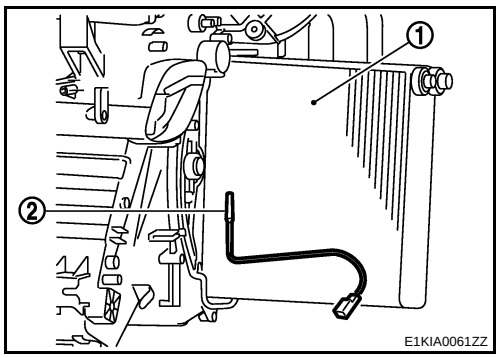
Removal and Installation

INFOID:0000000001183195

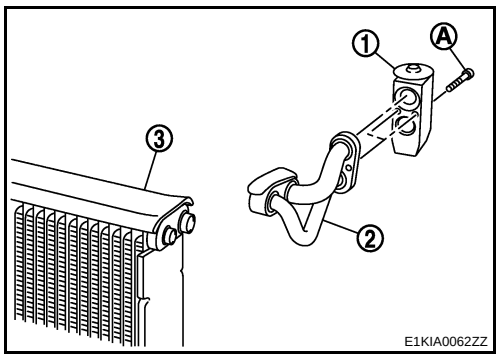
REMOVAL

1. Remove low-pressure pipe 2 and high-pressure pipe 1 from expansion valve. Refer to HA-96, "Removal and Installation", Refer to HA-100, "Removal and Installation".
   CAUTION:
   Cap or wrap the joint of expansion valve, low-pressure pipe 2 and high-pressure pipe 1 with suitable material such as vinyl tape to avoid the entry of air.
2. Remove heater and cooling unit assembly.
3. Remove evaporator cover fixing screws and cover.

4. Slide evaporator (1), and intake sensor (2) from heater and cooling unit assembly.



5. Cut upper insulator (3) and remove mounting bolt (A) and pressure pipe assembly(2) and expansion valve (1), from evaporator.
6. Remove evaporator.



INSTALLATION

Installation is basically the reverse order of removal.

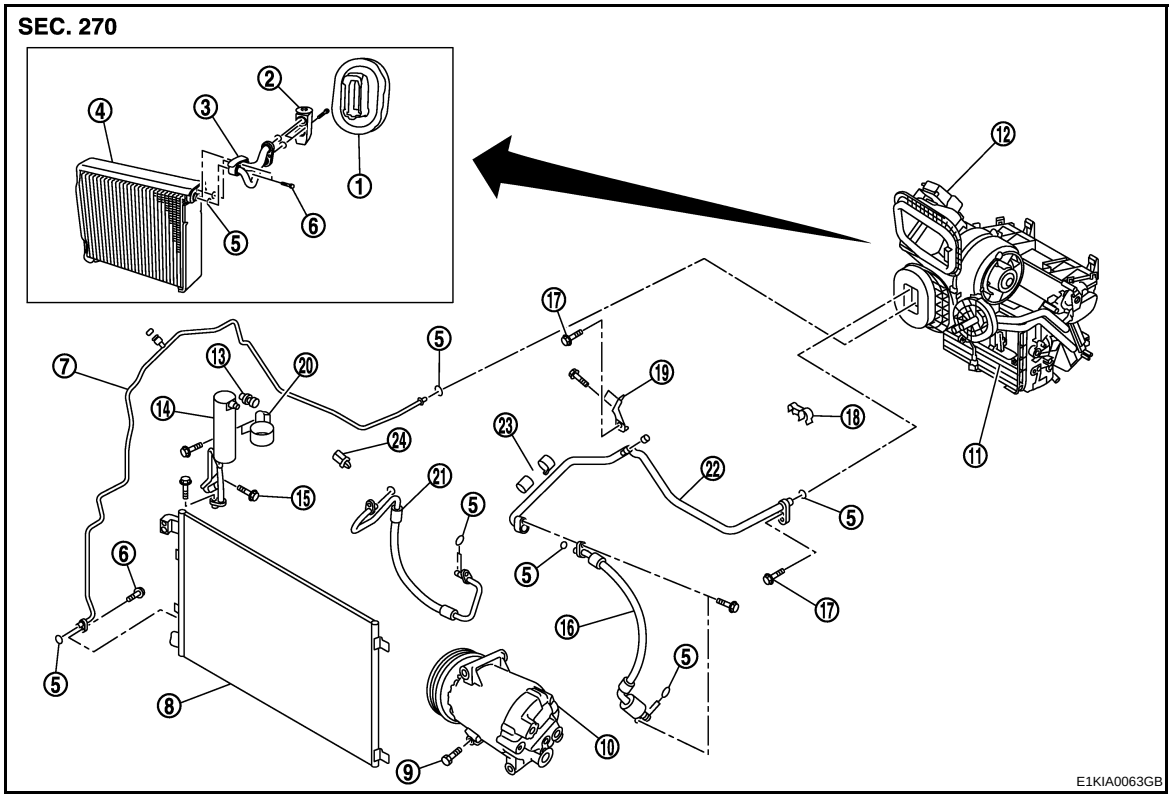
CAUTION:

- **Replace O-rings of low-pressure pipe 1 and high-pressure pipe 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 flexible hose (high-pressure pipe 1) and low-pressure pipe 1 (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.**

EXPANSION VALVE

Exploded View

INFOID:0000000001183196



1. Heater sealing
2. Expansion valve
3. Low pressure pipe 1 and high pressure pipe 2 assembly
4. Evaporator
5. O-ring
6. Connector pipe fixing bolt
7. High pressure pipe 1
8. Condenser assembly
9. Fixing bolt
10. Compressor
11. Heater & cooling unit assembly
12. Heater & blower unit assembly
13. Refrigerant pressure sensor
14. Liquid tank
15. Liquid tank fixing screw
16. Low pressure flexible hose
17. Fixing bolt
18. Pipes fixing clip
19. Low & high pressure pipe bracket
20. Liquid tank fixing bracket
21. High pressure flexible hose
22. Low pressure pipe 2
23. Low pressure pipe fixing clamp assembly
24. Pipe mantening clip

Removal and Installation

INFOID:0000000001183197

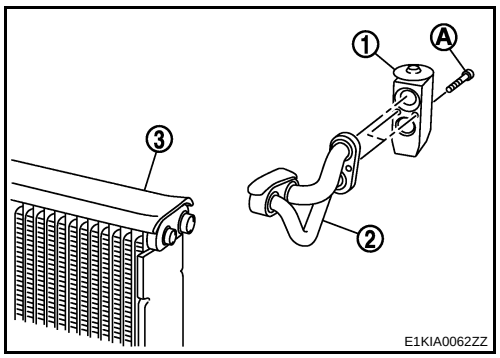
REMOVAL

1. Remove evaporator (3). Refer to HA-102, "Removal and Installation".
2. Remove low pressure pipe 1 and high pressure pipe 2 assembly (2). Refer to HA-102, "Removal and Installation".

3. Remove mounting bolts (A), and then remove expansion valve (1) from low and high pressure pipe assembly (2).

CAUTION:

Cap or wrap the joint of expansion valve, low and high pressure pipe assembly, evaporator and 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 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.**

SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

Compressor

INFOID:0000000001183198

Model		DELPHI THERMAL HUNGARY make 5CVC
Type		Variable displacement swash plate
Displacement cm^3 (cu in)/rev	Max.	120 (7.32)
Cylinder bore × stroke (Max.) mm (in.)		–
Direction of rotation		Clockwise (viewed from clutch)
Drive belt		Poly V
Disc to pulley clearance	Standard	–

Lubricant

INFOID:0000000001183199

Model		DELPHI THERMAL HUNGARY make 5 CVC
Name		Nissan A/C System Oil Type S (DH-PS)
Capacity m ℓ (US fl oz, Imp fl oz)	Total in system	150 (5.03, 5.3)
	Compressor (Service part) charging amount	150 (5.03, 5.3)

Refrigerant

INFOID:0000000001183200

Type	HFC-134a (R-134a)
Capacity kg (lb)	0.45 ± 0.025 (0.99 ± 0.055)

Engine Idling Speed

INFOID:0000000001183201

Refer to ECK-231, "Idle Speed".

Belt Tension

INFOID:0000000001183202

Refer to EM-260, "Inspection and Adjustment".

BASIC INSPECTION

DIAGNOSIS AND REPAIR WORKFLOW

Work Flow

INFOID:0000000001550576

DETAILED FLOW

1.LISTEN TO CUSTOMER COMPLAINT

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

>> GO TO 2.

2.VERIFY THE SYMPTOM WITH OPERATIONAL CHECK

Verify the symptom with operational check. Refer to HAC-6, "Description & Inspection".

>> GO TO 3.

3.GO TO APPROPRIATE TROUBLE DIAGNOSIS

Go to appropriate trouble diagnosis (Refer to HAC-122, "Diagnosis Chart By Symptom").

>> GO TO 4.

4.REPAIR OR REPLACE

Repair or replace the specific parts

>> GO TO 5.

5.FINAL CHECK

Final check.

Is the inspection result normal?

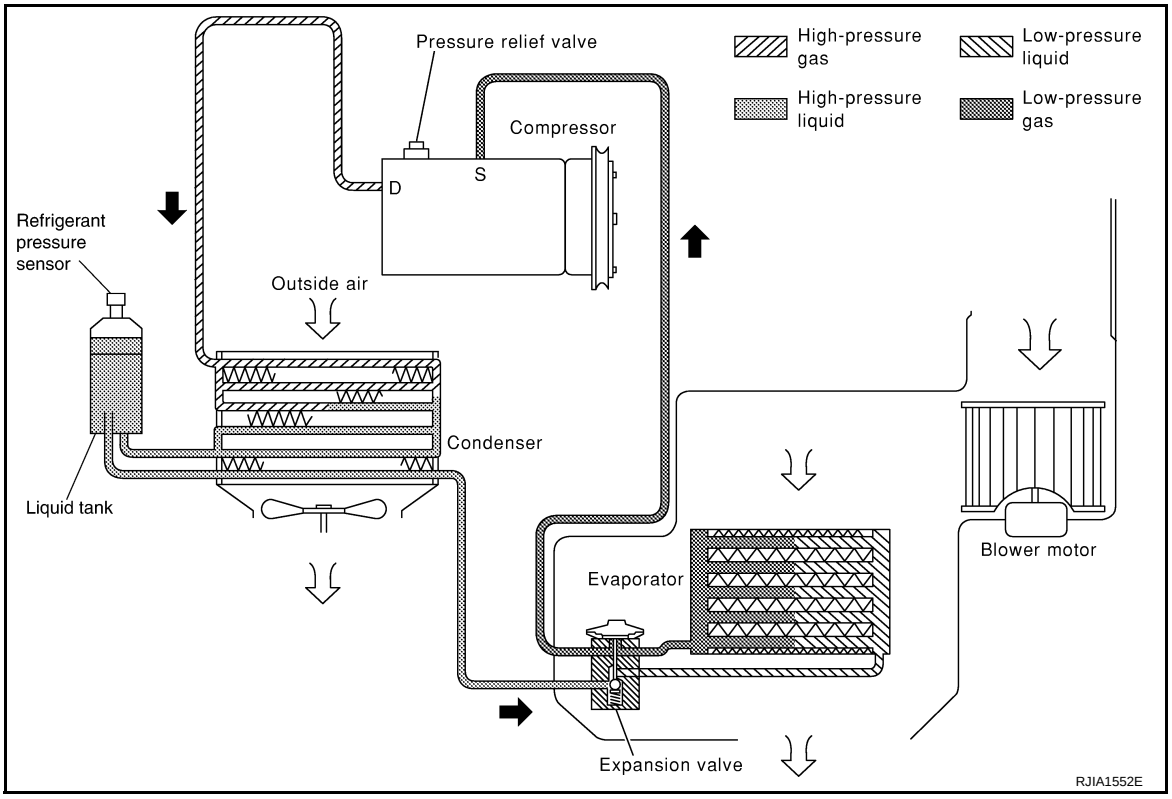
YES >> CHECK OUT
NO >> GO TO 3.

FUNCTION DIAGNOSIS

REFRIGERATION SYSTEM

System Diagram

INFOID:0000000001550577



System Description

INFOID:0000000001550578

REFRIGERANT CYCLE

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

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 2,800 kPa (28.5 kg/cm^2, 406.1 psi), or below about 200 kPa (2.04 kg/cm^2, 29 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 3,628 kPa (37 kg/cm^2, 526 psi)], the release port on the pressure relief valve automatically opens and releases refrigerant into the atmosphere.

LUBRICANT

Maintenance of Lubricant Quantity in Compressor

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:

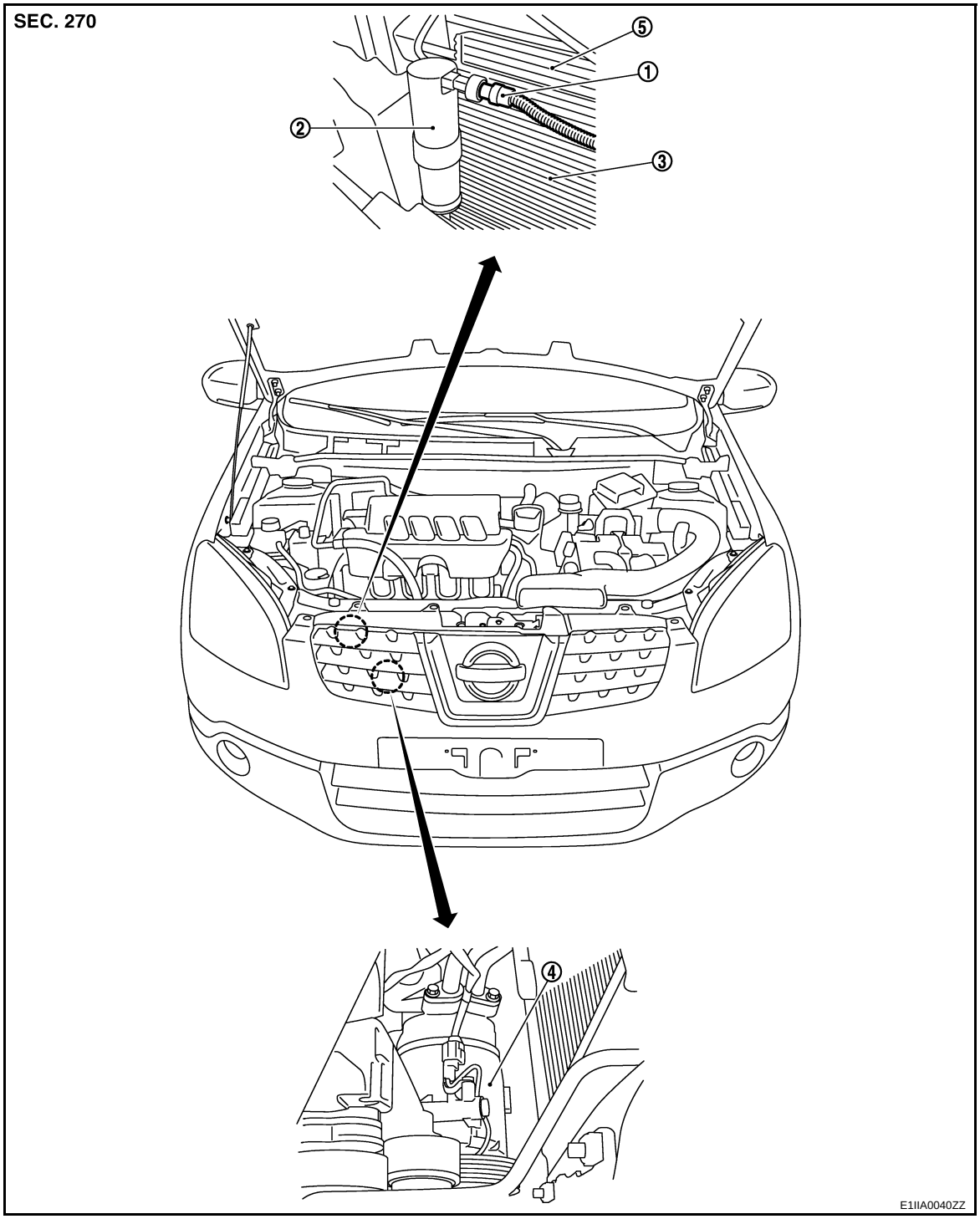
- Lack of lubricant: May lead to a seized compressor.
- Excessive lubricant: Inadequate cooling (thermal exchange interference)

Lubricant

Name : Nissan A/C System Oil Type S

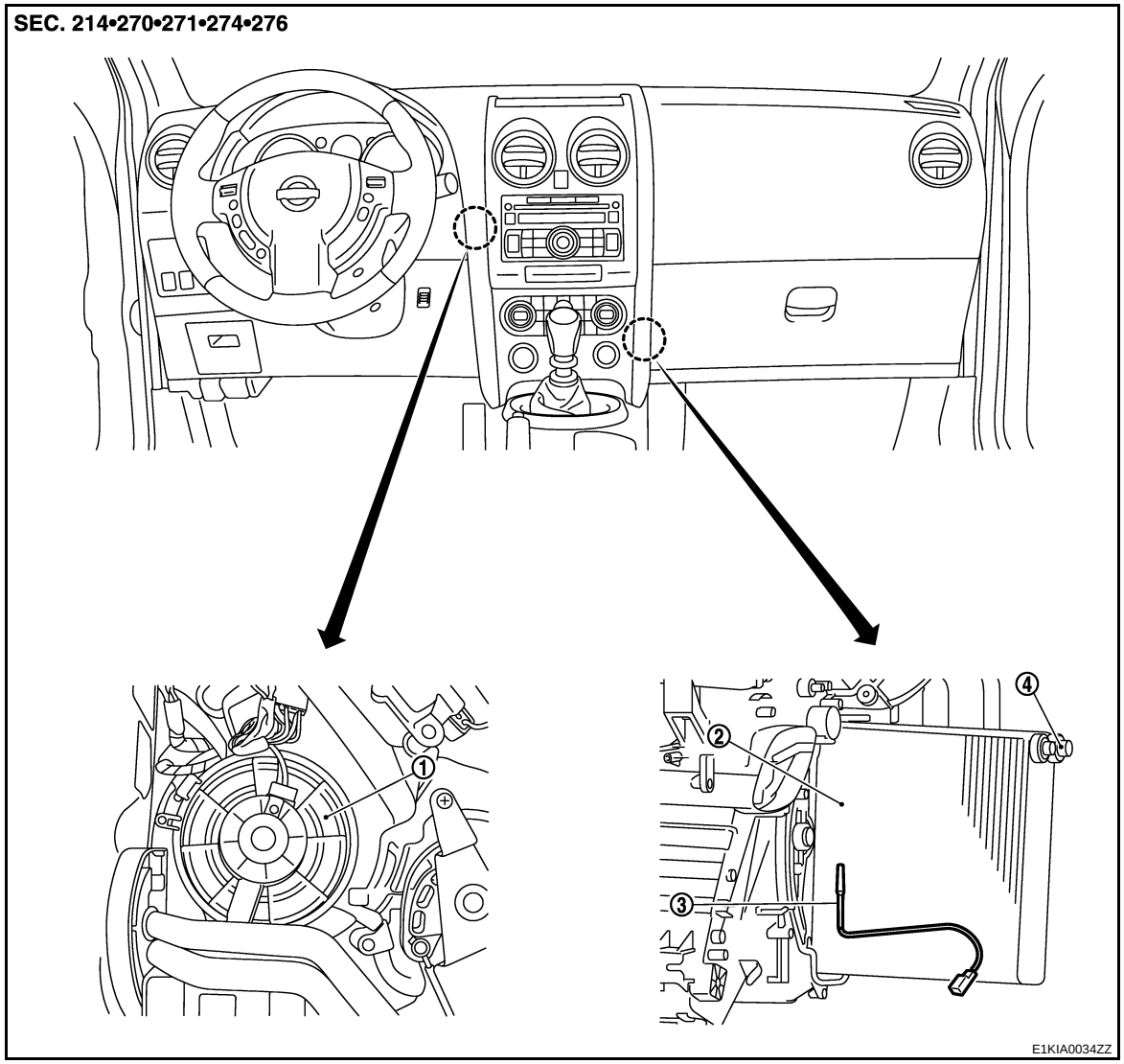
Component Parts Location

INFOID:0000000001550579



1. Refrigerant pressure sensor
2. Liquid tank
3. Condenser
4. Compressor
5. Radiator

SEC. 214•270•271•274•276



1. Blower motor assembly
2. Evaporator
3. Intake sensor (AT only)
4. Expansion valve

Component Description

INFOID:0000000001550580

Component	Description
Compressor	Intakes, compresses, and discharges refrigerant, then conveys it to condenser.
Condenser	Condenses refrigerant, and then conveys it to liquid tank.
Liquid tank	Drives moisture out of refrigerant, eliminates foreign matter, then conveys refrigerant to expansion valve.
Refrigerant pressure sensor	Refer to HAC-70, "Component Inspection".
Expansion valve	Vaporizes refrigerant, controls the amount of flow, then conveys refrigerant to evaporator.
Evaporator	Cools passing air, and then conveys it to compressor.
Blower motor	Takes in air in the vehicle or fresh outside air, and then adjusts room temperature by air conditioning.

SYMPTOM DIAGNOSIS

REFRIGERATION SYSTEM SYMPTOMS

SYMPTOM DIAGNOSIS PROCEDURE

SYMPTOM DIAGNOSIS PROCEDURE : Trouble Diagnosis For Unusual Pressure

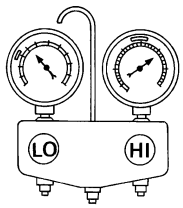
INFOID:0000000001550581

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

BOTH HIGH- AND LOW-PRESSURE SIDES ARE TOO HIGH : Symptom Table

INFOID:0000000001550582

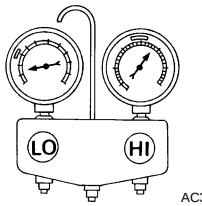
Gauge indication	Refrigerant cycle	Probable cause	Corrective action
Both high- and low-pressure sides are too high.  AC359A	The pressure returns to normal is reduced soon after water is splashed on condenser.	Excessive refrigerant charge in refrigeration cycle.	Reduce refrigerant until specified pressure is obtained.
	Air suction by cooling fan is insufficient.	Insufficient condenser cooling performance. ↓ 1. Condenser fins are clogged. 2. Improper fan rotation of cooling fan.	• Clean condenser. • Check and repair cooling fan as necessary.
	• Low-pressure pipe is not cold. • When compressor is stopped high-pressure value quickly drops by approximately 196 kPa (2 kg/cm^2, 28 psi). It then decreases gradually thereafter.	Poor heat exchange in condenser (After compressor operation stops, high-pressure decreases too slowly.). ↓ Air in refrigeration cycle.	Evacuate repeatedly and recharge system.
	Engine tends to overheat.	Engine cooling systems malfunction.	Check and repair each engine cooling system.
	• An area of the low-pressure pipe is colder than areas near the evaporator outlet. • 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

HIGH-PRESSURE SIDE IS TOO HIGH AND LOW-PRESSURE SIDE IS TOO LOW :

Symptom Table

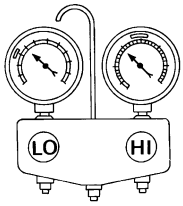
INFOID:0000000001550583

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

HIGH-PRESSURE SIDE IS TOO LOW AND LOW-PRESSURE SIDE IS TOO HIGH : Symptom Table

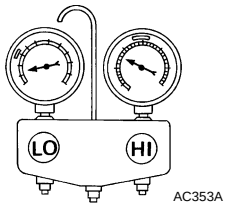
INFOID:0000000001550584

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

BOTH HIGH- AND LOW-PRESSURE SIDES ARE TOO LOW : Symptom Table

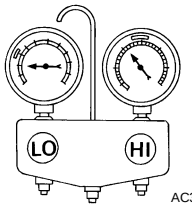
INFOID:0000000001550585

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 HA-137, "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 HAC-86, "Diagnosis Procedure". • Replace compressor. • Repair evaporator fins. • Replace evaporator. • Refer to HAC-62, "Diagnosis Procedure".

LOW-PRESSURE SIDE SOMETIMES BECOMES NEGATIVE

LOW-PRESSURE SIDE SOMETIMES BECOMES NEGATIVE : Symptom Table

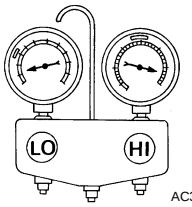
INFOID:0000000001550586

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

LOW-PRESSURE SIDE BECOMES NEGATIVE : Symptom Table

INFOID:0000000001550587

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.

PRECAUTION

PRECAUTIONS

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

INFOID:0000000001550588

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 SRC 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 SRC 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.**

Precaution Necessary for Steering Wheel Rotation After Battery Disconnect

INFOID:0000000001550589

NOTE:

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

For models equipped with the Intelligent Key system and NATS, an electrically controlled steering lock mechanism is adopted on the key cylinder.
For this reason, if the battery is disconnected or if the battery is discharged, the steering wheel will lock and steering wheel rotation will become impossible.
If steering wheel rotation is required when battery power is interrupted, follow the procedure below before starting the repair operation.

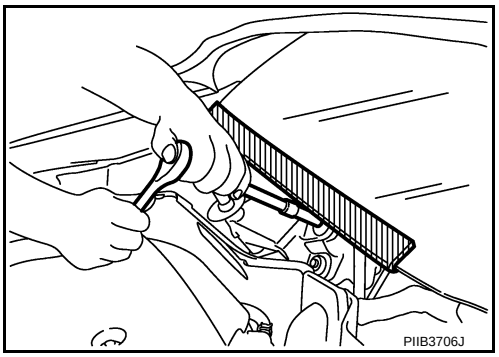
OPERATION PROCEDURE

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

Precaution for Procedure without Cowl Top Cover

INFOID:0000000001550590

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



Precautions For Xenon Headlamp Service

INFOID:0000000001550591

WARNING:

Comply with the following warnings to prevent any serious accident.

- **Disconnect the battery cable (negative terminal) or the power supply fuse before installing, removing, or touching the xenon headlamp (bulb included). The xenon headlamp contains high-voltage generated parts.**
- **Never work with wet hands.**
- **Check the xenon headlamp ON-OFF status after assembling it to the vehicle. Never turn the xenon headlamp ON in other conditions. Connect the power supply to the vehicle-side connector. (Turning it ON outside the lamp case may cause fire or visual impairments.)**
- **Never touch the bulb glass immediately after turning it OFF. It is extremely hot.**

CAUTION:

Comply with the following cautions to prevent any error and malfunction.

- **Install the xenon bulb securely. (Insufficient bulb socket installation may melt the bulb, the connector, the housing, etc. by high-voltage leakage or corona discharge.)**
- **Never perform HID circuit inspection with a tester.**
- **Never touch the xenon bulb glass with hands. Never put oil and grease on it.**
- **Dispose of the used xenon bulb after packing it in thick vinyl without breaking it.**
- **Never wipe out dirt and contamination with organic solvent (thinner, gasoline, etc.).**

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

INFOID:0000000001550592

CAUTION:

- **CFC-12 (R-12) refrigerant and HFC-134a (R-134a) refrigerant are not compatible. These refrigerants must never be mixed, even in the smallest amounts. If the refrigerants are mixed and compressor malfunction is likely occur.**
- **Use only specified lubricant for the HFC-134a (R-134a) A/C system and HFC-134a (R-134a) components. If lubricant other than that specified is used, compressor malfunction is likely to occur.**
- **The specified HFC-134a (R-134a) lubricant rapidly absorbs moisture from the atmosphere. The following handling precautions must be observed:**
- **When removing refrigerant components from a vehicle, immediately cap (seal) the component to minimize the entry of moisture from the atmosphere.**
- **When installing refrigerant components to a vehicle, never remove the caps (unseal) until just before connecting the components. Connect all refrigerant loop components as quickly as possible to minimize the entry of moisture into system.**
- **Only use the specified lubricant from a sealed container. Immediately reseal containers of lubricant. Without proper sealing, lubricant will become moisture saturated and should not be used.**
- **Never allow lubricant (Nissan A/C System Oil Type S) to come in contact with styrene foam parts. Damage may result.**

General Refrigerant Precaution

INFOID:0000000001550593

WARNING:

- **Avoid breathing A/C refrigerant and lubricant vapor or mist. Exposure may irritate eyes, nose and throat. Use only approved recovery/recycling equipment to discharge HFC-134a (R-134a) refrigerant.**

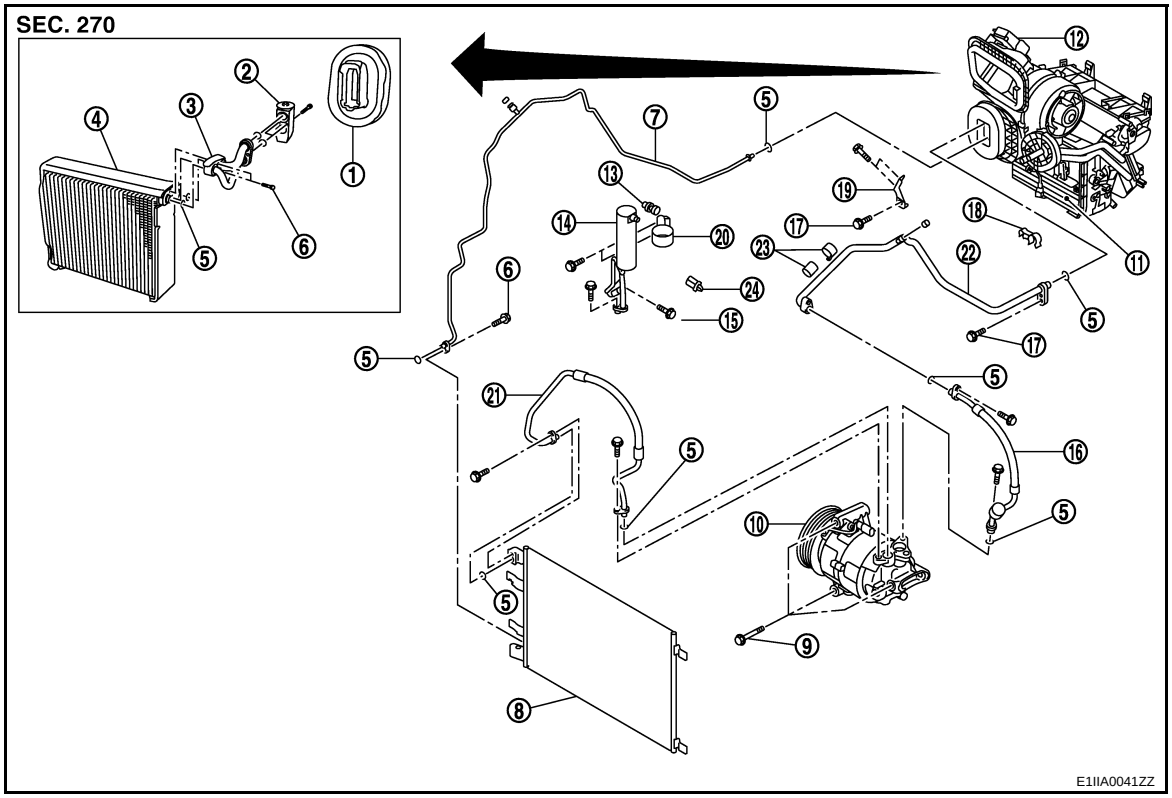
If accidental system discharge occurs, ventilate work area before resuming service. Additional health and safety information may be obtained from refrigerant and lubricant manufacturers.
- **Never release refrigerant into the air. Use approved recovery/recycling equipment to capture the refrigerant every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

Refrigerant Connection

INFOID:0000000001550594

A new type refrigerant connection has been introduced to all refrigerant lines except the following location.
- Expansion valve to evaporator
- Refrigerant pressure sensor to liquid tank

O-RING AND REFRIGERANT CONNECTION



1. Heater sealing
2. Expansion valve
3. Low pressure pipe 1 and high pressure pipe 2 assembly
4. Evaporator
5. O-ring
6. Connector pipe fixing bolt
7. High pressure pipe 1
8. Condenser assembly
9. Fixing bolt
10. Compressor
11. Heater & cooling unit assembly
12. Heater & blower unit assembly
13. Refrigerant pressure sensor
14. Liquid tank
15. Liquid tank fixing screw
16. Low pressure flexible hose
17. Fixing bolt
18. Pipes fixing clip

19. Low & high pressure pipe bracket
20. Liquid tank fixing bracket
21. High pressure flexible hose
22. Low pressure pipe 2
23. Low pressure pipe fixing clamp assembly
24. Pipe mantening clip

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

O-Ring Part Numbers and Specifications

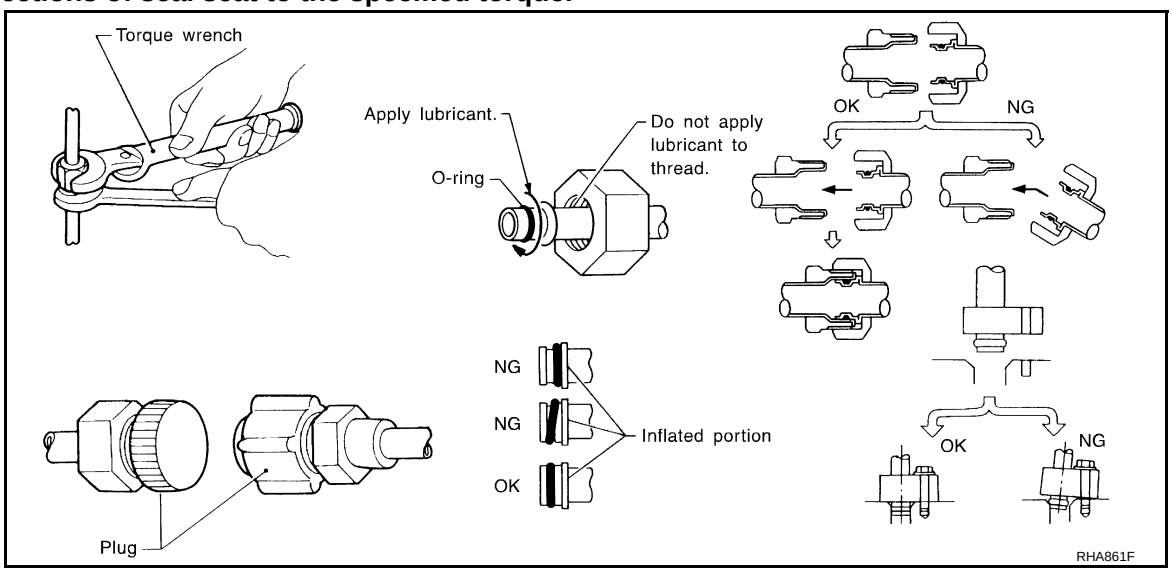
Connection type	Piping connection point		Part number	QTY	O-ring size
New	Low pressure pipe 2 to expansion valve		92473 N8210	1	16
	High pressure flexible pipe 1 to condenser		92472 N8210	1	12
	High pressure pipe 1 to expansion valve		92471 N8210	1	8
	Low pressure pipe 1 and high pressure pipe 2 assembly to expansion valve	Inlet	92475 71L00	1	12
		Outlet	92475 72L00	1	16
	Low pressure pipe 1 and high pressure pipe 2 assembly to evaporator	Inlet	92475 71L00	1	12
		Outlet	92475 72L00	1	16
	High pressure pipe 1 to liquid tank		92471 N8210	1	8
	Compressor to low pressure flexible hose		92474 N8210	1	16
	Compressor to high pressure flexible hose		92472 N8210	1	12
	Liquid tank to condenser		92473 N8210	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 tube, 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 portion of tube.**
- **When replacing the O-ring, be careful not to damage O-ring and tube.**
- **Connect tube until a click can be heard, then tighten the nut or bolt by hand. 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.**



Service Equipment

INFOID:0000000001550595

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.

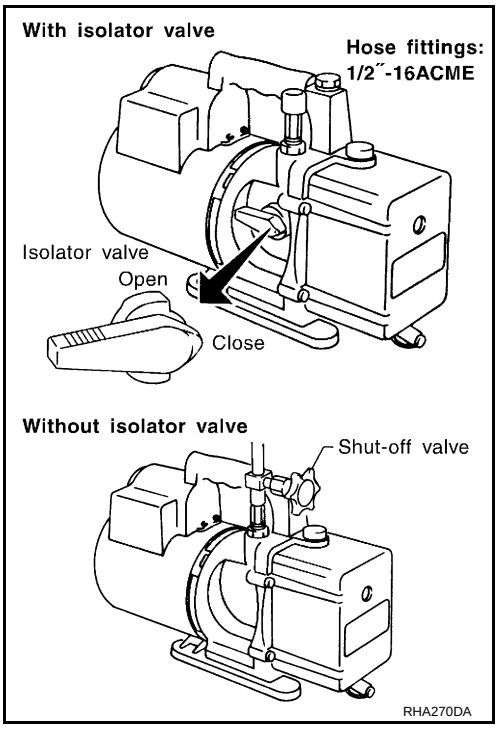
VACUUM PUMP

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.

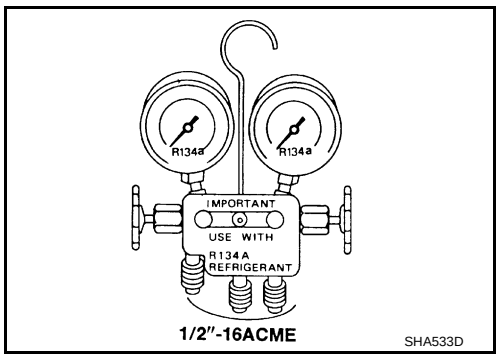
- Usually vacuum pumps have a manual isolator valve as part of the pump. Close this valve to isolate the service hose from the pump.
- For pumps without an isolator, use a hose equipped with a manual shut-off valve near the pump end. Close the valve to isolate the hose from the pump.
- If the hose has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



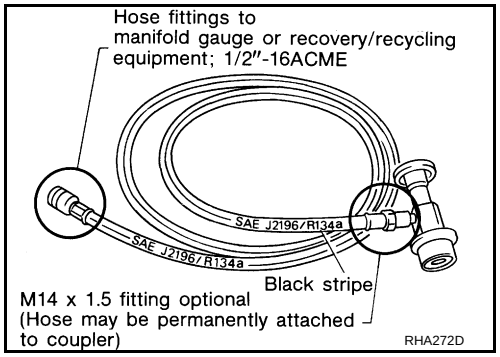
MANIFOLD GAUGE SET

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

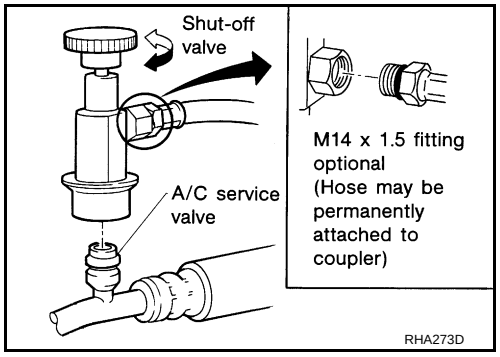
Be certain that the service hoses display the markings described (colored hose with black stripe). All hoses must include positive shut-off devices (either manual or automatic) near the end of the hoses opposite to the manifold gauge.



SERVICE COUPLERS

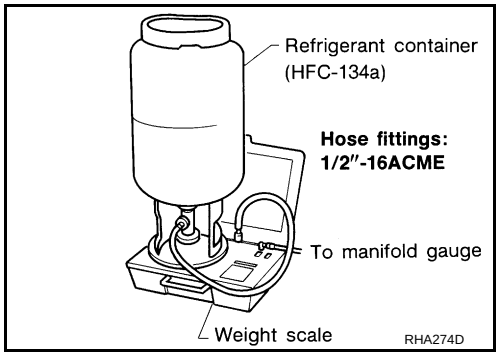
Never attempt to connect HFC-134a (R-134a) service couplers to a CFC-12 (R-12) A/C system. The HFC-134a (R-134a) couplers will not properly connect to the CFC-12 (R-12) system. However, if an improper connection is attempted, discharging and contamination may occur.

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 electronic scale or of quality recycle/recharge equipment.

COMPRESSOR

General Precautions

INFOID:0000000001550596

CAUTION:

- **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 HA-133, "Adjustment".**
- **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.**

LEAK DETECTION DYE

General Precautions

INFOID:0000000001550597

CAUTION:

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

IDENTIFICATION

NOTE:

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

IDENTIFICATION LABEL FOR VEHICLE

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

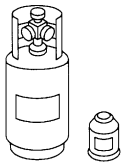
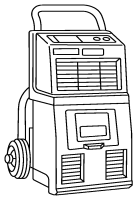
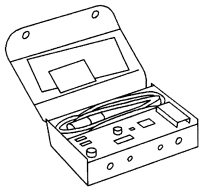
PREPARATION

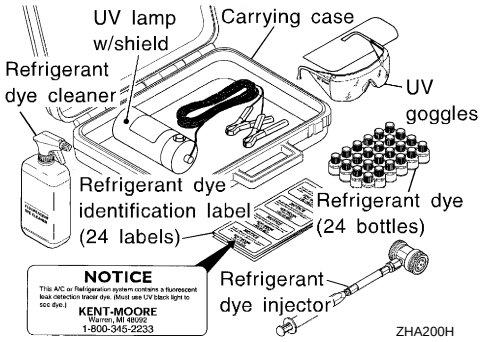
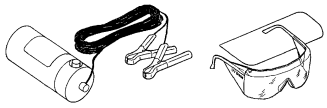
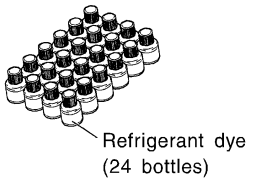
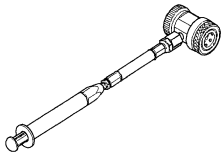
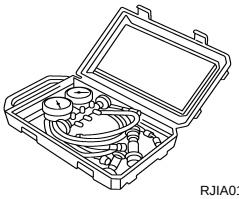
PREPARATION

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

INFOID:0000000001550598

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.
Adapters that convert one size fitting to another must never be used: refrigerant/lubricant contamination will occur and compressor malfunction will result.

Tool number Tool name		Description
HFC-134a (R-134a) refrigerant	 S-NT196	Container color: Light blue Container marking: HFC-134a (R-134a) Fitting size: Thread size • Large container 1/2 ″ -16 ACME
KLH00-PAGS0 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) Lubricity: 40 m ℓ (1.4 Imp fl oz.)
Recovery/Recycling/ Recharging equipment (ACR4)	 RJIA0195E	Function: Refrigerant recovery and recycling and recharging
Electrical leak detector	 A/C leak detector SHA705EB	Power supply: DC 12V (Cigarette lighter)

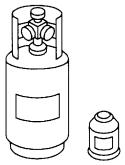
Tool number Tool name		Description
(J-43926) Refrigerant dye leak detection kit Kit includes: (J-42220) UV lamp and UV safety goggles (J-41459) HFC-134a (R-134a)dye injector Use with J-41447, 1/4 ounce bottle (J-41447) HFC-134a (R-134a) fluorescent leak detection dye (Box of 24, 1/4 ounce bottles) (J-43872) Refrigerant dye cleaner		Power supply: DC 12V (Battery terminal)
(J-42220) UV lamp and UV safety goggles		Power supply: DC 12V (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)		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		For injecting 1/4 ounce of fluorescent leak detection dye into A/C system.
(J-43872) Refrigerant dye cleaner		For cleaning dye spills.
Manifold gauge set (with hoses and couplers)		Identification: • The gauge face indicates HFC-134a (R-134a). Fitting size: Thread size • 1/2″-16 ACME

Sealant or/and Lubricant

INFOID:0000000001550599

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

- 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 name		Description
HFC-134a (R-134a) refrigerant	 S-NT196	Container color: Light blue Container marking: HFC-134a (R-134a) Fitting size: Thread size • Large container 1/2″-16 ACME
Nissan A/C System Oil Type S (DH-PS)	 S-NT197	Type: Polyalkylene glycol oil (PAG), type S (DH-PS) Application: HFC-134a (R-134a) swash plate compressors (Nissan only) Capacity: 40 m ℓ (1.4 US fl oz., 1.4 Imp fl oz.)

ON-VEHICLE MAINTENANCE

LUBRICANT

Adjustment

INFOID:0000000001550600

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.

Is it successful?

YES >> GO TO 2.
NO >> 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 >> Refer to "LUBRICANT ADJUSTING PROCEDURE FOR COMPRESSOR REPLACEMENT".
NO >> Refer to "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:

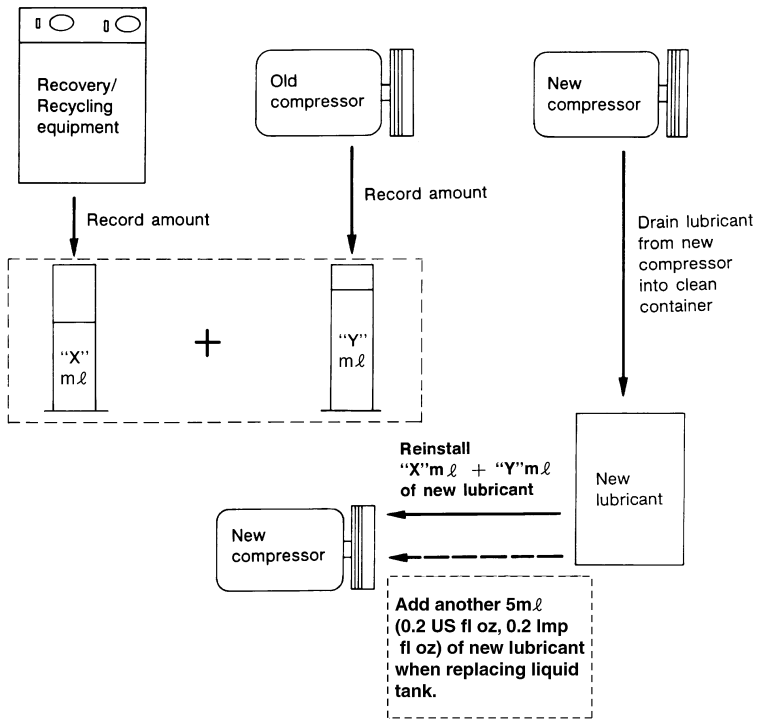
Part replaced	Lubricant to be added to system	Remarks
	Amount of lubricant mℓ (US fl oz., Imp fl oz.)	
Evaporator	75 (2.5, 2.6)	—
Condenser	35 (1.2, 1.2)	—
Liquid tank	10 (0.3, 0.4)	—
In case of refrigerant leak	30 (1.0, 1.1)	Large leak
	—	Small leak *1

*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 HA-123, "Working with HFC-134a (R-134a)".
3. Confirm refrigerant purity in vehicle A/C system using recovery/recycling recharging equipment and refrigerant identifier. If NG, refer to HA-123, "Working with HFC-134a (R-134a)".
4. Discharge refrigerant into the refrigerant recovery/recycling equipment. Measure lubricant discharged into the recovery/recycling equipment.
5. Drain the lubricant from the old (removed) compressor into a graduated container and recover the amount of lubricant drained.
6. Drain the lubricant from the new compressor into a separate, clean container.
7. Measure an amount of new lubricant installed equal to amount drained from old compressor. Add this lubricant to new compressor through the suction port opening.
8. Measure an amount of new lubricant equal to the amount recovered during discharging. Add this lubricant to new compressor through the suction port opening.
9. If the liquid tank also needs to be replaced, add another 5 m ℓ (0.2 US fl oz., 0.2 Imp fl oz.) of lubricant at this time.
   Do not add this 5 m ℓ (0.2 US fl oz., 0.2 Imp fl oz.) of lubricant when replaces the compressor only.

Lubricant adjusting procedure for compressor replacement

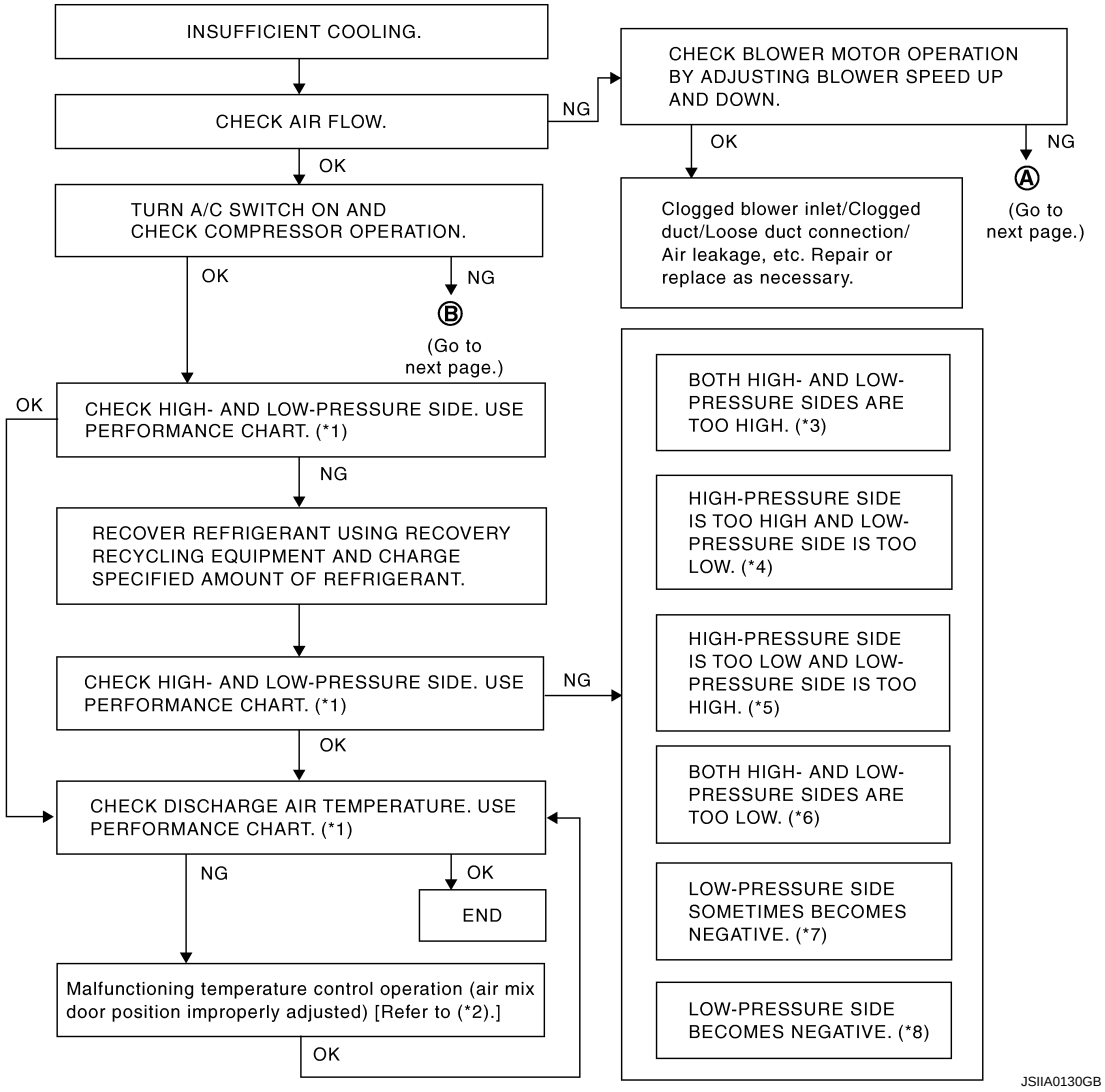


REFRIGERATION SYSTEM

Inspection

INFOID:0000000001550601

PERFORMANCE TEST DIAGNOSIS



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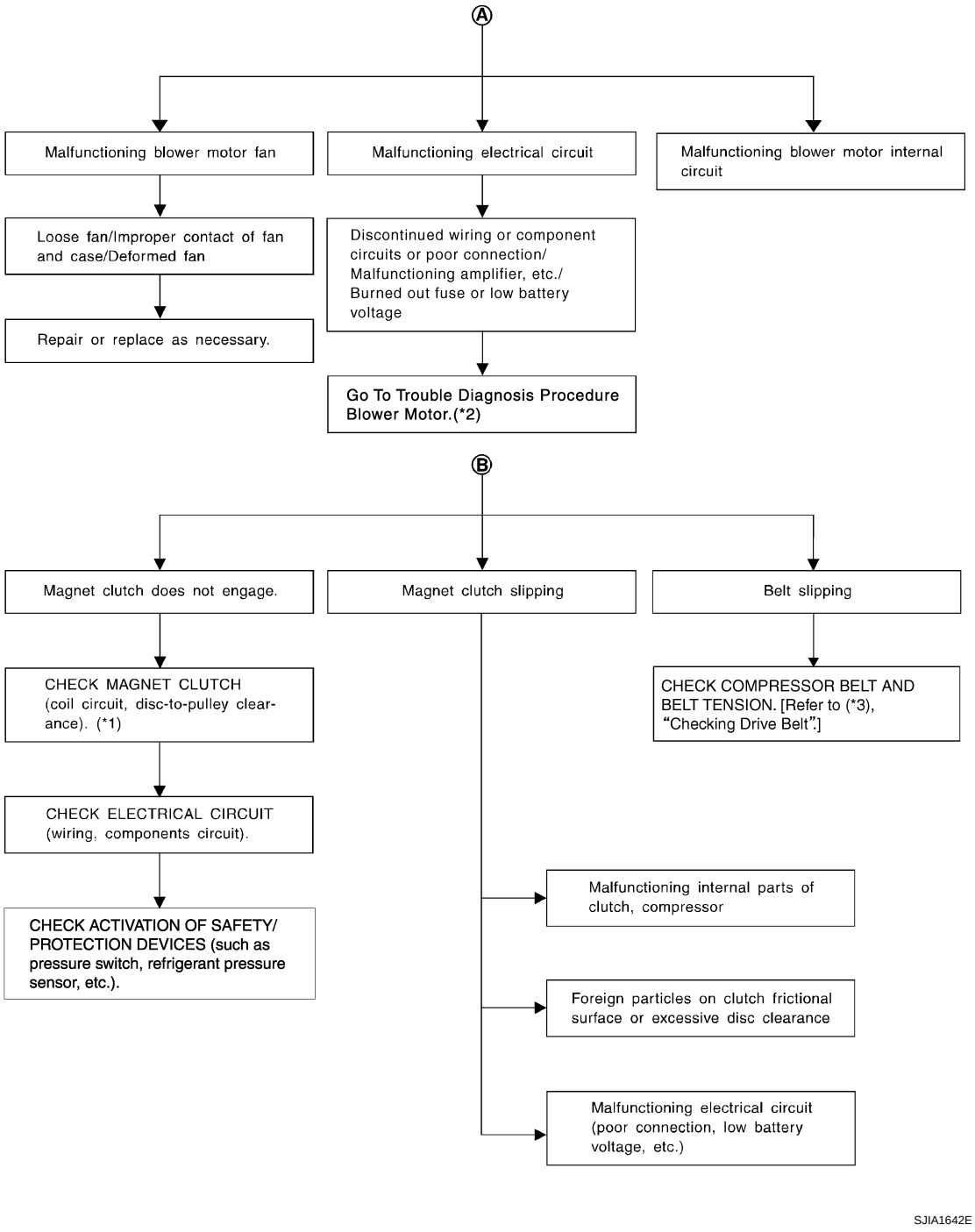
*1 HA-136, "Performance Chart"
*2 HAC-54, "Diagnosis Procedure"
*3 HA-118, "BOTH HIGH- AND LOW-PRESSURE SIDES ARE TOO HIGH : Symptom Table"
*4 HA-118, "HIGH-PRESSURE SIDE IS TOO HIGH AND LOW-PRESSURE SIDE IS TOO LOW : Symptom Table"
*5 HA-119, "HIGH-PRESSURE SIDE IS TOO LOW AND LOW-PRESSURE SIDE IS TOO HIGH : Symptom Table"
*6 HA-120, "BOTH HIGH- AND LOW-PRESSURE SIDES ARE TOO LOW : Symptom Table"
*7 HA-121, "LOW-PRESSURE SIDE SOMETIMES BECOMES NEGATIVE : Symptom Table"
*8 HA-121, "LOW-PRESSURE SIDE BECOMES NEGATIVE : Symptom Table"



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*1 HA-135, "Inspection" *2 HAC-62, "Diagnosis Procedure" *3 EM-260, "Inspection and Adjustment"

Performance Chart

INFOID:0000000001555635

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

Vehicle condition	Indoors or in the shade (in a well-ventilated place)
Hood	Open
TEMP.	Max. COLD
Mode switch	(Ventilation) set
Intake switch	(Recirculation) set
Fan (blower) speed	Max. speed set
Engine speed	Idle speed
Operate the air conditioning system for 10 minutes before taking measurements.	

TEST READING

Recirculating-to-discharge Air Temperature Table

Inside air (Recirculating air) at blower assembly inlet		Discharge air temperature at center ventilator °C (°F)
Relative humidity %	Air temperature °C (°F)	
50 - 60	20 (68)	7.0 - 7.3 (44.6 - 45.1)
	25 (77)	8.9 - 10.0 (48.0 - 50.0)
	30 (86)	10.9 - 13.1 (51.6 - 55.6)
	35 (95)	17.8 - 19.3 (64.0 - 66.7)
60 - 70	20 (68)	7.3 - 7.6 (45.1 - 45.7)
	25 (77)	10.0 - 11.0 (50.0 - 51.8)
	30 (86)	13.1 - 15.2 (55.6 - 59.4)
	35 (95)	19.3 - 20.8 (66.7 - 69.4)

Ambient Air Temperature-to-operating Pressure Table

Ambient air		High-pressure (Discharge side)							
Relative humidity %	Air temperature °C (°F)	Bar		kPa		kg/cm^2		psi	
		From	to	From	to	From	to	From	to
50 - 70	20 (68)	9.3	11.2	930.0	1120.0	9.5	11.4	134.9	162.4
	25 (77)	12.7	14.4	1270.0	1440.0	13.0	14.7	184.2	208.8
	30 (86)	14.5	17.8	1450.0	1780.0	14.8	18.2	210.3	258.1
	35 (95)	17.3	19.5	1730.0	1950.0	17.6	19.9	250.9	282.8
	40 (104)	17.5	19.4	1750.0	1940.0	17.8	19.8	253.8	281.3

Ambient Air Temperature-to-operating Pressure Table

Ambient air		Low pressure (Suction side)							
Relative humidity %	Air temperature °C (°F)	Bar		kPa		kg/cm^2		psi	
		From	to	From	to	From	to	From	to
50 - 70	20 (68)	2.1	2.2	210.0	220.0	2.1	2.2	30.5	31.9
	25 (77)	2.5	2.5	250.0	250.0	2.5	2.5	36.3	36.3
	30 (86)	2.5	3.1	250.0	310.0	2.5	3.2	36.3	45.0
	35 (95)	3.2	3.6	320.0	360.0	3.3	3.7	46.4	52.2
	40 (104)	3.6	4.0	360.0	400.0	3.7	4.1	52.2	58.0

Refrigerant Leaks

INFOID:0000000001550602

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.

FLUORESCENT LEAK DETECTOR

Inspection

INFOID:0000000001550603

CHECKING SYSTEM FOR LEAKS USING THE FLUORESCENT LEAK DETECTOR

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

(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.

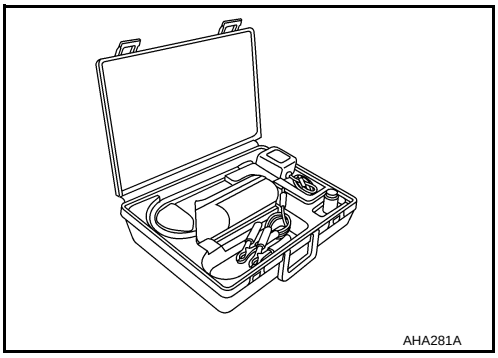
ELECTRICAL LEAK DETECTOR

Inspection

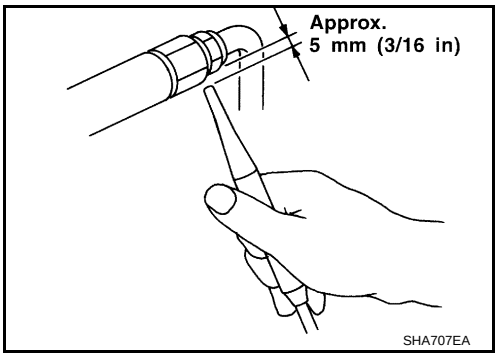
INFOID:0000000001550604

PRECAUTIONS FOR HANDLING LEAK DETECTOR

When performing a refrigerant leak check, use an electrical leak detector (SST: J-41995) 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.

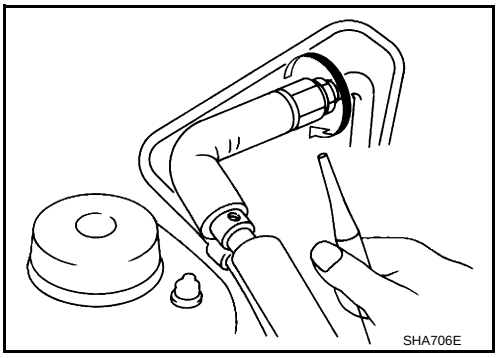

AHA281A

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

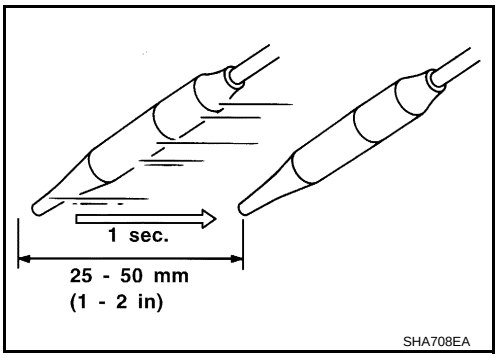


SHA707EA

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


SHA706E

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



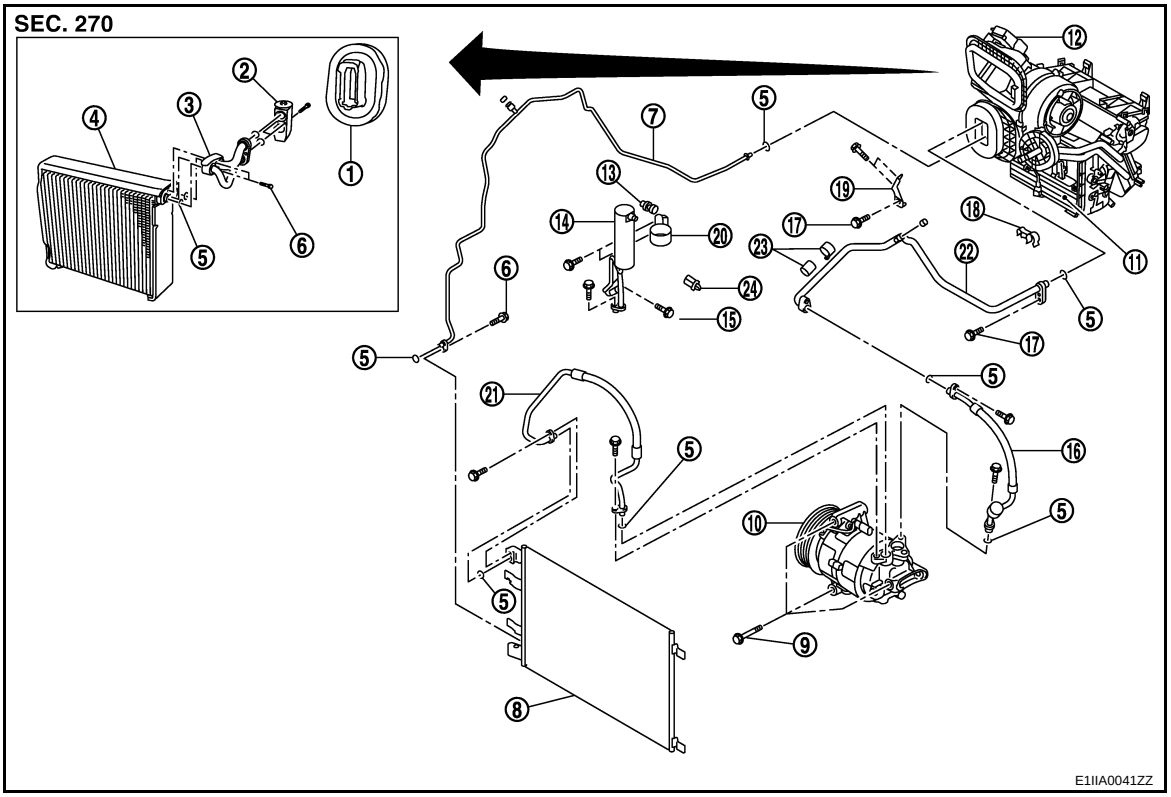
SHA708EA

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 j) to the low-pressure side (evaporator drain hose k to shaft seal p). 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.



1. Heater sealing	2. Expansion valve	3. Low pressure pipe 1 and high pressure pipe 2 assembly
4. Evaporator	5. O-ring	6. Connector pipe fixing bolt
7. High pressure pipe 1	8. Condenser assembly	9. Fixing bolt
10. Compressor	11. Heater & cooling unit assembly	12. Heater & blower unit assembly
13. Refrigerant pressure sensor	14. Liquid tank	15. Liquid tank fixing screw
16. Low pressure flexible hose	17. Fixing bolt	18. Pipes fixing clip
19. Low & high pressure pipe bracket	20. Liquid tank fixing bracket	21. High pressure flexible hose
22. Low pressure pipe 2	23. Low pressure pipe fixing clamp assembly	24. Pipe mantening clip

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

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

Cooling unit (Evaporator)

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

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

5. If a leak detector detects a leak, verify at least once by blowing compressed air into area of suspected leak, then repeat check as outlined above.
6. Do not stop when one leak is found. Continue to check for additional leaks at all system components. If no leaks are found, perform steps 7 - 10.
7. Start the engine.
8. Set the A/C control as follows;

a. A/C switch: ON

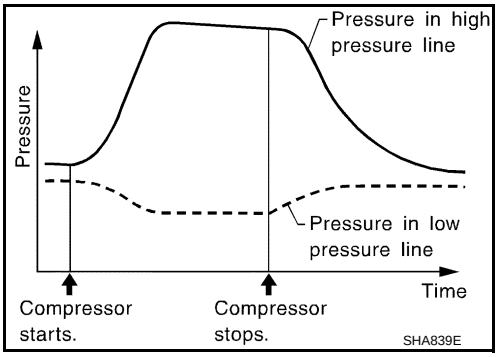
b. MODE door position: VENT (Ventilation)

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.

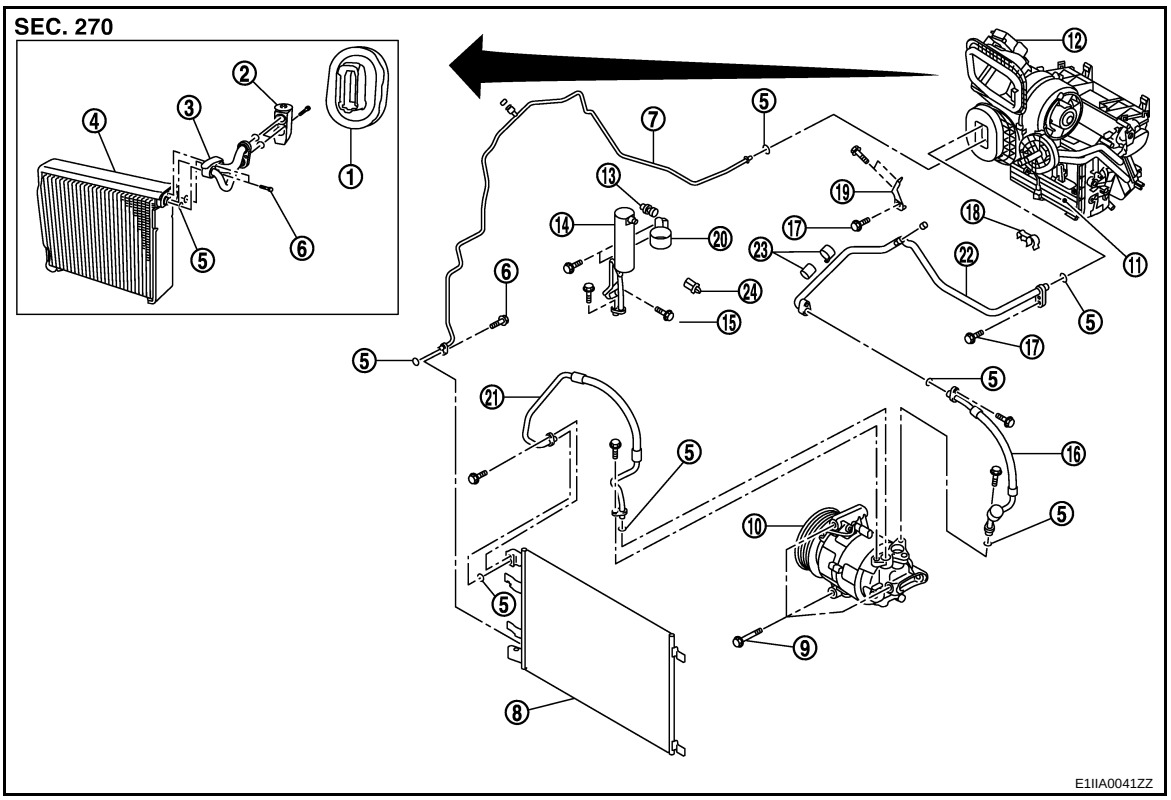
ON-VEHICLE REPAIR

REFRIGERATION SYSTEM

Exploded View

INFOID:0000000001550605

Refer to HA-124, "Refrigerant Connection".



1. Heater sealing	2. Expansion valve	3. Low pressure pipe 1 and high pressure pipe 2 assembly
4. Evaporator	5. O-ring	6. Connector pipe fixing bolt
7. High pressure pipe 1	8. Condenser assembly	9. Fixing bolt
10. Compressor	11. Heater & cooling unit assembly	12. Heater & blower unit assembly
13. Refrigerant pressure sensor	14. Liquid tank	15. Liquid tank fixing screw
16. Low pressure flexible hose	17. Fixing bolt	18. Pipes fixing clip
19. Low & high pressure pipe bracket	20. Liquid tank fixing bracket	21. High pressure flexible hose
22. Low pressure pipe 2	23. Low pressure pipe fixing clamp assembly	24. Pipe mantening clip

Inspection After Installation

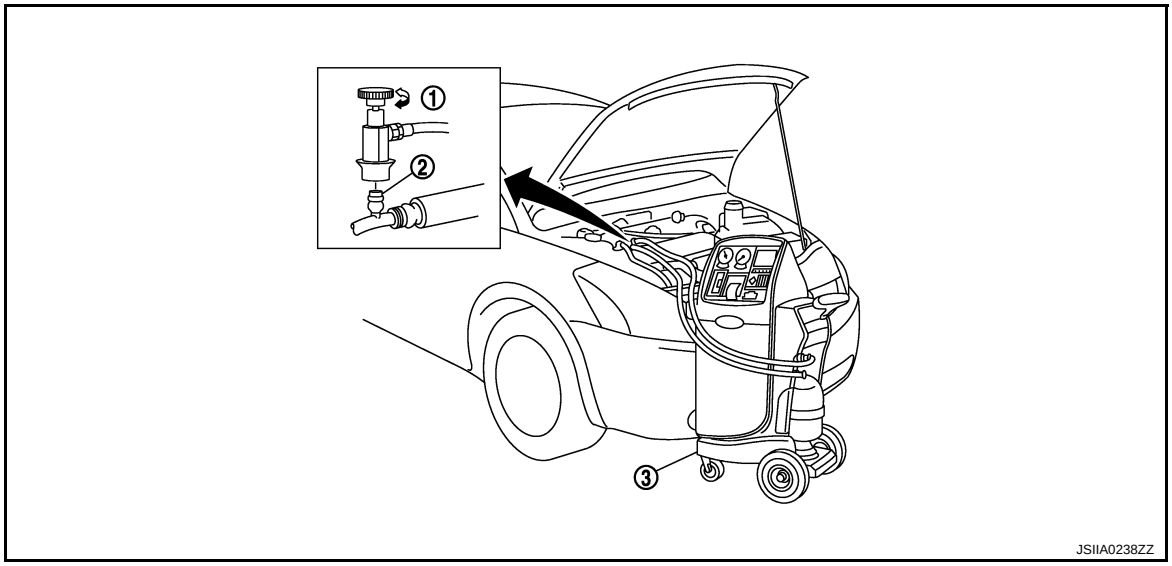
INFOID:0000000001550606

SETTING OF SERVICE TOOLS AND EQUIPMENT

Discharging Refrigerant

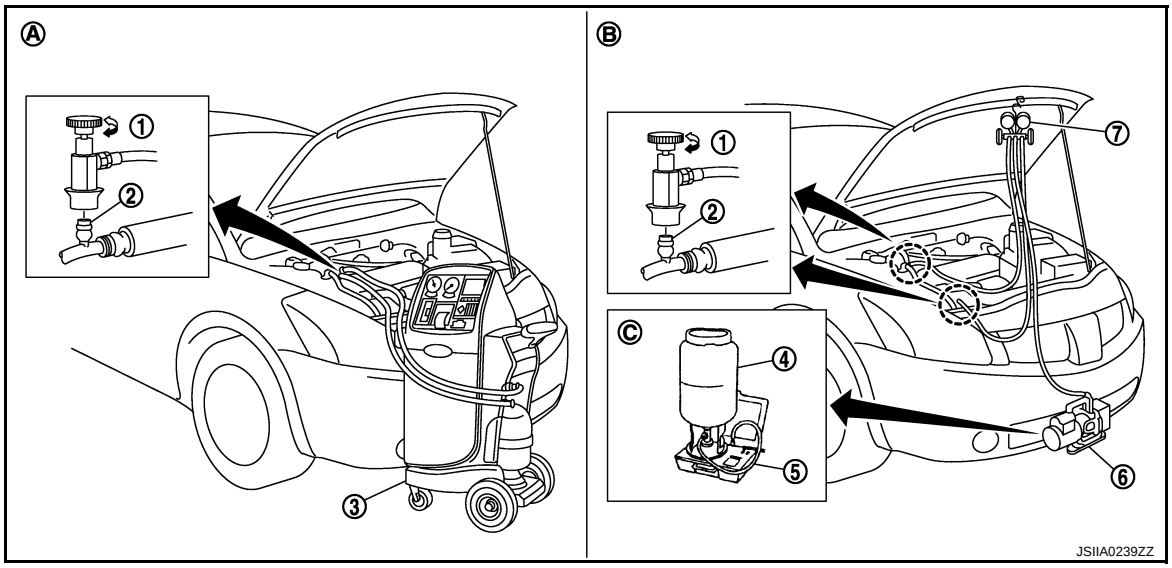
WARNING:

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.



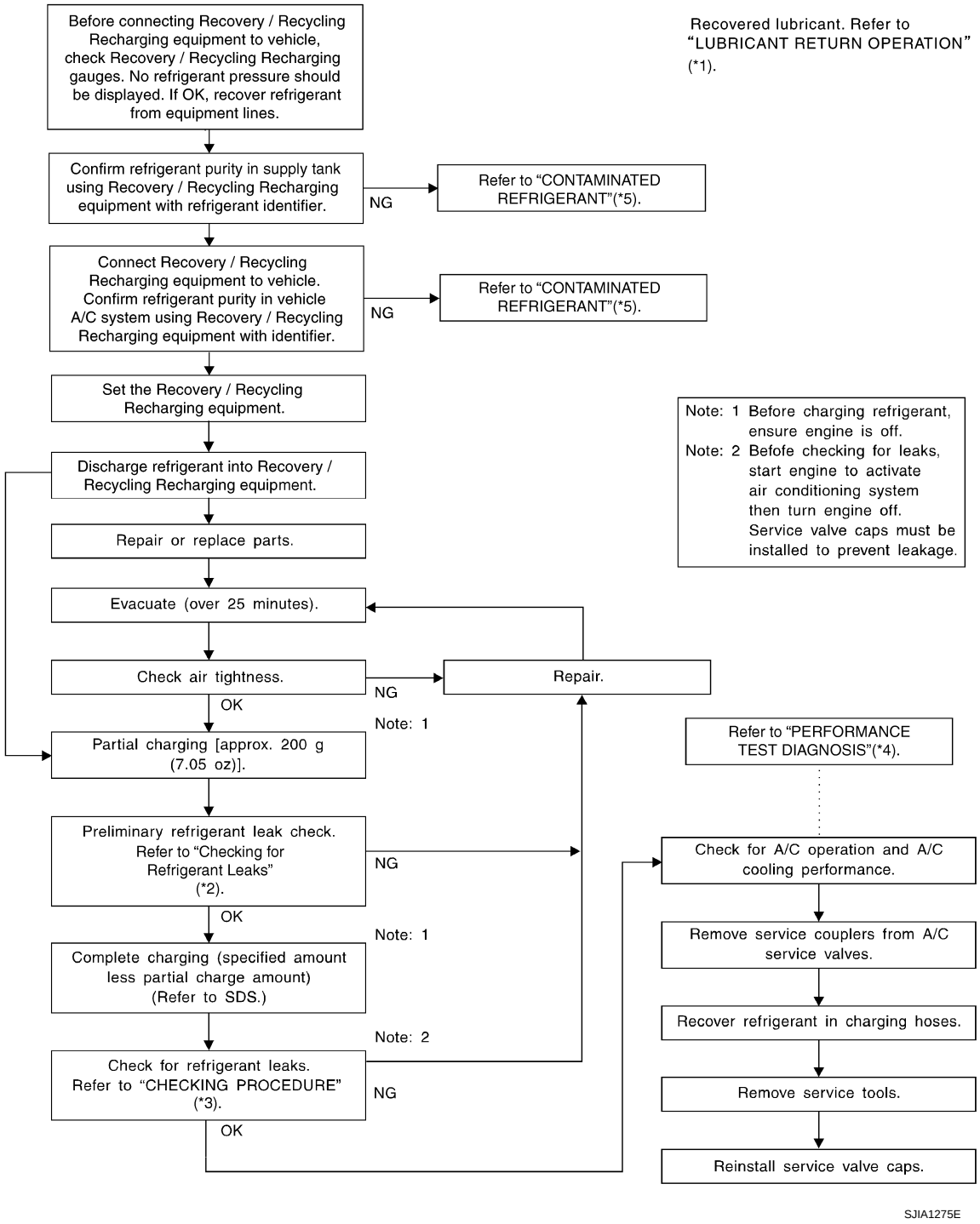
1. Shut-off valve
2. A/C service valve
3. Recovery/Recycling/Recharging equipment

Evacuating System and Charging Refrigerant



1. Shut-off valve
2. A/C service valve
3. Recovery/Recycling/Recharging equipment
4. Refrigerant container (HFC-134a)
5. Weight scale (J-39650)
6. Vacuum pump (J-39649)
7. Manifold gauge set (J-39183)

A. Preferred (best) method
B. Alternative method
C. For charging



*1 HA-133, "Adjustment"

*2 "REFRIGERANT LEAKS" in HA-137, "Refrigerant Leaks".

*3 "CHECKING PROCEDURE" in HA-135, "Inspection".

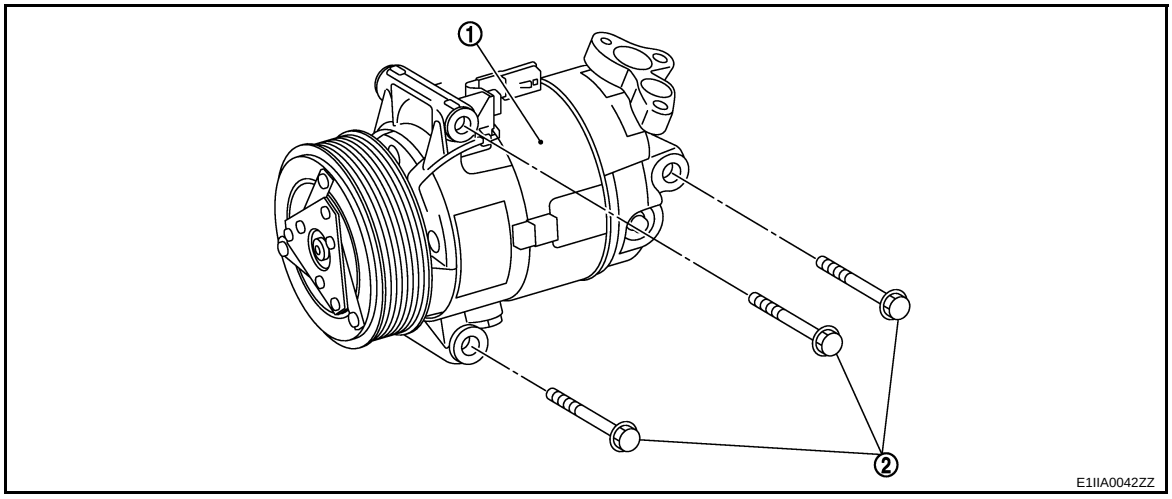
*4 "PERFORMANCE TEST DIAGNOSIS" in HA-135, "Inspection".

*5 "CONTAMINATED REFRIGERANT" in HAC-132, "Working with HFC-134a (R-134a)".

COMPRESSOR

Exploded View

INFOID:0000000001550607



1. Compressor
2. Compressor fixing bolt

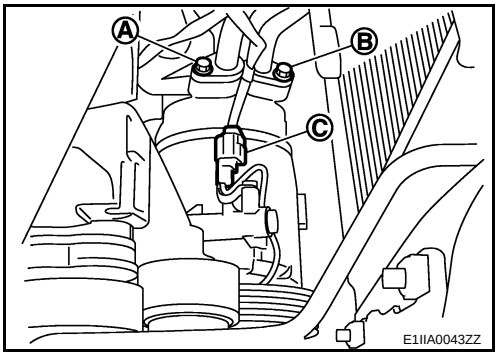
Refer to GI-4, "Components" for symbols in the figure.

Removal and Installation

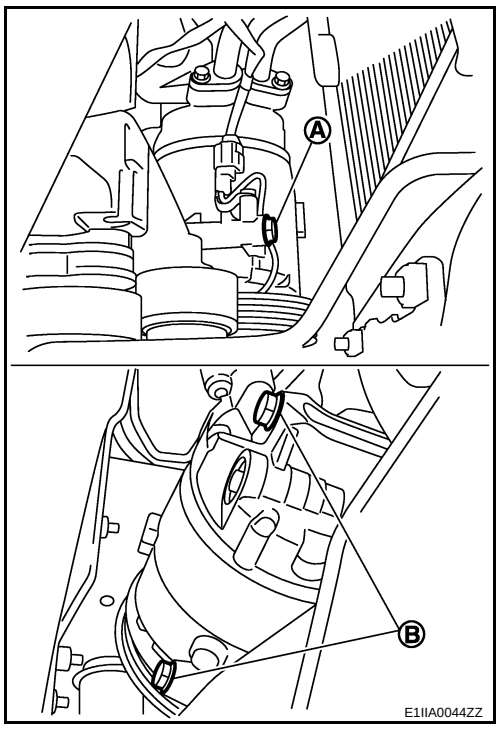
INFOID:0000000001550608

REMOVAL

1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
2. Remove engine cover ornament.
3. Remove cooling fan. Refer to CO-77, "Exploded View".
4. Remove drive belt. Refer to EM-348, "Exploded View".
5. Remove alternator. Refer to CHG-23, "M9R MODELS : Exploded View".
6. Remove low pressure flexible hose fixing bolt (A) from compressor and high pressure flexible hose fixing bolt (B) from compressor.
   Remove compressor harness connector (C).
   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. Remove engine undercover.

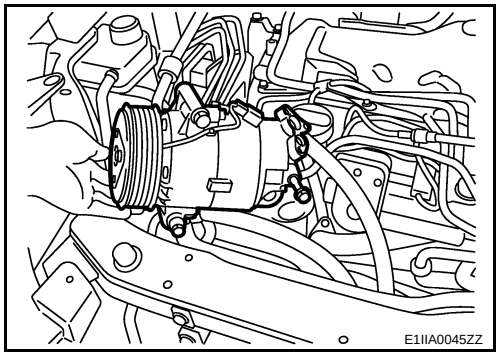


8. Remove mounting bolts (A) and (B) from compressor.



9. Remove the compressor from the vehicle.

Compressor fixing bolt : 25 N.m (2.6 kg-m, 18 ft-lb)



INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

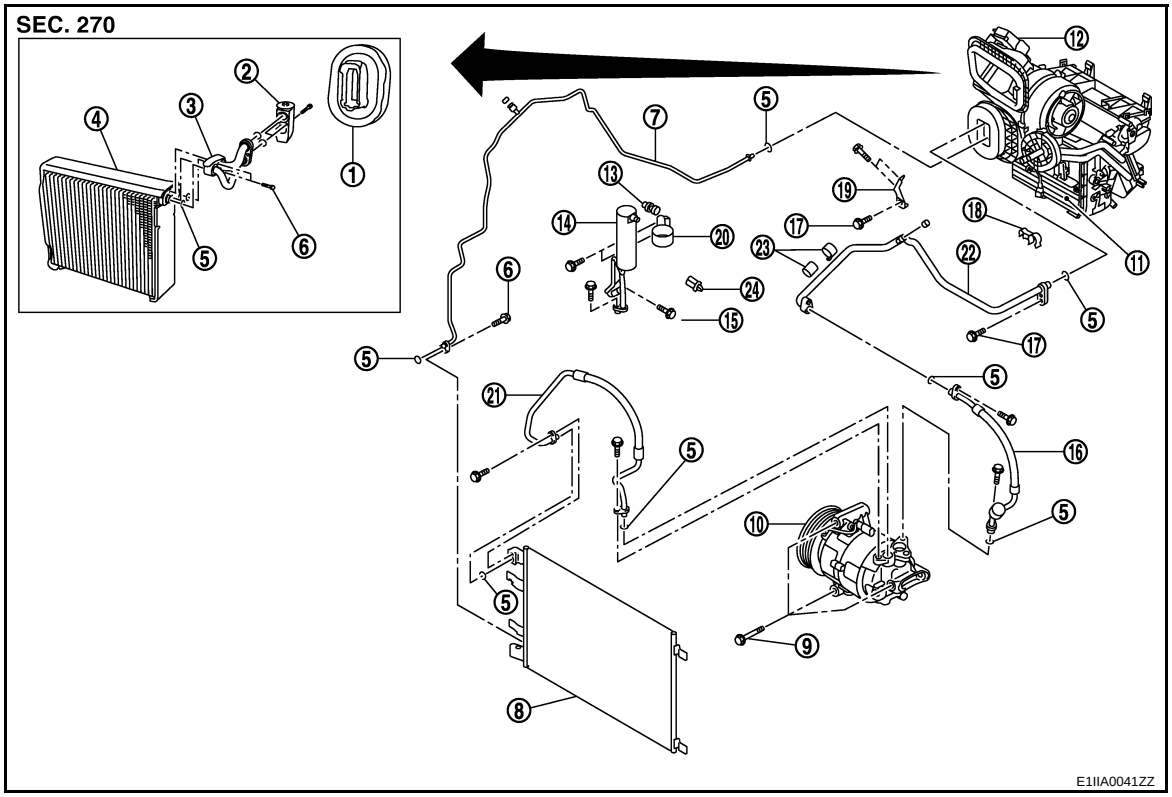
- **Replace O-rings of low-pressure flexible hose and high-pressure flexible hose with new ones, and then apply compressor oil to it when installing it.**
- **When recharging refrigerant, check for leaks.**

LOW-PRESSURE FLEXIBLE HOSE AND PIPE 2

Exploded View

INFOID:0000000001550609

Refer to HA-124, "Refrigerant Connection".



1. Heater sealing
2. Expansion valve
3. Low pressure pipe 1 and high pressure pipe 2 assembly
4. Evaporator
5. O-ring
6. Connector pipe fixing bolt
7. High pressure pipe 1
8. Condenser assembly
9. Fixing bolt
10. Compressor
11. Heater & cooling unit assembly
12. Heater & blower unit assembly
13. Refrigerant pressure sensor
14. Liquid tank
15. Liquid tank fixing screw
16. Low pressure flexible hose
17. Fixing bolt
18. Pipes fixing clip
19. Low & high pressure pipe bracket
20. Liquid tank fixing bracket
21. High pressure flexible hose
22. Low pressure pipe 2
23. Low pressure pipe fixing clamp assembly
24. Pipe mantening clip

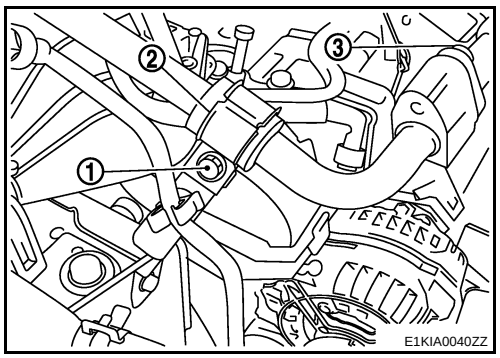
Removal and Installation

INFOID:0000000001550610

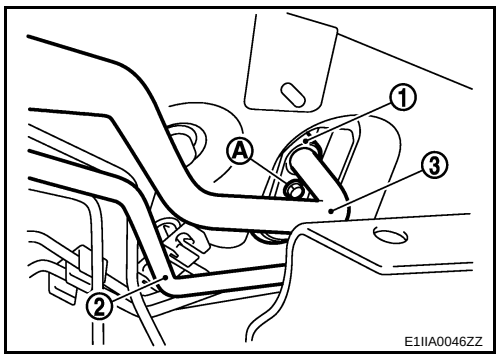
REMOVAL

1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
2. Remove upper engine cover ornament. Refer to EM-267, "Removal and Installation".

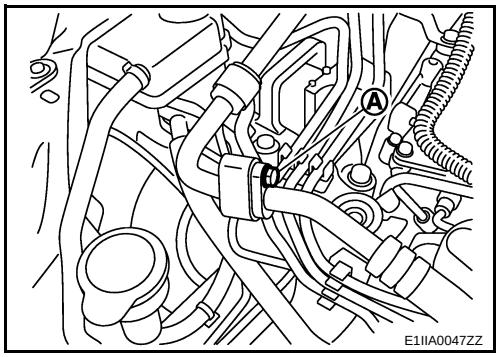
3. Remove mounting bolt (1) and clamp (2), from low pressure pipe bracket support.
4. Remove low and high-pressure maintaining clip, from both pipes, then remove fixing bolt (3) from low-pressure flexible hose and low-pressure pipe 2.
5. Remove engine room insulator fixing clip from cowl top.



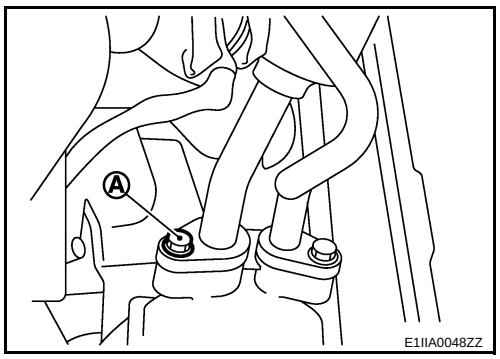
6. Pull dash lower insulator (upper), then remove pipes bracket fixing bolt (A), from expansion valve, and release pipes fixing bracket (1) from high pressure pipe 1 (2), to remove low pressure pipe 2 (3) from expansion valve.
CAUTION:
Cap or wrap the joint of the low pressure flexible hose and pipe, and extension valve exit with suitable material such as vinyl tape to avoid the entry of air.



7. Remove low pressure pipe connector fixing bolt (A), with suitable tools, then remove low pressure pipe from low pressure flexible hose.
CAUTION:
Cap or wrap the joint of the low pressure pipe connector, and low pressure flexible hose, with suitable material such as vinyl tape to avoid the entry of air.



8. Remove low pressure flexible hose fixing bolt (A), from air conditioner compressor, and remove low pressure flexible hose.
CAUTION:
Cap or wrap the joint of low pressure flexible hose with suitable material such as vinyl tape to avoid the entry of air.



Pipe bracket fixing bolt to expansion valve	**: 4.4 N·m (0.45 kg-m, 39.0 in-lb)**
Low pressure flexible pipe fixing bolt to compressor	**: 4.4 N·m (0.45 kg-m, 39.0 in-lb)**

INSTALLATION

Installation is basically the reverse order of removal.

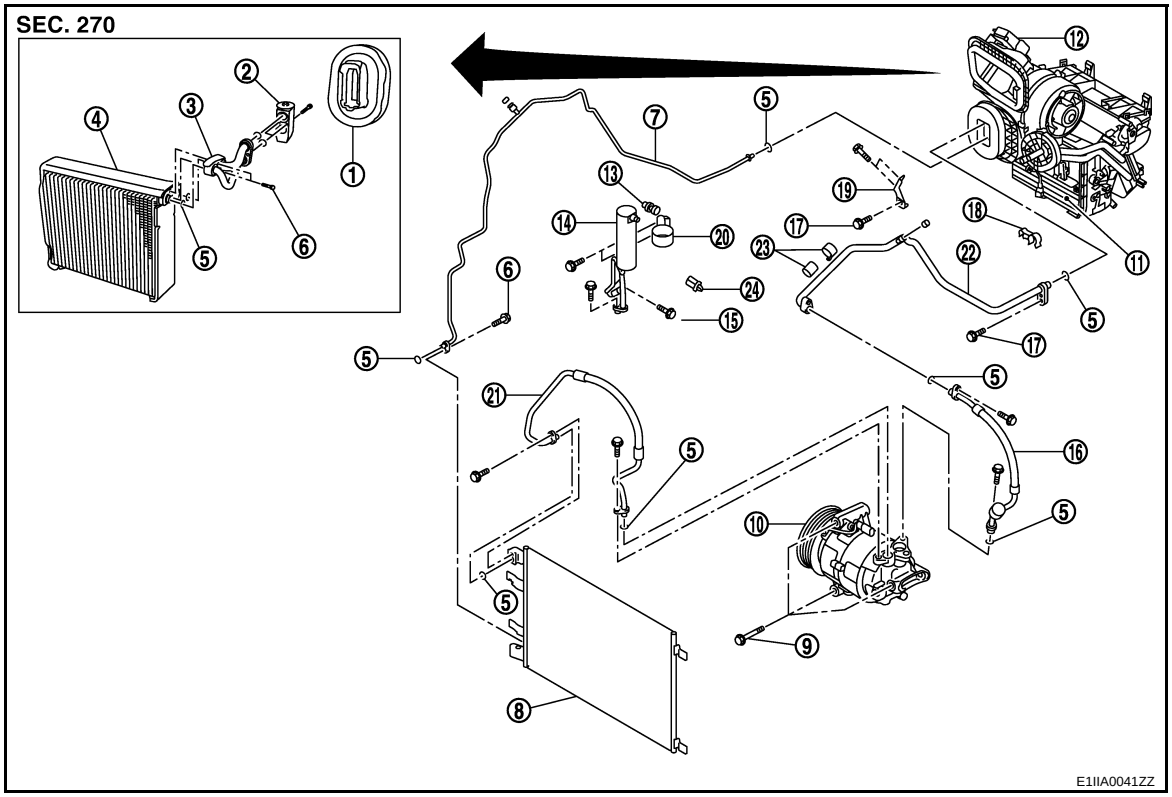
CAUTION:
- **Replace O-rings of low-pressure flexible hose and low-pressure pipe 2 with new ones, and then apply compressor oil to it when installing it.**
- **Female-side piping connection is thin and easy to deform. Slowly insert the male-side piping straight in axial direction.**
- **Insert piping 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.**

HIGH-PRESSURE FLEXIBLE HOSE

Exploded View

INFOID:0000000001550611

Refer to HA-124, "Refrigerant Connection".



1. Heater sealing
2. Expansion valve
3. Low pressure pipe 1 and high pressure pipe 2 assembly
4. Evaporator
5. O-ring
6. Connector pipe fixing bolt
7. High pressure pipe 1
8. Condenser assembly
9. Fixing bolt
10. Compressor
11. Heater & cooling unit assembly
12. Heater & blower unit assembly
13. Refrigerant pressure sensor
14. Liquid tank
15. Liquid tank fixing screw
16. Low pressure flexible hose
17. Fixing bolt
18. Pipes fixing clip
19. Low & high pressure pipe bracket
20. Liquid tank fixing bracket
21. High pressure flexible hose
22. Low pressure pipe 2
23. Low pressure pipe fixing clamp assembly
24. Pipe mantening clip

Removal and Installation

INFOID:0000000001550612

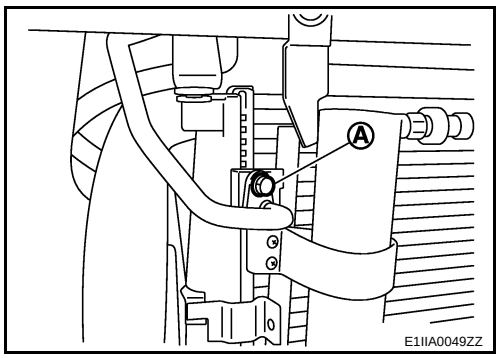
REMOVAL

1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
2. Remove engine cover ornament. Refer to EM-267, "Removal and Installation".
3. Remove front grille. Refer to EXT-17, "Exploded View".
4. Remove radiator shroud.

5. Remove high pressure flexible hose fixing bolt (A) from condenser, then pull high pressure flexible hose to remove it from condenser.

CAUTION:

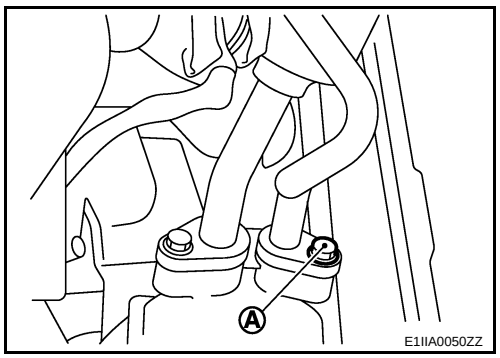
Cap or wrap the joint of high pressure flexible hose and condenser assembly with suitable material such as vinyl tape to avoid the entry of air.



6. Remove high pressure flexible hose fixing bolt (A) from compressor, then pull high pressure flexible hose to remove it from compressor.

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.



High pressure fixing bolt to condenser

: 4.4 N·m (0.45 kg-m, 39 in-lb)

High pressure fixing bolt to compressor

: 4.4 N·m (0.45 kg-m, 39 in-lb)

INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

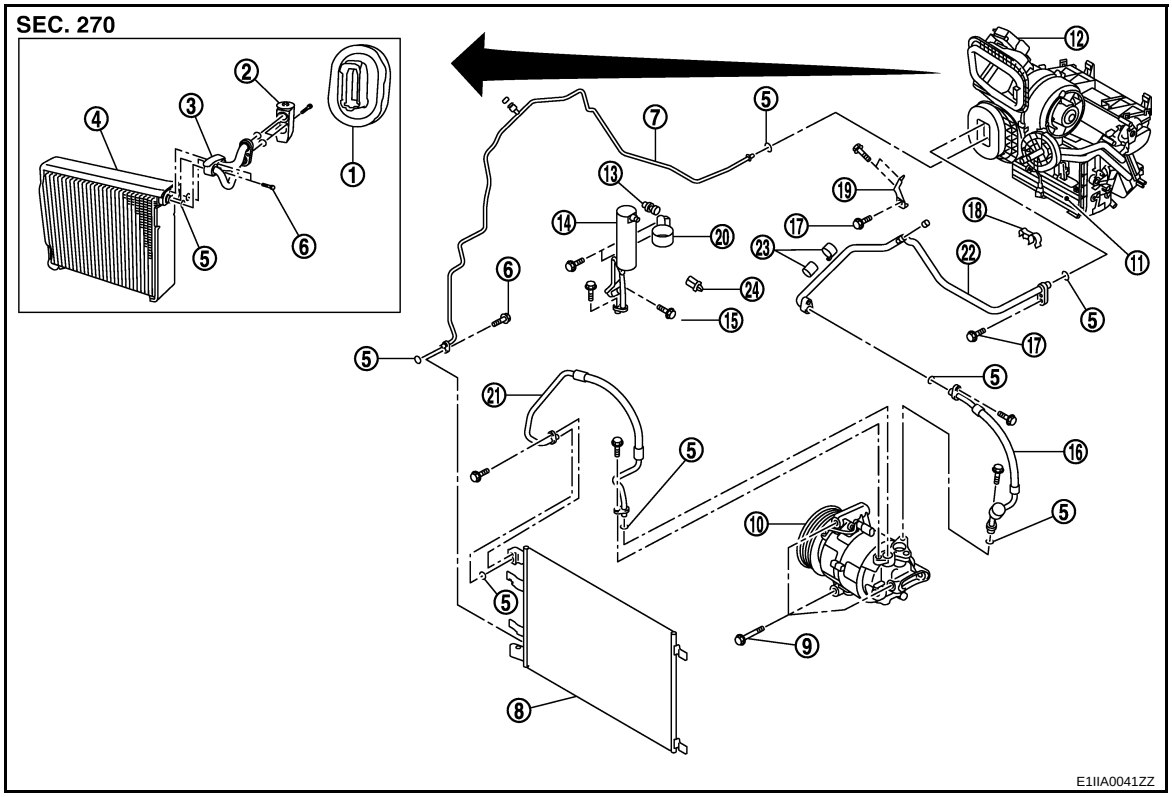
- **Replace O-rings of high-pressure flexible hose with new ones, and then apply compressor oil to it when installing it.**
- **Female-side piping connection is thin and easy to deform. Slowly insert the male-side piping straight in axial direction.**
- **Insert piping securely until a click is heard.**
- **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 PIPE 1 (ENGINE COMPARTMENT)

Exploded View

INFOID:0000000001550613

Refer to HA-124, "Refrigerant Connection".



1. Heater sealing
2. Expansion valve
3. Low pressure pipe 1 and high pressure pipe 2 assembly
4. Evaporator
5. O-ring
6. Connector pipe fixing bolt
7. High pressure pipe 1
8. Condenser assembly
9. Fixing bolt
10. Compressor
11. Heater & cooling unit assembly
12. Heater & blower unit assembly
13. Refrigerant pressure sensor
14. Liquid tank
15. Liquid tank fixing screw
16. Low pressure flexible hose
17. Fixing bolt
18. Pipes fixing clip
19. Low & high pressure pipe bracket
20. Liquid tank fixing bracket
21. High pressure flexible hose
22. Low pressure pipe 2
23. Low pressure pipe fixing clamp assembly
24. Pipe mantening clip

Removal and Installation

INFOID:0000000001550614

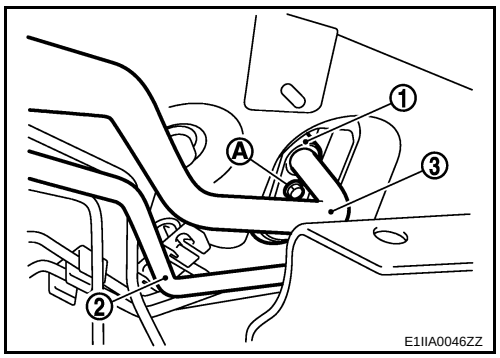
REMOVAL

1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
2. Remove engine cover ornament. Refer to EM-267, "Removal and Installation".

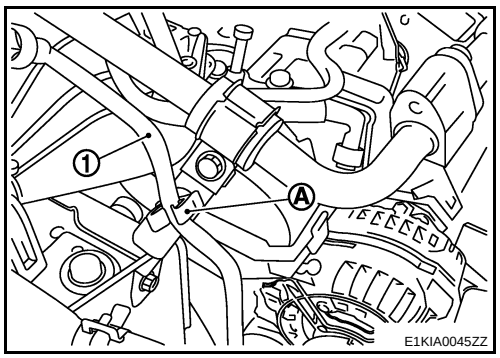
3. Pull dash lower insulator (upper), then remove pipes bracket fixing bolt (A), from expansion valve, and release pipes fixing bracket (1) from high pressure pipe 1 (2), to remove low pressure pipe 2 (3) from expansion valve.

CAUTION:

Cap or wrap the joint of the low pressure flexible hose and pipe, and extension valve exit with suitable material such as vinyl tape.



4. Remove high pressure pipe 1 (1) from clip (A).

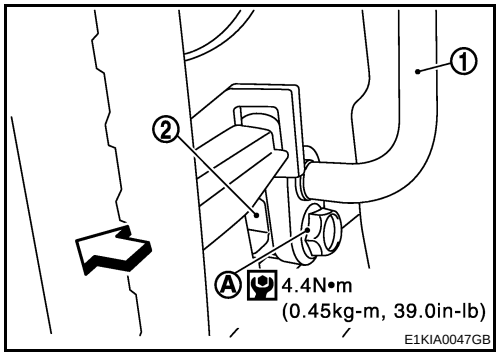


Remove high-pressure pipe 1 mounting bolt (A) from condenser (2).

CAUTION:

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

Remove high pressure pipe 1 (1).



INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

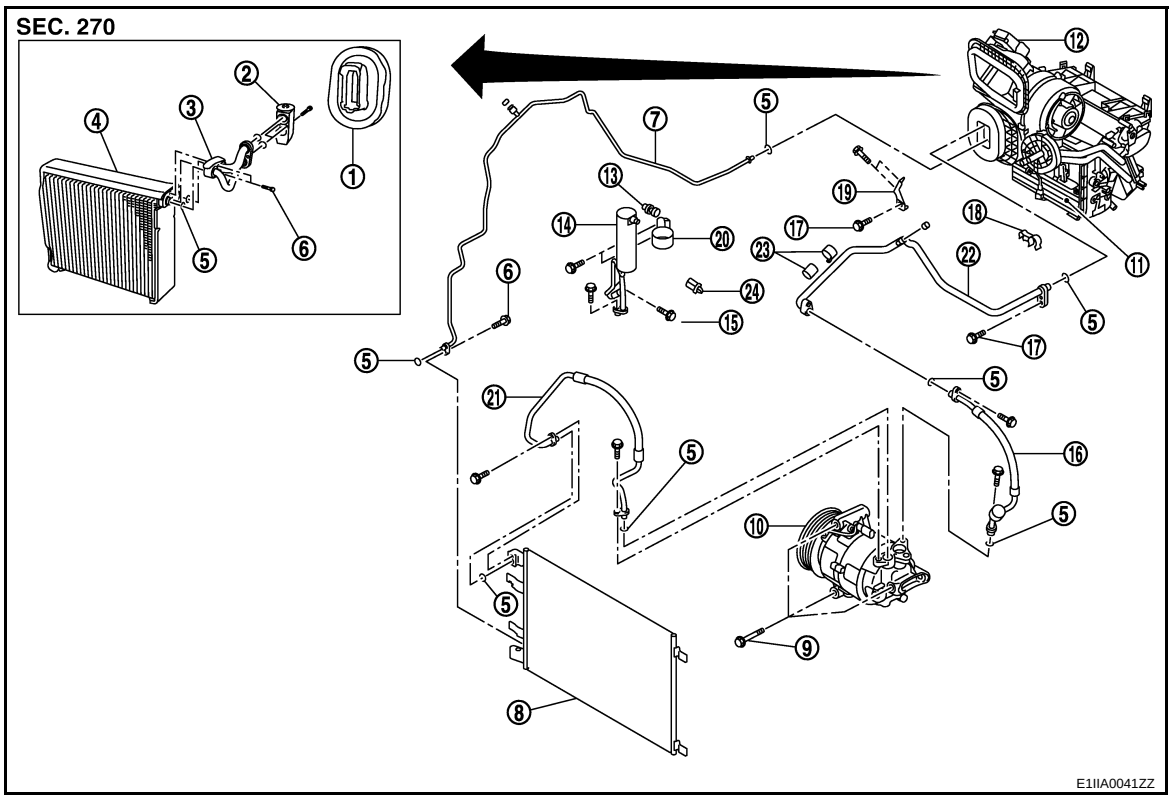
- **Replace O-rings of high-pressure pipe 1 with new ones, and then apply compressor oil to it when installing it.**
- **Female-side piping connection is thin and easy to deform. Slowly insert the male-side piping straight in axial direction.**
- **Insert piping securely until a click is heard.**
- **After 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.**

LOW-PRESSURE PIPE 1 AND HIGH-PRESSURE PIPE 2

Exploded View

INFOID:0000000001550615

Refer to HA-124, "Refrigerant Connection".



1. Heater sealing
2. Expansion valve
3. Low pressure pipe 1 and high pressure pipe 2 assembly
4. Evaporator
5. O-ring
6. Connector pipe fixing bolt
7. High pressure pipe 1
8. Condenser assembly
9. Fixing bolt
10. Compressor
11. Heater & cooling unit assembly
12. Heater & blower unit assembly
13. Refrigerant pressure sensor
14. Liquid tank
15. Liquid tank fixing screw
16. Low pressure flexible hose
17. Fixing bolt
18. Pipes fixing clip
19. Low & high pressure pipe bracket
20. Liquid tank fixing bracket
21. High pressure flexible hose
22. Low pressure pipe 2
23. Low pressure pipe fixing clamp assembly
24. Pipe mantening clip

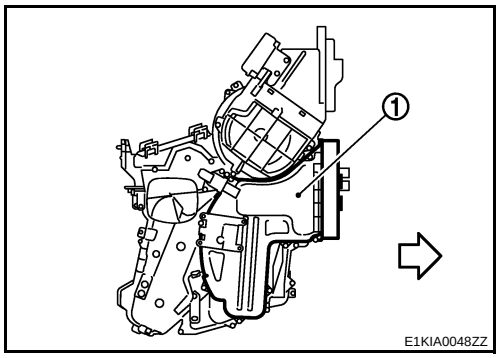
Removal and Installation

INFOID:0000000001550616

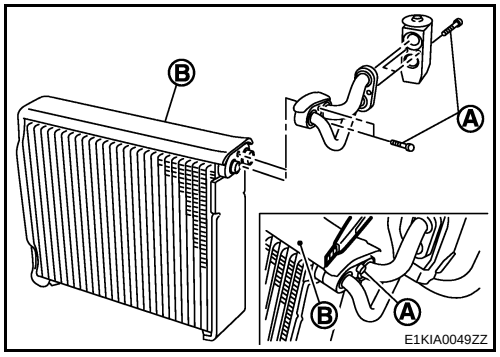
REMOVAL

1. Set the temperature at 18°C (60°F), and then disconnect the battery cable from the negative terminal.
2. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
3. Remove engine cover ornament. Refer to EM-267, "Removal and Installation".
4. Remove high-pressure pipe 1 and low pressure pipe 2 from expansion valve. Refer to HA-148, "Removal and Installation" and HA-152, "Removal and Installation".
   CAUTION:
   Cap or wrap the joint of the, high-pressure pipe 1, low-pressure pipe 2, and the expansion valve with suitable material such as vinyl tape to avoid the entry of air.
5. Remove instrument panel. Refer to IP-12, "Removal and Installation".
6. Remove foot duct (RH / LH). Refer to VTL-56, "FOOT DUCT : Removal and Installation".
7. Remove steering column. Refer to ST-10, "Removal and Installation".

8. Remove steering member. Refer to ST-15, "Removal and Installation".
9. Remove heater and cooling assembly. Refer to VTL-33, "Removal and Installation".
10. Remove mounting screws, and then remove evaporator cover (1).



11. Using a thin cutter, cut the evaporator insulator (B), and remove fixing bolt (A) then remove low-pressure pipe 1 and high-pressure pipe 2 assembly.
CAUTION:
Cap or wrap the joint of expansion valve, high-pressure pipe 2 and low-pressure pipe 1 with suitable material such as vinyl tape to avoid the entry of air.



INSTALLATION

Installation is basically the reverse order of removal.

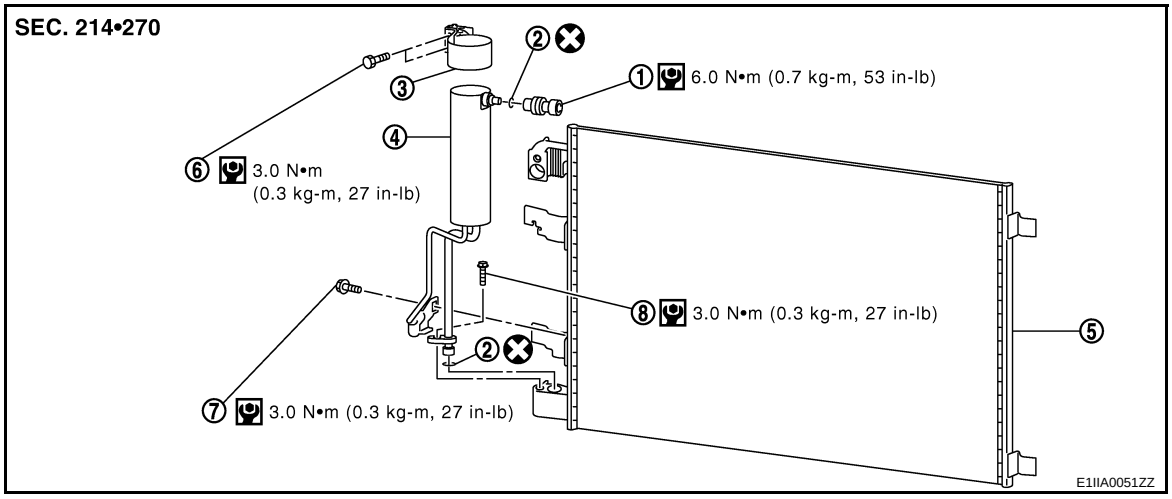
CAUTION:

- **Replace O-rings of high-pressure pipe 1, 2 and low-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.**

CONDENSER

Exploded View

INFOID:0000000001550617



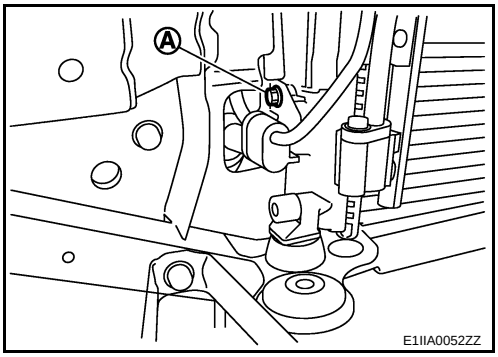
1. Refrigerant pressure sensor
2. O-ring
3. Liquid tank bracket
4. Liquid tank
5. Condensor
6. Liquid tank fixing screw
7. Liquid tank pipe fixing screw
8. Liquid tank pipe fixing bolt

Removal and Installation

INFOID:0000000001550618

REMOVAL

1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
2. Remove front grille. Refer to EXT-17, "Exploded View".
3. Remove front bumper fascia. Refer to EXT-11, "Exploded View".
4. Remove engine undercover.
5. Remove radiator shroud.
6. Remove charge air cooler. Refer to EM-357, "Exploded View".
7. Remove high pressure pipe fixing bolt from liquid tank.
   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.
8. Remove liquid tank pipe fixing screw (A) from radiator.

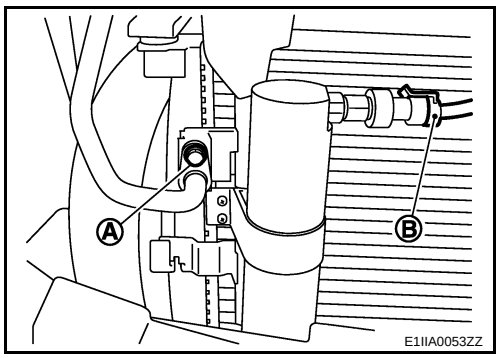


9. Remove high pressure flexible hose fixing bolt (A) from condenser.

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.

Disconnect refrigerant pressure sensor harness connector (B).



10. Remove the condenser from the vehicle.

CAUTION:

Take care do not damaged condenser or radiator.

INSTALLATION

Installation is basically the reverse order of removal.

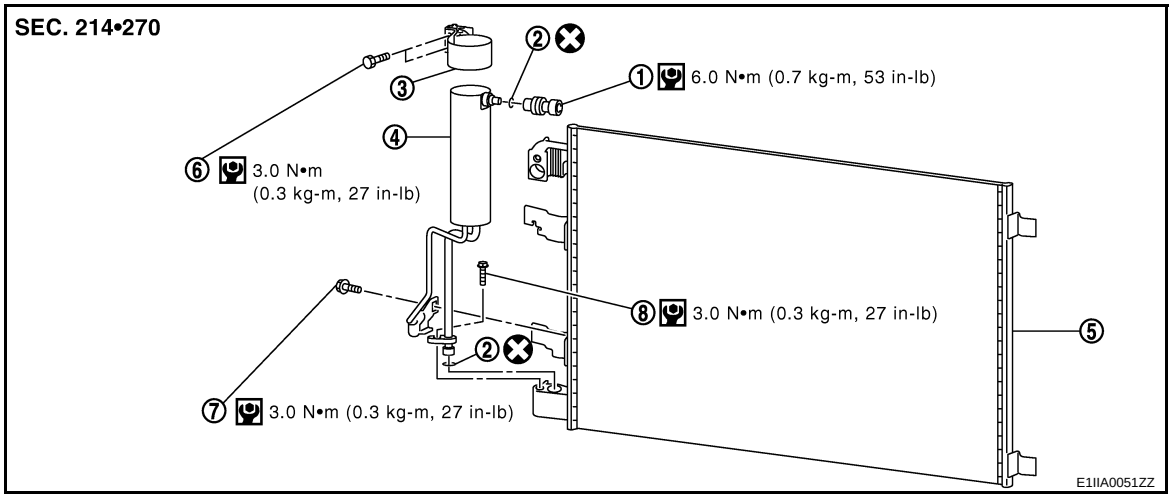
CAUTION:

- **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.**

LIQUID TANK

Exploded View

INFOID:0000000001550619



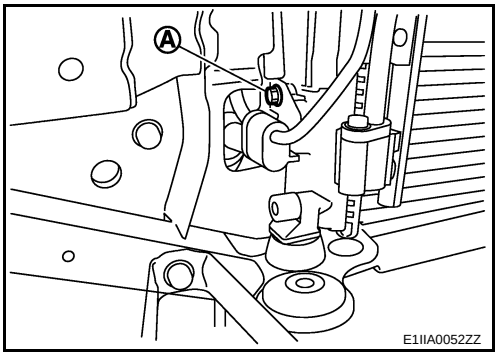
1. Refrigerant pressure sensor
2. O-ring
3. Liquid tank bracket
4. Liquid tank
5. Condensor
6. Liquid tank fixing screw
7. Liquid tank pipe fixing screw
8. Liquid tank pipe fixing bolt

Removal and Installation

INFOID:0000000001550620

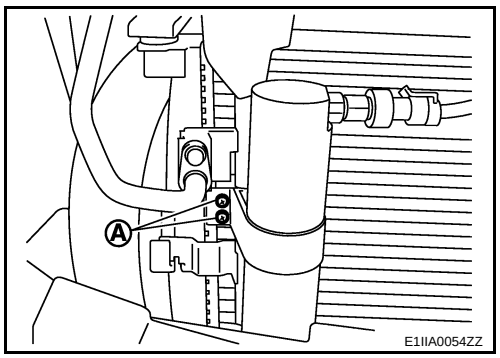
REMOVAL

1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
2. Remove engine cover ornament. Refer to EM-267, "Removal and Installation".
3. Remove front grille. Refer to EXT-17, "Removal and Installation".
4. Remove front bumper fascia. Refer to EXT-11, "Exploded View".
5. Remove engine undercover.
6. Remove radiator shroud.
7. Remove charge air cooler. Refer to EM-357, "Exploded View".
8. Disconnect refrigerant pressure sensor harness connector.
9. Remove high pressure pipe fixing bolt from liquid tank pipe.
   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.
10. Remove liquid tank pipe fixing screw (A) from radiator.



11. Remove liquid tank pipe fixing bolt from condenser.
    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.

12. Remove liquid tank pipe bracket fixing screws (A).



13. Remove the liquid tank assembly.

INSTALLATION

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

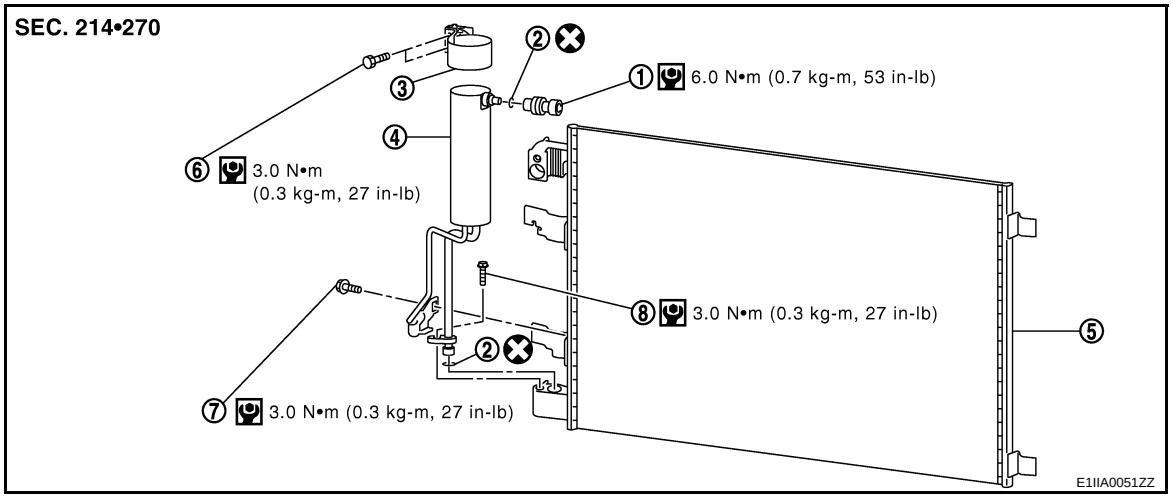
CAUTION:

- **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.**

REFRIGERANT PRESSURE SENSOR

Exploded View

INFOID:0000000001550621



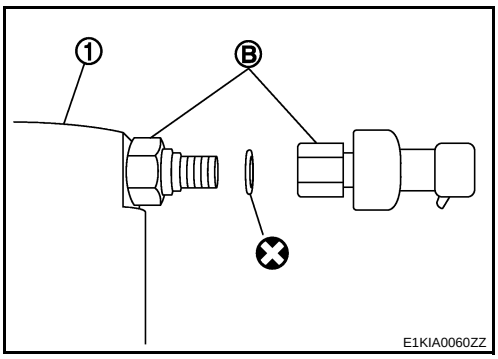
1. Refrigerant pressure sensor
2. O-ring
3. Liquid tank bracket
4. Liquid tank
5. Condensor
6. Liquid tank fixing screw
7. Liquid tank pipe fixing screw
8. Liquid tank pipe fixing bolt

Removal and Installation

INFOID:0000000001550622

REMOVAL

1. Remove liquid tank. Refer to HA-315, "Exploded View".
2. Fix the liquid tank (1) with a vise. Remove the refrigerant pressure sensor from liquid tank adaptator (B) with a wrench.
   CAUTION:
   Be careful not to damage liquid tank.



INSTALLATION

Installation is basically the reverse order of removal.

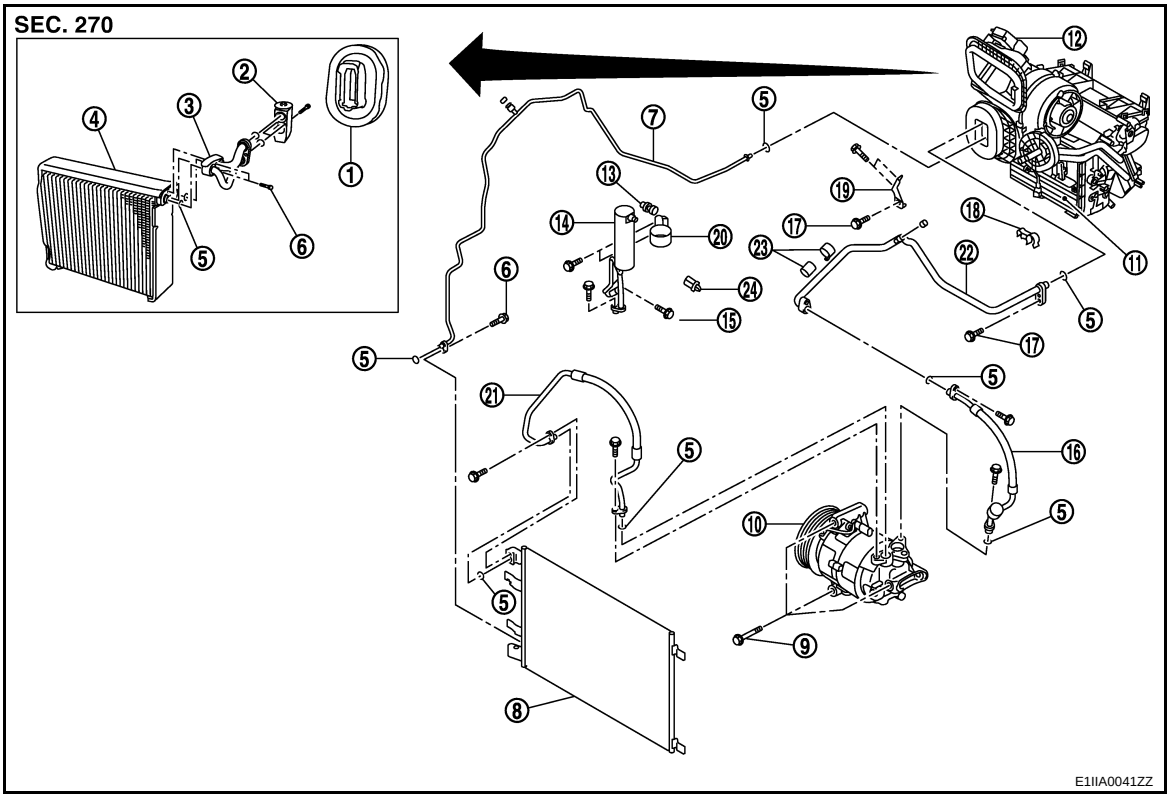
CAUTION:

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

EVAPORATOR

Exploded View

INFOID:0000000001550623



1. Heater sealing	2. Expansion valve	3. Low pressure pipe 1 and high pressure pipe 2 assembly
4. Evaporator	5. O-ring	6. Connector pipe fixing bolt
7. High pressure pipe 1	8. Condenser assembly	9. Fixing bolt
10. Compressor	11. Heater & cooling unit assembly	12. Heater & blower unit assembly
13. Refrigerant pressure sensor	14. Liquid tank	15. Liquid tank fixing screw
16. Low pressure flexible hose	17. Fixing bolt	18. Pipes fixing clip
19. Low & high pressure pipe bracket	20. Liquid tank fixing bracket	21. High pressure flexible hose
22. Low pressure pipe 2	23. Low pressure pipe fixing clamp assembly	24. Pipe mantening clip

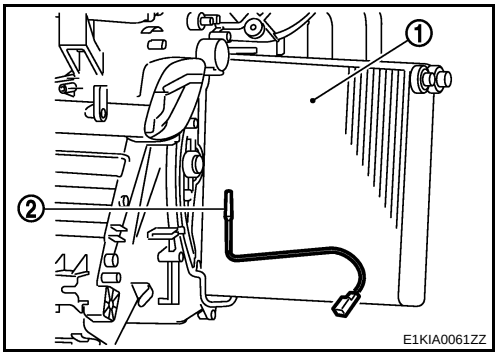
Removal and Installation

INFOID:0000000001550624

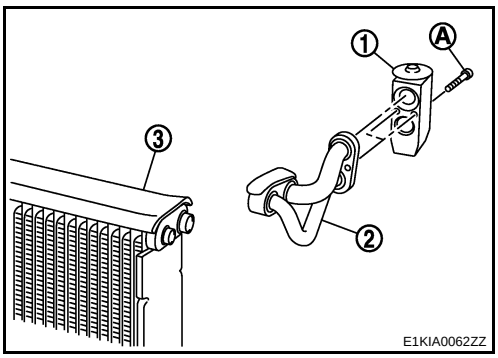
REMOVAL

1. Remove low-pressure pipe 2 and high-pressure pipe 1 from expansion valve. Refer to HA-148, "Removal and Installation", Refer to HA-152, "Removal and Installation".
   CAUTION:
   Cap or wrap the joint of expansion valve, low-pressure pipe 2 and high-pressure pipe 1 with suitable material such as vinyl tape to avoid the entry of air.
2. Remove heater and cooling unit assembly.
3. Remove evaporator cover fixing screws and cover.

4. Slide evaporator (1), and intake sensor (2) from heater and cooling unit assembly.



5. Cut upper insulator (3) and remove mounting bolt (A) and pressure pipe assembly(2) and expansion valve (1), from evaporator.
6. Remove evaporator.



INSTALLATION

Installation is basically the reverse order of removal.

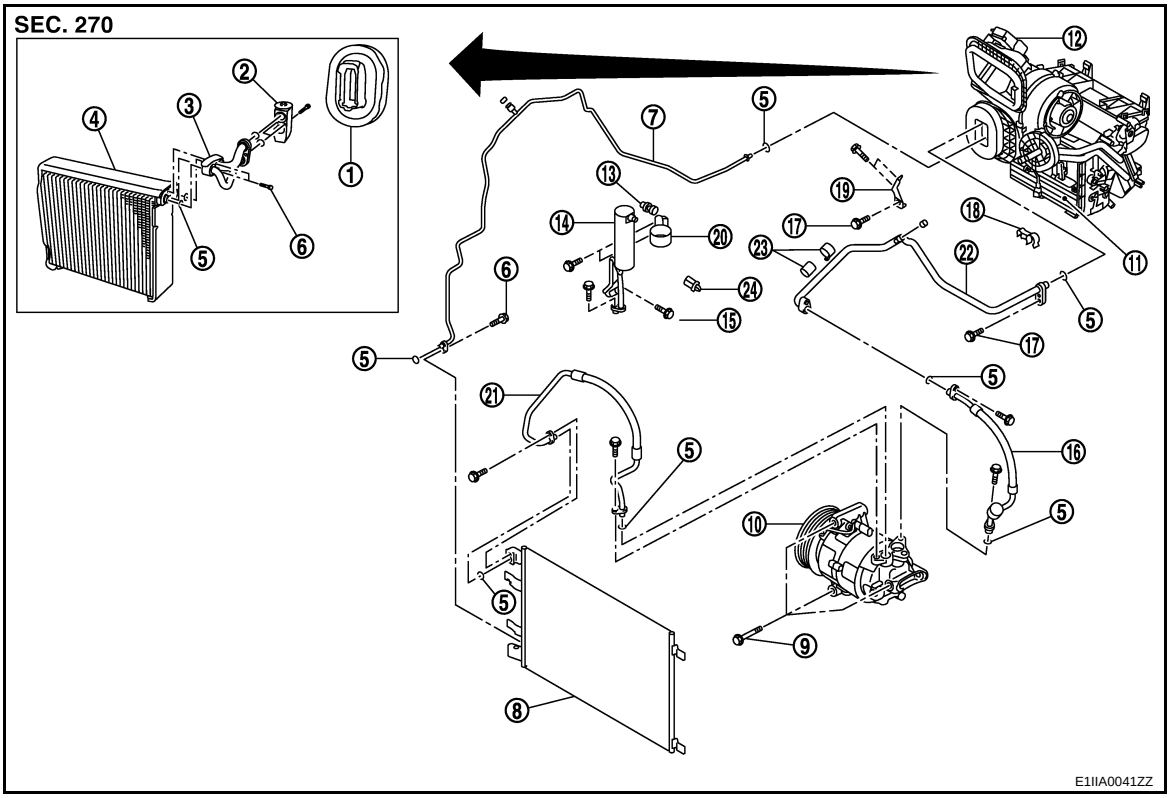
CAUTION:

- **Replace O-rings of low-pressure pipe 1 and high-pressure pipe 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 flexible hose (high-pressure pipe 1) and low-pressure pipe 1 (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.**

EXPANSION VALVE

Exploded View

INFOID:0000000001550625



1. Heater sealing	2. Expansion valve	3. Low pressure pipe 1 and high pressure pipe 2 assembly
4. Evaporator	5. O-ring	6. Connector pipe fixing bolt
7. High pressure pipe 1	8. Condenser assembly	9. Fixing bolt
10. Compressor	11. Heater & cooling unit assembly	12. Heater & blower unit assembly
13. Refrigerant pressure sensor	14. Liquid tank	15. Liquid tank fixing screw
16. Low pressure flexible hose	17. Fixing bolt	18. Pipes fixing clip
19. Low & high pressure pipe bracket	20. Liquid tank fixing bracket	21. High pressure flexible hose
22. Low pressure pipe 2	23. Low pressure pipe fixing clamp assembly	24. Pipe mantening clip

Removal and Installation

INFOID:0000000001550626

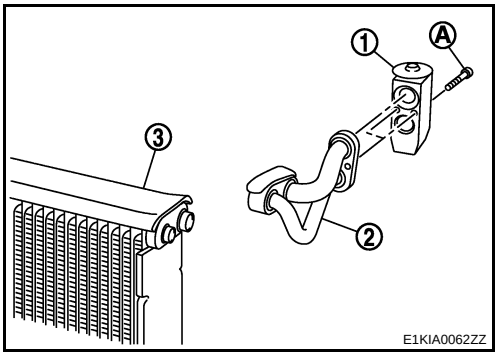
REMOVAL

1. Remove evaporator (3). Refer to HA-154, "Removal and Installation".
2. Remove low pressure pipe 1 and high pressure pipe 2 assembly (2). Refer to HA-154, "Removal and Installation".

3. Remove mounting bolts (A), and then remove expansion valve (1) from low and high pressure pipe assembly (2).

CAUTION:

Cap or wrap the joint of expansion valve, low and high pressure pipe assembly, evaporator and 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 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.**

SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

Compressor

INFOID:0000000001550627

Model		DELPHI THERMAL HUNGARY make 5CVC
Type		Variable displacement swash plate
Displacement cm^3 (cu in)/rev	Max.	120 (7.32)
Cylinder bore × stroke (Max.) mm (in.)		–
Direction of rotation		Clockwise (viewed from clutch)
Drive belt		Poly V
Disc to pulley clearance	Standard	–

Lubricant

INFOID:0000000001550628

Model		DELPHI THERMAL HUNGARY make 5 CVC
Name		Nissan A/C System Oil Type S (DH-PS)
Capacity m ℓ (US fl oz, Imp fl oz)	Total in system	150 (5.03, 5.3)
	Compressor (Service part) charging amount	150 (5.03, 5.3)

Refrigerant

INFOID:0000000001550629

Type	HFC-134a (R-134a)
Capacity kg (lb)	0.45 ± 0.025 (0.99 ± 0.055)

Engine Idling Speed

INFOID:0000000001550630

Refer to ECK-231, "Idle Speed".

Belt Tension

INFOID:0000000001550631

Refer to EM-260, "Inspection and Adjustment".

BASIC INSPECTION

DIAGNOSIS AND REPAIR WORKFLOW

Work Flow

INFOID:0000000001183203

DETAILED FLOW

1. LISTEN TO CUSTOMER COMPLAINT

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

>> GO TO 2.

2. VERIFY THE SYMPTOM WITH OPERATIONAL CHECK

Verify the symptom with operational check. Refer to HAC-140, "Description & Inspection".

>> GO TO 3.

3. GO TO APPROPRIATE TROUBLE DIAGNOSIS

Go to appropriate trouble diagnosis (Refer to HAC-212, "Diagnosis Chart By Symptom" below).

>> GO TO 4.

4. REPAIR OR REPLACE

Repair or replace the specific parts

>> GO TO 5.

5. FINAL CHECK

Final check.

Is the inspection result normal?

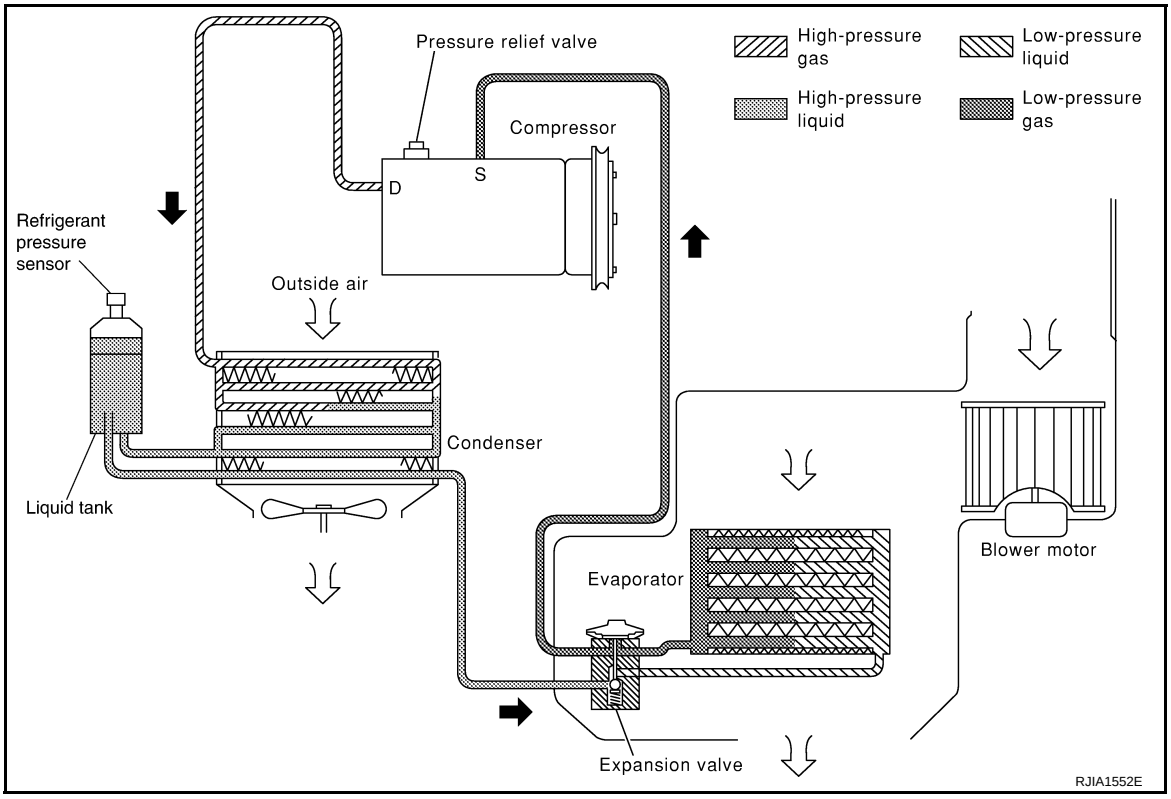
YES >> CHECK OUT
NO >> GO TO 3.

FUNCTION DIAGNOSIS

REFRIGERATION SYSTEM

System Diagram

INFOID:0000000001183204



System Description

INFOID:0000000001183205

REFRIGERANT CYCLE

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

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 3,628 kPa (37 kg/cm^2, 526 psi)], the release port on the pressure relief valve automatically opens and releases refrigerant into the atmosphere.

LUBRICANT

Maintenance of Lubricant Quantity in Compressor

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)

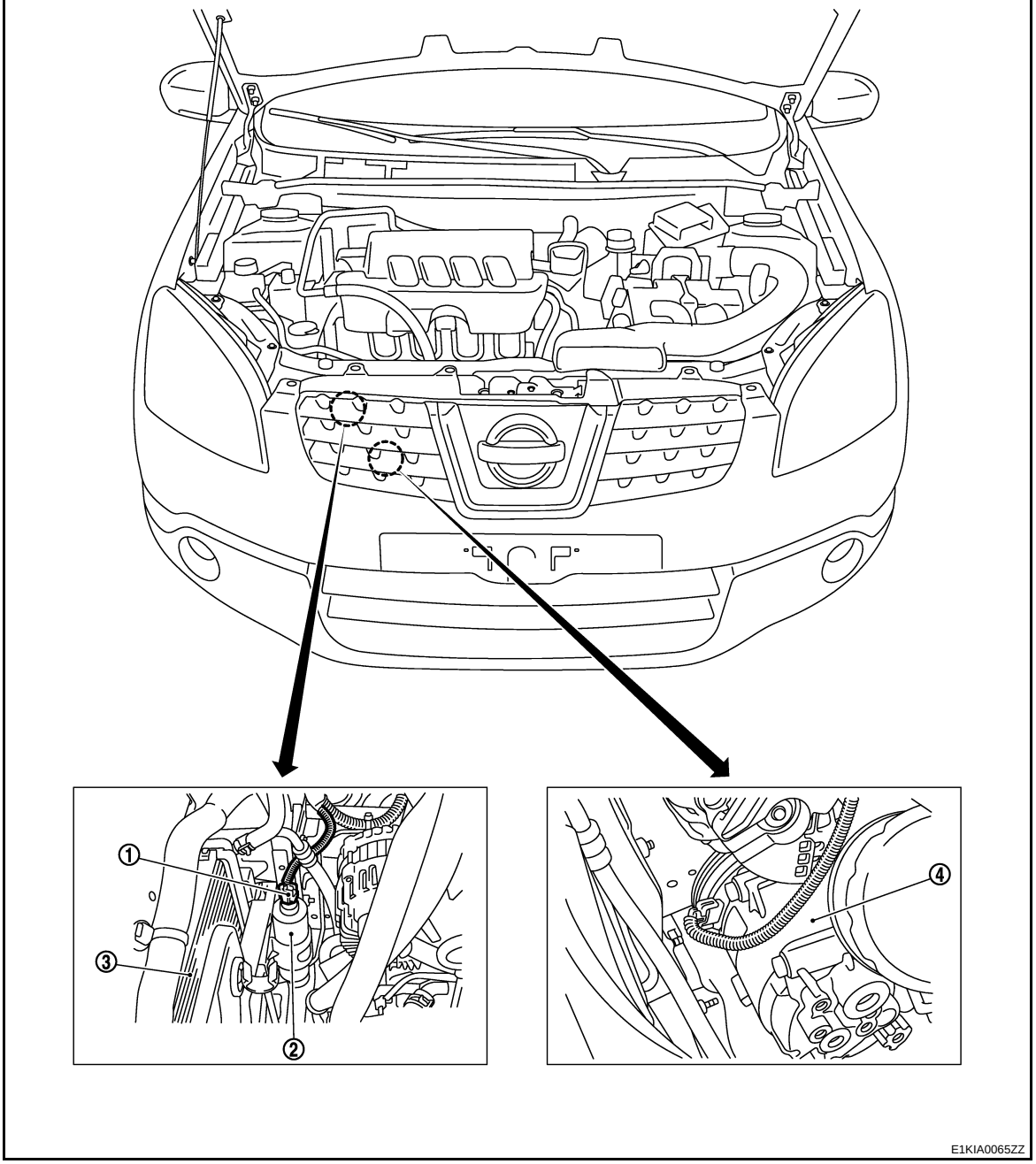
Lubricant

Name	**: Nissan A/C System Oil Type S**

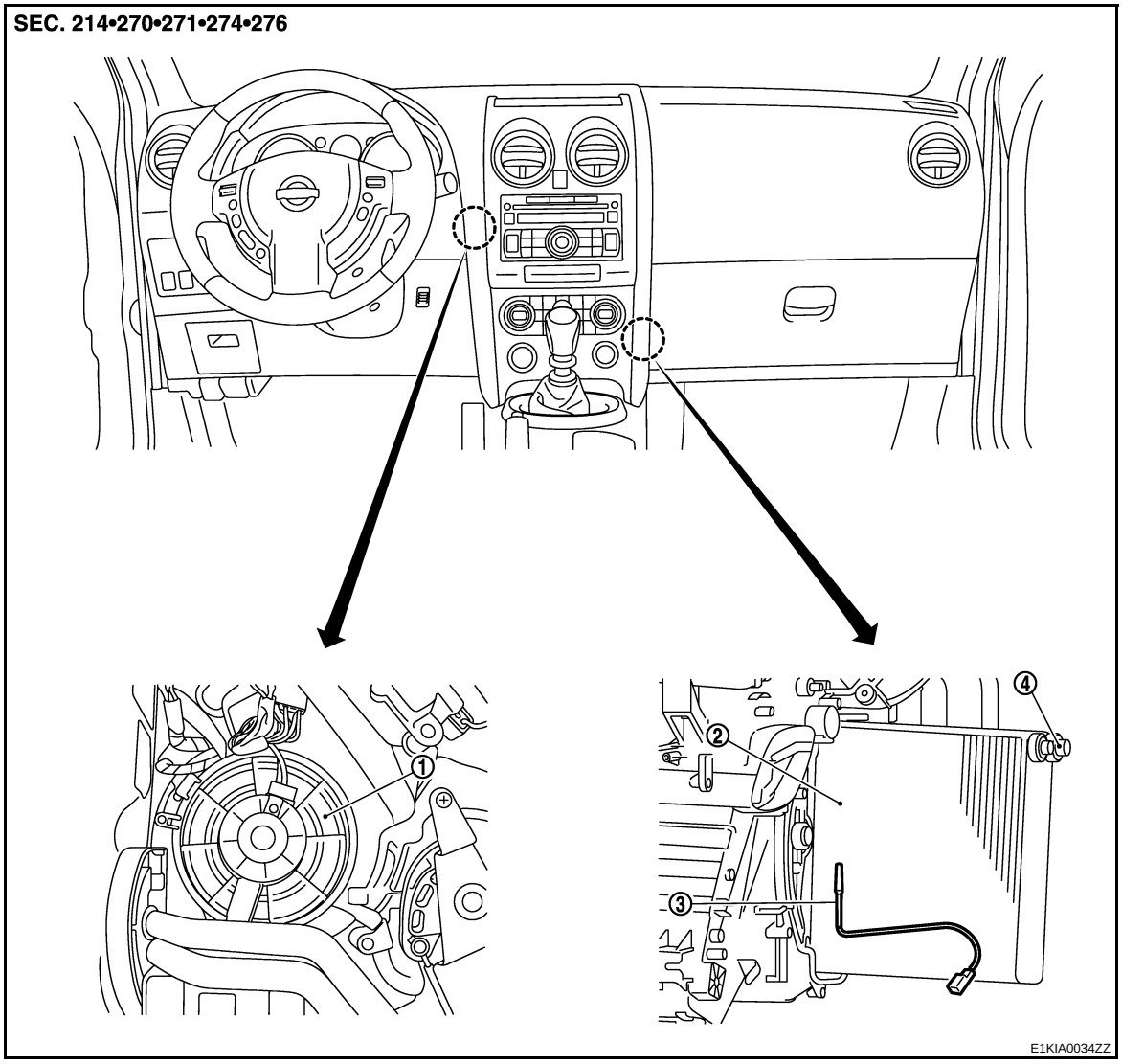
Component Parts Location

INFOID:0000000001183206

SEC. 214•270•271•274•276



1. Refrigerant pressure sensor
2. Liquid tank
3. Radiator
4. Compressor



1. Blower motor assembly
2. Evaporator
3. Intake sensor (AT only)
4. Expansion valve

Component Description

INFOID:0000000001183207

Component	Description
Compressor	Intakes, compresses, and discharges refrigerant, then conveys it to condenser.
Condenser	Condenses refrigerant, and then conveys it to liquid tank.
Liquid tank	Drives moisture out of refrigerant, eliminates foreign matter, then conveys refrigerant to expansion valve.
Refrigerant pressure sensor	Refer to HAC-172, "Component Inspection".
Expansion valve	Vaporizes refrigerant, controls the amount of flow, then conveys refrigerant to evaporator.
Evaporator	Cools passing air, and then conveys it to compressor.
Blower motor	Takes in air in the vehicle or fresh outside air, and then adjusts room temperature by air conditioning.

SYMPTOM DIAGNOSIS

REFRIGERATION SYSTEM SYMPTOMS

SYMPTOM DIAGNOSIS PROCEDURE

SYMPTOM DIAGNOSIS PROCEDURE : Trouble Diagnosis For Unusual Pressure

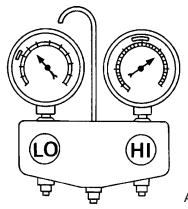
INFOID:0000000001183208

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

BOTH HIGH- AND LOW-PRESSURE SIDES ARE TOO HIGH : Symptom Table

INFOID:0000000001183209

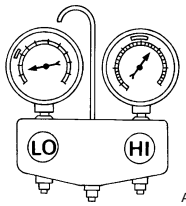
Gauge indication	Refrigerant cycle	Probable cause	Corrective action
Both high- and low-pressure sides are too high.  AC359A	The pressure returns to normal is reduced soon after water is splashed on condenser.	Excessive refrigerant charge in refrigeration cycle.	Reduce refrigerant until specified pressure is obtained.
	Air suction by cooling fan is insufficient.	Insufficient condenser cooling performance. ↓ 1. Condenser fins are clogged. 2. Improper fan rotation of cooling fan.	• Clean condenser. • Check and repair cooling fan as necessary.
	• Low-pressure pipe is not cold. • When compressor is stopped high-pressure value quickly drops by approximately 196 kPa (2 kg/cm^2, 28 psi). It then decreases gradually thereafter.	Poor heat exchange in condenser (After compressor operation stops, high-pressure decreases too slowly.). ↓ Air in refrigeration cycle.	Evacuate repeatedly and recharge system.
	Engine tends to overheat.	Engine cooling systems malfunction.	Check and repair each engine cooling system.
	• An area of the low-pressure pipe is colder than areas near the evaporator outlet. • 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

HIGH-PRESSURE SIDE IS TOO HIGH AND LOW-PRESSURE SIDE IS TOO LOW :

Symptom Table

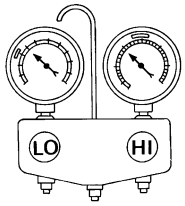
INFOID:0000000001183210

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

HIGH-PRESSURE SIDE IS TOO LOW AND LOW-PRESSURE SIDE IS TOO HIGH : Symptom Table

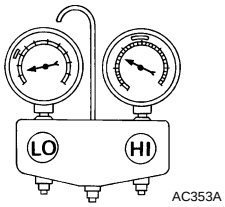
INFOID:0000000001183211

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

BOTH HIGH- AND LOW-PRESSURE SIDES ARE TOO LOW : Symptom Table

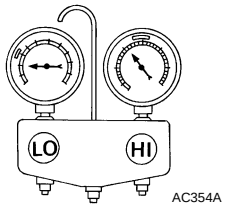
INFOID:0000000001183212

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 HA-190, "Refrigerant Leaks" (HR/MR), HA-242, "Refrigerant Leaks" (K9K).
	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.	• Replace compressor. • Repair evaporator fins. • Replace evaporator. • Refer to HAC-164, "Diagnosis Procedure".

LOW-PRESSURE SIDE SOMETIMES BECOMES NEGATIVE

LOW-PRESSURE SIDE SOMETIMES BECOMES NEGATIVE : Symptom Table

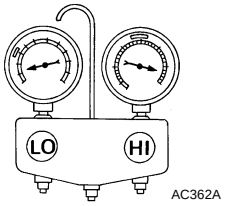
INFOID:0000000001183213

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

LOW-PRESSURE SIDE BECOMES NEGATIVE : Symptom Table

INFOID:0000000001183214

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.

PRECAUTION

PRECAUTIONS

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

INFOID:0000000001183215

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 AIRBAG” and “SEAT BELT” of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision 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 AIRBAG”.**
- **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.**

Precaution Necessary for Steering Wheel Rotation After Battery Disconnect

INFOID:0000000001183216

NOTE:

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

For models equipped with the Intelligent Key system and NATS, an electrically controlled steering lock mechanism is adopted on the key cylinder.
For this reason, if the battery is disconnected or if the battery is discharged, the steering wheel will lock and steering wheel rotation will become impossible.
If steering wheel rotation is required when battery power is interrupted, follow the procedure below before starting the repair operation.

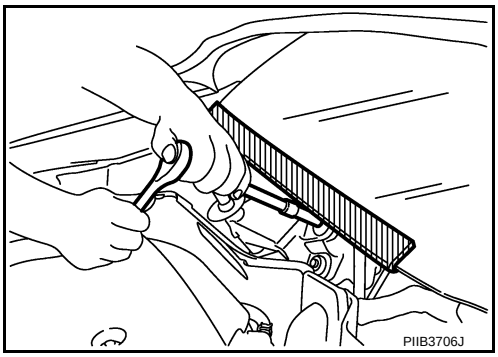
OPERATION PROCEDURE

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

Precaution for Procedure without Cowl Top Cover

INFOID:0000000001183217

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



Precautions For Xenon Headlamp Service

INFOID:0000000001183218

WARNING:

Comply with the following warnings to prevent any serious accident.

- **Disconnect the battery cable (negative terminal) or the power supply fuse before installing, removing, or touching the xenon headlamp (bulb included). The xenon headlamp contains high-voltage generated parts.**
- **Never work with wet hands.**
- **Check the xenon headlamp ON-OFF status after assembling it to the vehicle. Never turn the xenon headlamp ON in other conditions. Connect the power supply to the vehicle-side connector. (Turning it ON outside the lamp case may cause fire or visual impairments.)**
- **Never touch the bulb glass immediately after turning it OFF. It is extremely hot.**

CAUTION:

Comply with the following cautions to prevent any error and malfunction.

- **Install the xenon bulb securely. (Insufficient bulb socket installation may melt the bulb, the connector, the housing, etc. by high-voltage leakage or corona discharge.)**
- **Never perform HID circuit inspection with a tester.**
- **Never touch the xenon bulb glass with hands. Never put oil and grease on it.**
- **Dispose of the used xenon bulb after packing it in thick vinyl without breaking it.**
- **Never wipe out dirt and contamination with organic solvent (thinner, gasoline, etc.).**

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

INFOID:0000000001183219

CAUTION:

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

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

General Refrigerant Precaution

INFOID:0000000001183220

WARNING:

- **Avoid breathing A/C refrigerant and lubricant vapor or mist. Exposure may irritate eyes, nose and throat. Use only approved recovery/recycling equipment to discharge HFC-134a (R-134a) refrigerant.**

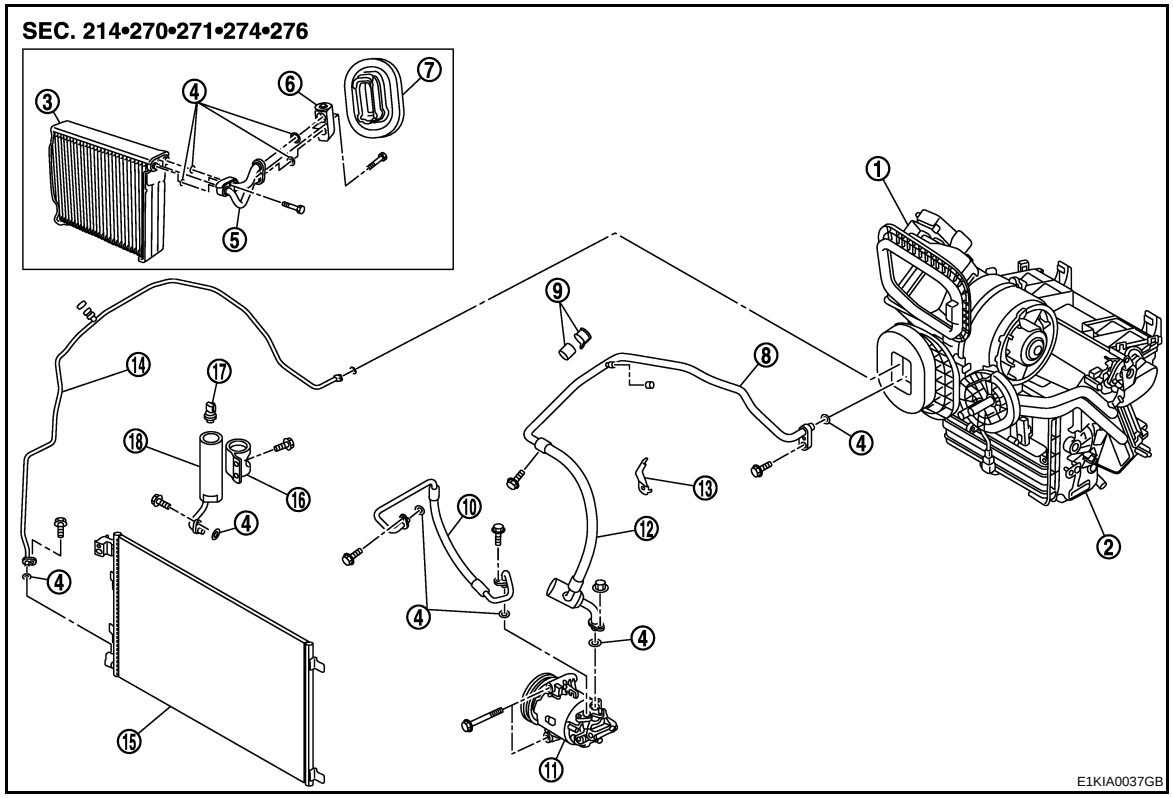
If accidental system discharge occurs, ventilate work area before resuming service. Additional health and safety information may be obtained from refrigerant and lubricant manufacturers.
- **Never release refrigerant into the air. Use approved recovery/recycling equipment to capture the refrigerant every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

Refrigerant Connection

INFOID:0000000001183221

A new type refrigerant connection has been introduced to all refrigerant lines except the following location.
- Expansion valve to evaporator
- Refrigerant pressure sensor to liquid tank

O-RING AND REFRIGERANT CONNECTION



1. Heater & blower unit assembly	2. Heater & cooling unit assembly	3. Evaporator
4. O-ring	5. Low pressure pipe 1 and high pressure pipe 2 assembly	6. Expansion valve
7. Heater sealing	8. Low pressure flexible hose and pipe 2	9. Low pressure pipe 2 fixing clamp assembly
10. High pressure flexible hose	11. Compressor	12. Low pressure flexible hose

13. Low & high pipe bracket support
14. High pressure pipe 1
15. Condenser assembly
16. Liquid tank fixing bracket
17. Refrigerant pressure sensor
18. Liquid tank

CAUTION:

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

O-Ring Part Numbers and Specifications

Connection type	Piping connection point		Part number	QTY	O-ring size
New	Low pressure pipe 2 to expansion valve		92473 N8210	1	16
	High pressure flexible pipe 1 to condenser		92472 N8210	1	12
	High pressure pipe 1 to expansion valve		92471 N8210	1	8
	Low pressure pipe 1 and high pressure	Inlet	92475 71L00	1	12
	pipe 2 assembly to expansion valve	Outlet	92475 72L00	1	16
	Low pressure pipe 1 and high pressure	Inlet	92475 71L00	1	12
	pipe 2 assembly to evaporator	Outlet	92475 72L00	1	16
	High pressure pipe 1 to liquid tank		92471 N8210	1	8
	Compressor to low pressure flexible hose		77030 65315	2	16
	Compressor to high pressure flexible hose		77030 65316	2	12
	Liquid tank to condenser		92473 N8210	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:

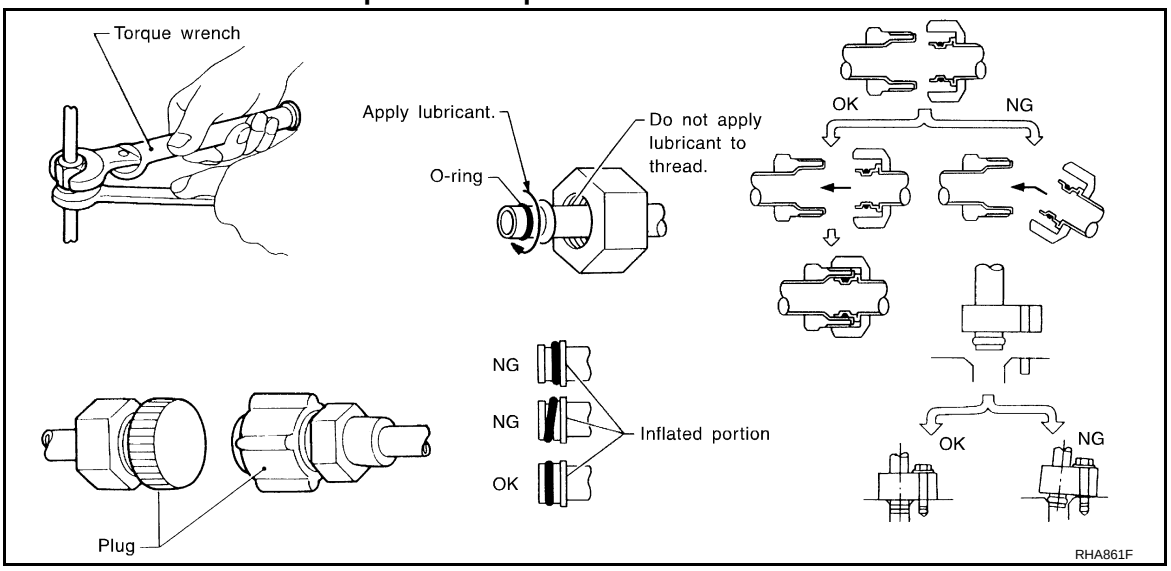
When replacing or cleaning refrigerant cycle components, observe the following.

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



Service Equipment

INFOID:0000000001183222

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.

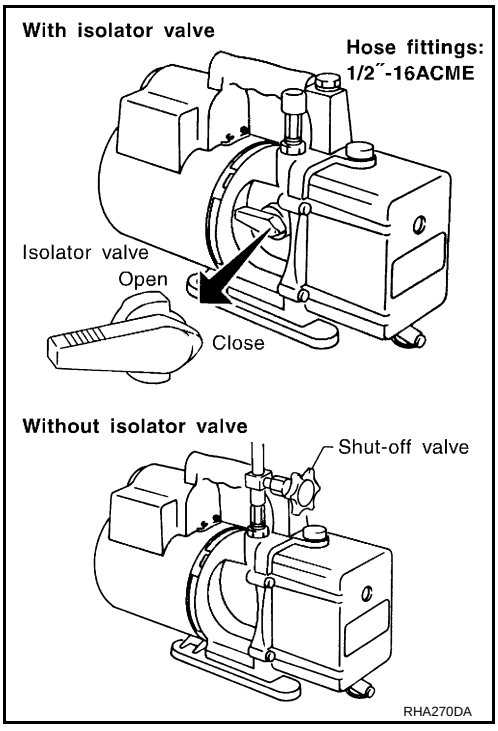
VACUUM PUMP

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.

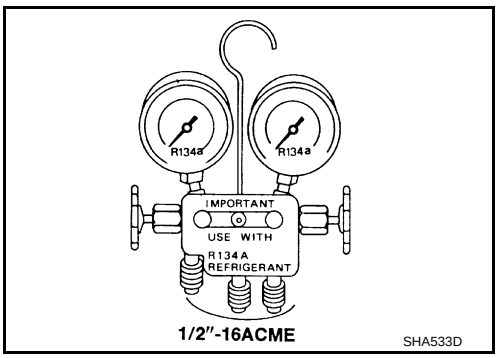
- Usually vacuum pumps have a manual isolator valve as part of the pump. Close this valve to isolate the service hose from the pump.
- For pumps without an isolator, use a hose equipped with a manual shut-off valve near the pump end. Close the valve to isolate the hose from the pump.
- If the hose has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



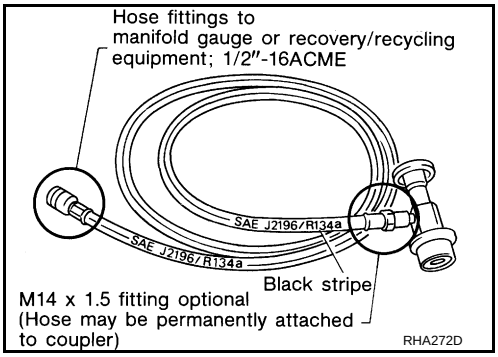
MANIFOLD GAUGE SET

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

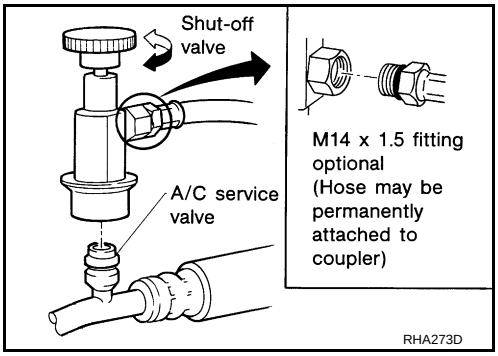
Be certain that the service hoses display the markings described (colored hose with black stripe). All hoses must include positive shut-off devices (either manual or automatic) near the end of the hoses opposite to the manifold gauge.



SERVICE COUPLERS

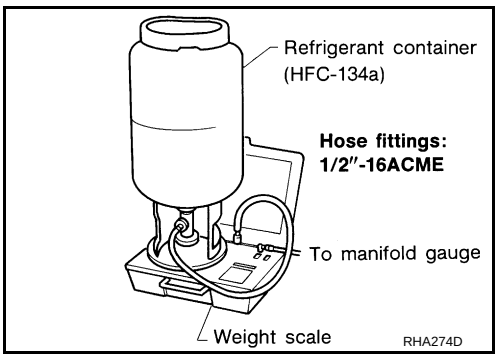
Never attempt to connect HFC-134a (R-134a) service couplers to a CFC-12 (R-12) A/C system. The HFC-134a (R-134a) couplers will not properly connect to the CFC-12 (R-12) system. However, if an improper connection is attempted, discharging and contamination may occur.

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 electronic scale or of quality recycle/recharge equipment.

COMPRESSOR

General Precautions

INFOID:0000000001183223

CAUTION:

- **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 HA-238, "Adjustment".**
- **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.**

LEAK DETECTION DYE

General Precautions

INFOID:0000000001183224

CAUTION:

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

IDENTIFICATION

NOTE:

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

IDENTIFICATION LABEL FOR VEHICLE

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

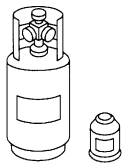
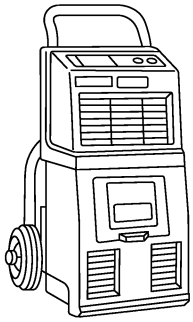
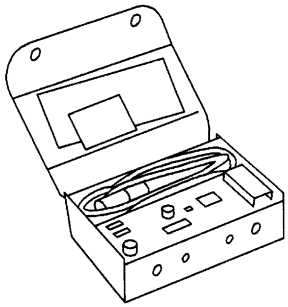
PREPARATION

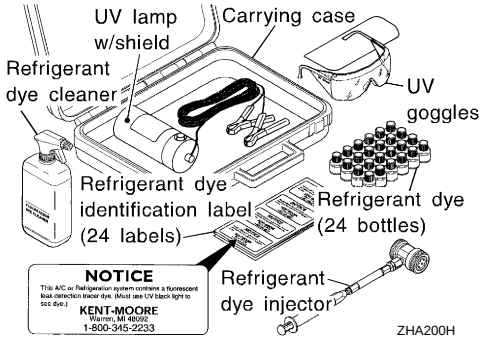
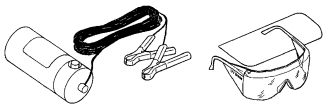
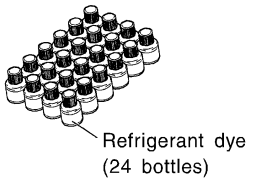
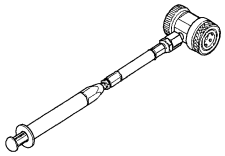
PREPARATION

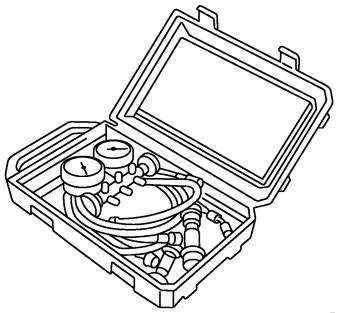
HFC-134a (R-134a) Service Tools and Equipment

INFOID:0000000001183225

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.
Adapters that convert one size fitting to another must never be used: refrigerant/lubricant contamination will occur and compressor malfunction will result.

Tool number Tool name		Description
HFC-134a (R-134a) refrigerant	 S-NT196	Container color: Light blue Container marking: HFC-134a (R-134a) Fitting size: Thread size • Large container 1/2″-16 ACME
KLH00-PAGS0 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) Lubricity: 40 m ℓ (1.4 Imp fl oz.)
Recovery/Recycling/ Recharging equipment (ACR4)	 RJIA0195E	Function: Refrigerant recovery and recycling and recharging
Electrical leak detector	 A/C leak detector SHA705EB	Power supply: DC 12V (Cigarette lighter)

Tool number Tool name		Description
(J-43926) Refrigerant dye leak detection kit Kit includes: (J-42220) UV lamp and UV safety goggles (J-41459) HFC-134a (R-134a) dye injector Use with J-41447, 1/4 ounce bottle (J-41447) HFC-134a (R-134a) fluorescent leak detection dye (Box of 24, 1/4 ounce bottles) (J-43872) Refrigerant dye cleaner		Power supply: DC 12 V (Battery terminal)
(J-42220) UV lamp and UV safety goggles		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)		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		For injecting 1/4 ounce of fluorescent leak detection dye into A/C system

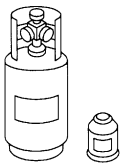
Tool number Tool name		Description
(J-43872) Refrigerant dye cleaner	 SHA441F	For cleaning dye spills
(J-39183) Manifold gauge set (with hoses and couplers)	 RJIA0196E	Identification: • The gauge face indicates HFC-134a (R-134a). Fitting size: Thread size • 1/2″-16 ACME

Sealant or/and Lubricant

INFOID:0000000001183226

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

- 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 name		Description
HFC-134a (R-134a) refrigerant	 S-NT196	Container color: Light blue Container marking: HFC-134a (R-134a) Fitting size: Thread size • Large container 1/2″-16 ACME
Nissan A/C System Oil Type S (DH-PS)	 S-NT197	Type: Polyalkylene glycol oil (PAG), type S (DH-PS) Application: HFC-134a (R-134a) swash plate compressors (Nissan only) Capacity: 40 m ℓ (1.4 US fl oz., 1.4 Imp fl oz.)

ON-VEHICLE MAINTENANCE

LUBRICANT

Adjustment

INFOID:0000000001183227

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.

Is it successful?

YES >> GO TO 2.
NO >> 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 >> Refer to "LUBRICANT ADJUSTING PROCEDURE FOR COMPRESSOR REPLACEMENT".
NO >> Refer to "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:

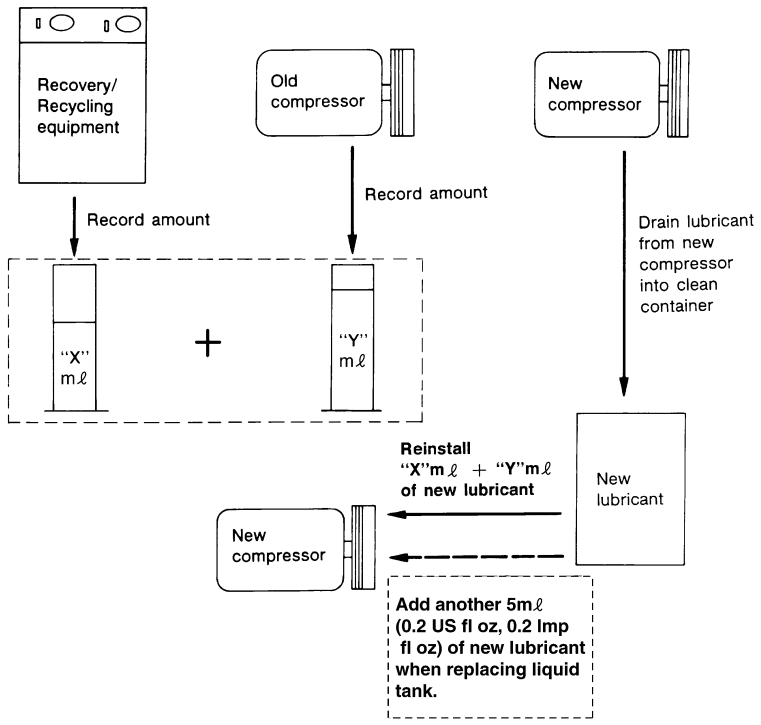
Part replaced	Lubricant to be added to system	Remarks
	Amount of lubricant mℓ (US fl oz., Imp fl oz.)	
Evaporator	75 (2.5, 2.6)	—
Condenser	35 (1.2, 1.2)	—
Liquid tank	10 (0.3, 0.4)	—
In case of refrigerant leak	30 (1.0, 1.1)	Large leak
	—	Small leak *1

*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 HA-228, "Working with HFC-134a (R-134a)".
3. Confirm refrigerant purity in vehicle A/C system using recovery/recycling recharging equipment and refrigerant identifier. If NG, refer to HA-228, "Working with HFC-134a (R-134a)".
4. Discharge refrigerant into the refrigerant recovery/recycling equipment. Measure lubricant discharged into the recovery/recycling equipment.
5. Drain the lubricant from the old (removed) compressor into a graduated container and recover the amount of lubricant drained.
6. Drain the lubricant from the new compressor into a separate, clean container.
7. Measure an amount of new lubricant installed equal to amount drained from old compressor. Add this lubricant to new compressor through the suction port opening.
8. Measure an amount of new lubricant equal to the amount recovered during discharging. Add this lubricant to new compressor through the suction port opening.
9. If the liquid tank also needs to be replaced, add another 5 m ℓ (0.2 US fl oz., 0.2 Imp fl oz.) of lubricant at this time.
   Do not add this 5 m ℓ (0.2 US fl oz., 0.2 Imp fl oz.) of lubricant when replaces the compressor only.

Lubricant adjusting procedure for compressor replacement

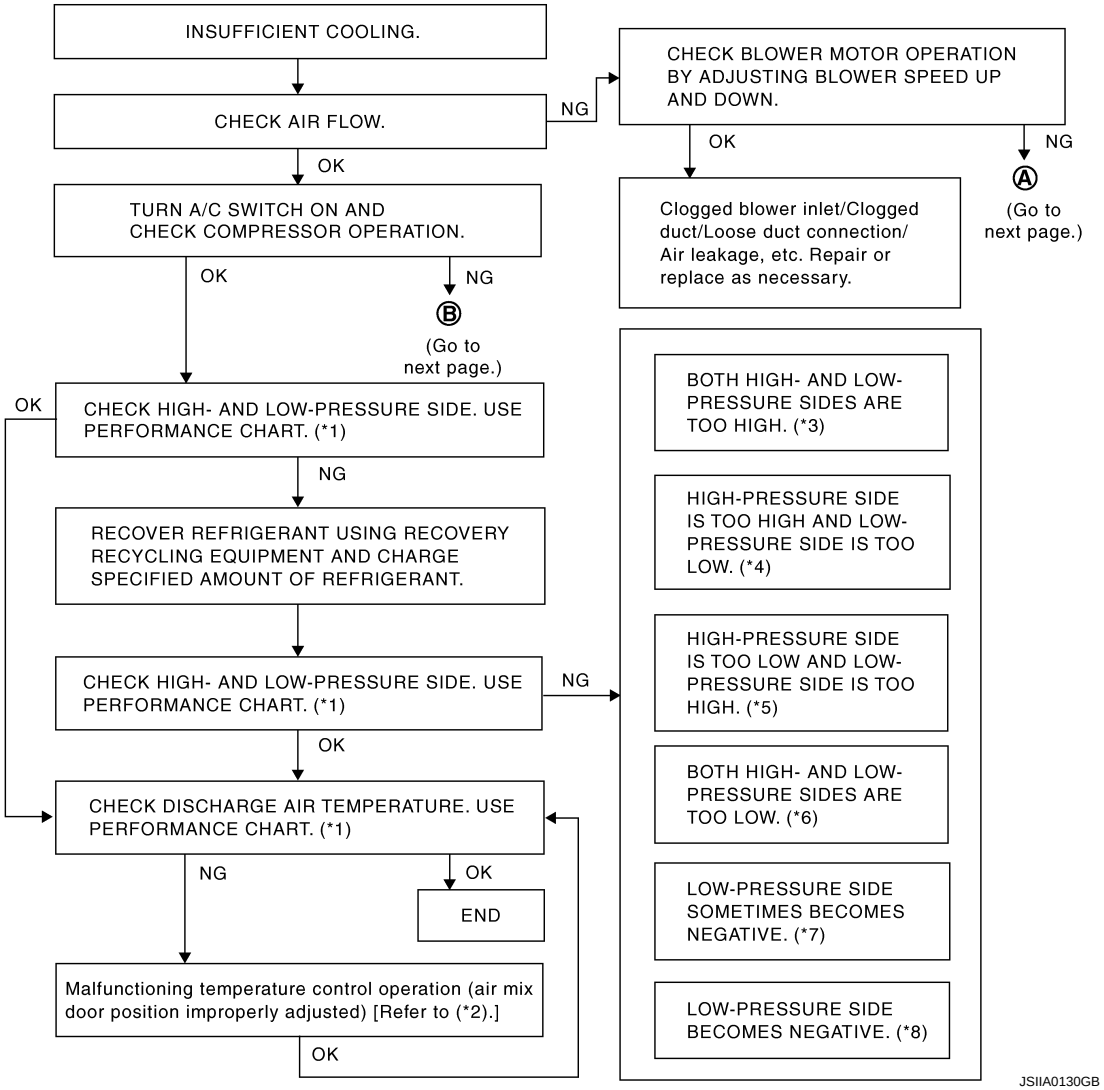


REFRIGERATION SYSTEM

Inspection

INFOID:0000000001183228

PERFORMANCE TEST DIAGNOSIS



*1 HA-189, "Performance Chart"

*2 HAC-212, "Diagnosis Chart By Symptom"

*3 HA-223, "BOTH HIGH- AND LOW-PRESSURE SIDES ARE TOO HIGH : Symptom Table"

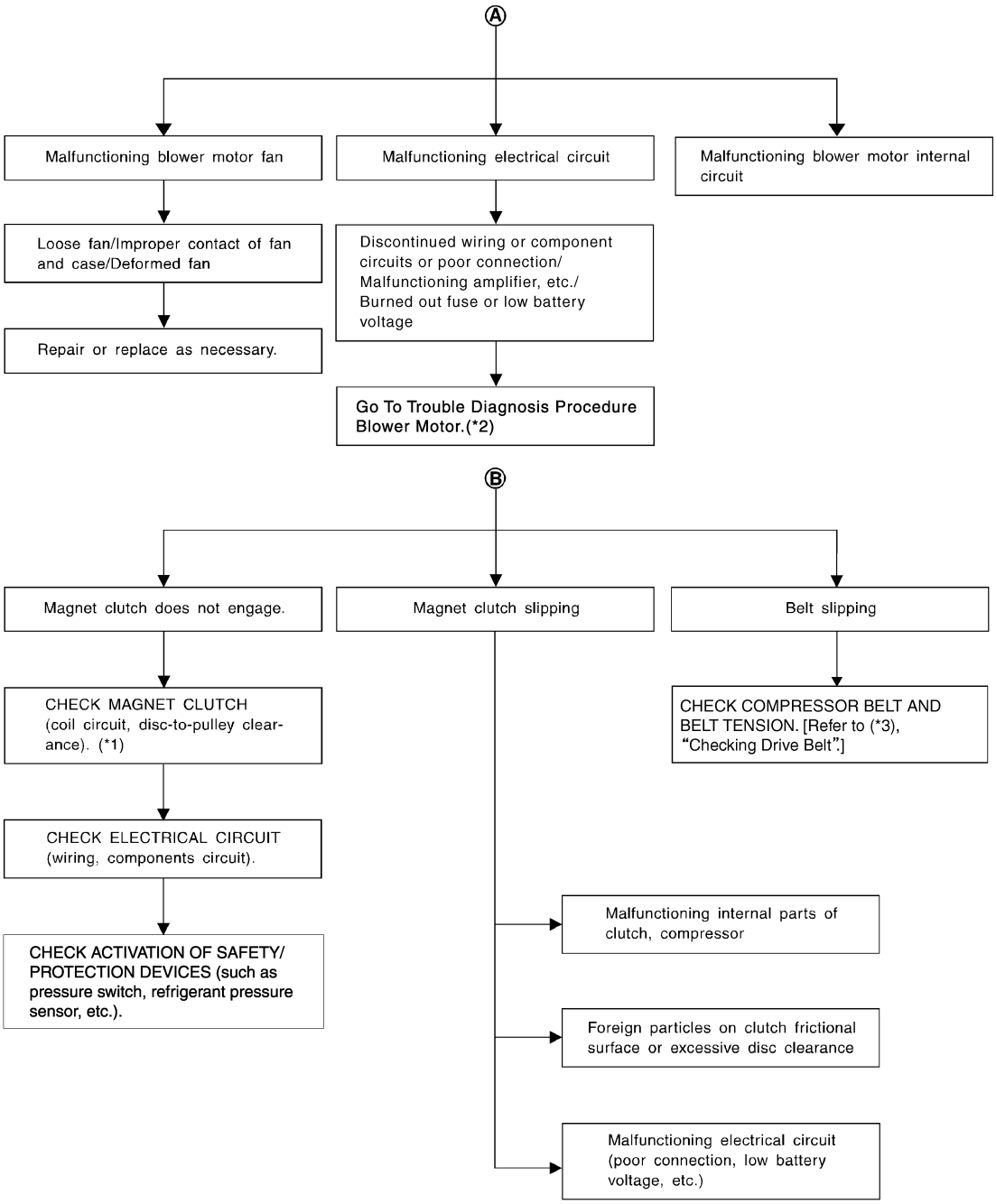
*4 HA-223, "HIGH-PRESSURE SIDE IS TOO HIGH AND LOW-PRESSURE SIDE IS TOO LOW : Symptom Table"

*5 HA-224, "HIGH-PRESSURE SIDE IS TOO LOW AND LOW-PRESSURE SIDE IS TOO HIGH : Symptom Table"

*6 HA-225, "BOTH HIGH- AND LOW-PRESSURE SIDES ARE TOO LOW : Symptom Table"

*7 HA-225, "LOW-PRESSURE SIDE SOMETIMES BECOMES NEGATIVE : Symptom Table"

*8 HA-226, "LOW-PRESSURE SIDE BECOMES NEGATIVE : Symptom Table"



SJIA1642E

*1 HA-188, "Inspection" *2 HAC-212, "Diagnosis Chart By Symptom" *3 EM-16, "Checking" (HR), EM-135, "Checking" (MR)

Performance Chart

INFOID:0000000001555636

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

Vehicle condition	Indoors or in the shade (in a well-ventilated place)
Hood	Open
TEMP.	Max. COLD
Mode switch	(Ventilation) set
Intake switch	(Recirculation) set
Fan (blower) speed	Max. speed set
Engine speed	Idle speed
Operate the air conditioning system for 10 minutes before taking measurements.	

TEST READING

Recirculating-to-discharge Air Temperature Table

Inside air (Recirculating air) at blower assembly inlet		Discharge air temperature at center ventilator °C (°F)
Relative humidity %	Air temperature °C (°F)	
50 - 60	20 (68)	7.0 - 7.3 (44.6 - 45.1)
	25 (77)	8.9 - 10.0 (48.0 - 50.0)
	30 (86)	10.9 - 13.1 (51.6 - 55.6)
	35 (95)	17.8 - 19.3 (64.0 - 66.7)
60 - 70	20 (68)	7.3 - 7.6 (45.1 - 45.7)
	25 (77)	10.0 - 11.0 (50.0 - 51.8)
	30 (86)	13.1 - 15.2 (55.6 - 59.4)
	35 (95)	19.3 - 20.8 (66.7 - 69.4)

Ambient Air Temperature-to-operating Pressure Table

Ambient air		High-pressure (Discharge side)							
Relative humidity %	Air temperature °C (°F)	Bar		kPa		kg/cm^2		psi	
		From	to	From	to	From	to	From	to
50 - 70	20 (68)	9.3	11.2	930.0	1120.0	9.5	11.4	134.9	162.4
	25 (77)	12.7	14.4	1270.0	1440.0	13.0	14.7	184.2	208.8
	30 (86)	14.5	17.8	1450.0	1780.0	14.8	18.2	210.3	258.1
	35 (95)	17.3	19.5	1730.0	1950.0	17.6	19.9	250.9	282.8
	40 (104)	17.5	19.4	1750.0	1940.0	17.8	19.8	253.8	281.3

Ambient Air Temperature-to-operating Pressure Table

Ambient air		Low pressure (Suction side)							
Relative humidity %	Air temperature °C (°F)	Bar		kPa		kg/cm^2		psi	
		From	to	From	to	From	to	From	to
50 - 70	20 (68)	2.1	2.2	210.0	220.0	2.1	2.2	30.5	31.9
	25 (77)	2.5	2.5	250.0	250.0	2.5	2.5	36.3	36.3
	30 (86)	2.5	3.1	250.0	310.0	2.5	3.2	36.3	45.0
	35 (95)	3.2	3.6	320.0	360.0	3.3	3.7	46.4	52.2
	40 (104)	3.6	4.0	360.0	400.0	3.7	4.1	52.2	58.0

Refrigerant Leaks

INFOID:0000000001183229

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.

FLUORESCENT LEAK DETECTOR

Inspection

INFOID:0000000001183230

CHECKING SYSTEM FOR LEAKS USING THE FLUORESCENT LEAK DETECTOR

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

(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.

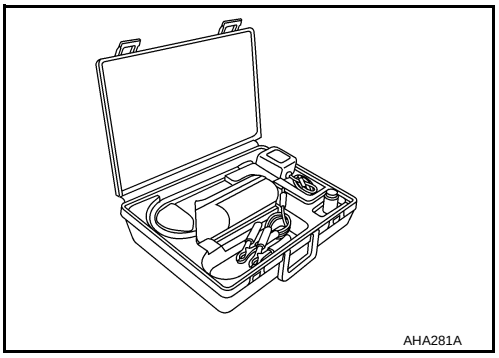
ELECTRICAL LEAK DETECTOR

Inspection

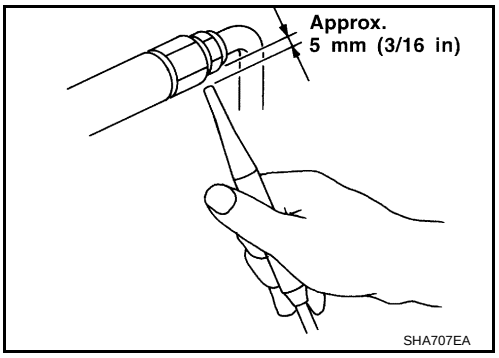
INFOID:0000000001183231

PRECAUTIONS FOR HANDLING LEAK DETECTOR

When performing a refrigerant leak check, use an electrical leak detector (SST: J-41995) 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.

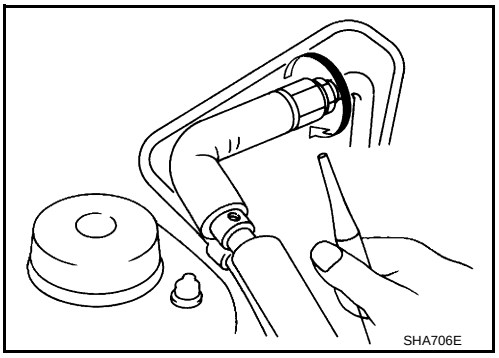

AHA281A

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

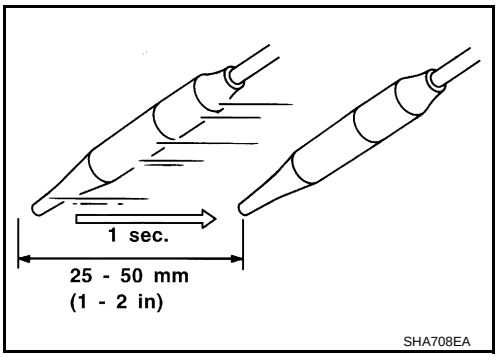


SHA707EA

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


SHA706E

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



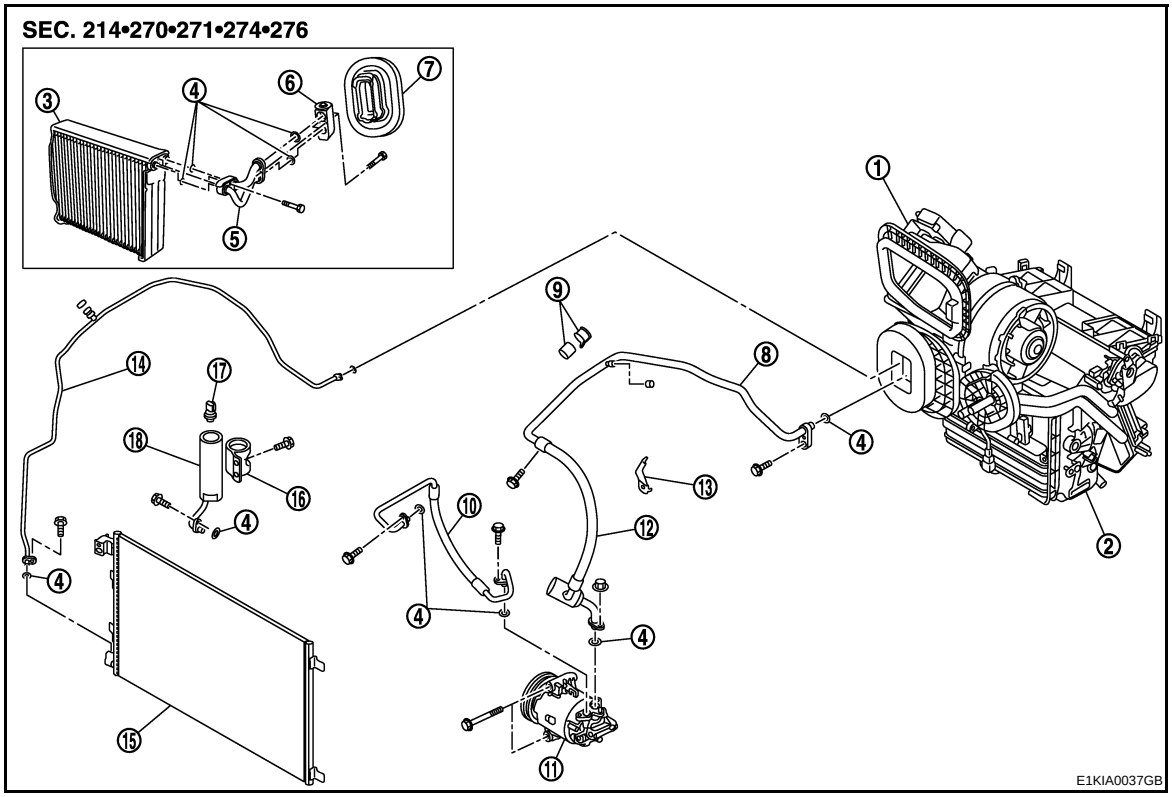
SHA708EA

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 j) to the low-pressure side (evaporator drain hose k to shaft seal p). 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.



1. Heater & blower unit assembly	2. Heater & cooling unit assembly	3. Evaporator
4. O-ring	5. Low pressure pipe 1 and high pressure pipe 2 assembly	6. Expansion valve
7. Heater sealing	8. Low pressure flexible hose and pipe 2	9. Low pressure pipe 2 fixing clamp assembly
10. High pressure flexible hose	11. Compressor	12. Low pressure flexible hose
13. Low & high pipe bracket support	14. High pressure pipe 1	15. Condenser assembly
16. Liquid tank fixing bracket	17. Refrigerant pressure sensor	18. Liquid tank

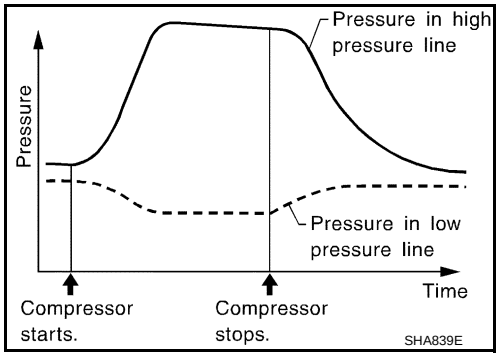
Compressor
Check the fitting of high- and low-pressure flexible hoses, relief valve and shaft seal.
Condenser
Check the fitting of condenser pipe assembly, high-pressure flexible hose and pipe.
Liquid tank
Check the fitting of radiator & condenser assembly and refrigerant pressure sensor.
Service valves
Check all around the service valves. Ensure service valve caps are secured on the service valves (to prevent leaks).
NOTE:
After removing A/C manifold gauge set from service valves, wipe any residue from valves to prevent any false readings by leak detector.
Cooling unit (Evaporator)

With engine OFF, turn blower fan on “High” for at least 15 seconds to dissipate any refrigerant trace in the cooling unit. Wait a minimum of 10 minutes accumulation time (refer to the manufacturer’s recommended procedure for actual wait time) before inserting the leak detector probe into the drain hose.
Keep the probe inserted for at least 10 seconds. Use caution not to contaminate the probe tip with water or dirt that may be in the drain hose.

5. If a leak detector detects a leak, verify at least once by blowing compressed air into area of suspected leak, then repeat check as outlined above.
6. Do not stop when one leak is found. Continue to check for additional leaks at all system components.
If no leaks are found, perform steps 7 - 10.
7. Start 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.

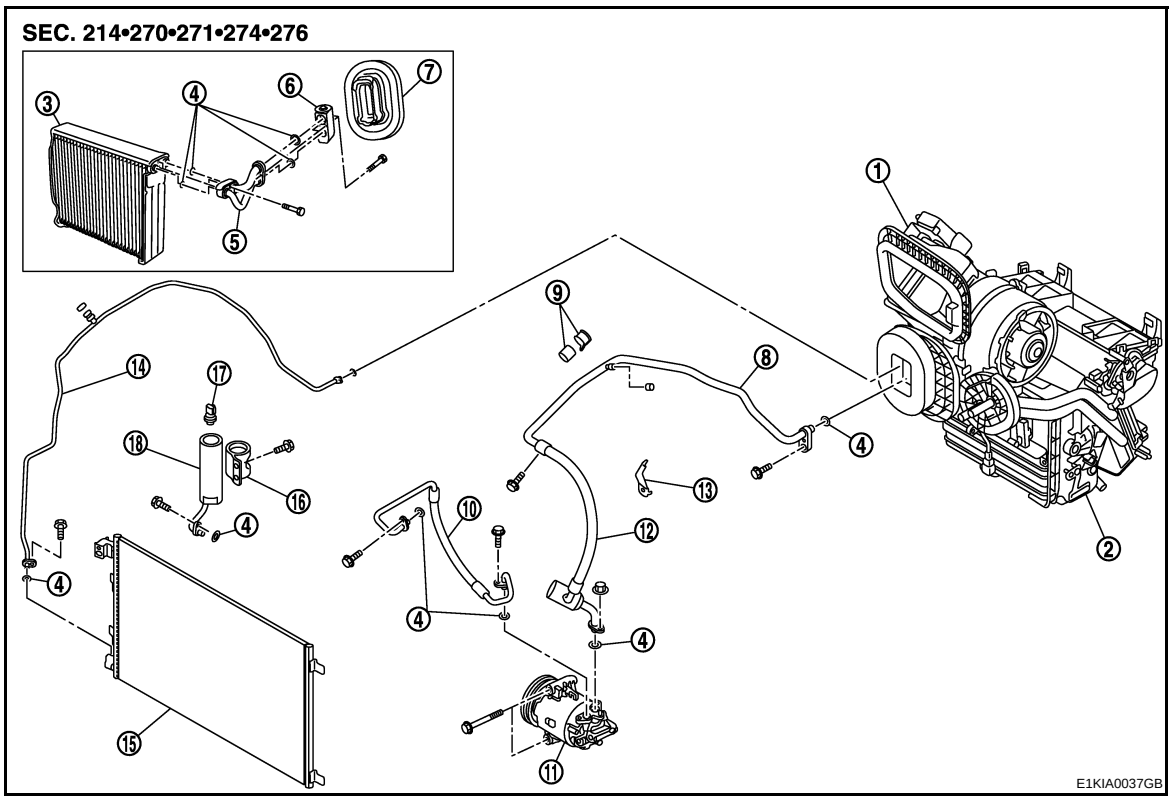
ON-VEHICLE REPAIR

REFRIGERATION SYSTEM

Exploded View

INFOID:0000000001183232

Refer to HA-229, "Refrigerant Connection".



1. Heater & blower unit assembly	2. Heater & cooling unit assembly	3. Evaporator
4. O-ring	5. Low pressure pipe 1 and high pressure pipe 2 assembly	6. Expansion valve
7. Heater sealing	8. Low pressure flexible hose and pipe 2	9. Low pressure pipe 2 fixing clamp assembly
10. High pressure flexible hose	11. Compressor	12. Low pressure flexible hose
13. Low & high pipe bracket support	14. High pressure pipe 1	15. Condenser assembly
16. Liquid tank fixing bracket	17. Refrigerant pressure sensor	18. Liquid tank

Inspection After Installation

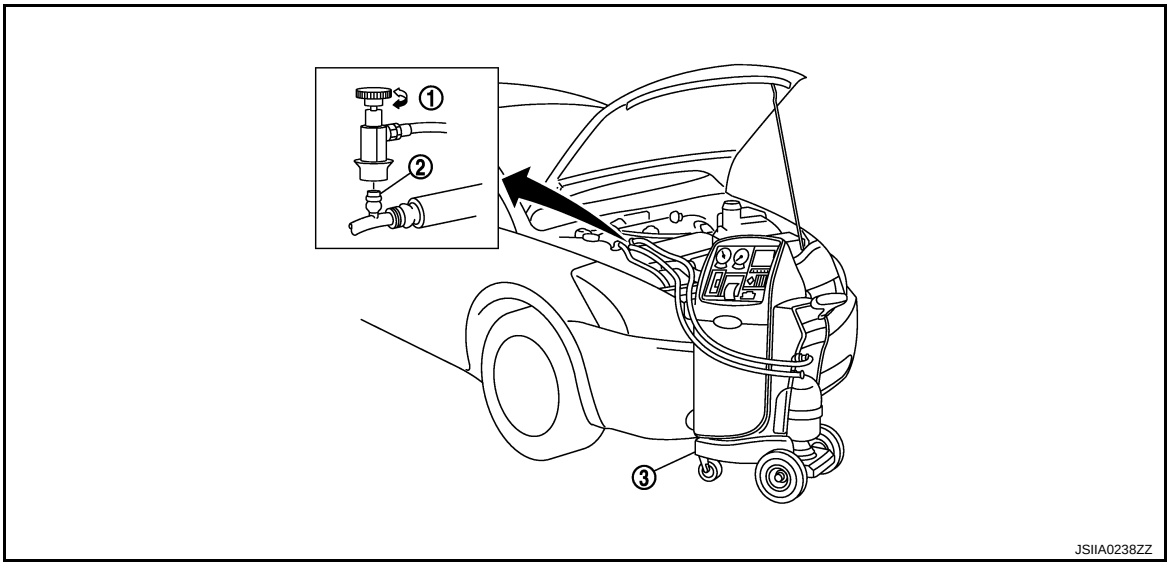
INFOID:0000000001183233

SETTING OF SERVICE TOOLS AND EQUIPMENT

Discharging Refrigerant

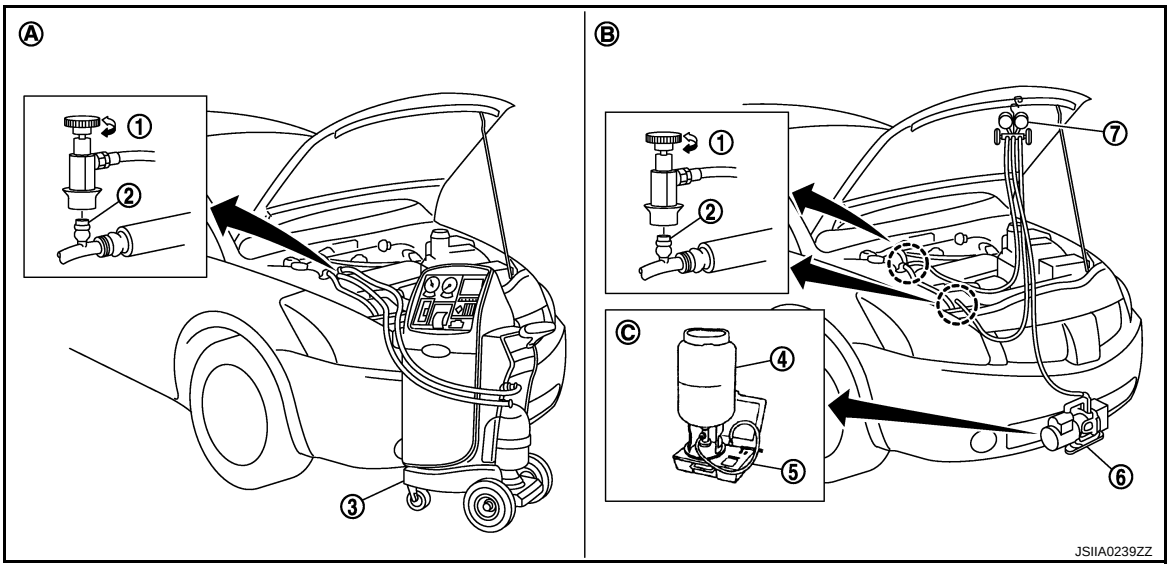
WARNING:

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.



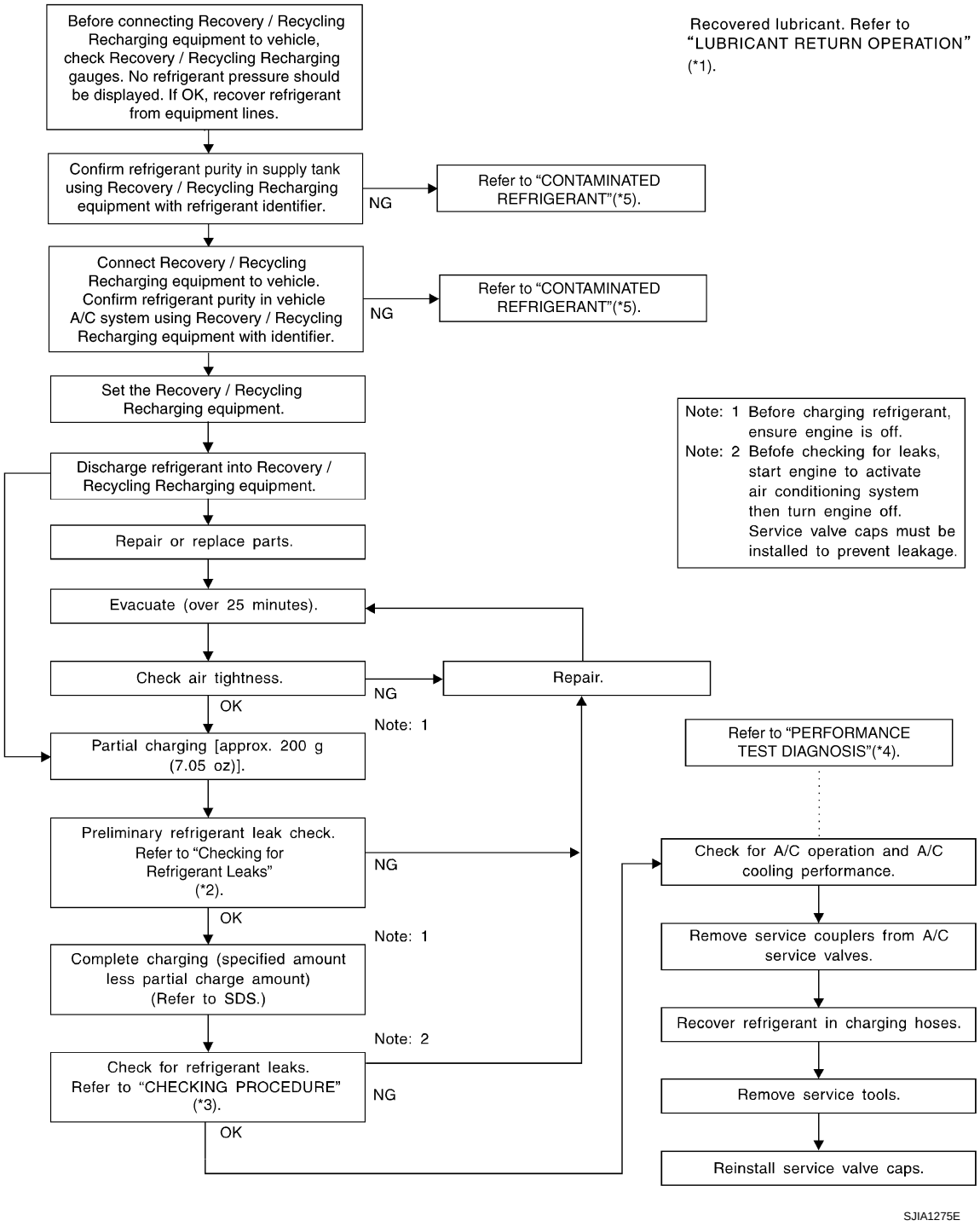
1. Shut-off valve
2. A/C service valve
3. Recovery/Recycling/Recharging equipment

Evacuating System and Charging Refrigerant



1. Shut-off valve
2. A/C service valve
3. Recovery/Recycling/Recharging equipment
4. Refrigerant container (HFC-134a)
5. Weight scale (J-39650)
6. Vacuum pump (J-39649)
7. Manifold gauge set (J-39183)

A. Preferred (best) method
B. Alternative method
C. For charging



*1 HA-238, "Adjustment"

*2 "REFRIGERANT LEAKS" in HA-190, "Refrigerant Leaks" (HR/MR), HA-242, "Refrigerant Leaks" (K9K).

*3 "CHECKING PROCEDURE" in HA-240, "Inspection".

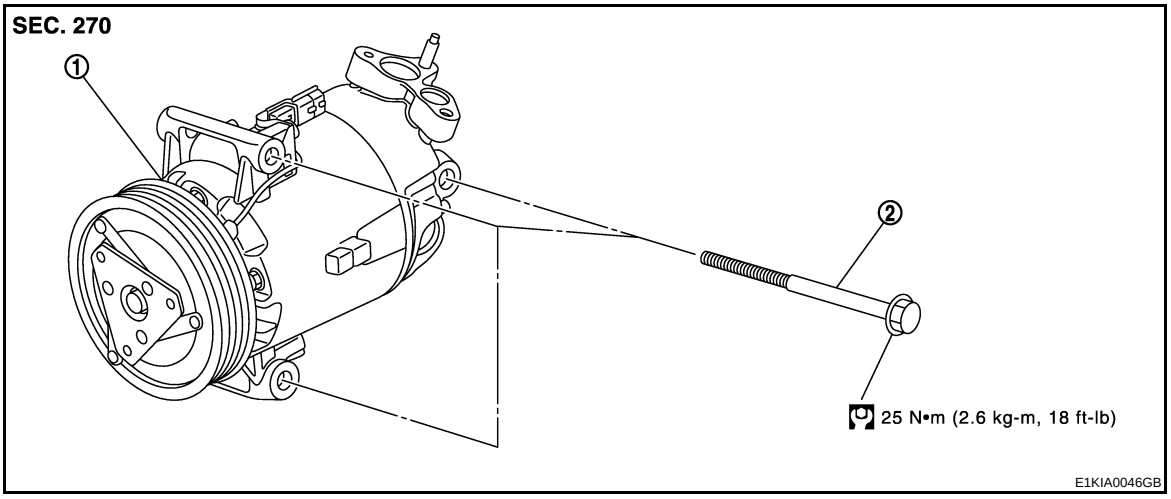
*4 "PERFORMANCE TEST DIAGNOSIS" in HA-240, "Inspection".

*5 "CONTAMINATED REFRIGERANT" in HA-228, "Working with HFC-134a (R-134a)".

COMPRESSOR

Exploded View

INFOID:0000000001183234



1. Compressor
2. Bolt

Refer to GI-4, "Components" for symbols in the figure.

Removal and Installation

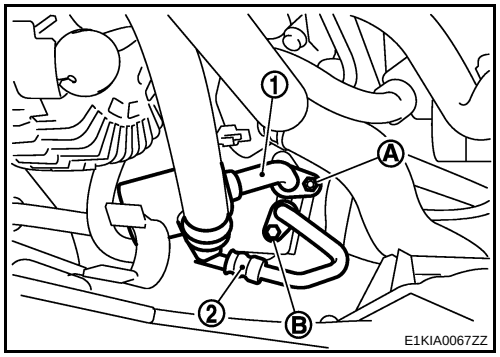
INFOID:0000000001183235

REMOVAL

1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
2. Remove engine cover ornament.
3. Remove air intake hoses (RH) and air duct (LH). Refer to EM-28, "Exploded View" (HR), EM-145, "Removal and Installation" (MR).
4. Remove engine undercover, using power tools.
5. Drain engine coolant from radiator. Refer to CO-9, "Draining" (HR), CO-30, "Draining" (MR).
6. Remove drive belt. Refer to EM-17, "Removal and Installation" (HR), EM-135, "Removal and Installation" (MR).
7. Remove lower radiator hose from engine. Refer to CO-13, "Exploded View" (HR), CO-34, "Exploded View" (MR).
8. Remove mounting nuts (A) from low-pressure flexible hose (1) and mounting bolt (B) from high-pressure flexible hose (2).
9. Remove low-pressure flexible hose and high-pressure flexible hose from compressor.

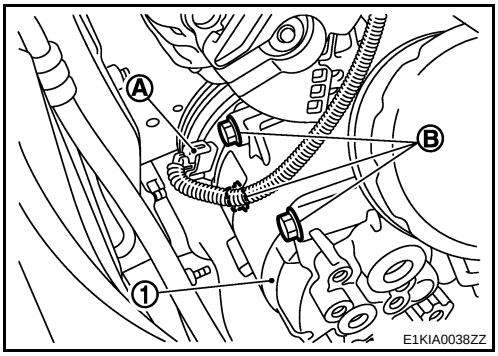
   CAUTION:

   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.



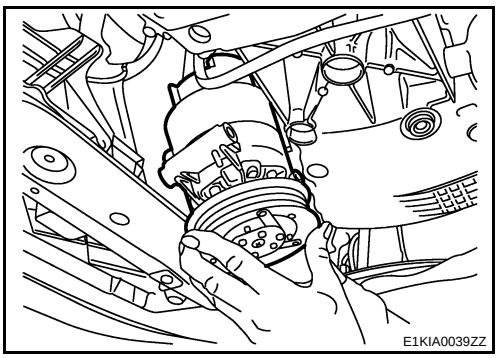
10. Disconnect harness connector from compressor.

11. Remove compressor harness connector (A), then remove mounting bolts (B) from compressor (1), using power tools.



12. Remove the compressor from the vehicle.

Compressor fixing bolt to engine
: 25 N·m (2.6 kg-m, 18.5 ft-lb)



INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

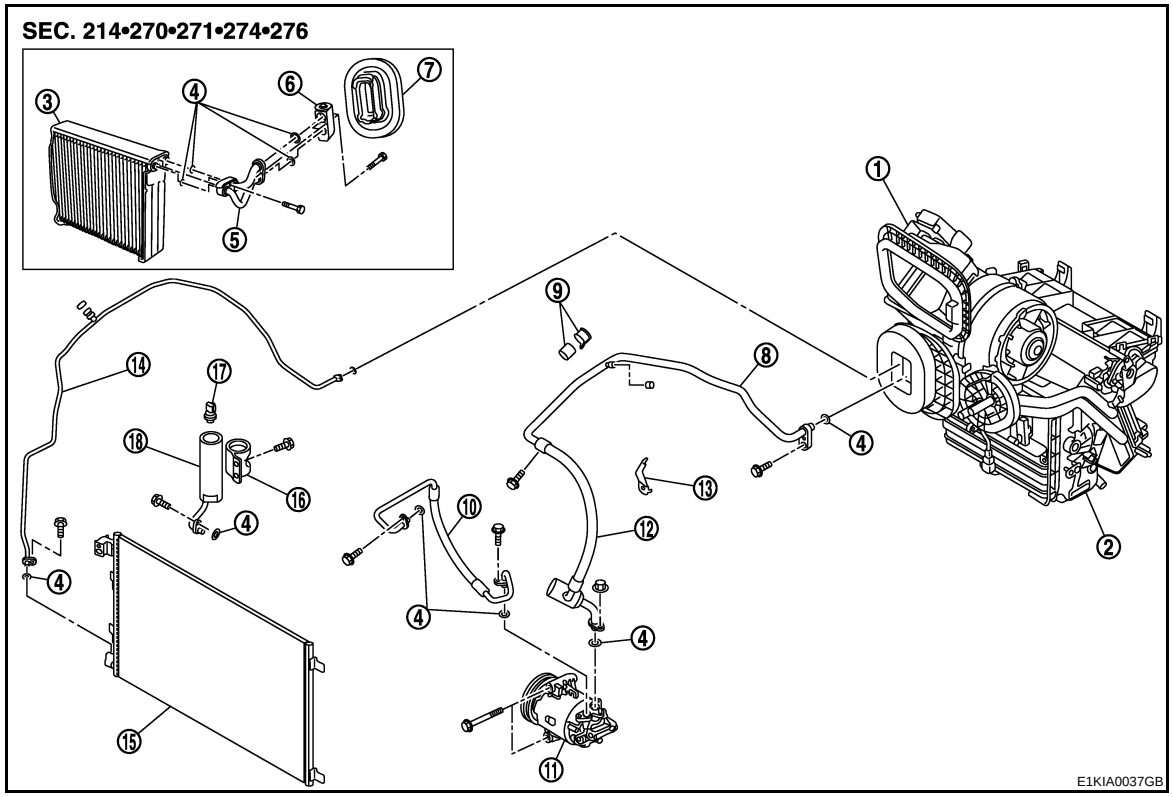
- **Replace O-rings of low-pressure flexible hose and high-pressure flexible hose with new ones, and then apply compressor oil to it when installing it.**
- **When recharging refrigerant, check for leaks.**

LOW-PRESSURE FLEXIBLE HOSE AND PIPE 2

Exploded View

INFOID:0000000001183236

Refer to HA-229, "Refrigerant Connection".



1. Heater & blower unit assembly	2. Heater & cooling unit assembly	3. Evaporator
4. O-ring	5. Low pressure pipe 1 and high pressure pipe 2 assembly	6. Expansion valve
7. Heater sealing	8. Low pressure flexible hose and pipe 2	9. Low pressure pipe 2 fixing clamp assembly
10. High pressure flexible hose	11. Compressor	12. Low pressure flexible hose
13. Low & high pipe bracket support	14. High pressure pipe 1	15. Condenser assembly
16. Liquid tank fixing bracket	17. Refrigerant pressure sensor	18. Liquid tank

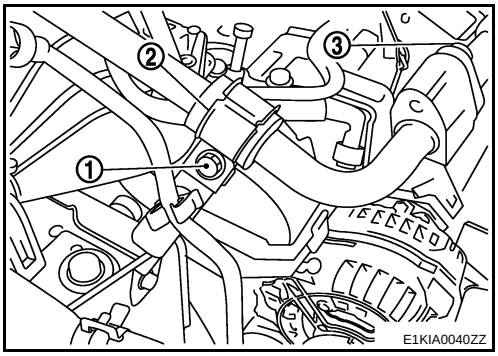
Removal and Installation

INFOID:0000000001183237

REMOVAL

1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
2. Remove upper engine cover ornament. Refer to EM-147, "Exploded View" (MR).
3. Remove air intake hose (RH side), and air duct (LH). Refer to EM-28, "Exploded View" (HR), EM-145, "Exploded View" (MR).

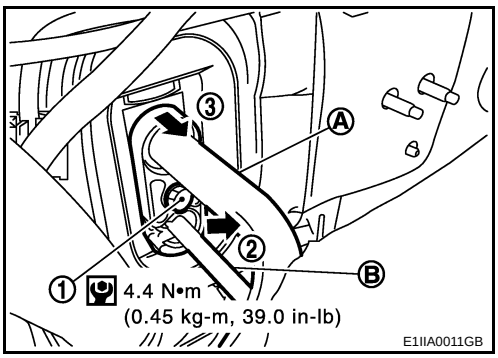
4. Remove mounting bolt (1) and clamp (2), from low pressure pipe bracket support.
5. Remove low and high-pressure maintaining clip, from both pipes then remove fixing bolt (3).
6. Remove engine room insulator fixing clip from cowl top.



7. Pull engine room insulator, then remove pipes bracket fixing bolt (1), from expansion valve, and release pipes fixing bracket as shown in order (1) to (3) from high pressure pipe 1 (B), to remove low pressure flexible hose and pipe 2 (A) from expansion valve.

CAUTION:

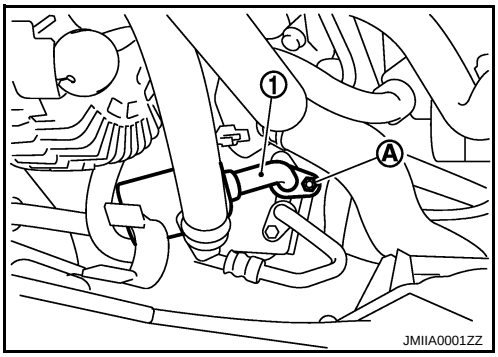
Cap or wrap the joint of the low pressure then remove fixing bolt (3) pipe 2, and expansion valve exit with suitable material such as vinyl tape to avoid the entry of air.



8. Remove low pressure flexible hose fixing nut (A), from air conditioner compressor, and remove low pressure flexible hose (1).

CAUTION:

Cap or wrap the joint of 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:

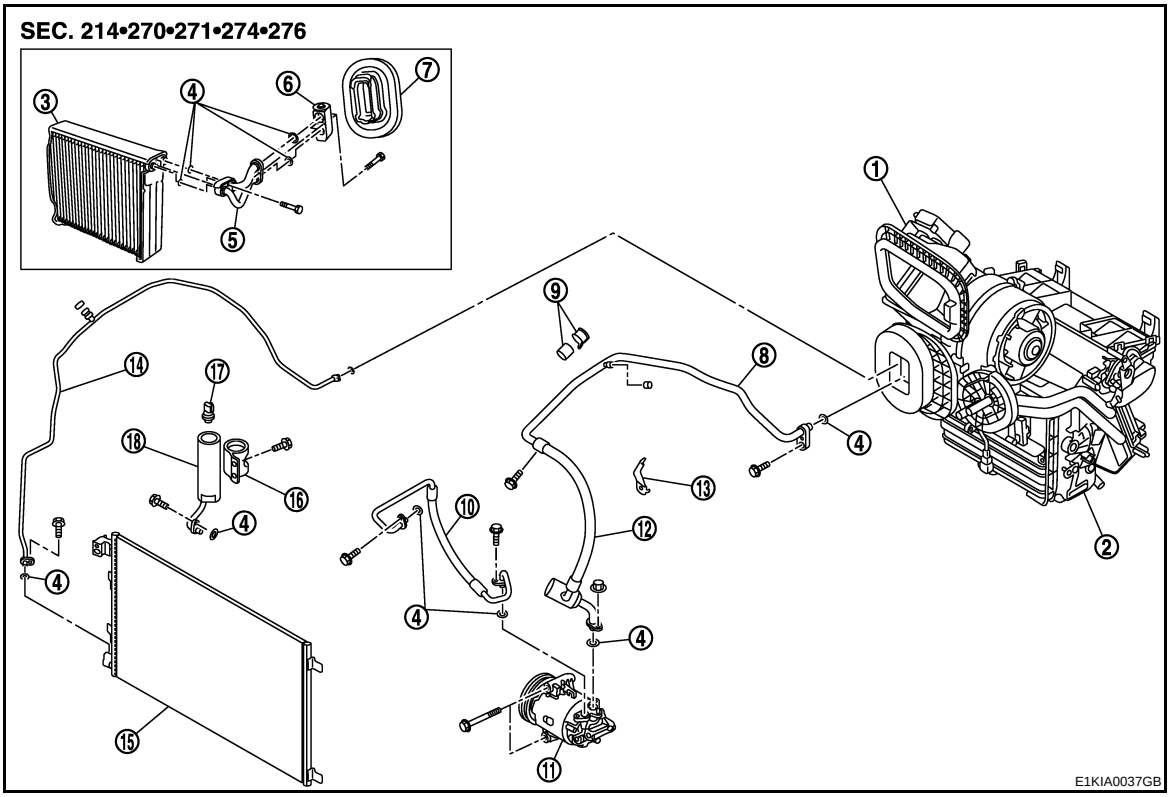
- **Replace O-rings of low-pressure flexible hose and low-pressure pipe 2 with new ones, and then apply compressor oil to it when installing it.**
- **Female-side piping connection is thin and easy to deform. Slowly insert the male-side piping straight in axial direction.**
- **Insert piping securely 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.**

HIGH-PRESSURE FLEXIBLE HOSE

Exploded View

INFOID:0000000001183238

Refer to HA-229, "Refrigerant Connection".



1. Heater & blower unit assembly
2. Heater & cooling unit assembly
3. Evaporator
4. O-ring
5. Low pressure pipe 1 and high pressure pipe 2 assembly
6. Expansion valve
7. Heater sealing
8. Low pressure flexible hose and pipe 2
9. Low pressure pipe 2 fixing clamp assembly
10. High pressure flexible hose
11. Compressor
12. Low pressure flexible hose
13. Low & high pipe bracket support
14. High pressure pipe 1
15. Condenser assembly
16. Liquid tank fixing bracket
17. Refrigerant pressure sensor
18. Liquid tank

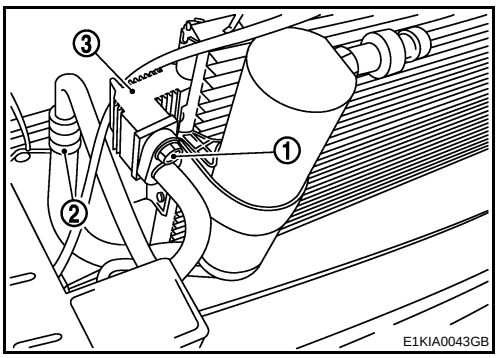
Removal and Installation

INFOID:0000000001183239

REMOVAL

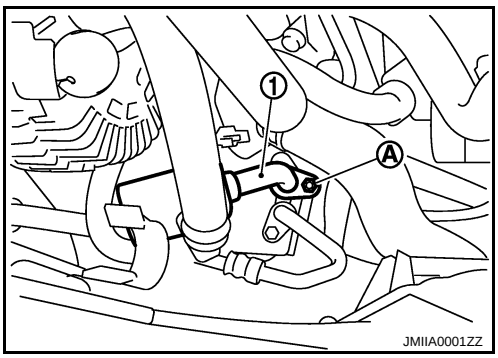
1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
2. Remove engine cover ornament. Refer to EM-147, "Exploded View" (MR).
3. Remove air intake hose (RH) and air duct (LH). Refer to EM-28, "Exploded View" (HR), EM-145, "Exploded View" (MR).
4. Remove front grille. Refer to EXT-17, "Exploded View".
5. Remove radiator air guide (RH). Refer to CO-13, "Exploded View" (HR), CO-34, "Exploded View" (MR).

6. Remove high pressure flexible hose fixing bolt (1) from condenser (3), then pull high pressure flexible hose (2) to remove it from condenser.



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

7. Remove high pressure flexible hose fixing nut (A) from compressor, then pull high pressure flexible hose (1) to remove it from compressor. 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.

High pressure fixing bolt to condenser
: 4.4 N·m (0.45 kg-m, 39 in-lb)
High pressure fixing bolt to compressor
: 4.4 N·m (0.45 kg-m, 39 in-lb)

INSTALLATION

Installation is basically the reverse order of removal.

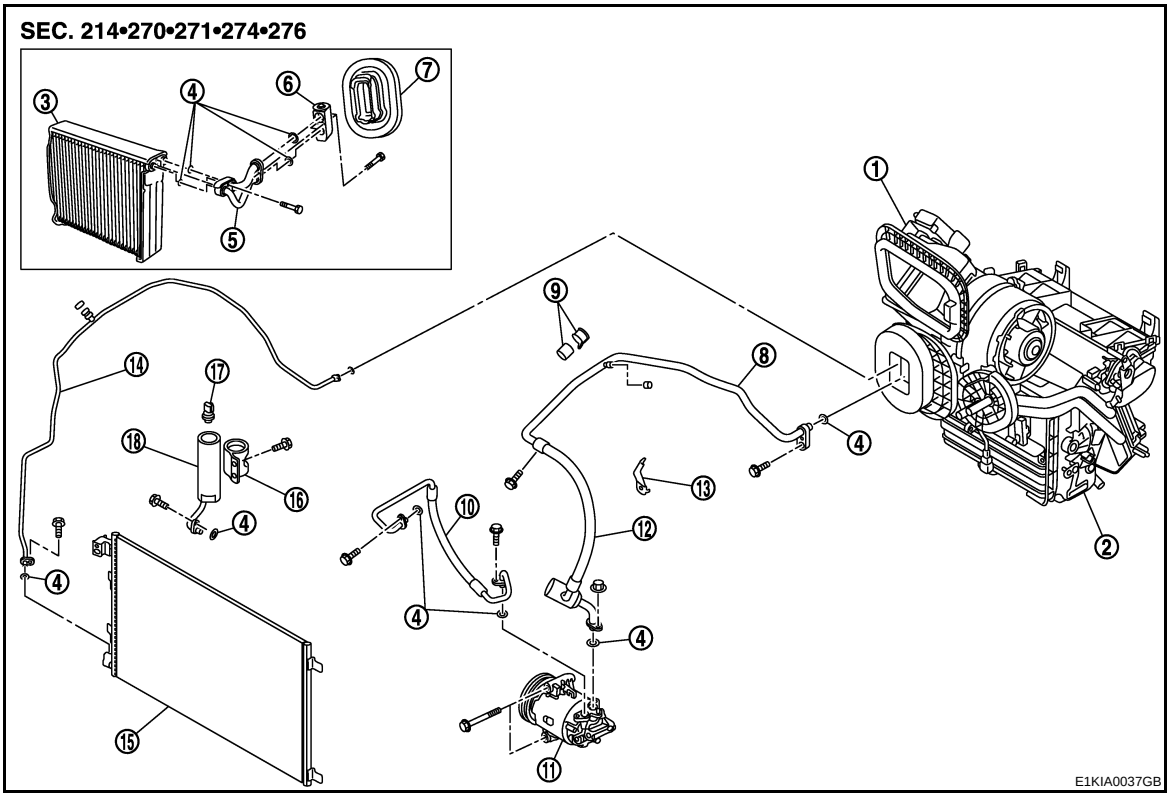
CAUTION:
- **Replace O-rings of high-pressure flexible hose with new ones, and then apply compressor oil to it when installing it.**
- **Female-side piping connection is thin and easy to deform. Slowly insert the male-side piping straight in axial direction.**
- **Insert piping securely until a click 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 PIPE 1 (ENGINE COMPARTMENT)

Exploded View

INFOID:0000000001183240

Refer to HA-229, "Refrigerant Connection".



1. Heater & blower unit assembly
2. Heater & cooling unit assembly
3. Evaporator
4. O-ring
5. Low pressure pipe 1 and high pressure pipe 2 assembly
6. Expansion valve
7. Heater sealing
8. Low pressure flexible hose and pipe 2
9. Low pressure pipe 2 fixing clamp assembly
10. High pressure flexible hose
11. Compressor
12. Low pressure flexible hose
13. Low & high pipe bracket support
14. High pressure pipe 1
15. Condenser assembly
16. Liquid tank fixing bracket
17. Refrigerant pressure sensor
18. Liquid tank

Removal and Installation

INFOID:0000000001183241

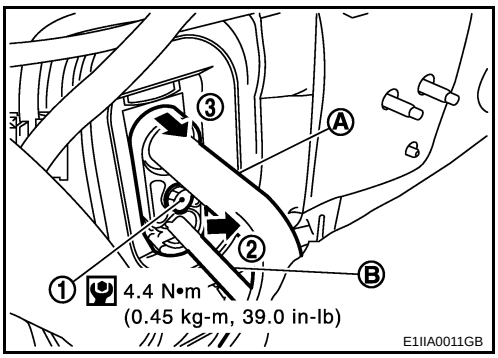
REMOVAL

1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
2. Remove engine cover ornament.
3. Remove intake hose (RH) and air duct (LH). Refer to EM-28, "Removal and Installation", EM-145, "Removal and Installation", EM-266, "Removal and Installation".

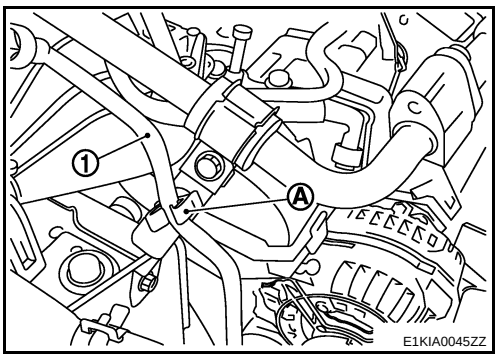
4. Pull engine room insulator, then remove pipes bracket fixing bolt (1), from expansion valve, then release pipe fixing bracket as shown from (1) to (3) from high pressure pipe 1 (B), to disconnect it from expansion valve.

CAUTION:

Cap or wrap the joint of the high pressure pipe 1, and expansion valve in, with suitable material such as vinyl tape to avoid the entry of air.



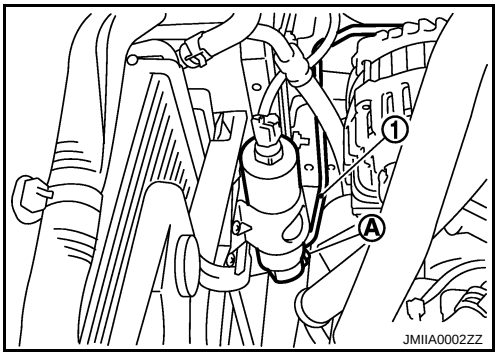
5. Remove high pressure pipe 1 (1) from clip (A).



Remove high-pressure pipe 1 mounting bolt (A) from liquid tank, then remove high-pressure pipe 1 (1).

CAUTION:

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



INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

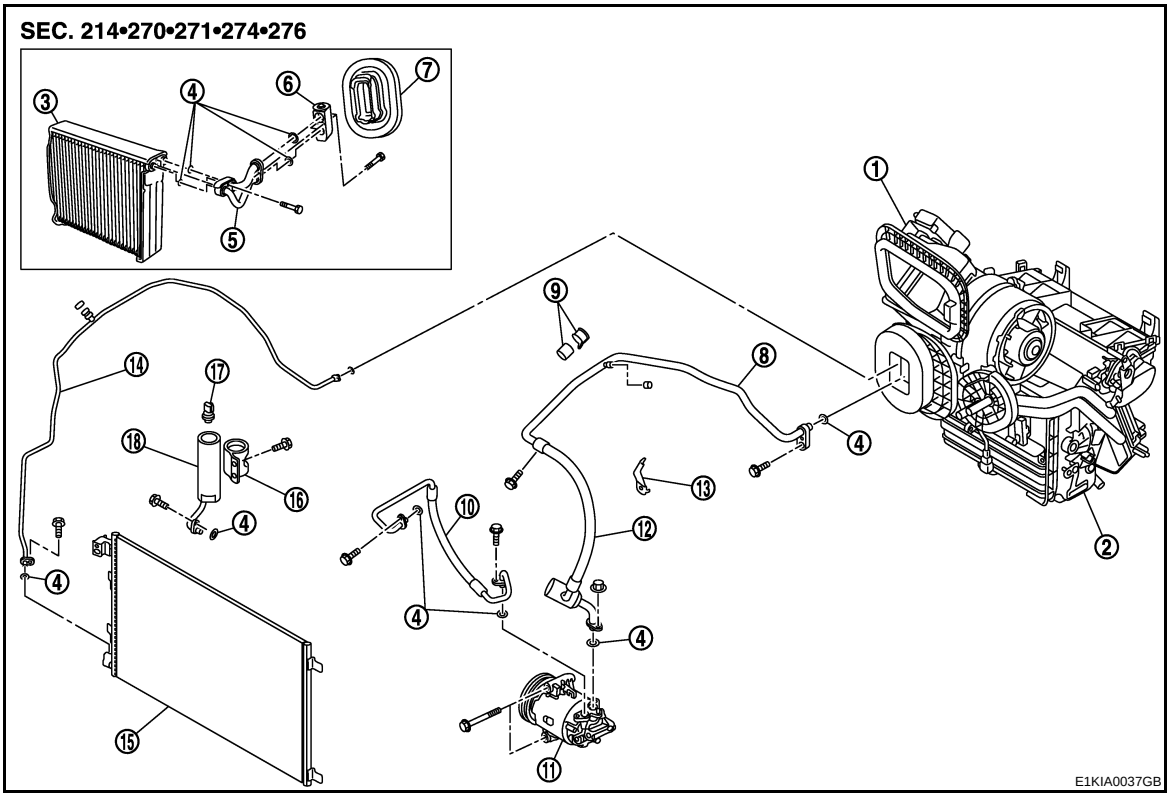
- **Replace O-rings of high-pressure pipe 1 with new ones, and then apply compressor oil to it when installing it.**
- **Female-side piping connection is thin and easy to deform. Slowly insert the male-side piping straight in axial direction.**
- **Insert piping securely until a click is heard.**
- **After 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 PIPE 1 AND HIGH-PRESSURE PIPE 2

Exploded View

INFOID:0000000001183242

Refer to HA-229, "Refrigerant Connection".



1. Heater & blower unit assembly	2. Heater & cooling unit assembly	3. Evaporator
4. O-ring	5. Low pressure pipe 1 and high pressure pipe 2 assembly	6. Expansion valve
7. Heater sealing	8. Low pressure flexible hose and pipe 2	9. Low pressure pipe 2 fixing clamp assembly
10. High pressure flexible hose	11. Compressor	12. Low pressure flexible hose
13. Low & high pipe bracket support	14. High pressure pipe 1	15. Condenser assembly
16. Liquid tank fixing bracket	17. Refrigerant pressure sensor	18. Liquid tank

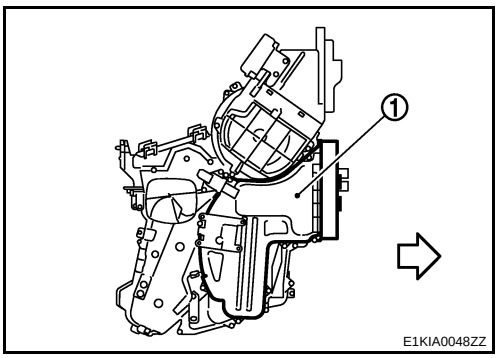
Removal and Installation

INFOID:0000000001183243

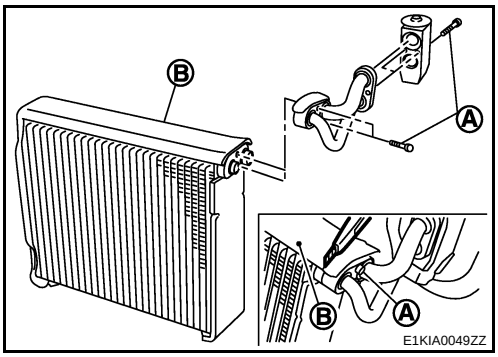
REMOVAL

1. Set the temperature at 18°C (60°F), and then disconnect the battery cable from the negative terminal.
2. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
3. Remove engine cover ornament. Refer to EM-28, "Removal and Installation".
4. Remove high-pressure pipe 1 and low pressure pipe 2 from expansion valve. Refer to HA-205, "Removal and Installation", HA-201, "Removal and Installation".
   CAUTION:
   Cap or wrap the joint of the, high-pressure pipe 1, low-pressure pipe 2, and the expansion valve with suitable material such as vinyl tape to avoid the entry of air.
5. Remove heater cooling fixing clamp, and heater hoses. Refer to CO-21, "Removal and Installation", CO-44, "Removal and Installation".
6. Remove instrument panel.Refer to IP-12, "Removal and Installation".
7. Remove foot duct (RH / LH). Refer to VTL-50, "SIDE DEFROSTER NOZZLE : Removal and Installation".
8. Remove steering column. Refer to ST-10, "Removal and Installation".

9. Disconnect Heater and cooling unit harness connectors from steering member main harness.
10. Remove steering member.
11. Remove heater and cooling assembly. Refer to VTL-33, "Removal and Installation".
12. Remove mounting screws, and then remove evaporator cover (1).



13. Using a thin cutter, cut the evaporator insulator (B), and then remove fixing bolt (A) and low-pressure pipe 1 and high-pressure pipe 2 assembly.
    CAUTION:
    Cap or wrap the joint of expansion valve, high-pressure pipe 2 and low-pressure pipe 1 with suitable material such as vinyl tape to avoid the entry of air.



INSTALLATION

Installation is basically the reverse order of removal.

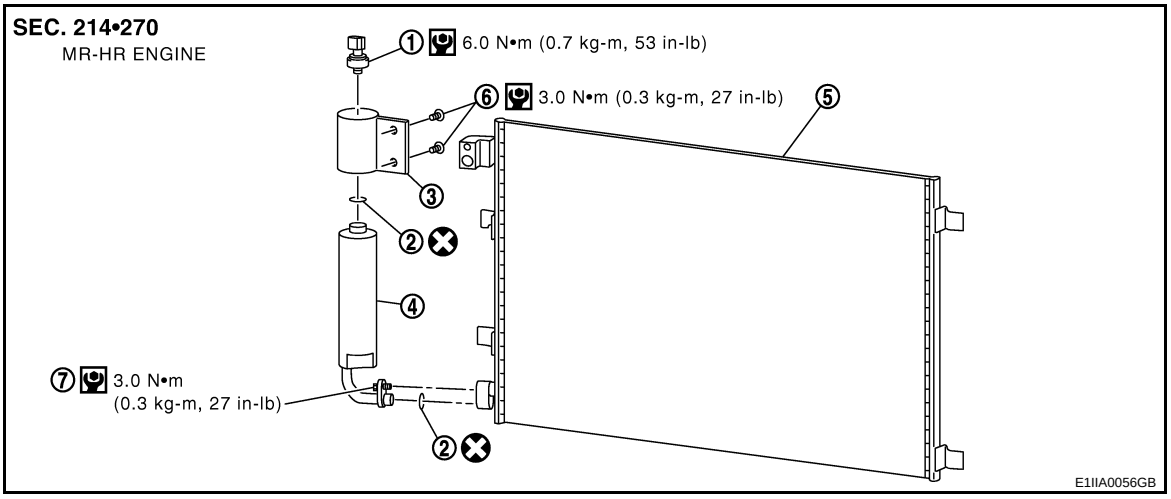
CAUTION:

- **Replace O-rings of high-pressure pipe 1, 2 and low-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.**

CONDENSER

Exploded View

INFOID:0000000001183244



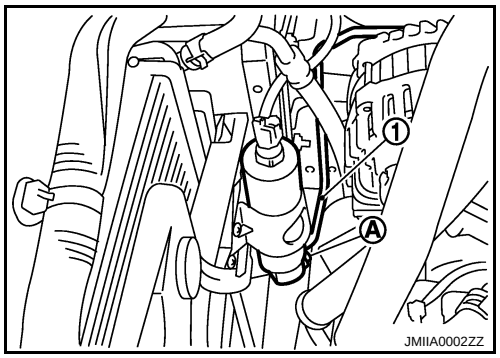
1. Refrigerant pressure sensor
2. O-ring
3. Liquid tank bracket
4. Liquid tank
5. Condenser
6. Liquid tank fixing screw
7. Liquid tank pipe fixing bolt

Removal and Installation

INFOID:0000000001183245

REMOVAL

1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
2. Remove engine cover ornament. Refer to EM-28, "Removal and Installation", EM-145, "Removal and Installation".
3. Remove front grille. Refer to EXT-17, "Removal and Installation".
4. Remove radiator hose, and drain coolant. Refer to CO-13, "Exploded View" (HR), CO-34, "Exploded View" (MR).
5. Remove upper radiator fixing bracket. Refer to CO-13, "Exploded View" (HR), CO-34, "Exploded View" (MR).
6. Remove radiator air-guide duct (RH). Refer to CO-13, "Exploded View" (HR), CO-34, "Exploded View" (MR).
7. Remove high-pressure pipe 1 fixing bolt (A) and high pressure pipe (1) from liquid tank. Refer to HA-205, "Removal and Installation".



8. Remove high-pressure flexible pipe 1 from condenser. Refer to HA-203, "Removal and Installation".
   CAUTION:
   Cap or wrap the joint of low and high-pressure pipe 1 and condenser with suitable material such as vinyl tape to avoid the entry of air.
9. Remove harness connector from refrigerant pressure sensor.
10. Remove liquid tank pipes and liquid tank from condenser and radiator. Refer to HA-211, "Removal and Installation".
    CAUTION:
    Cap or wrap the joint of liquid tank pipes and condenser with suitable material such as vinyl tape to avoid the entry of air.
11. Remove radiator fixing brackets. Refer to CO-13, "Exploded View" (HR), CO-34, "Exploded View" (MR).
12. Release radiator maintaining pawls, then pull-up the condenser assembly to release it from radiator. Refer to CO-13, "Removal and Installation" (HR), CO-35, "Removal and Installation" (MR).

13. Maintain radiator pushing back.
14. Pull upward to remove condenser.
    CAUTION:
    Take care do not damaged condenser or radiator.

INSTALLATION

Installation is basically the reverse order of removal.

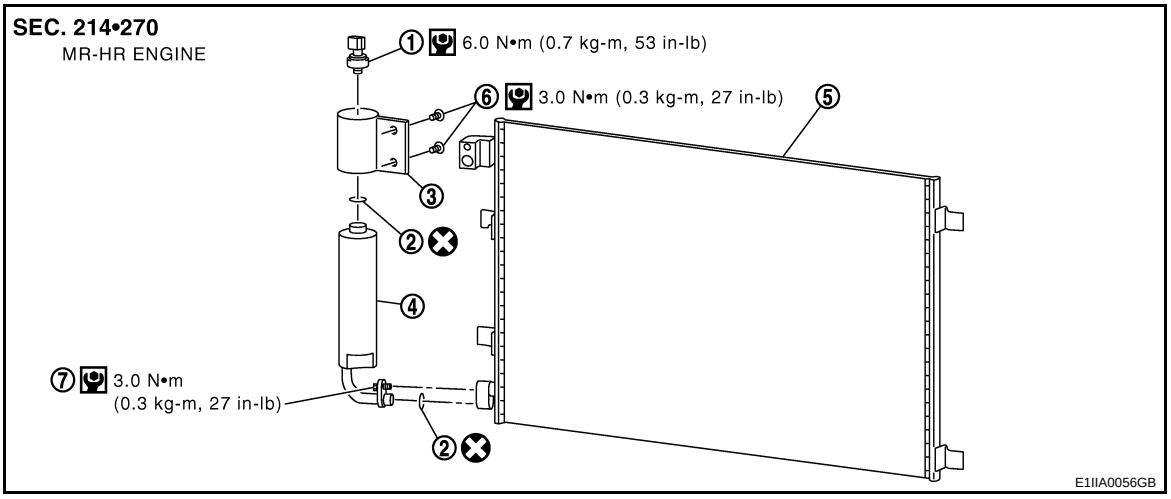
CAUTION:

- **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.**

LIQUID TANK

Exploded View

INFOID:0000000001183246



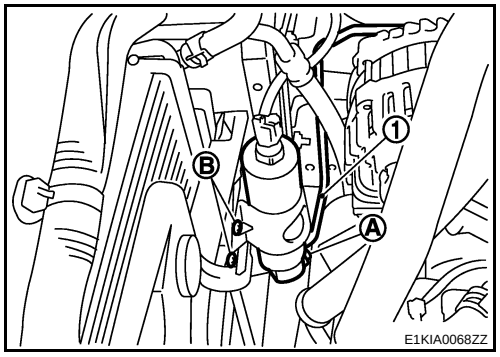
1. Refrigerant pressure sensor
2. O-ring
3. Liquid tank bracket
4. Liquid tank
5. Condenser
6. Liquid tank fixing screw
7. Liquid tank pipe fixing bolt

Removal and Installation

INFOID:0000000001183247

REMOVAL

1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
2. Remove engine cover ornament. Refer to EM-147, "Exploded View" (MR).
3. Clean liquid tank and its surrounding area, and remove dust and rust from liquid tank.
   CAUTION:
   Be sure to clean carefully.
4. Disconnect refrigerant sensor harness connector. Refer to HA-212, "Removal and Installation".
5. Remove liquid tank bracket support mounting screws (B).
6. Remove high pressure pipe 1 (1) mounting bolt (A) from liquid tank. Refer to HA-205, "Removal and Installation".
7. Remove liquid tank high pressure pipe mounting bolt (A) from condenser.
8. Remove liquid tank pipe bracket fixing screw.
   CAUTION:
   Cap or wrap the joint of high pressure pipe, liquid tank pipes and condenser with suitable material such as vinyl tape to avoid the entry of air.
9. Remove liquid tank assembly.



INSTALLATION

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

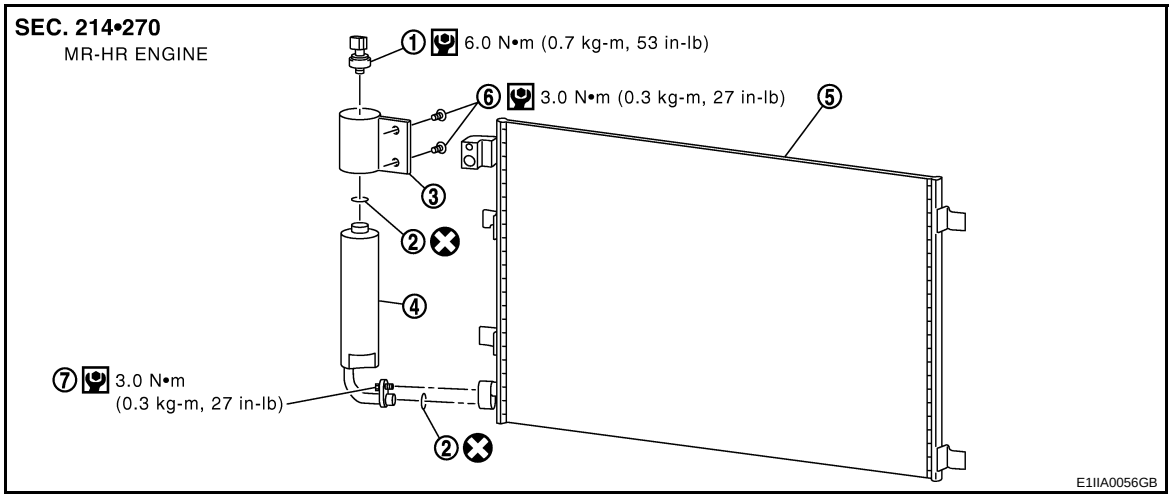
CAUTION:

- **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.**

REFRIGERANT PRESSURE SENSOR

Exploded View

INFOID:0000000001183248



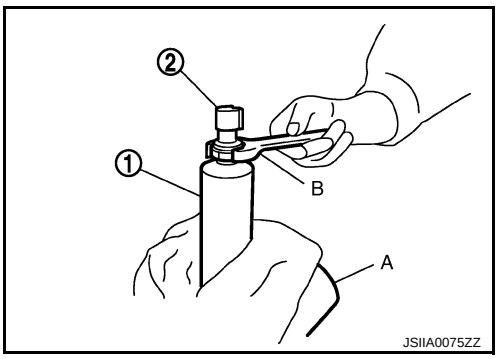
1. Refrigerant pressure sensor
2. O-ring
3. Liquid tank bracket
4. Liquid tank
5. Condenser
6. Liquid tank fixing screw
7. Liquid tank pipe fixing bolt

Removal and Installation

INFOID:0000000001183249

REMOVAL

1. Remove liquid tank. Refer to HA-211, "Exploded View".
2. Fix the liquid tank (1) with a vise (A). Remove the refrigerant pressure sensor (2) with a wrench (B).
   CAUTION:
   Be careful not to damage liquid tank.



INSTALLATION

Installation is basically the reverse order of removal.

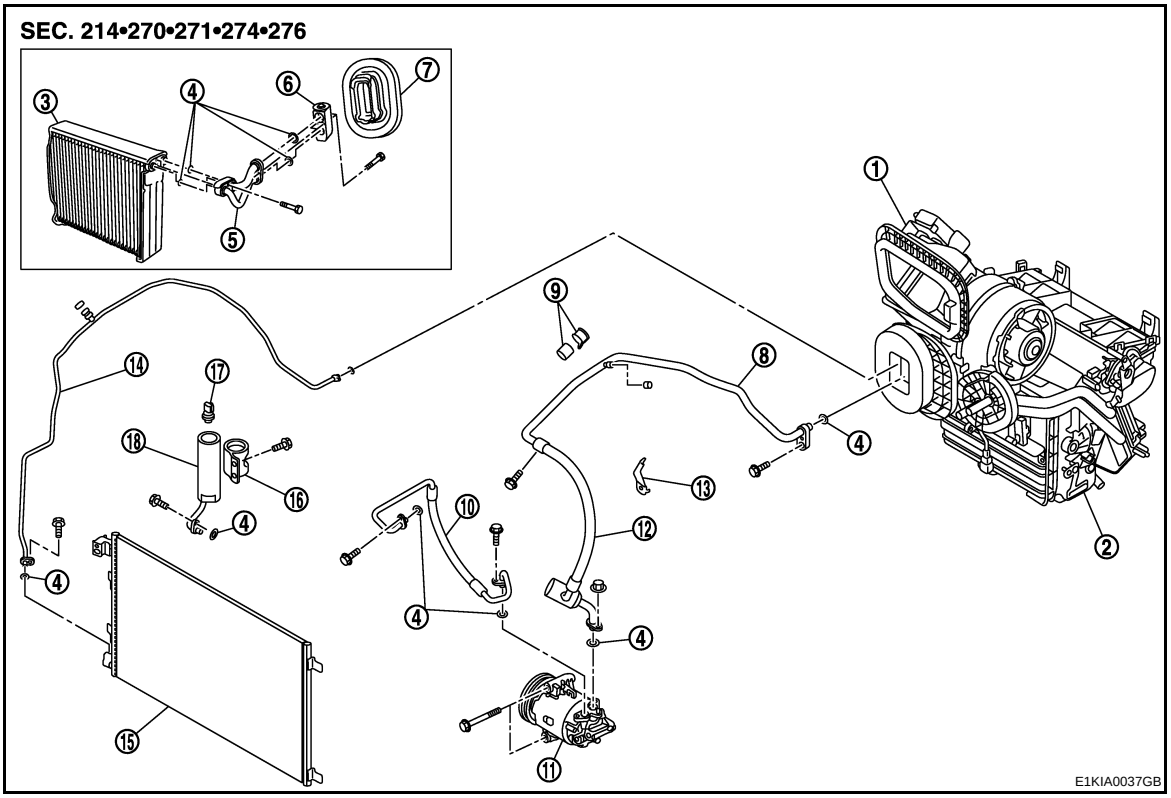
CAUTION:

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

EVAPORATOR

Exploded View

INFOID:0000000001183250



1. Heater & blower unit assembly	2. Heater & cooling unit assembly	3. Evaporator
4. O-ring	5. Low pressure pipe 1 and high pressure pipe 2 assembly	6. Expansion valve
7. Heater sealing	8. Low pressure flexible hose and pipe 2	9. Low pressure pipe 2 fixing clamp assembly
10. High pressure flexible hose	11. Compressor	12. Low pressure flexible hose
13. Low & high pipe bracket support	14. High pressure pipe 1	15. Condenser assembly
16. Liquid tank fixing bracket	17. Refrigerant pressure sensor	18. Liquid tank

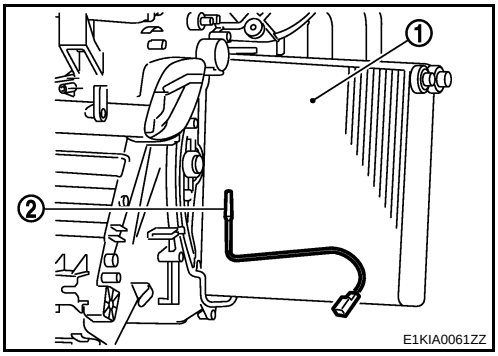
Removal and Installation

INFOID:0000000001183251

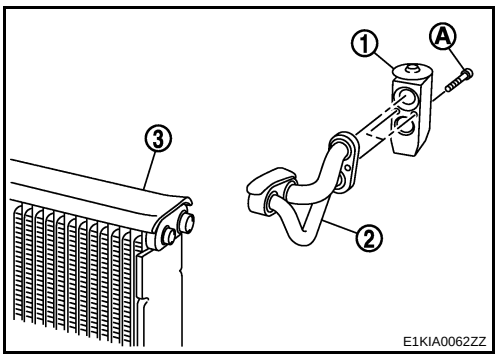
REMOVAL

1. Remove low-pressure pipe 2 and high-pressure pipe 1 from expansion valve. Refer to HA-201, "Removal and Installation", HA-205, "Removal and Installation".
   CAUTION:
   Cap or wrap the joint of expansion valve, low-pressure pipe 2 and high-pressure pipe 1 with suitable material such as vinyl tape to avoid the entry of air.
2. Remove heater and cooling fixing clamp and hoses. Refer to VTL-91, "Removal and Installation".
3. Remove heater and cooling unit assembly. Refer to VTL-91, "Removal and Installation".
4. Remove evaporator cover fixing screws and cover. Refer to HA-213, "Exploded View".

5. Slide evaporator (1) and intake sensor (2) from heater and cooling unit assembly.
6. Remove evaporator assembly.



7. Cut upper insulator (3) and remove mounting bolt (A), expansion valve and pressure pipe assembly(2), from evaporator.



INSTALLATION

Installation is basically the reverse order of removal.

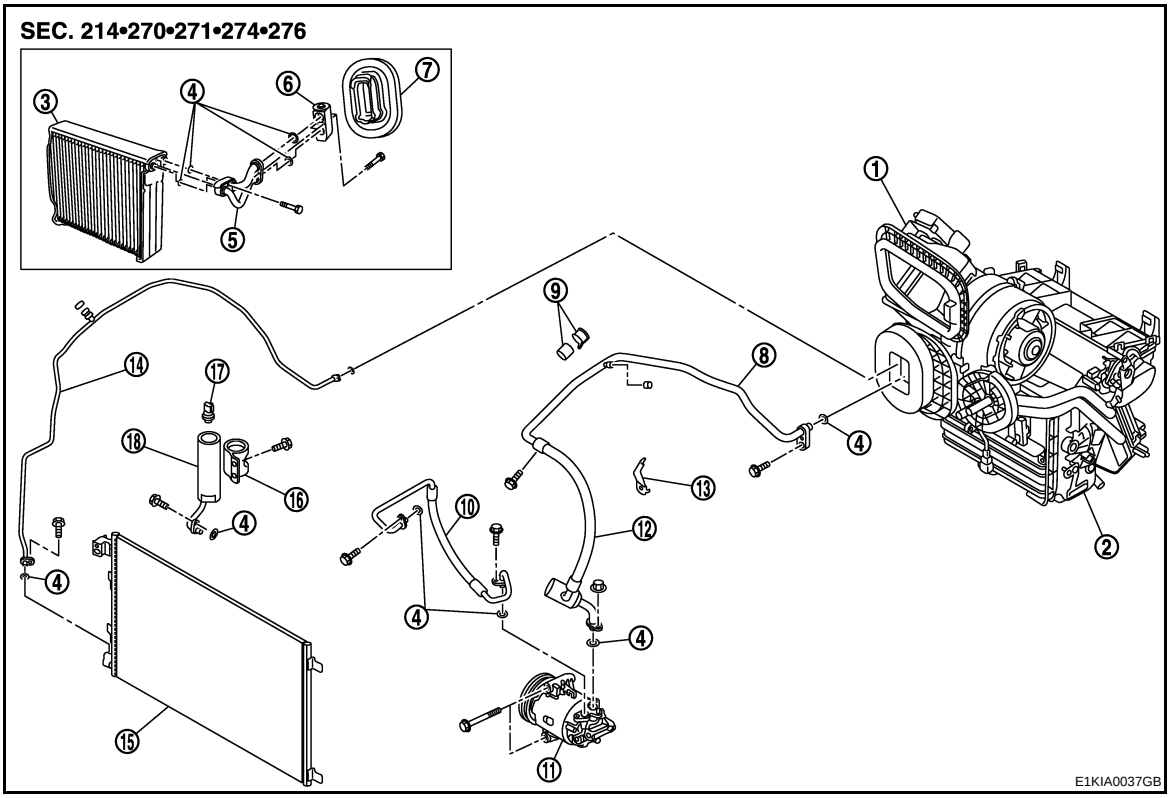
CAUTION:

- **Replace O-rings of low-pressure pipe 1 and high-pressure pipe 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 flexible hose (high-pressure pipe 1) and low-pressure pipe 1 (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.**

EXPANSION VALVE

Exploded View

INFOID:0000000001183252



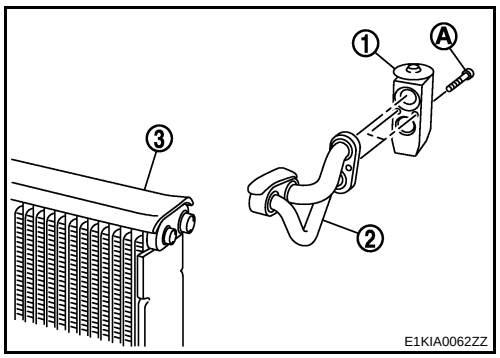
1. Heater & blower unit assembly
2. Heater & cooling unit assembly
3. Evaporator
4. O-ring
5. Low pressure pipe 1 and high pressure pipe 2 assembly
6. Expansion valve
7. Heater sealing
8. Low pressure flexible hose and pipe 2
9. Low pressure pipe 2 fixing clamp assembly
10. High pressure flexible hose
11. Compressor
12. Low pressure flexible hose
13. Low & high pipe bracket support
14. High pressure pipe 1
15. Condenser assembly
16. Liquid tank fixing bracket
17. Refrigerant pressure sensor
18. Liquid tank

Removal and Installation

INFOID:0000000001183253

REMOVAL

1. Remove evaporator (3). Refer to HA-213, "Exploded View".
2. Remove low pressure pipe 1 and high pressure pipe 2 assembly (2). Refer to HA-207, "Removal and Installation".
3. Remove mounting bolts (A), and then remove expansion valve (1) from low and high pressure pipe assembly (2).
   CAUTION:
   Cap or wrap the joint of expansion valve, low and high pressure pipe assembly, evaporator and 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 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.**

SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

Compressor

INFOID:0000000001183254

Model		CALSONICKANSEI
Type		Variable displacement swash plate
Displacement cm^3 (cu in)/rev	Max.	120 (7.32)
	Min.	6 (0.37)
Cylinder bore × stroke (Max.) mm (in.)		32 × 29 (1.26 × 1.14)
Direction of rotation		Clockwise (viewed from clutch)
Drive belt		Poly V 7 groove (HR engine), Poly V 6 groove (MR engine)

Lubricant

INFOID:0000000001183255

Model		CALSONICKANSEI
Name		Nissan A/C System Oil Type S (DH-PS)
Capacity m ℓ (US fl oz, Imp fl oz)	Total in system	150 (5.03, 5.3)
	Compressor (Service part) charging amount	150 (5.03, 5.3)

Refrigerant

INFOID:0000000001183256

Type	HFC-134a (R-134a)
Capacity kg (lb)	0.45 ± 0.025 (0.99 ± 0.055)

Engine Idling Speed

INFOID:0000000001183257

Refer to ECH-18, "IDLE SPEED : Description" (HR with EURO-OBD), ECH-357, "IDLE SPEED : Description" (HR without EURO-OBD), ECM-18, "IDLE SPEED : Description" (MR with OBD), ECM-361, "IDLE SPEED : Description" (MR without EURO-OBD).

Belt Tension

INFOID:0000000001183258

Refer to EM-16, "Tension Adjustment" (HR), EM-135, "Tension Adjustment" (MR).

BASIC INSPECTION

DIAGNOSIS AND REPAIR WORKFLOW

Work Flow

INFOID:0000000001183259

DETAILED FLOW

1.LISTEN TO CUSTOMER COMPLAINT

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

>> GO TO 2.

2.VERIFY THE SYMPTOM WITH OPERATIONAL CHECK

Verify the symptom with operational check. Refer to HAC-140, "Description & Inspection".

>> GO TO 3.

3.GO TO APPROPRIATE TROUBLE DIAGNOSIS

Go to appropriate trouble diagnosis (Refer to HAC-212, "Diagnosis Chart By Symptom").

>> GO TO 4.

4.REPAIR OR REPLACE

Repair or replace the specific parts

>> GO TO 5.

5.FINAL CHECK

Final check.

Is the inspection result normal?

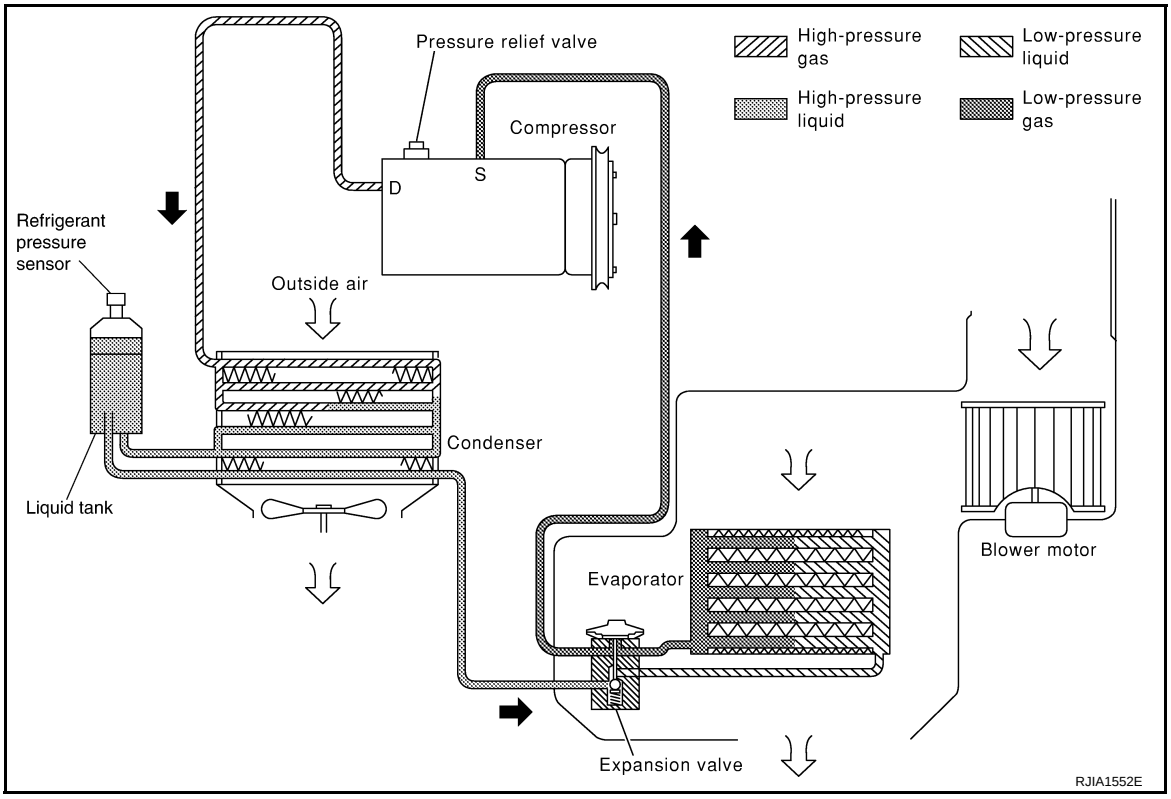
YES >> CHECK OUT
NO >> GO TO 3.

FUNCTION DIAGNOSIS

REFRIGERATION SYSTEM

System Diagram

INFOID:0000000001183260



System Description

INFOID:0000000001183261

REFRIGERANT CYCLE

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

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 2,800 kPa (28.5 kg/cm^2, 406.1 psi), or below about 200 kPa (2.04 kg/cm^2, 29 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 3,628 kPa (37 kg/cm^2, 526 psi)], the release port on the pressure relief valve automatically opens and releases refrigerant into the atmosphere.

LUBRICANT

Maintenance of Lubricant Quantity in Compressor

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:

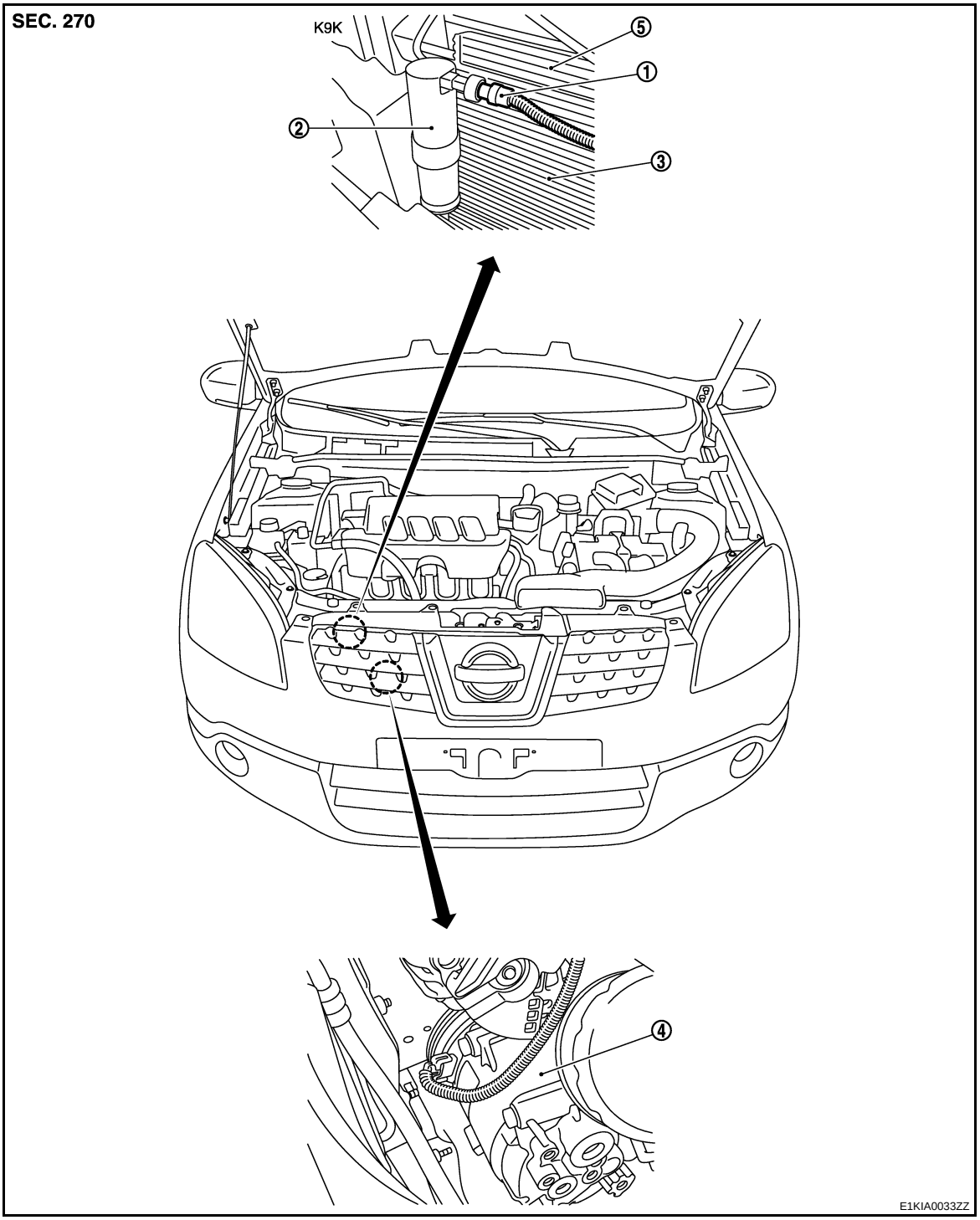
- Lack of lubricant: May lead to a seized compressor.
- Excessive lubricant: Inadequate cooling (thermal exchange interference)

Lubricant

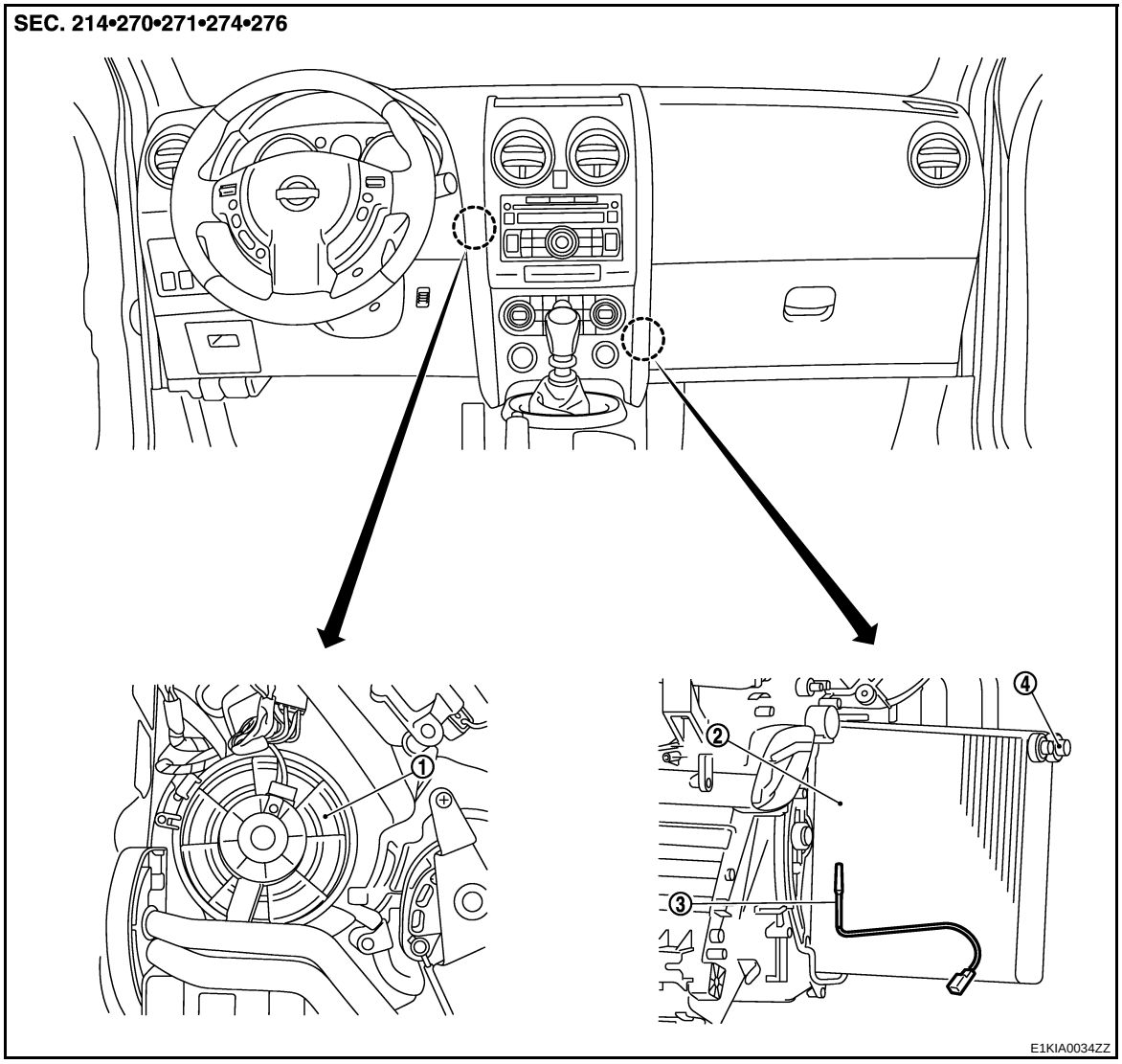
Name : Nissan A/C System Oil Type S

Component Parts Location

INFOID:0000000001183262



1. Refrigerant pressure sensor
2. Liquid tank
3. Condenser
4. Compressor
5. Radiator



1. Blower motor assembly
2. Evaporator
3. Intake sensor (AT only)
4. Expansion valve

Component Description

INFOID:0000000001183263

Component	Description
Compressor	Intakes, compresses, and discharges refrigerant, then conveys it to condenser.
Condenser	Condenses refrigerant, and then conveys it to liquid tank.
Liquid tank	Drives moisture out of refrigerant, eliminates foreign matter, then conveys refrigerant to expansion valve.
Refrigerant pressure sensor	Refer to HAC-172, "Component Inspection".
Expansion valve	Vaporizes refrigerant, controls the amount of flow, then conveys refrigerant to evaporator.
Evaporator	Cools passing air, and then conveys it to compressor.
Blower motor	Takes in air in the vehicle or fresh outside air, and then adjusts room temperature by air conditioning.

SYMPTOM DIAGNOSIS

REFRIGERATION SYSTEM SYMPTOMS

SYMPTOM DIAGNOSIS PROCEDURE

SYMPTOM DIAGNOSIS PROCEDURE : Trouble Diagnosis For Unusual Pressure

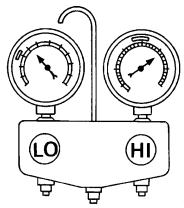
INFOID:0000000001183264

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

BOTH HIGH- AND LOW-PRESSURE SIDES ARE TOO HIGH : Symptom Table

INFOID:0000000001183265

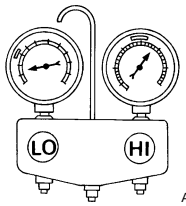
Gauge indication	Refrigerant cycle	Probable cause	Corrective action
Both high- and low-pressure sides are too high.  AC359A	The pressure returns to normal is reduced soon after water is splashed on condenser.	Excessive refrigerant charge in refrigeration cycle.	Reduce refrigerant until specified pressure is obtained.
	Air suction by cooling fan is insufficient.	Insufficient condenser cooling performance. ↓ 1. Condenser fins are clogged. 2. Improper fan rotation of cooling fan.	• Clean condenser. • Check and repair cooling fan as necessary.
	• Low-pressure pipe is not cold. • When compressor is stopped high-pressure value quickly drops by approximately 196 kPa (2 kg/cm^2, 28 psi). It then decreases gradually thereafter.	Poor heat exchange in condenser (After compressor operation stops, high-pressure decreases too slowly.). ↓ Air in refrigeration cycle.	Evacuate repeatedly and recharge system.
	Engine tends to overheat.	Engine cooling systems malfunction.	Check and repair each engine cooling system.
	• An area of the low-pressure pipe is colder than areas near the evaporator outlet. • 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

HIGH-PRESSURE SIDE IS TOO HIGH AND LOW-PRESSURE SIDE IS TOO LOW :

Symptom Table

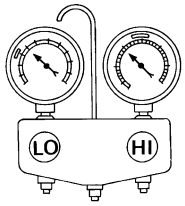
INFOID:0000000001183266

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

HIGH-PRESSURE SIDE IS TOO LOW AND LOW-PRESSURE SIDE IS TOO HIGH : Symptom Table

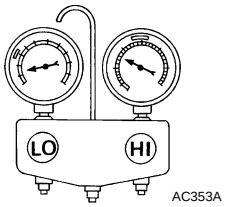
INFOID:0000000001183267

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

BOTH HIGH- AND LOW-PRESSURE SIDES ARE TOO LOW : Symptom Table

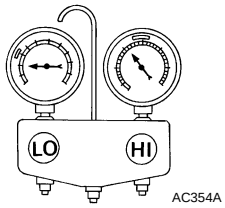
INFOID:0000000001183268

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 HA-242, "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.	• Replace compressor. • Repair evaporator fins. • Replace evaporator. • Refer to HAC-164, "Diagnosis Procedure".

LOW-PRESSURE SIDE SOMETIMES BECOMES NEGATIVE

LOW-PRESSURE SIDE SOMETIMES BECOMES NEGATIVE : Symptom Table

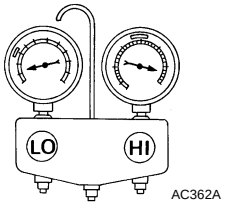
INFOID:0000000001183269

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

LOW-PRESSURE SIDE BECOMES NEGATIVE : Symptom Table

INFOID:0000000001183270

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.

PRECAUTION

PRECAUTIONS

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

INFOID:0000000001183271

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 AIRBAG” and “SEAT BELT” of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision 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 AIRBAG”.**
- **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.**

Precaution Necessary for Steering Wheel Rotation After Battery Disconnect

INFOID:0000000001183272

NOTE:

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

For models equipped with the Intelligent Key system and NATS, an electrically controlled steering lock mechanism is adopted on the key cylinder.
For this reason, if the battery is disconnected or if the battery is discharged, the steering wheel will lock and steering wheel rotation will become impossible.
If steering wheel rotation is required when battery power is interrupted, follow the procedure below before starting the repair operation.

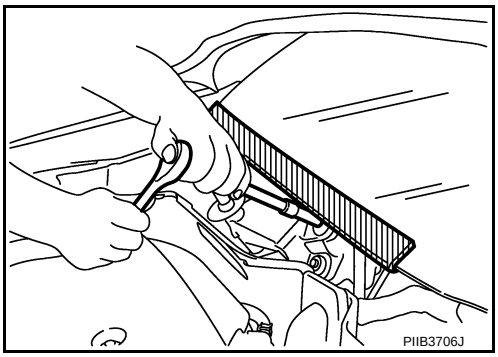
OPERATION PROCEDURE

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

Precaution for Procedure without Cowl Top Cover

INFOID:0000000001183273

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



Precautions For Xenon Headlamp Service

INFOID:0000000001183274

WARNING:

Comply with the following warnings to prevent any serious accident.

- **Disconnect the battery cable (negative terminal) or the power supply fuse before installing, removing, or touching the xenon headlamp (bulb included). The xenon headlamp contains high-voltage generated parts.**
- **Never work with wet hands.**
- **Check the xenon headlamp ON-OFF status after assembling it to the vehicle. Never turn the xenon headlamp ON in other conditions. Connect the power supply to the vehicle-side connector. (Turning it ON outside the lamp case may cause fire or visual impairments.)**
- **Never touch the bulb glass immediately after turning it OFF. It is extremely hot.**

CAUTION:

Comply with the following cautions to prevent any error and malfunction.

- **Install the xenon bulb securely. (Insufficient bulb socket installation may melt the bulb, the connector, the housing, etc. by high-voltage leakage or corona discharge.)**
- **Never perform HID circuit inspection with a tester.**
- **Never touch the xenon bulb glass with hands. Never put oil and grease on it.**
- **Dispose of the used xenon bulb after packing it in thick vinyl without breaking it.**
- **Never wipe out dirt and contamination with organic solvent (thinner, gasoline, etc.).**

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

INFOID:0000000001183275

CAUTION:

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

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

General Refrigerant Precaution

INFOID:0000000001183276

WARNING:

- **Avoid breathing A/C refrigerant and lubricant vapor or mist. Exposure may irritate eyes, nose and throat. Use only approved recovery/recycling equipment to discharge HFC-134a (R-134a) refrigerant.**

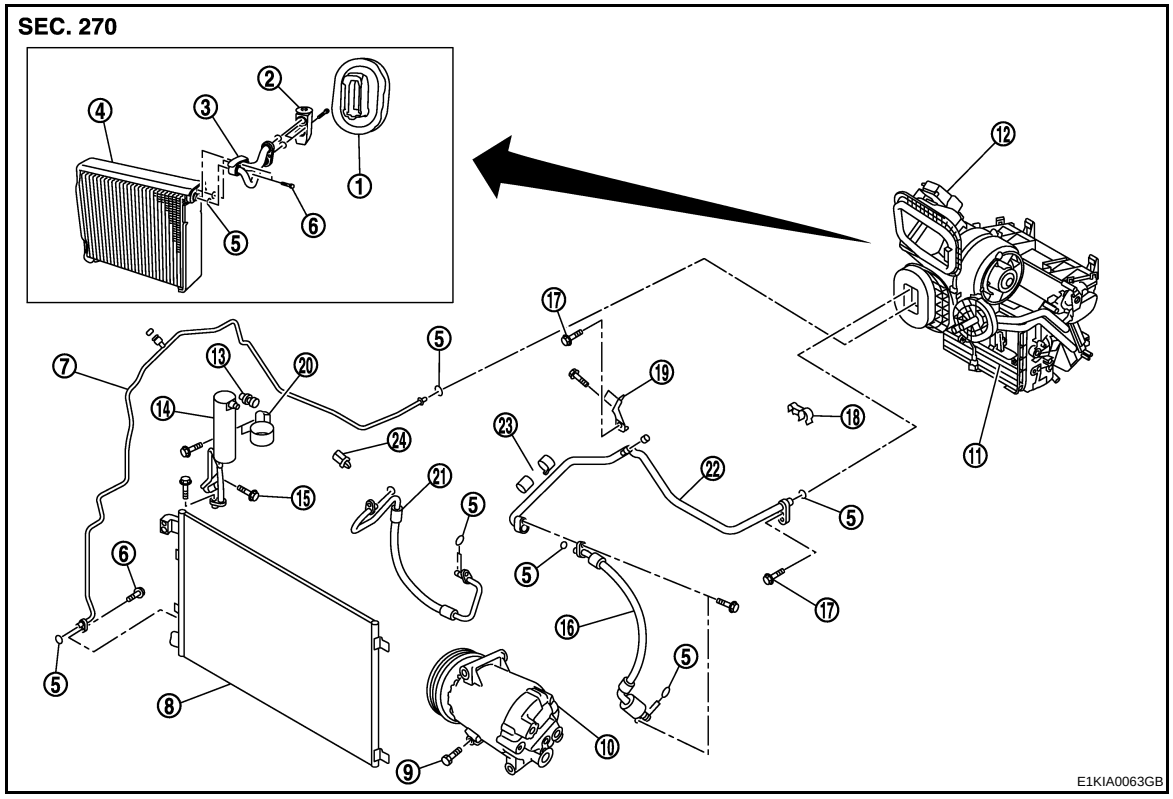
If accidental system discharge occurs, ventilate work area before resuming service. Additional health and safety information may be obtained from refrigerant and lubricant manufacturers.
- **Never release refrigerant into the air. Use approved recovery/recycling equipment to capture the refrigerant every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

Refrigerant Connection

INFOID:0000000001183277

A new type refrigerant connection has been introduced to all refrigerant lines except the following location.
- Expansion valve to evaporator
- Refrigerant pressure sensor to liquid tank

O-RING AND REFRIGERANT CONNECTION



1. Heater sealing	2. Expansion valve	3. Low pressure pipe 1 and high pressure pipe 2 assembly
4. Evaporator	5. O-ring	6. Connector pipe fixing bolt
7. High pressure pipe 1	8. Condenser assembly	9. Fixing bolt
10. Compressor	11. Heater & cooling unit assembly	12. Heater & blower unit assembly
13. Refrigerant pressure sensor	14. Liquid tank	15. Liquid tank fixing screw
16. Low pressure flexible hose	17. Fixing bolt	18. Pipes fixing clip

19. Low & high pressure pipe bracket
20. Liquid tank fixing bracket
21. High pressure flexible hose
22. Low pressure pipe 2
23. Low pressure pipe fixing clamp assembly
24. Pipe mantening clip

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

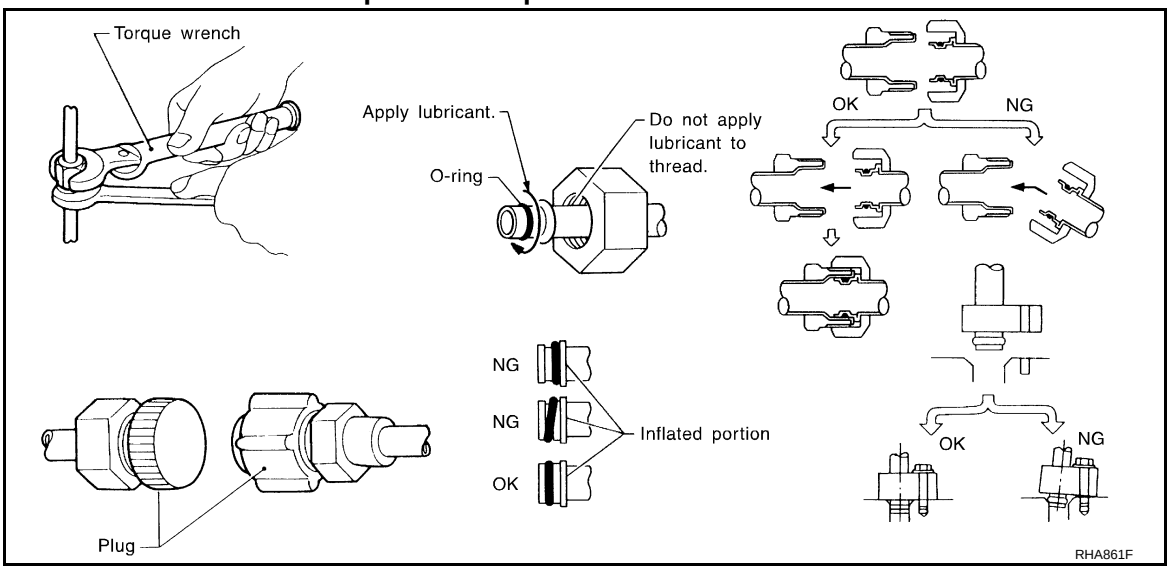
Connection type	Piping connection point		Part number	QTY	O-ring size
New	Low pressure flexible hose to Low pressure pipe 2		92473 N8210	1	16
	Low pressure pipe 2 to expansion valve		92473 N8210	1	16
	High pressure flexible pipe 1 to condenser		92472 N8210	1	12
	High pressure pipe 1 to expansion valve		92471 N8210	1	8
	Low pressure pipe 1 and high pressure pipe 2 assembly to expansion valve	Inlet	92475 71L00	1	12
		Outlet	92475 72L00	1	16
	Low pressure pipe 1 and high pressure pipe 2 assembly to evaporator	Inlet	92475 71L00	1	12
		Outlet	92475 72L00	1	16
	High pressure pipe 1 to liquid tank		92471 N8210	1	8
	Compressor to low pressure flexible hose		01-57-112	1	16
	Compressor to high pressure flexible hose		92472 N8210	1	12
	Liquid tank to condenser		92473 N8210	2	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 tube, 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 portion of tube.**
- **When replacing the O-ring, be careful not to damage O-ring and tube.**
- **Connect tube until a click can be heard, then tighten the nut or bolt by hand. 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.**



Service Equipment

INFOID:0000000001183278

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.

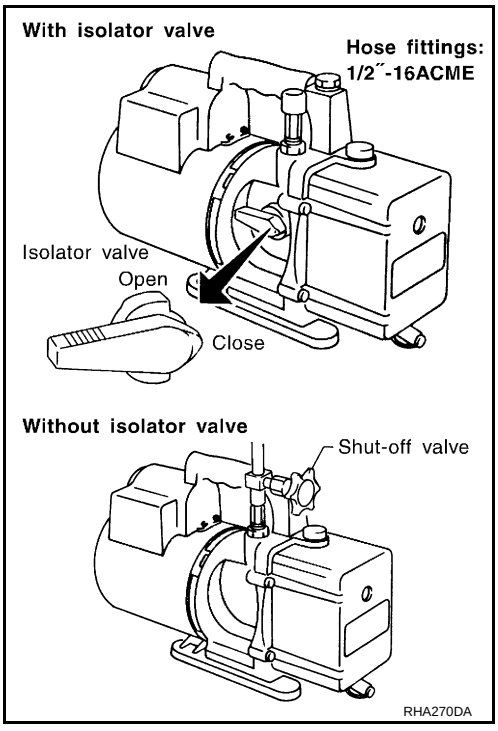
VACUUM PUMP

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.

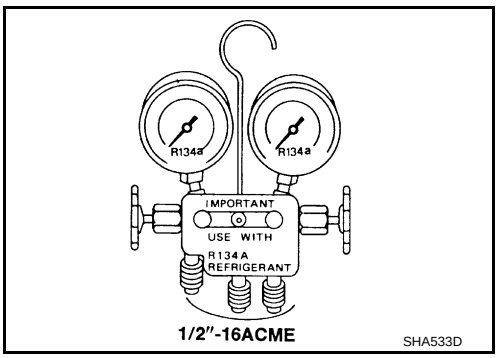
- Usually vacuum pumps have a manual isolator valve as part of the pump. Close this valve to isolate the service hose from the pump.
- For pumps without an isolator, use a hose equipped with a manual shut-off valve near the pump end. Close the valve to isolate the hose from the pump.
- If the hose has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



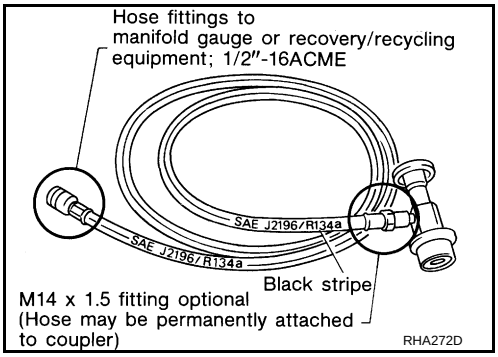
MANIFOLD GAUGE SET

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

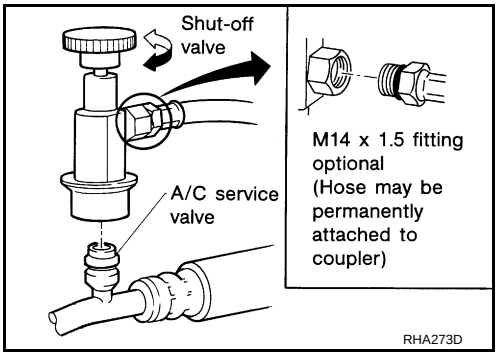
Be certain that the service hoses display the markings described (colored hose with black stripe). All hoses must include positive shut-off devices (either manual or automatic) near the end of the hoses opposite to the manifold gauge.



SERVICE COUPLERS

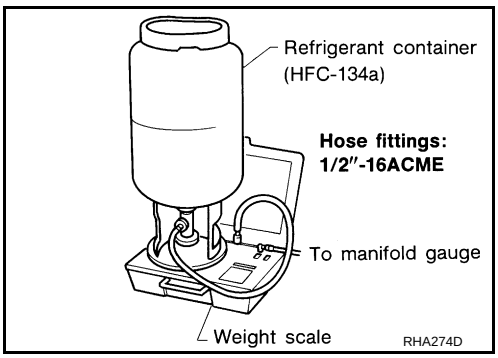
Never attempt to connect HFC-134a (R-134a) service couplers to a CFC-12 (R-12) A/C system. The HFC-134a (R-134a) couplers will not properly connect to the CFC-12 (R-12) system. However, if an improper connection is attempted, discharging and contamination may occur.

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 electronic scale or of quality recycle/recharge equipment.

COMPRESSOR

General Precautions

INFOID:0000000001183279

CAUTION:

- **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 HA-238, "Adjustment".**
- **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.**

LEAK DETECTION DYE

General Precautions

INFOID:0000000001183280

CAUTION:

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

IDENTIFICATION

NOTE:

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

IDENTIFICATION LABEL FOR VEHICLE

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

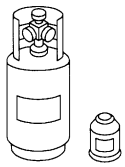
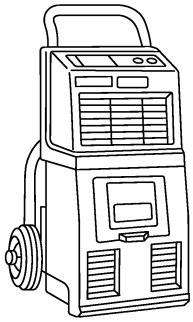
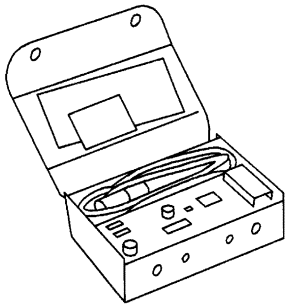
PREPARATION

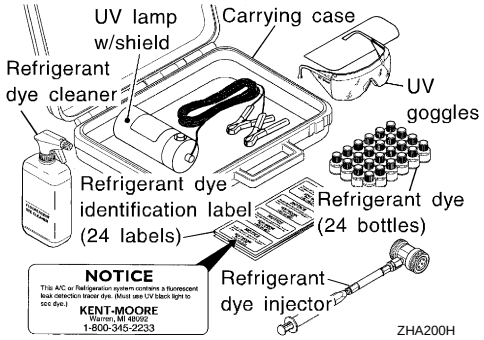
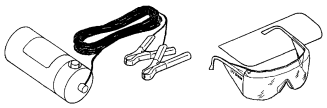
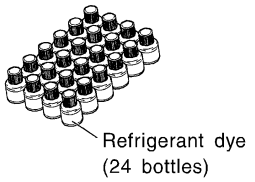
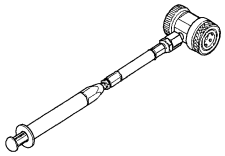
PREPARATION

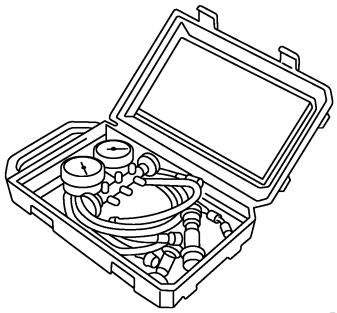
HFC-134a (R-134a) Service Tools and Equipment

INFOID:0000000001183281

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.
Adapters that convert one size fitting to another must never be used: refrigerant/lubricant contamination will occur and compressor malfunction will result.

Tool number Tool name		Description
HFC-134a (R-134a) refrigerant	 S-NT196	Container color: Light blue Container marking: HFC-134a (R-134a) Fitting size: Thread size • Large container 1/2″-16 ACME
KLH00-PAGS0 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) Lubricity: 40 m ℓ (1.4 Imp fl oz.)
Recovery/Recycling/ Recharging equipment (ACR4)	 RJIA0195E	Function: Refrigerant recovery and recycling and recharging
Electrical leak detector	 A/C leak detector SHA705EB	Power supply: DC 12V (Cigarette lighter)

Tool number Tool name		Description
(J-43926) Refrigerant dye leak detection kit Kit includes: (J-42220) UV lamp and UV safety goggles (J-41459) HFC-134a (R-134a) dye injector Use with J-41447, 1/4 ounce bottle (J-41447) HFC-134a (R-134a) fluorescent leak detection dye (Box of 24, 1/4 ounce bottles) (J-43872) Refrigerant dye cleaner		Power supply: DC 12 V (Battery terminal)
(J-42220) UV lamp and UV safety goggles		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)		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		For injecting 1/4 ounce of fluorescent leak detection dye into A/C system

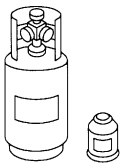
Tool number Tool name		Description
(J-43872) Refrigerant dye cleaner	 SHA441F	For cleaning dye spills
(J-39183) Manifold gauge set (with hoses and couplers)	 RJIA0196E	Identification: • The gauge face indicates HFC-134a (R-134a). Fitting size: Thread size • 1/2″-16 ACME

Sealant or/and Lubricant

INFOID:0000000001183282

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

- 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 name		Description
HFC-134a (R-134a) refrigerant	 S-NT196	Container color: Light blue Container marking: HFC-134a (R-134a) Fitting size: Thread size • Large container 1/2″-16 ACME
Nissan A/C System Oil Type S (DH-PS)	 S-NT197	Type: Polyalkylene glycol oil (PAG), type S (DH-PS) Application: HFC-134a (R-134a) swash plate compressors (Nissan only) Capacity: 40 m ℓ (1.4 US fl oz., 1.4 Imp fl oz.)

ON-VEHICLE MAINTENANCE

LUBRICANT

Adjustment

INFOID:0000000001183283

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.

Is it successful?

YES >> GO TO 2.
NO >> 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 >> Refer to "LUBRICANT ADJUSTING PROCEDURE FOR COMPRESSOR REPLACEMENT".
NO >> Refer to "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:

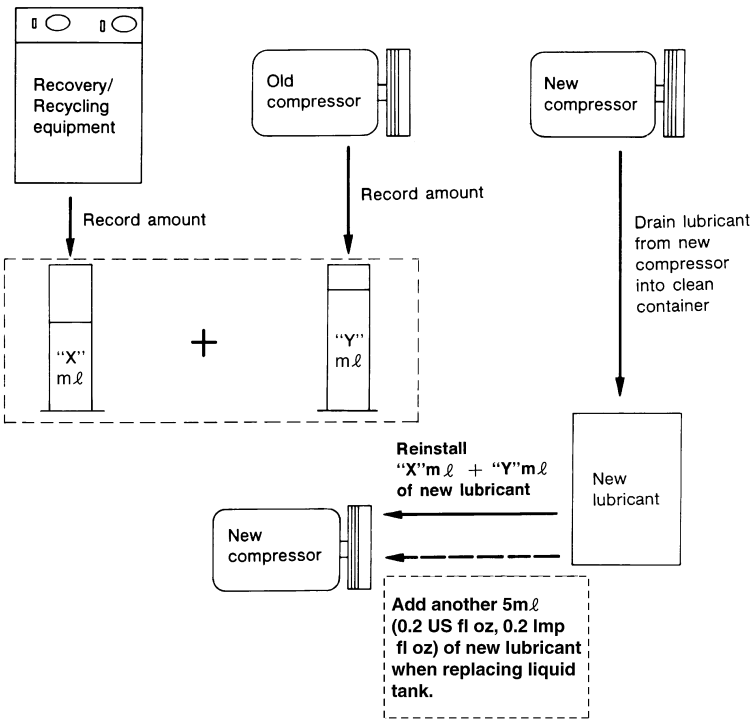
Part replaced	Lubricant to be added to system	Remarks
	Amount of lubricant mℓ (US fl oz., Imp fl oz.)	
Evaporator	75 (2.5, 2.6)	—
Condenser	35 (1.2, 1.2)	—
Liquid tank	10 (0.3, 0.4)	—
In case of refrigerant leak	30 (1.0, 1.1)	Large leak
	—	Small leak *1

*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 HA-228, "Working with HFC-134a (R-134a)".
3. Confirm refrigerant purity in vehicle A/C system using recovery/recycling recharging equipment and refrigerant identifier. If NG, refer to HA-228, "Working with HFC-134a (R-134a)".
4. Discharge refrigerant into the refrigerant recovery/recycling equipment. Measure lubricant discharged into the recovery/recycling equipment.
5. Drain the lubricant from the old (removed) compressor into a graduated container and recover the amount of lubricant drained.
6. Drain the lubricant from the new compressor into a separate, clean container.
7. Measure an amount of new lubricant installed equal to amount drained from old compressor. Add this lubricant to new compressor through the suction port opening.
8. Measure an amount of new lubricant equal to the amount recovered during discharging. Add this lubricant to new compressor through the suction port opening.
9. If the liquid tank also needs to be replaced, add another 5 m ℓ (0.2 US fl oz., 0.2 Imp fl oz.) of lubricant at this time.
   Do not add this 5 m ℓ (0.2 US fl oz., 0.2 Imp fl oz.) of lubricant when replaces the compressor only.

Lubricant adjusting procedure for compressor replacement

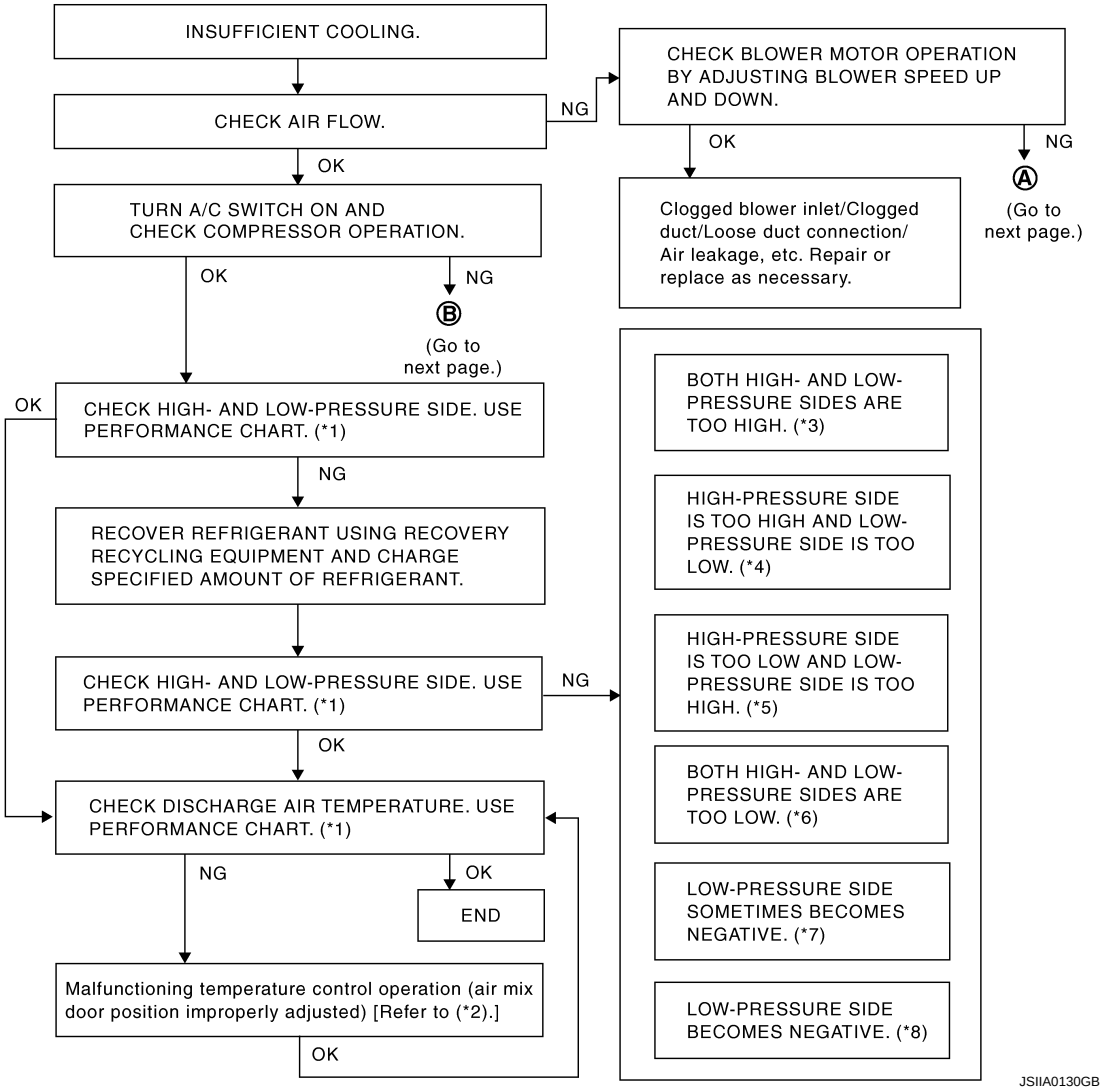


REFRIGERATION SYSTEM

Inspection

INFOID:0000000001183284

PERFORMANCE TEST DIAGNOSIS



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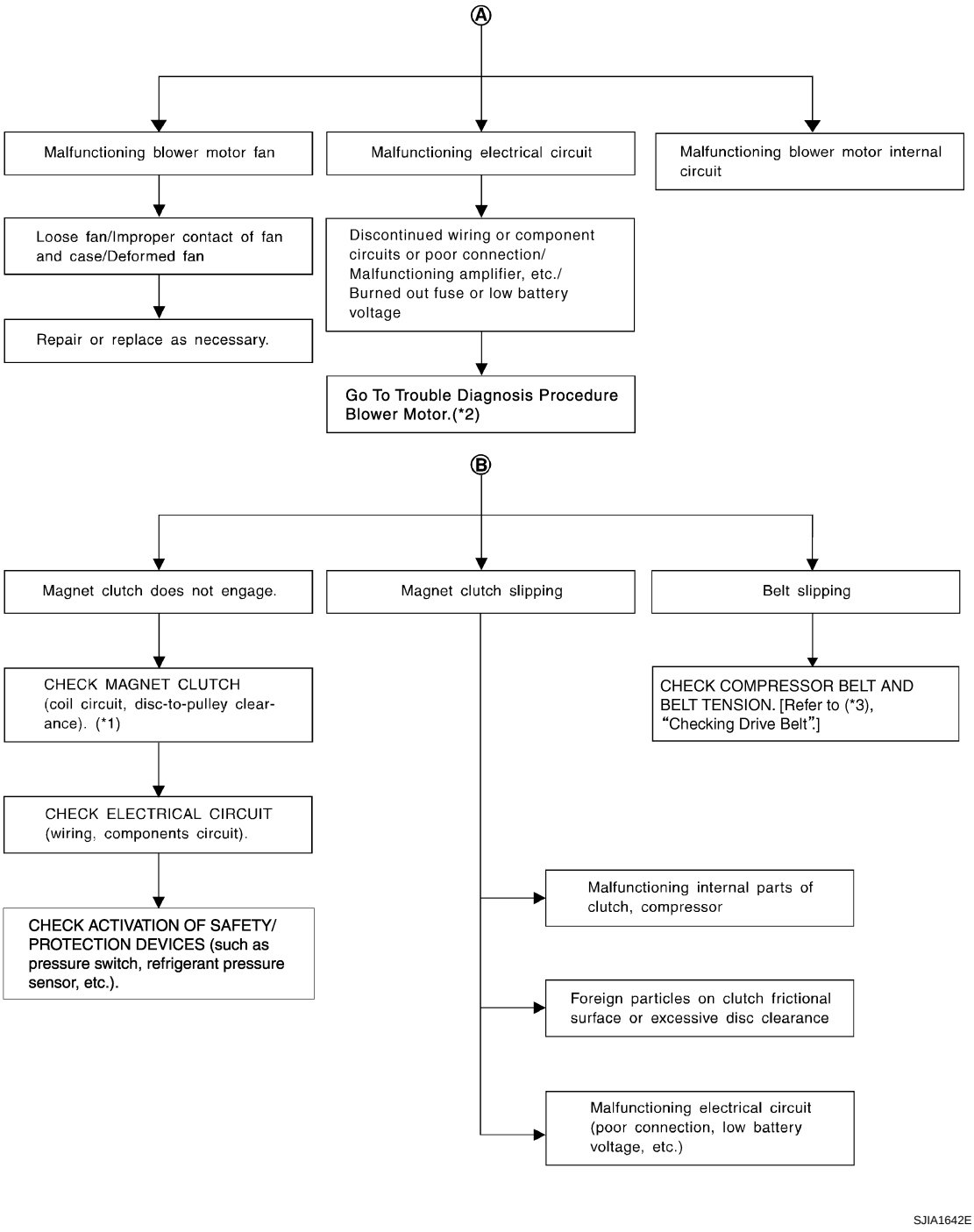
*1 HA-241, "Performance Chart"
*2 HAC-212, "Diagnosis Chart By Symptom"
*3 HA-223, "BOTH HIGH- AND LOW-PRESSURE SIDES ARE TOO HIGH : Symptom Table"
*4 HA-223, "HIGH-PRESSURE SIDE IS TOO HIGH AND LOW-PRESSURE SIDE IS TOO LOW : Symptom Table"
*5 HA-224, "HIGH-PRESSURE SIDE IS TOO LOW AND LOW-PRESSURE SIDE IS TOO HIGH : Symptom Table"
*6 HA-225, "BOTH HIGH- AND LOW-PRESSURE SIDES ARE TOO LOW : Symptom Table"
*7 HA-225, "LOW-PRESSURE SIDE SOMETIMES BECOMES NEGATIVE : Symptom Table"
*8 HA-226, "LOW-PRESSURE SIDE BECOMES NEGATIVE : Symptom Table"



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*1 HA-240, "Inspection" *2 HAC-164, "Diagnosis Procedure" *3 EM-260, "Inspection and Adjustment"

Performance Chart

INFOID:0000000001555637

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

Vehicle condition	Indoors or in the shade (in a well-ventilated place)
Hood	Open
TEMP.	Max. COLD
Mode switch	(Ventilation) set
Intake switch	(Recirculation) set
Fan (blower) speed	Max. speed set
Engine speed	Idle speed
Operate the air conditioning system for 10 minutes before taking measurements.	

TEST READING

Recirculating-to-discharge Air Temperature Table

Inside air (Recirculating air) at blower assembly inlet		Discharge air temperature at center ventilator °C (°F)
Relative humidity %	Air temperature °C (°F)	
50 - 60	20 (68)	7.0 - 7.3 (44.6 - 45.1)
	25 (77)	8.9 - 10.0 (48.0 - 50.0)
	30 (86)	10.9 - 13.1 (51.6 - 55.6)
	35 (95)	17.8 - 19.3 (64.0 - 66.7)
60 - 70	20 (68)	7.3 - 7.6 (45.1 - 45.7)
	25 (77)	10.0 - 11.0 (50.0 - 51.8)
	30 (86)	13.1 - 15.2 (55.6 - 59.4)
	35 (95)	19.3 - 20.8 (66.7 - 69.4)

Ambient Air Temperature-to-operating Pressure Table

Ambient air		High-pressure (Discharge side)							
Relative humidity %	Air temperature °C (°F)	Bar		kPa		kg/cm^2		psi	
		From	to	From	to	From	to	From	to
50 - 70	20 (68)	9.3	11.2	930.0	1120.0	9.5	11.4	134.9	162.4
	25 (77)	12.7	14.4	1270.0	1440.0	13.0	14.7	184.2	208.8
	30 (86)	14.5	17.8	1450.0	1780.0	14.8	18.2	210.3	258.1
	35 (95)	17.3	19.5	1730.0	1950.0	17.6	19.9	250.9	282.8
	40 (104)	17.5	19.4	1750.0	1940.0	17.8	19.8	253.8	281.3

Ambient Air Temperature-to-operating Pressure Table

Ambient air		Low pressure (Suction side)							
Relative humidity %	Air temperature °C (°F)	Bar		kPa		kg/cm^2		psi	
		From	to	From	to	From	to	From	to
50 - 70	20 (68)	2.1	2.2	210.0	220.0	2.1	2.2	30.5	31.9
	25 (77)	2.5	2.5	250.0	250.0	2.5	2.5	36.3	36.3
	30 (86)	2.5	3.1	250.0	310.0	2.5	3.2	36.3	45.0
	35 (95)	3.2	3.6	320.0	360.0	3.3	3.7	46.4	52.2
	40 (104)	3.6	4.0	360.0	400.0	3.7	4.1	52.2	58.0

Refrigerant Leaks

INFOID:0000000001183285

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.

FLUORESCENT LEAK DETECTOR

Inspection

INFOID:0000000001183286

CHECKING SYSTEM FOR LEAKS USING THE FLUORESCENT LEAK DETECTOR

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

(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.

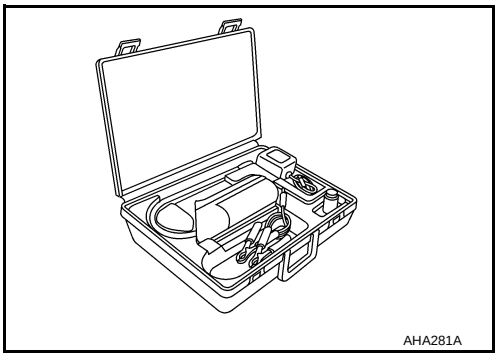
ELECTRICAL LEAK DETECTOR

Inspection

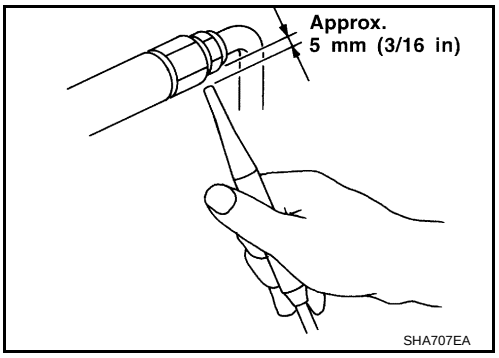
INFOID:0000000001183287

PRECAUTIONS FOR HANDLING LEAK DETECTOR

When performing a refrigerant leak check, use an electrical leak detector (SST: J-41995) 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.

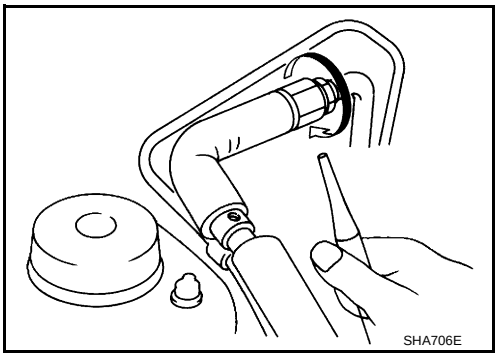

AHA281A

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

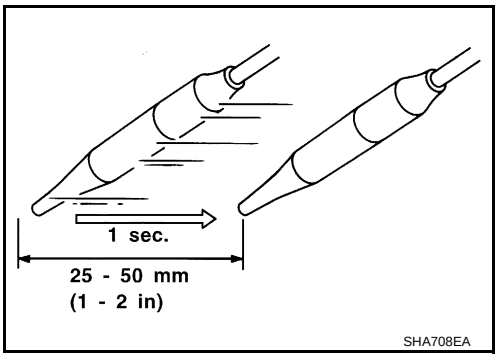


SHA707EA

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


SHA706E

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



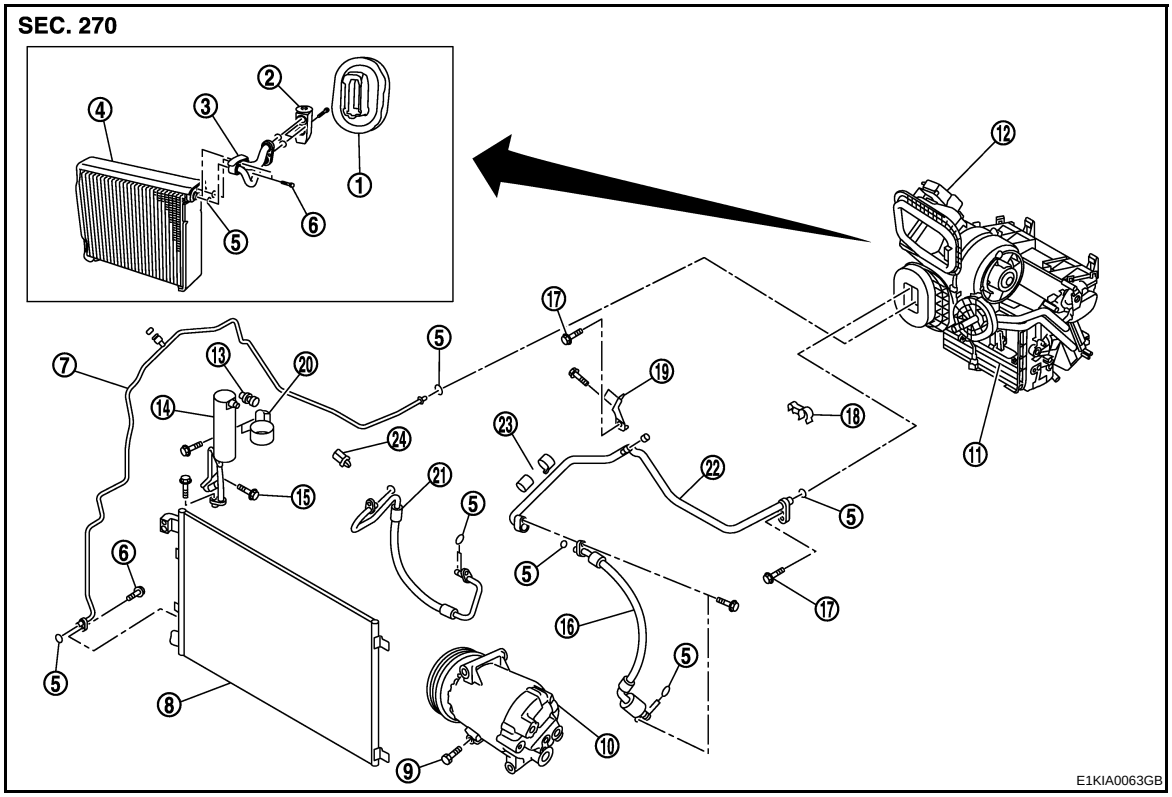
SHA708EA

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 j) to the low-pressure side (evaporator drain hose k to shaft seal p). 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.



1. Heater sealing
2. Expansion valve
3. Low pressure pipe 1 and high pressure pipe 2 assembly
4. Evaporator
5. O-ring
6. Connector pipe fixing bolt
7. High pressure pipe 1
8. Condenser assembly
9. Fixing bolt
10. Compressor
11. Heater & cooling unit assembly
12. Heater & blower unit assembly
13. Refrigerant pressure sensor
14. Liquid tank
15. Liquid tank fixing screw
16. Low pressure flexible hose
17. Fixing bolt
18. Pipes fixing clip
19. Low & high pressure pipe bracket
20. Liquid tank fixing bracket
21. High pressure flexible hose
22. Low pressure pipe 2
23. Low pressure pipe fixing clamp assembly
24. Pipe mantening clip

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

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

Cooling unit (Evaporator)

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

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

5. If a leak detector detects a leak, verify at least once by blowing compressed air into area of suspected leak, then repeat check as outlined above.
6. Do not stop when one leak is found. Continue to check for additional leaks at all system components. If no leaks are found, perform steps 7 - 10.
7. Start the engine.
8. Set the A/C control as follows;

a. A/C switch: ON

b. MODE door position: VENT (Ventilation)

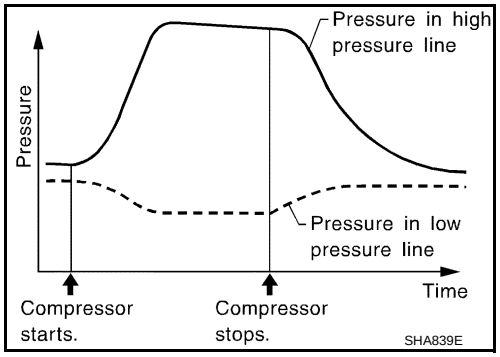
c. Intake door position: Recirculation

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.

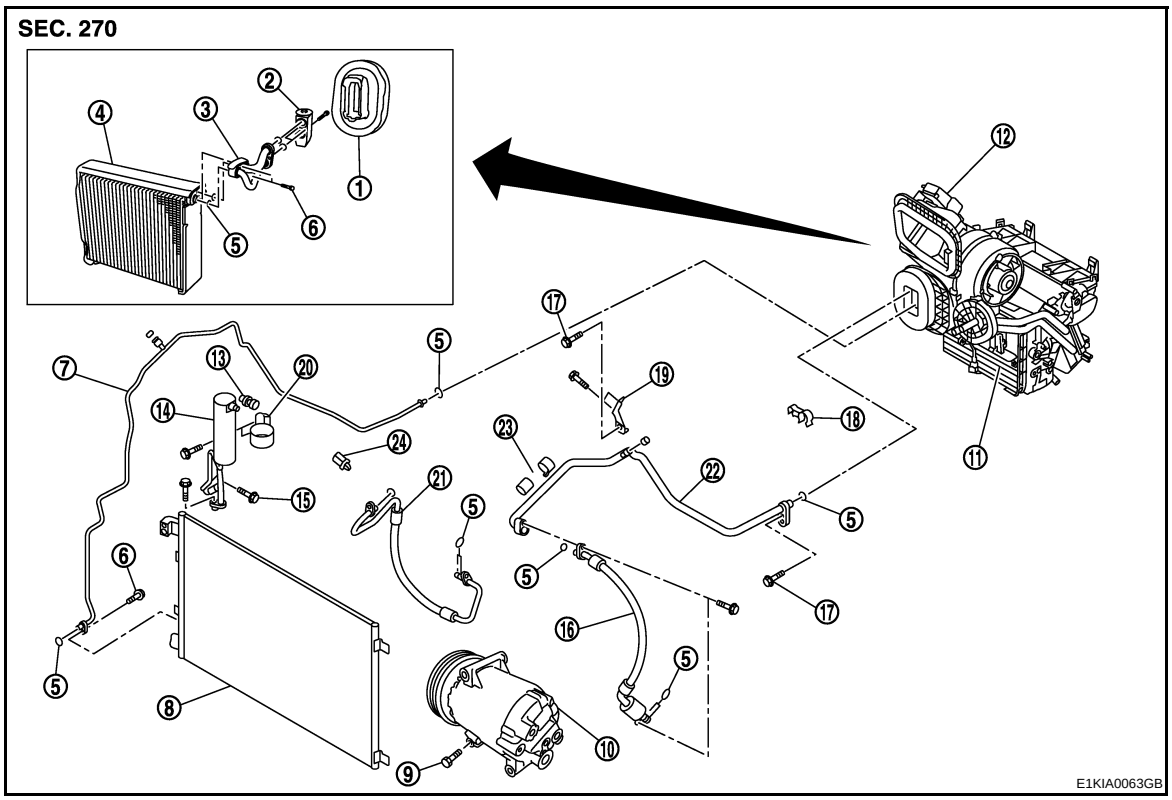
ON-VEHICLE REPAIR

REFRIGERATION SYSTEM

Exploded View

INFOID:0000000001183288

Refer to HA-229, "Refrigerant Connection".



1. Heater sealing	2. Expansion valve	3. Low pressure pipe 1 and high pressure pipe 2 assembly
4. Evaporator	5. O-ring	6. Connector pipe fixing bolt
7. High pressure pipe 1	8. Condenser assembly	9. Fixing bolt
10. Compressor	11. Heater & cooling unit assembly	12. Heater & blower unit assembly
13. Refrigerant pressure sensor	14. Liquid tank	15. Liquid tank fixing screw
16. Low pressure flexible hose	17. Fixing bolt	18. Pipes fixing clip
19. Low & high pressure pipe bracket	20. Liquid tank fixing bracket	21. High pressure flexible hose
22. Low pressure pipe 2	23. Low pressure pipe fixing clamp assembly	24. Pipe mantening clip

Inspection After Installation

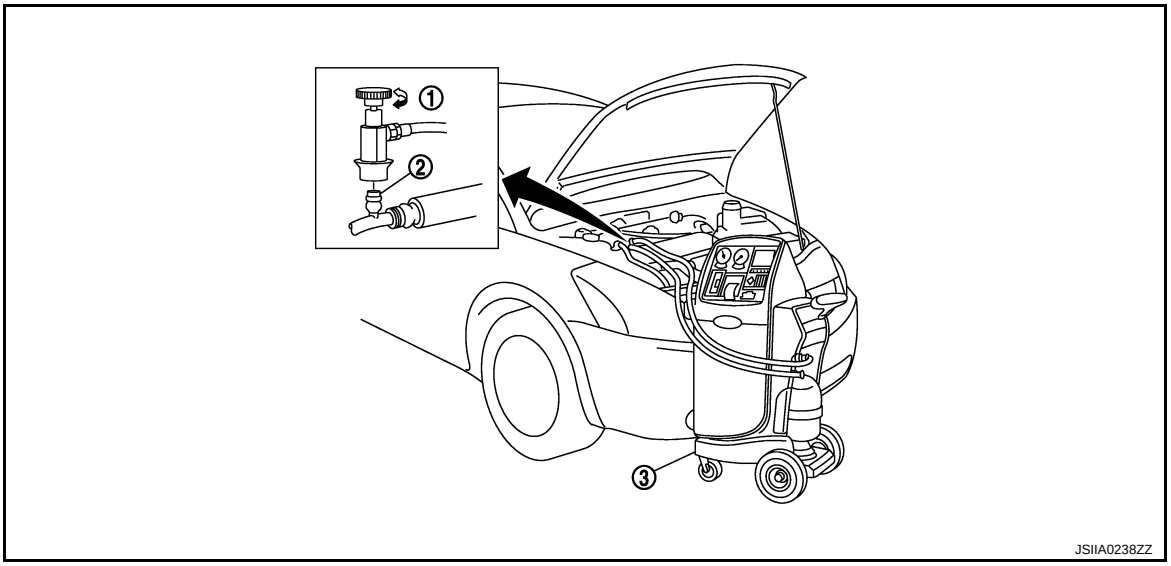
INFOID:0000000001183289

SETTING OF SERVICE TOOLS AND EQUIPMENT

Discharging Refrigerant

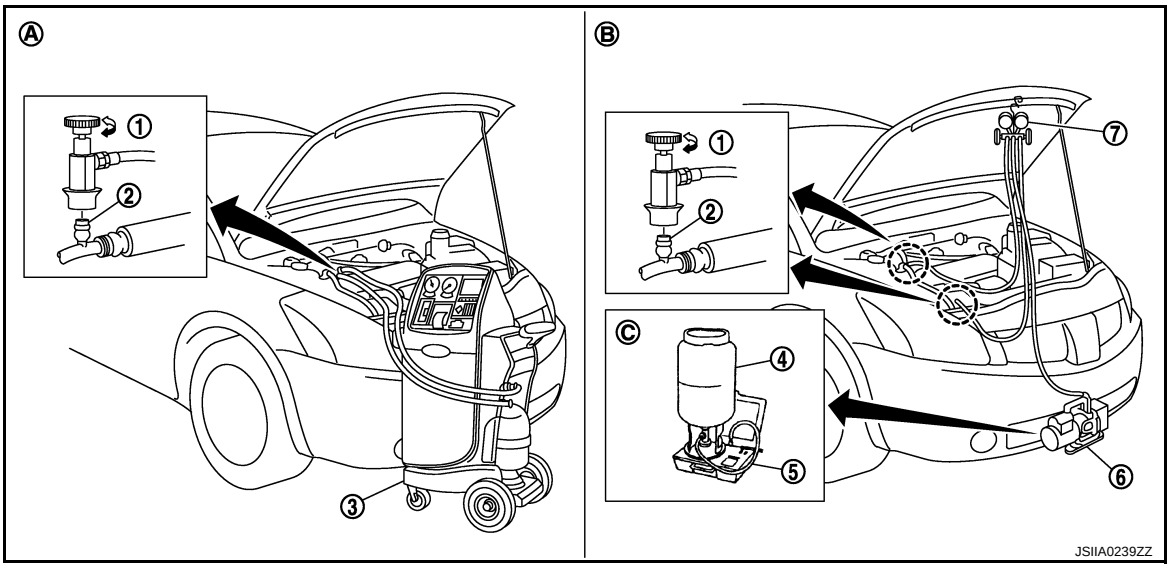
WARNING:

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.



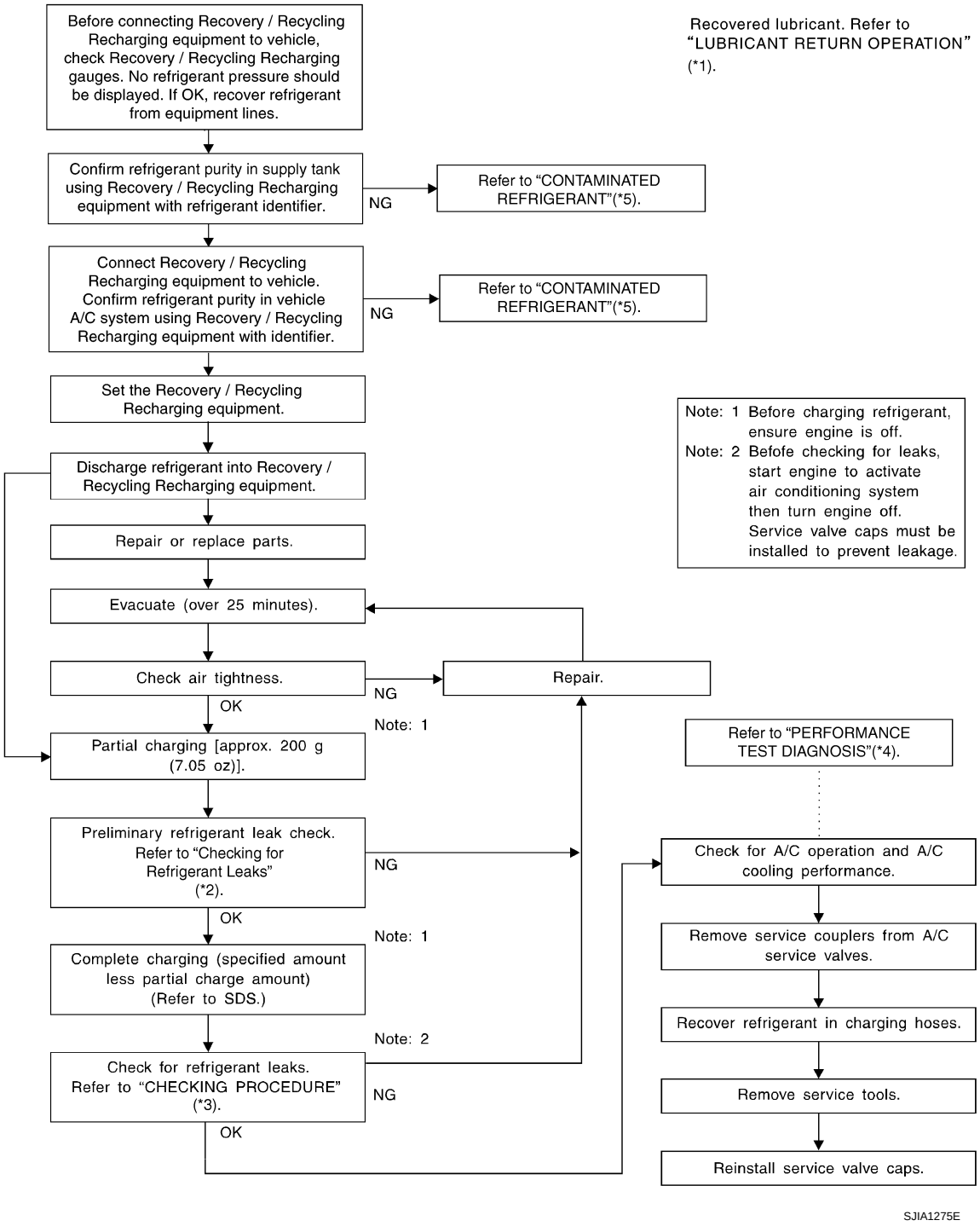
1. Shut-off valve
2. A/C service valve
3. Recovery/Recycling/Recharging equipment

Evacuating System and Charging Refrigerant



1. Shut-off valve
2. A/C service valve
3. Recovery/Recycling/Recharging equipment
4. Refrigerant container (HFC-134a)
5. Weight scale (J-39650)
6. Vacuum pump (J-39649)
7. Manifold gauge set (J-39183)

A. Preferred (best) method
B. Alternative method
C. For charging



*1 HA-238, "Adjustment"

*2 "REFRIGERANT LEAKS" in HA-242, "Refrigerant Leaks".

*3 "CHECKING PROCEDURE" in HA-240, "Inspection".

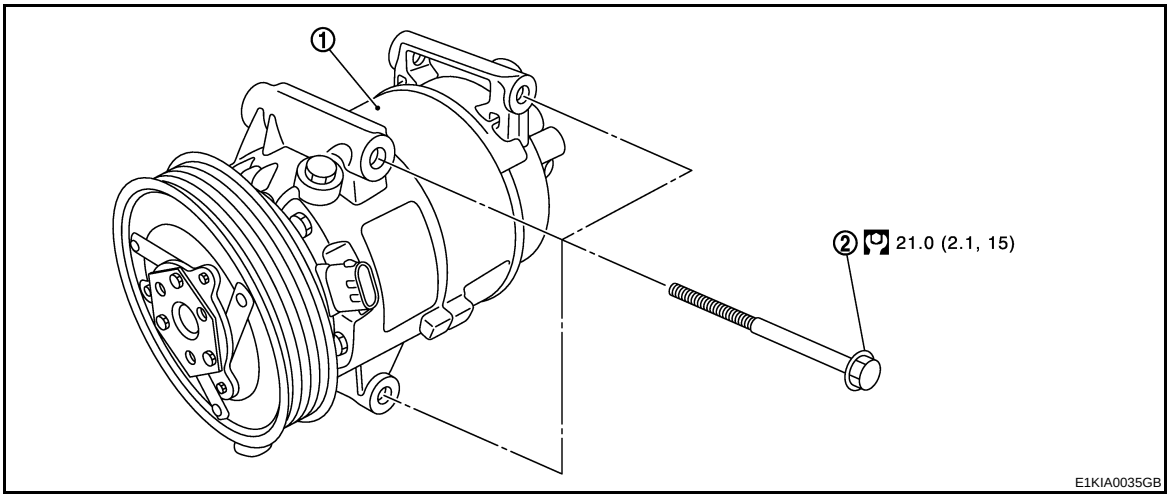
*4 "PERFORMANCE TEST DIAGNOSIS" in HA-240, "Inspection".

*5 "CONTAMINATED REFRIGERANT" in HA-228, "Working with HFC-134a (R-134a)".

COMPRESSOR

Exploded View

INFOID:0000000001183290



1. Compressor
2. Compressor fixing bolt

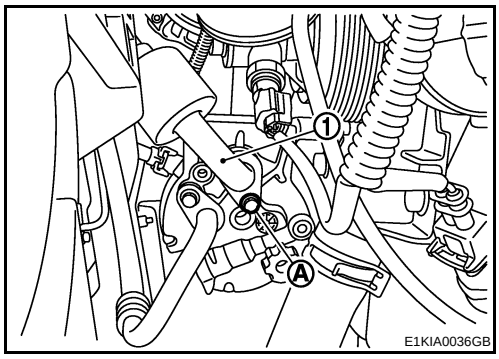
Refer to GI-4, "Components" for symbols in the figure.

Removal and Installation

INFOID:0000000001183291

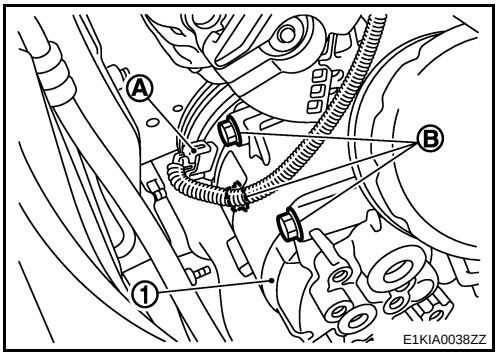
REMOVAL

1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
2. Remove engine cover ornament.
3. Remove air intake hoses (RH) and air duct (LH). Refer to EM-266, "Removal and Installation".
4. Remove engine undercover, using power tools.
5. Drain engine coolant from radiator. Refer to CO-52, "Draining".
6. Remove drive belt. Refer to EM-260, "Removal and Installation".
7. Remove lower radiator hose from engine. Refer to CO-56, "Removal and Installation".
8. Remove fixing bolts (A) and (B) from low-pressure flexible hose (1) and high-pressure flexible hose (2).
9. Remove low-pressure flexible hose and high-pressure flexible hose from compressor.
   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.



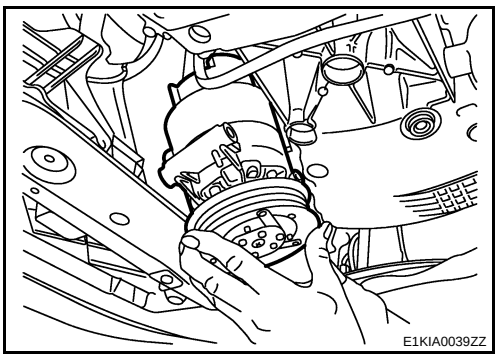
10. Disconnect harness connector from compressor.

11. Remove compressor harness connector (A), then remove mounting bolts (B) from compressor (1), using power tools.



12. Remove the compressor from the vehicle.

Compressor fixing bolt to engine
: 21 N·m (2.2 kg-m, 15.5 ft-lb)



INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

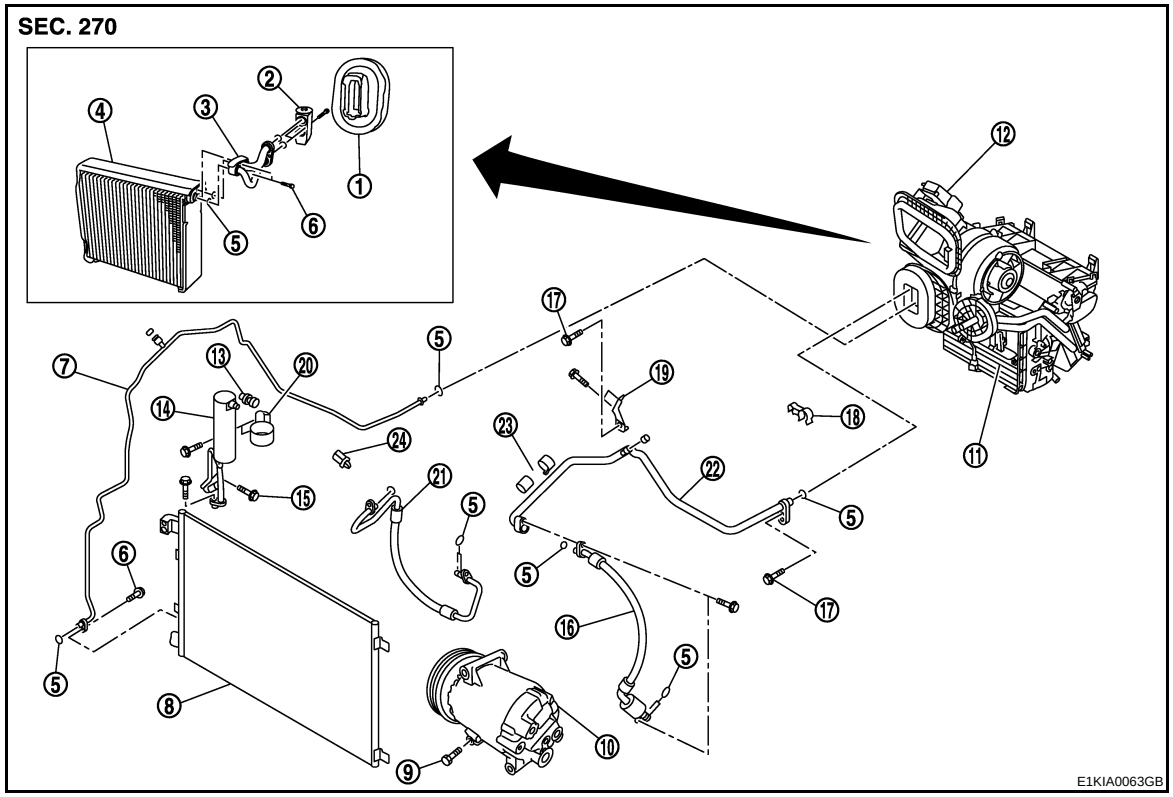
- **Replace O-rings of low-pressure flexible hose and high-pressure flexible hose with new ones, and then apply compressor oil to it when installing it.**
- **When recharging refrigerant, check for leaks.**

LOW-PRESSURE FLEXIBLE HOSE AND PIPE 2

Exploded View

INFOID:0000000001183292

Refer to HA-229, "Refrigerant Connection".



1. Heater sealing
2. Expansion valve
3. Low pressure pipe 1 and high pressure pipe 2 assembly
4. Evaporator
5. O-ring
6. Connector pipe fixing bolt
7. High pressure pipe 1
8. Condenser assembly
9. Fixing bolt
10. Compressor
11. Heater & cooling unit assembly
12. Heater & blower unit assembly
13. Refrigerant pressure sensor
14. Liquid tank
15. Liquid tank fixing screw
16. Low pressure flexible hose
17. Fixing bolt
18. Pipes fixing clip
19. Low & high pressure pipe bracket
20. Liquid tank fixing bracket
21. High pressure flexible hose
22. Low pressure pipe 2
23. Low pressure pipe fixing clamp assembly
24. Pipe mantening clip

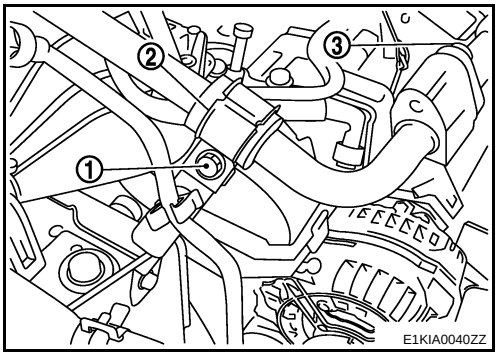
Removal and Installation

INFOID:0000000001183293

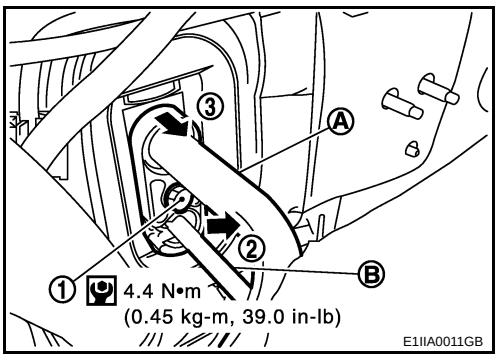
REMOVAL

1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
2. Remove upper engine cover ornament. Refer to EM-267, "Removal and Installation".
3. Remove air intake hose (RH side), and air duct (LH). Refer to EM-266, "Removal and Installation".

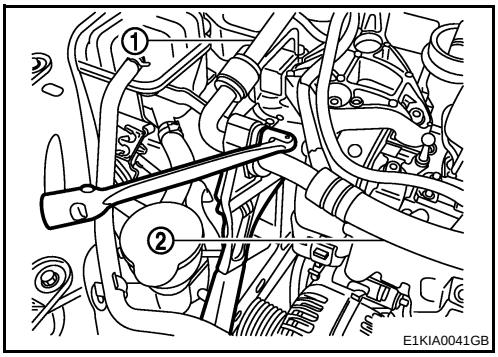
4. Remove mounting bolt (1) and clamp (2), from low pressure pipe bracket support.
5. Remove low and high-pressure maintaining clip, from both pipes, then remove fixing bolt (3) from low-pressure flexible hose and low-pressure pipe 2.
6. Remove engine room insulator fixing clip from cowl top.



7. Pull engine room insulator, then remove pipes bracket fixing bolt (1), from expansion valve, and release pipes fixing bracket, as shown in order (1) to (3), from high pressure pipe 1 (B), to remove low pressure flexible hose and pipe 2 (A) from expansion valve.
CAUTION:
Cap or wrap the joint of the low pressure then remove fixing bolt (3) pipe 2, and expansion valve exit with suitable material such as vinyl tape to avoid the entry of air.

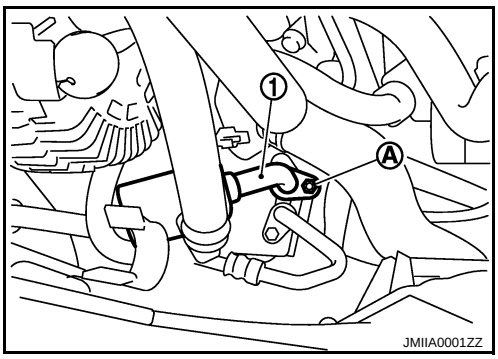


8. Remove low pressure pipe 2 connector fixing nut, with suitable tools, then remove low pressure pipe 2 (1) from low pressure flexible hose (2).
CAUTION:
Cap or wrap the joint of the low pressure pipe 2 connector, and low pressure flexible hose, with suitable material such as vinyl tape to avoid the entry of air.



9. Remove low pressure flexible hose fixing bolt (A), from air conditioner compressor, and remove low pressure flexible hose (1).
CAUTION:
Cap or wrap the joint of low-pressure flexible hose with suitable material such as vinyl tape to avoid the entry of air.

Pipe bracket fixing bolt to expansion valve
: 4.4 N·m (0.45 kg-m, 39 in-lb)
Low pressure flexible pipe fixing bolt to compressor
: 4.4 N·m (0.45 kg-m, 39 in-lb)



INSTALLATION

Installation is basically the reverse order of removal.

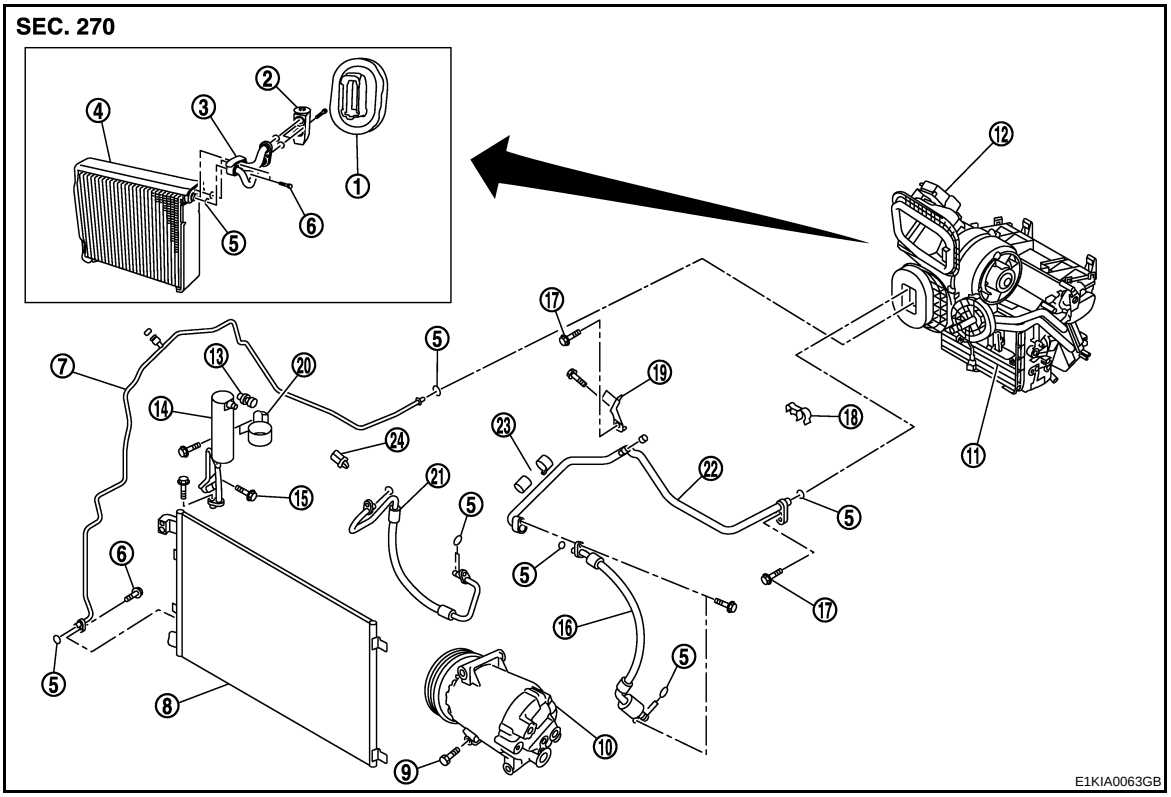
CAUTION:
- **Replace O-rings of low-pressure flexible hose and low-pressure pipe 2 with new ones, and then apply compressor oil to it when installing it.**
- **Female-side piping connection is thin and easy to deform. Slowly insert the male-side piping straight in axial direction.**
- **Insert piping 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.**

HIGH-PRESSURE FLEXIBLE HOSE

Exploded View

INFOID:0000000001183294

Refer to HA-229, "Refrigerant Connection".



1. Heater sealing	2. Expansion valve	3. Low pressure pipe 1 and high pressure pipe 2 assembly
4. Evaporator	5. O-ring	6. Connector pipe fixing bolt
7. High pressure pipe 1	8. Condenser assembly	9. Fixing bolt
10. Compressor	11. Heater & cooling unit assembly	12. Heater & blower unit assembly
13. Refrigerant pressure sensor	14. Liquid tank	15. Liquid tank fixing screw
16. Low pressure flexible hose	17. Fixing bolt	18. Pipes fixing clip
19. Low & high pressure pipe bracket	20. Liquid tank fixing bracket	21. High pressure flexible hose
22. Low pressure pipe 2	23. Low pressure pipe fixing clamp assembly	24. Pipe mantening clip

Removal and Installation

INFOID:0000000001183295

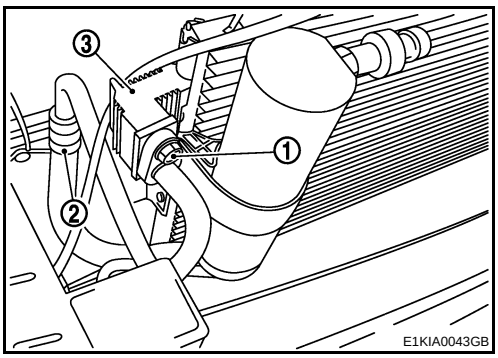
REMOVAL

1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
2. Remove engine cover ornament. Refer to EM-267, "Removal and Installation".
3. Remove air intake hose (RH) and air duct (LH). Refer to EM-266, "Removal and Installation".
4. Remove front grille. Refer to EXT-17, "Removal and Installation".
5. Remove radiator air guide (RH). Refer to CO-56, "Removal and Installation".

6. Remove high pressure flexible hose fixing bolt (1) from condenser (3), then pull high pressure flexible hose (2) to remove it from condenser.

CAUTION:

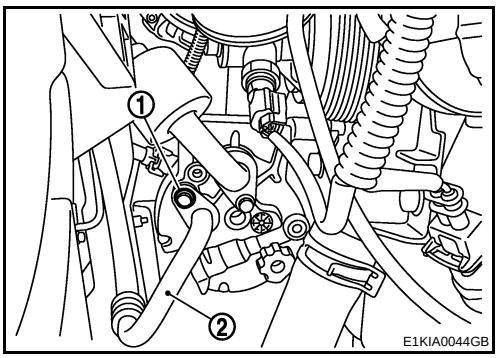
Cap or wrap the joint of high-pressure flexible hose and condenser assembly with suitable material such as vinyl tape to avoid the entry of air.



7. Remove high pressure flexible hose fixing bolt (1) from compressor, then pull high pressure flexible hose (2) to remove it from compressor.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.



High pressure fixing bolt to condensor

: 4.4 N·m (0.45 kg-m, 39 in-lb)

High pressure fixing bolt to compressor

: 4.4 N·m (0.45 kg-m, 39 in-lb)

INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

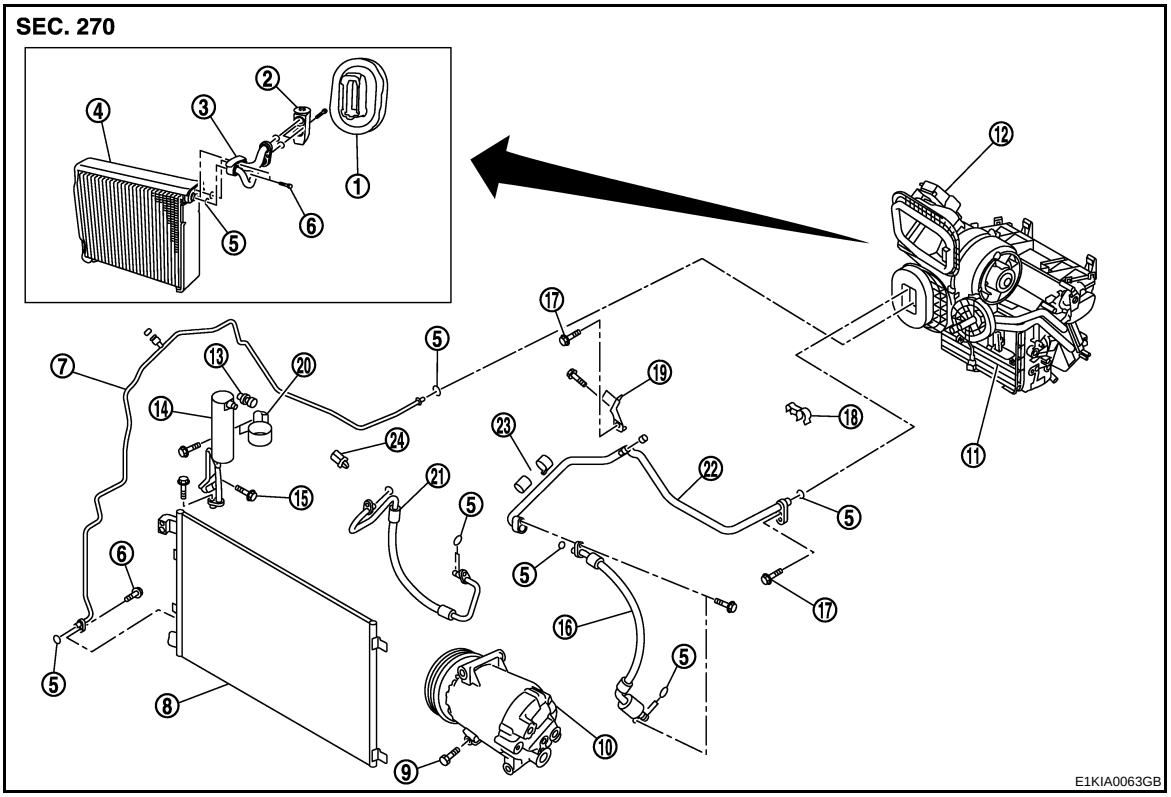
- **Replace O-rings of high-pressure flexible hose with new ones, and then apply compressor oil to it when installing it.**
- **Female-side piping connection is thin and easy to deform. Slowly insert the male-side piping straight in axial direction.**
- **Insert piping securely until a click is heard.**
- **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 PIPE 1 (ENGINE COMPARTMENT)

Exploded View

INFOID:0000000001183296

Refer to HA-229, "Refrigerant Connection".



1. Heater sealing
2. Expansion valve
3. Low pressure pipe 1 and high pressure pipe 2 assembly
4. Evaporator
5. O-ring
6. Connector pipe fixing bolt
7. High pressure pipe 1
8. Condenser assembly
9. Fixing bolt
10. Compressor
11. Heater & cooling unit assembly
12. Heater & blower unit assembly
13. Refrigerant pressure sensor
14. Liquid tank
15. Liquid tank fixing screw
16. Low pressure flexible hose
17. Fixing bolt
18. Pipes fixing clip
19. Low & high pressure pipe bracket
20. Liquid tank fixing bracket
21. High pressure flexible hose
22. Low pressure pipe 2
23. Low pressure pipe fixing clamp assembly
24. Pipe mantening clip

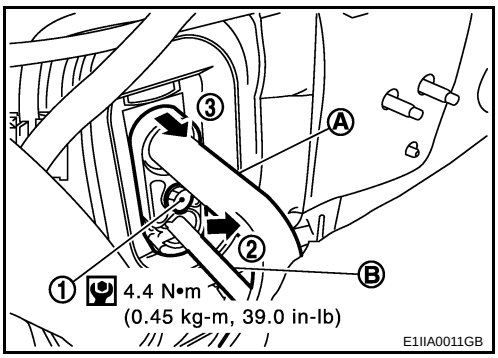
Removal and Installation

INFOID:0000000001183297

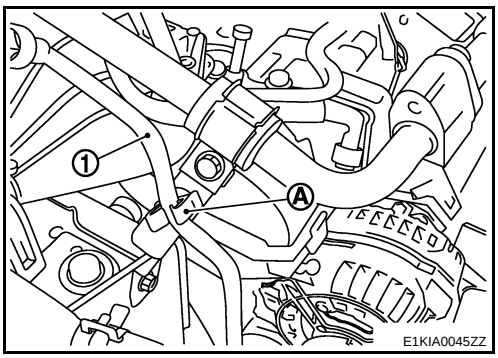
REMOVAL

1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
2. Remove engine cover ornament. Refer to EM-267, "Removal and Installation".
3. Remove intake hose (RH) and air duct (LH). Refer to EM-266, "Removal and Installation".

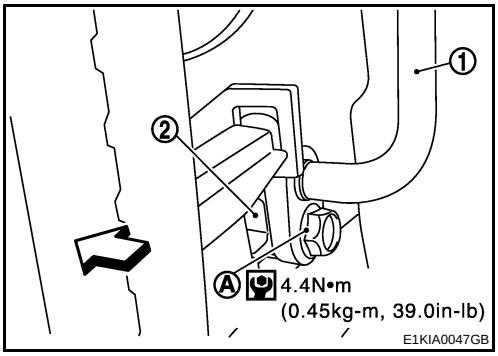
4. Pull engine room insulator, then remove pipes bracket fixing bolt, from expansion valve, then release pipe fixing bracket from high pressure pipe 1, to disconnect it from expansion valve.
CAUTION:
Cap or wrap the joint of the high pressure pipe 1, and expansion valve in, with suitable material such as vinyl tape to avoid the entry of air.



5. Remove high pressure pipe 1 (1) from clip (A).



- Remove high-pressure pipe 1 mounting bolt (A) from condenser (2).
- Remove high pressure pipe 1 (1).
CAUTION:
Cap or wrap the joint of the high pressure pipe 1, and condenser, with suitable material such as vinyl tape to avoid the entry of air.



INSTALLATION

Installation is basically the reverse order of removal.

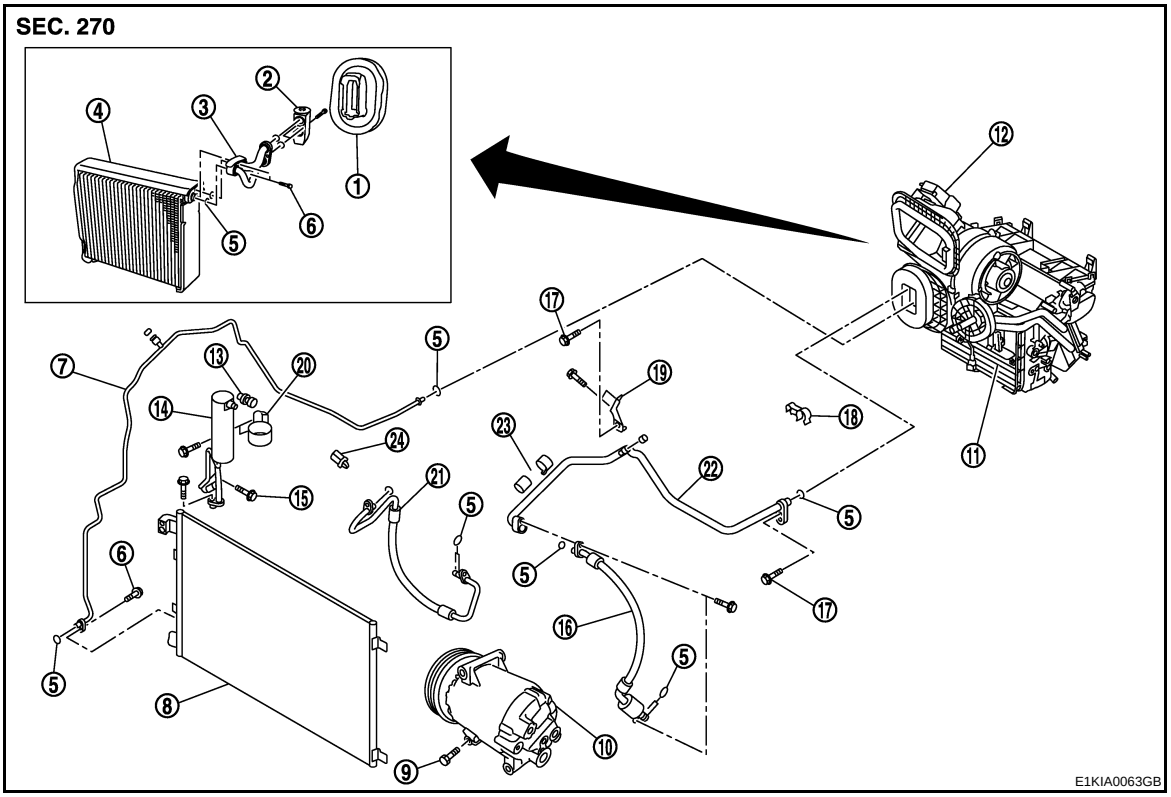
CAUTION:
- **Replace O-rings of high-pressure pipe 1 with new ones, and then apply compressor oil to it when installing it.**
- **Female-side piping connection is thin and easy to deform. Slowly insert the male-side piping straight in axial direction.**
- **Insert piping securely until a click is heard.**
- **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 PIPE 1 AND HIGH-PRESSURE PIPE 2

Exploded View

INFOID:0000000001183298

Refer to HA-229, "Refrigerant Connection".



1. Heater sealing
2. Expansion valve
3. Low pressure pipe 1 and high pressure pipe 2 assembly
4. Evaporator
5. O-ring
6. Connector pipe fixing bolt
7. High pressure pipe 1
8. Condenser assembly
9. Fixing bolt
10. Compressor
11. Heater & cooling unit assembly
12. Heater & blower unit assembly
13. Refrigerant pressure sensor
14. Liquid tank
15. Liquid tank fixing screw
16. Low pressure flexible hose
17. Fixing bolt
18. Pipes fixing clip
19. Low & high pressure pipe bracket
20. Liquid tank fixing bracket
21. High pressure flexible hose
22. Low pressure pipe 2
23. Low pressure pipe fixing clamp assembly
24. Pipe mantening clip

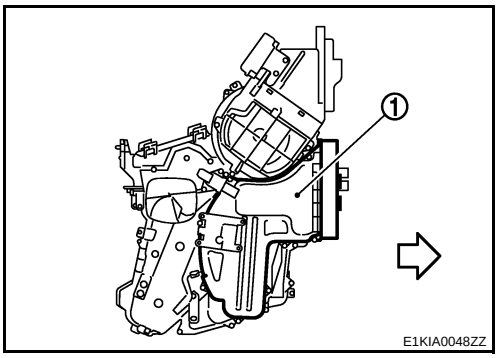
Removal and Installation

INFOID:0000000001183299

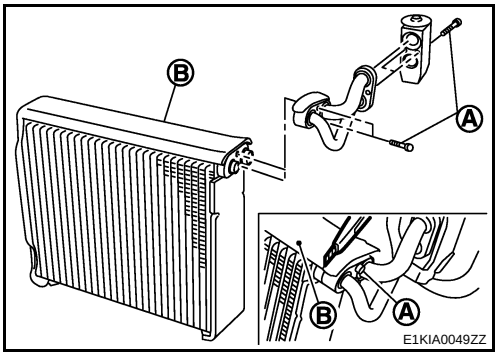
REMOVAL

1. Set the temperature at 18°C (60°F), and then disconnect the battery cable from the negative terminal.
2. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
3. Remove engine cover ornament. Refer to EM-267, "Removal and Installation".
4. Remove high-pressure pipe 1 and low pressure pipe 2 from expansion valve. Refer to HA-253, "Removal and Installation" and HA-257, "Removal and Installation".
   CAUTION:
   Cap or wrap the joint of the, high-pressure pipe 1, low-pressure pipe 2, and the expansion valve with suitable material such as vinyl tape to avoid the entry of air.
5. Remove instrument panel.Refer to IP-12, "Removal and Installation".
6. Remove foot duct (RH / LH). Refer to VTL-112, "FLOOR DUCT : Removal and Installation".
7. Remove steering column. Refer to ST-10, "Removal and Installation".

8. Remove steering member. Refer to ST-15, "Removal and Installation".
9. Remove heater and cooling assembly. Refer to VTL-91, "Removal and Installation".
10. Remove mounting screws, and then remove evaporator cover (1).



11. Using a thin cutter, cut the evaporator insulator (B), and remove fixing bolt (A) then remove low-pressure pipe 1 and high-pressure pipe 2 assembly.
CAUTION:
Cap or wrap the joint of expansion valve, high-pressure pipe 2 and low-pressure pipe 1 with suitable material such as vinyl tape to avoid the entry of air.



INSTALLATION

Installation is basically the reverse order of removal.

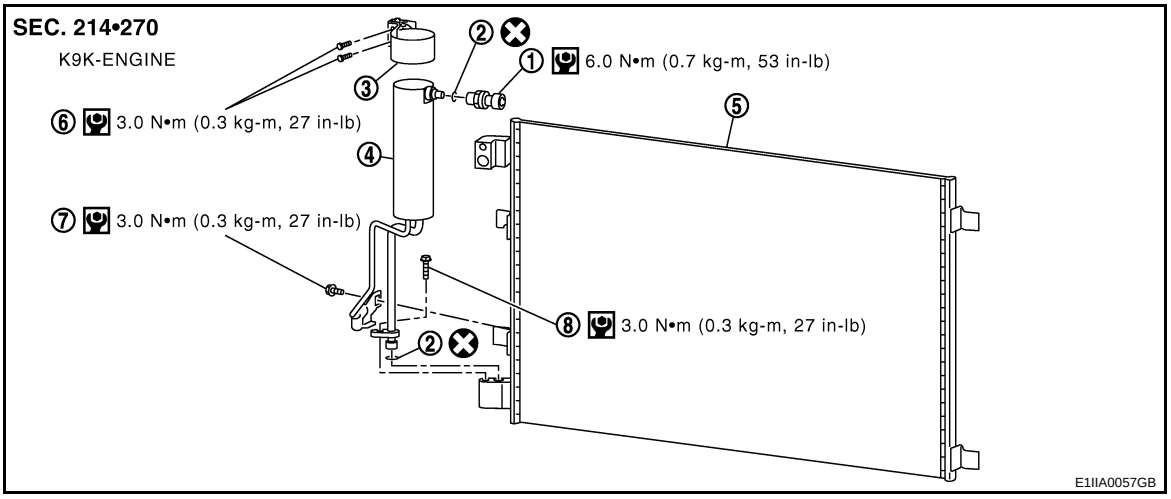
CAUTION:

- **Replace O-rings of high-pressure pipe 1, 2 and low-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.**

CONDENSER

Exploded View

INFOID:0000000001183300



1. Refrigerant pressure sensor
2. O-ring
3. Liquid tank bracket
4. Liquid tank
5. Condensor
6. Liquid tank fixing screw
7. Liquid tank pipe fixing screw
8. Liquid tank pipe fixing bolt

Removal and Installation

INFOID:0000000001183301

REMOVAL

1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
2. Remove engine cover ornament. Refer to EM-267, "Removal and Installation".
3. Remove front grille. Refer to EXT-17, "Removal and Installation".
4. Remove radiator hose, and drain coolant. Refer to CO-56, "Removal and Installation".
5. Remove upper radiator fixing bracket. Refer to CO-56, "Removal and Installation".
6. Remove radiator air-guide duct (RH). Refer to CO-56, "Removal and Installation".
7. Remove high-pressure pipe 1 from condenser. Refer to HA-257, "Removal and Installation".
8. Remove high-pressure flexible pipe 1 from condenser. Refer to HA-255, "Removal and Installation".
   CAUTION:
   Cap or wrap the joint of low and high-pressure pipe 1 and condenser with suitable material such as vinyl tape to avoid the entry of air.
9. Remove harness connector from refrigerant pressure sensor.
10. Remove liquid tank pipes and liquid tank from condenser and radiator. Refer to HA-263, "Removal and Installation", Refer to CO-56, "Removal and Installation".
    CAUTION:
    Cap or wrap the joint of liquid tank pipes and condenser with suitable material such as vinyl tape to avoid the entry of air.
11. Remove radiator fixing brackets. Refer to CO-56, "Removal and Installation".
12. Release radiator maintaining pawls, then pull-up the condenser assembly to release it from radiator. Refer to CO-56, "Removal and Installation".
13. Maintain radiator pushing back.
14. Pull upward to remove condenser.
    CAUTION:
    Take care do not damaged condenser or radiator.

INSTALLATION

Installation is basically the reverse order of removal.

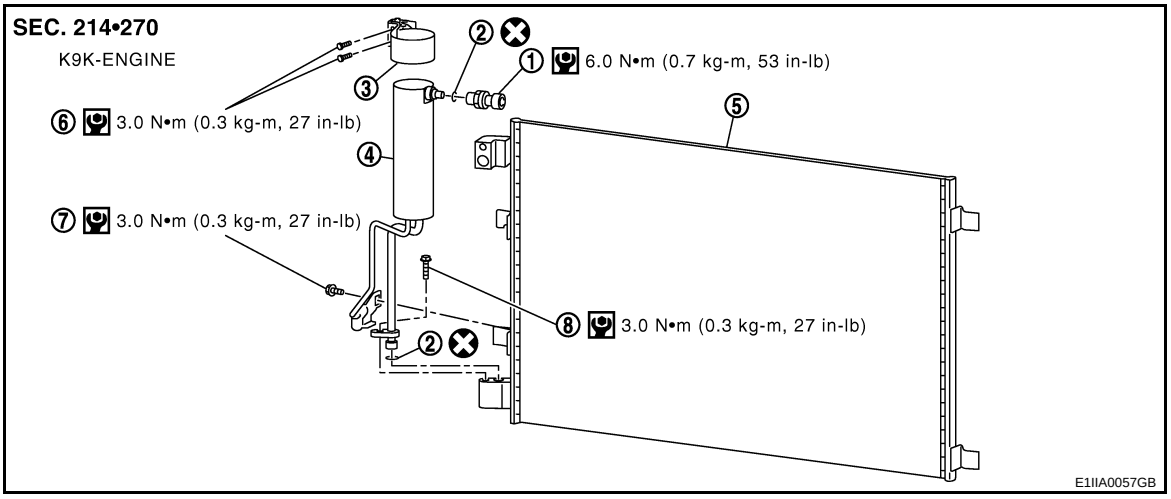
CAUTION:

- **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.**

LIQUID TANK

Exploded View

INFOID:0000000001183302



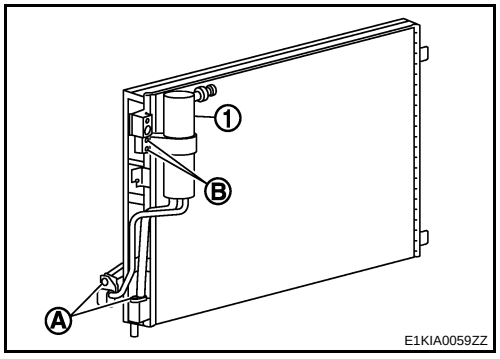
1. Refrigerant pressure sensor
2. O-ring
3. Liquid tank bracket
4. Liquid tank
5. Condensor
6. Liquid tank fixing screw
7. Liquid tank pipe fixing screw
8. Liquid tank pipe fixing bolt

Removal and Installation

INFOID:0000000001183303

REMOVAL

1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
2. Remove engine cover ornament. Refer to EM-267, "Removal and Installation".
3. Remove front grille. Refer to EXT-17, "Removal and Installation".
4. Clean liquid tank and its surrounding area, and remove dust and rust from liquid tank.
   CAUTION:
   Be sure to clean carefully.
5. Disconnect refrigerant sensor harness connector. Refer to HA-264, "Removal and Installation".
6. Remove air inlet tube and hose from change air cooler. Refer to EM-267, "Removal and Installation".
7. Remove radiator air-guide duct (RH) fixing clip to move air-guide duct. Refer to CO-56, "Removal and Installation".
8. Remove liquid tank bracket support mounting screws (B).
9. Remove high pressure pipe 1 mounting bolt (A). Refer to HA-257, "Removal and Installation".
10. Remove liquid tank high pressure pipe mounting bolt (A).
11. Remove liquid tank pipe bracket fixing screw (B).
    CAUTION:
    Cap or wrap the joint of high pressure pipe, liquid tank pipes and condenser with suitable material such as vinyl tape to avoid the entry of air.
12. Remove liquid tank assembly (1).



INSTALLATION

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

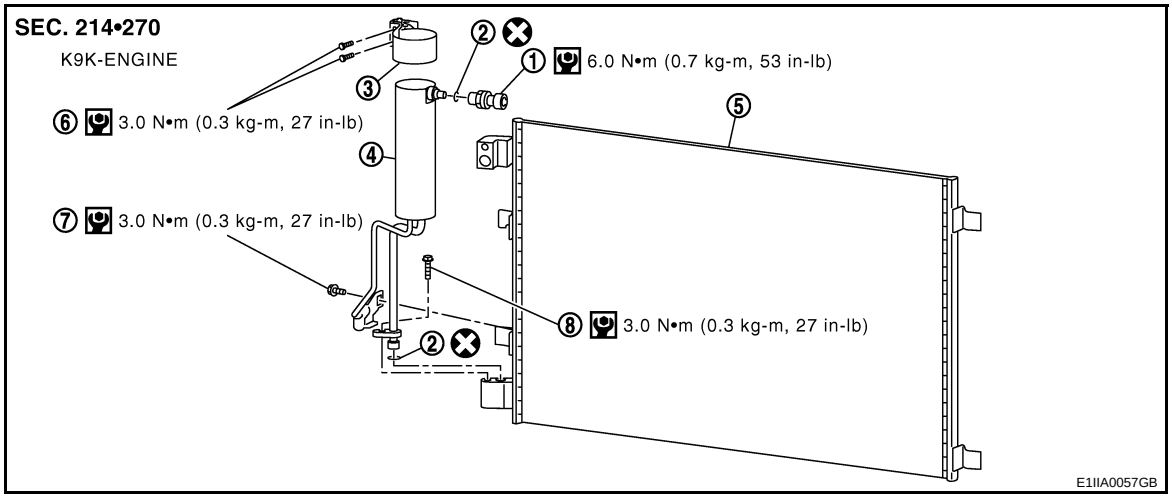
CAUTION:

- **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.**

REFRIGERANT PRESSURE SENSOR

Exploded View

INFOID:0000000001183304



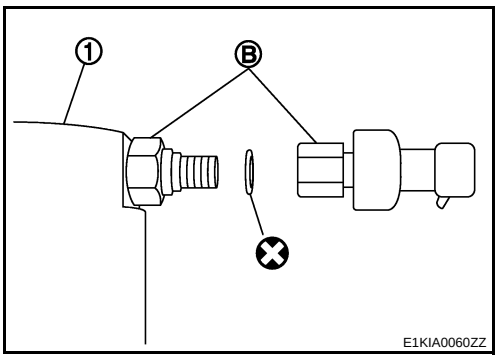
1. Refrigerant pressure sensor
2. O-ring
3. Liquid tank bracket
4. Liquid tank
5. Condensor
6. Liquid tank fixing screw
7. Liquid tank pipe fixing screw
8. Liquid tank pipe fixing bolt

Removal and Installation

INFOID:0000000001183305

REMOVAL

1. Remove liquid tank. Refer to HA-263, "Exploded View".
2. Fix the liquid tank (1) with a vise. Remove the refrigerant pressure sensor from liquid tank adaptator with a wrench (B).
   CAUTION:
   Be careful not to damage liquid tank.



INSTALLATION

Installation is basically the reverse order of removal.

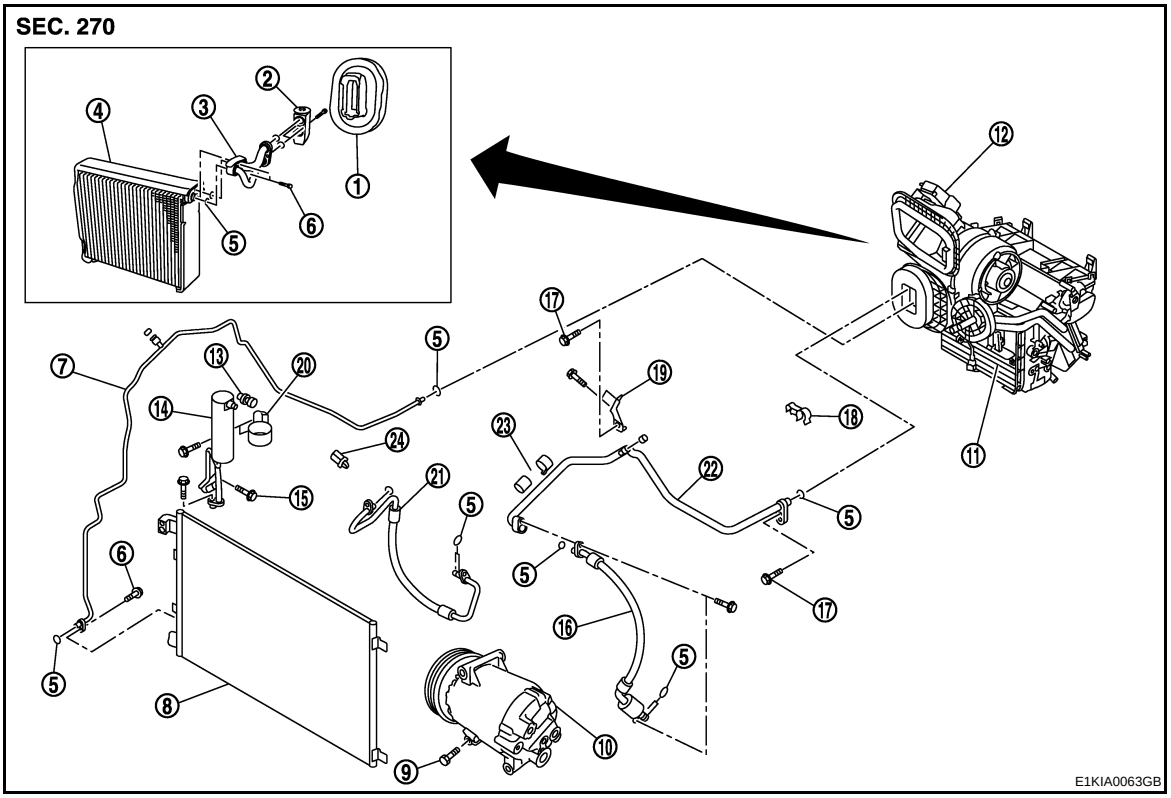
CAUTION:

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

EVAPORATOR

Exploded View

INFOID:0000000001183306



1. Heater sealing	2. Expansion valve	3. Low pressure pipe 1 and high pressure pipe 2 assembly
4. Evaporator	5. O-ring	6. Connector pipe fixing bolt
7. High pressure pipe 1	8. Condenser assembly	9. Fixing bolt
10. Compressor	11. Heater & cooling unit assembly	12. Heater & blower unit assembly
13. Refrigerant pressure sensor	14. Liquid tank	15. Liquid tank fixing screw
16. Low pressure flexible hose	17. Fixing bolt	18. Pipes fixing clip
19. Low & high pressure pipe bracket	20. Liquid tank fixing bracket	21. High pressure flexible hose
22. Low pressure pipe 2	23. Low pressure pipe fixing clamp assembly	24. Pipe mantening clip

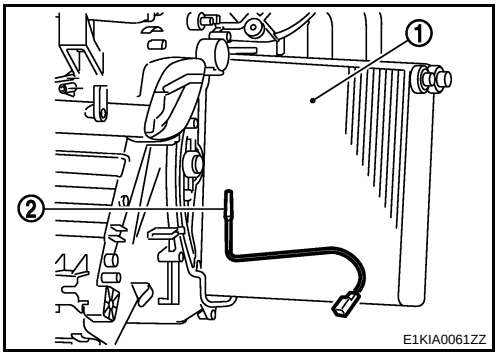
Removal and Installation

INFOID:0000000001183307

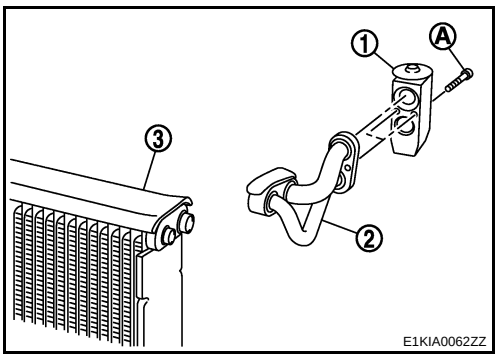
REMOVAL

1. Remove low-pressure pipe 2 and high-pressure pipe 1 from expansion valve. Refer to HA-253, "Removal and Installation". Refer to HA-257, "Removal and Installation".
   CAUTION:
   Cap or wrap the joint of expansion valve, low-pressure pipe 2 and high-pressure pipe 1 with suitable material such as vinyl tape to avoid the entry of air.
2. Remove heater and cooling unit assembly. Refer to VTL-91, "Removal and Installation".
3. Remove evaporator cover fixing screws and cover. Refer to HA-265, "Removal and Installation".

4. Slide evaporator (1) from heater and cooling unit assembly.



5. Cut upper insulator (3) and remove mounting bolt (A), (1) expansion valve and pressure pipe assembly (2), from evaporator.
6. Remove evaporator.



INSTALLATION

Installation is basically the reverse order of removal.

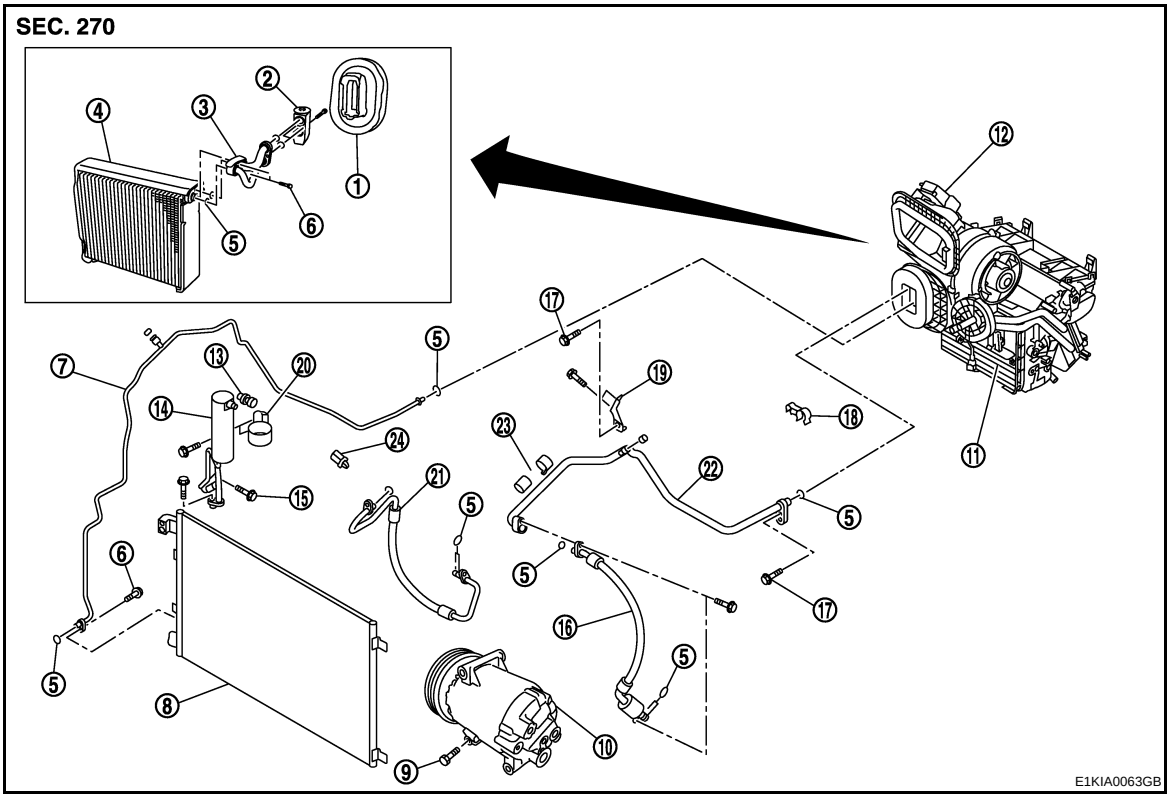
CAUTION:

- **Replace O-rings of low-pressure pipe 1 and high-pressure pipe 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 flexible hose (high-pressure pipe 1) and low-pressure pipe 1 (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.**

EXPANSION VALVE

Exploded View

INFOID:0000000001183308



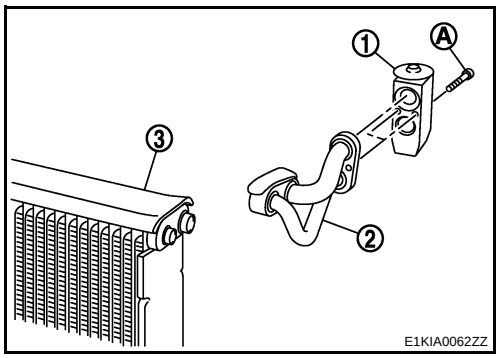
1. Heater sealing	2. Expansion valve	3. Low pressure pipe 1 and high pressure pipe 2 assembly
4. Evaporator	5. O-ring	6. Connector pipe fixing bolt
7. High pressure pipe 1	8. Condenser assembly	9. Fixing bolt
10. Compressor	11. Heater & cooling unit assembly	12. Heater & blower unit assembly
13. Refrigerant pressure sensor	14. Liquid tank	15. Liquid tank fixing screw
16. Low pressure flexible hose	17. Fixing bolt	18. Pipes fixing clip
19. Low & high pressure pipe bracket	20. Liquid tank fixing bracket	21. High pressure flexible hose
22. Low pressure pipe 2	23. Low pressure pipe fixing clamp assembly	24. Pipe mantening clip

Removal and Installation

INFOID:0000000001183309

REMOVAL

1. Remove evaporator (3). Refer to HA-265, "Removal and Installation".
2. Remove low pressure pipe 1 and high pressure pipe 2 assembly (2). Refer to HA-259, "Removal and Installation".
3. Remove mounting bolts (A), and then remove expansion valve (1) from low and high pressure pipe assembly (2).
   CAUTION:
   Cap or wrap the joint of expansion valve, low and high pressure pipe assembly, evaporator and 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 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.**

SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

Compressor

INFOID:0000000001183310

Model		DELPHI THERMAL HUNGARY make 5 CVC
Type		Variable displacement swash plate
Displacement cm^3 (cu in)/rev	Max.	120 (7.32)
Cylinder bore × stroke (Max.) mm (in.)		-
Direction of rotation		Clockwise (viewed from clutch)
Drive belt		Poly V
Disc to pulley clearance	Standard	-

Lubricant

INFOID:0000000001183311

Model		DELPHI THERMAL HUNGARY make 5 CVC
Name		Nissan A/C System Oil Type S (DH-PS)
Capacity m ℓ (US fl oz, Imp fl oz)	Total in system	150 (5.03, 5.3)
	Compressor (Service part) charging amount	150 (5.03, 5.3)

Refrigerant

INFOID:0000000001183312

Type	HFC-134a (R-134a)
Capacity kg (lb)	0.45 ± 0.025 (0.99 ± 0.055)

Engine Idling Speed

INFOID:0000000001183313

Refer to ECK-231, "Idle Speed".

Belt Tension

INFOID:0000000001183314

Refer to EM-260, "Inspection and Adjustment".

BASIC INSPECTION

DIAGNOSIS AND REPAIR WORKFLOW

Work Flow

INFOID:0000000001550633

DETAILED FLOW

1. LISTEN TO CUSTOMER COMPLAINT

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

>> GO TO 2.

2. VERIFY THE SYMPTOM WITH OPERATIONAL CHECK

Verify the symptom with operational check. Refer to HAC-140, "Description & Inspection".

>> GO TO 3.

3. GO TO APPROPRIATE TROUBLE DIAGNOSIS

Go to appropriate trouble diagnosis (Refer to HAC-212, "Diagnosis Chart By Symptom").

>> GO TO 4.

4. REPAIR OR REPLACE

Repair or replace the specific parts

>> GO TO 5.

5. FINAL CHECK

Final check.

Is the inspection result normal?

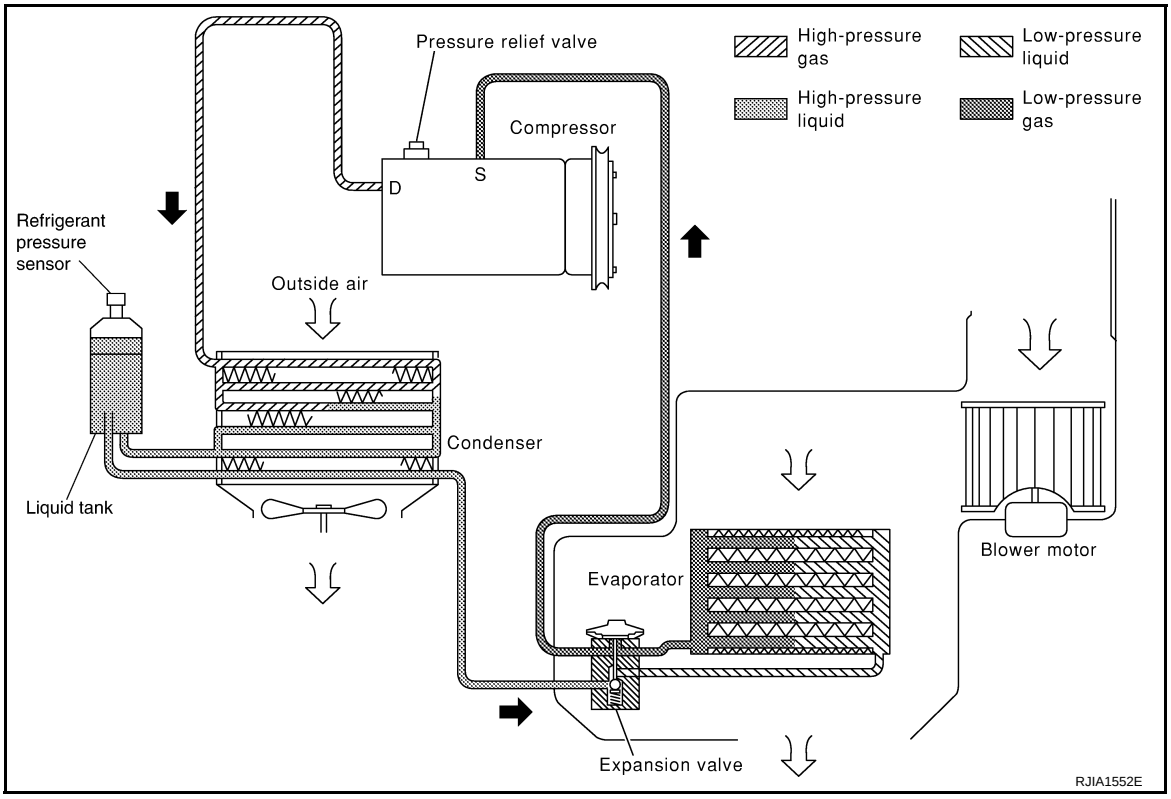
YES >> CHECK OUT
NO >> GO TO 3.

FUNCTION DIAGNOSIS

REFRIGERATION SYSTEM

System Diagram

INFOID:0000000001550634



System Description

INFOID:0000000001550635

REFRIGERANT CYCLE

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

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 2,800 kPa (28.5 kg/cm^2, 406.1 psi), or below about 200 kPa (2.04 kg/cm^2, 29 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 3,628 kPa (37 kg/cm^2, 526 psi)], the release port on the pressure relief valve automatically opens and releases refrigerant into the atmosphere.

LUBRICANT

Maintenance of Lubricant Quantity in Compressor

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:

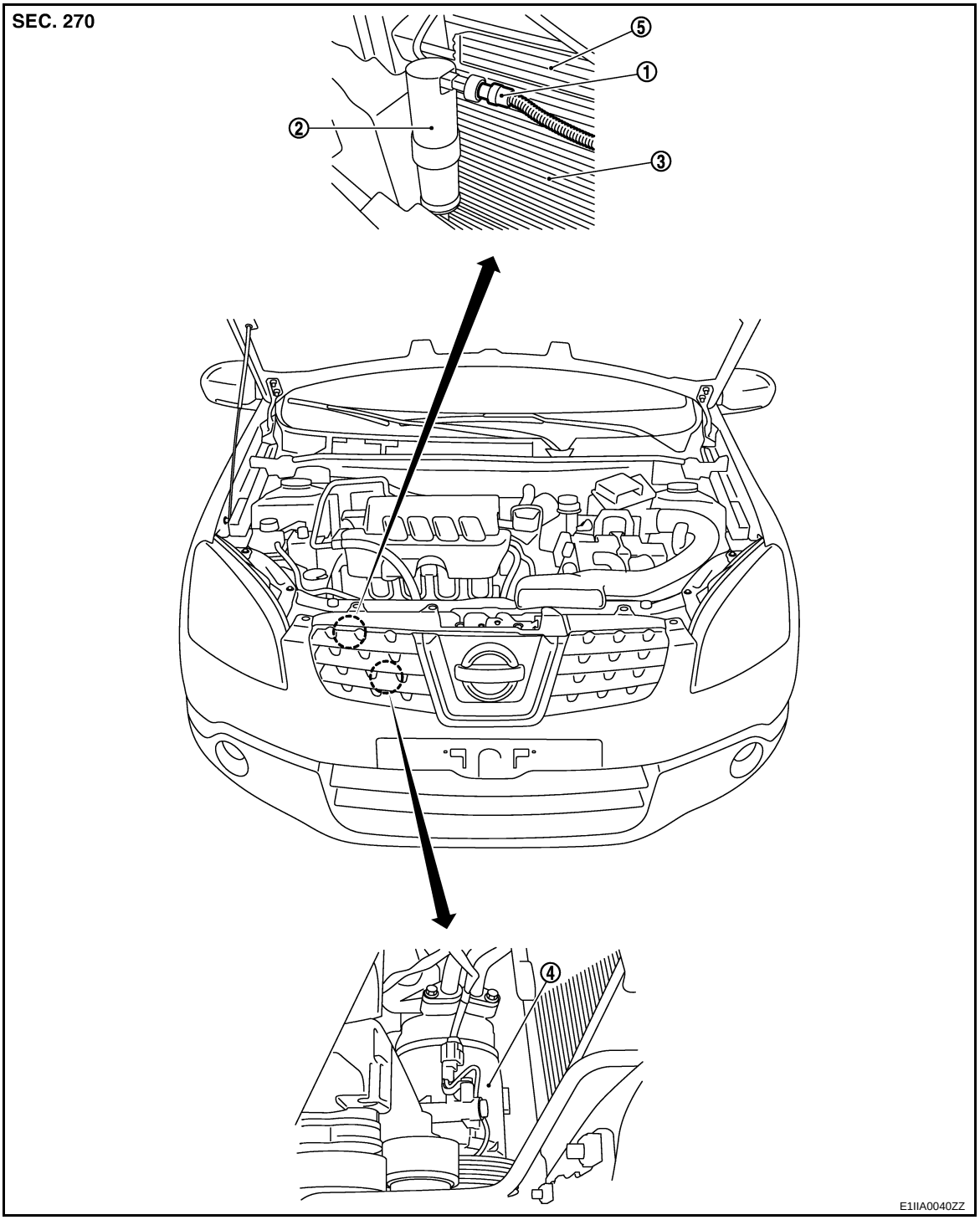
- Lack of lubricant: May lead to a seized compressor.
- Excessive lubricant: Inadequate cooling (thermal exchange interference)

Lubricant

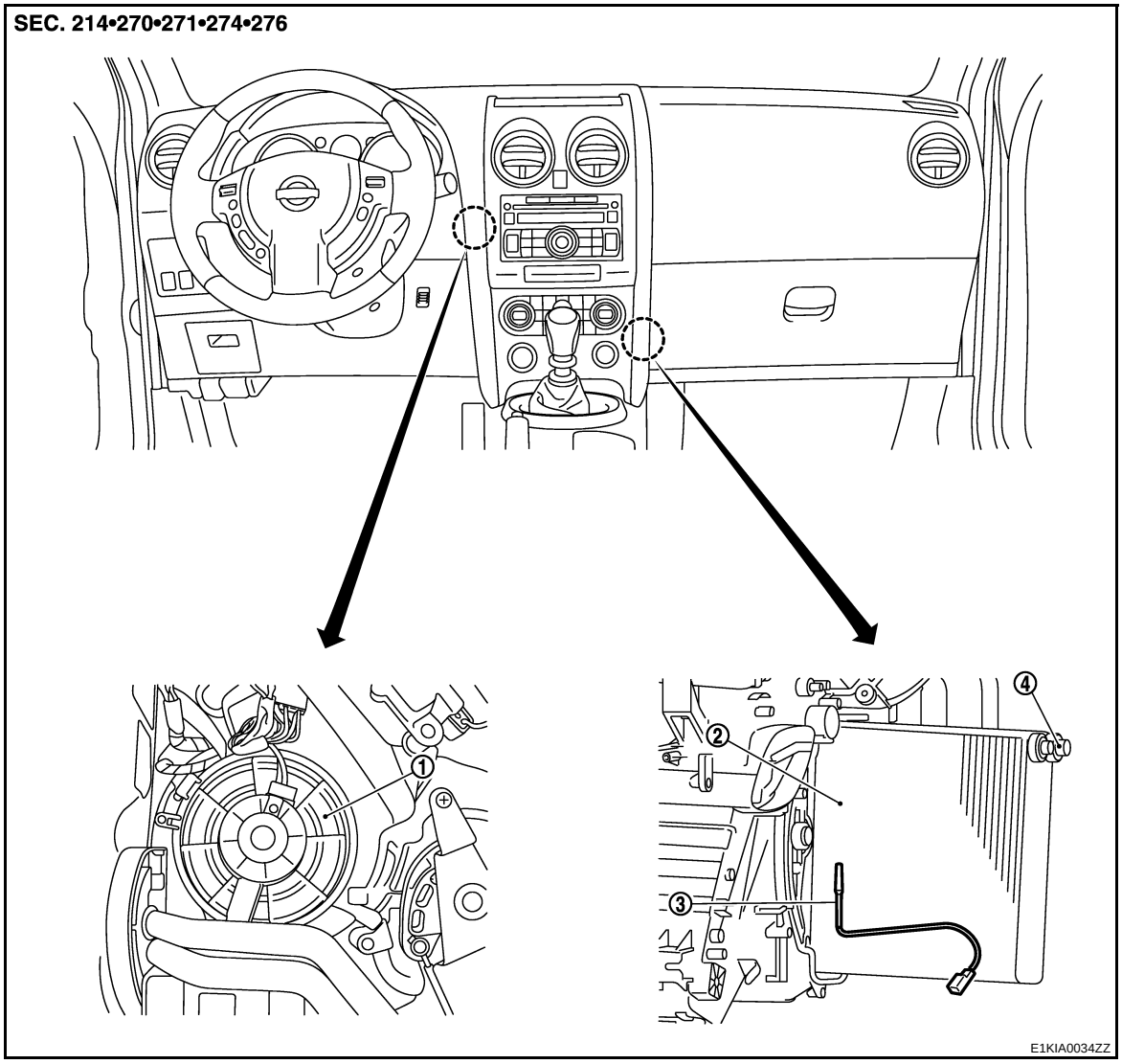
Name : Nissan A/C System Oil Type S

Component Parts Location

INFOID:0000000001550636



1. Refrigerant pressure sensor
2. Liquid tank
3. Condenser
4. Compressor
5. Radiator



1. Blower motor assembly
2. Evaporator
3. Intake sensor (AT only)
4. Expansion valve

Component Description

INFOID:0000000001550637

Component	Description
Compressor	Intakes, compresses, and discharges refrigerant, then conveys it to condenser.
Condenser	Condenses refrigerant, and then conveys it to liquid tank.
Liquid tank	Drives moisture out of refrigerant, eliminates foreign matter, then conveys refrigerant to expansion valve.
Refrigerant pressure sensor	Refer to HAC-172, "Component Inspection".
Expansion valve	Vaporizes refrigerant, controls the amount of flow, then conveys refrigerant to evaporator.
Evaporator	Cools passing air, and then conveys it to compressor.
Blower motor	Takes in air in the vehicle or fresh outside air, and then adjusts room temperature by air conditioning.

SYMPTOM DIAGNOSIS

REFRIGERATION SYSTEM SYMPTOMS

SYMPTOM DIAGNOSIS PROCEDURE

SYMPTOM DIAGNOSIS PROCEDURE : Trouble Diagnosis For Unusual Pressure

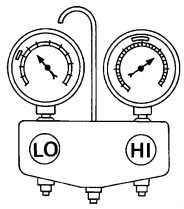
INFOID:0000000001550638

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

BOTH HIGH- AND LOW-PRESSURE SIDES ARE TOO HIGH : Symptom Table

INFOID:0000000001550639

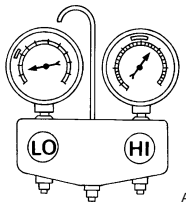
Gauge indication	Refrigerant cycle	Probable cause	Corrective action
Both high- and low-pressure sides are too high.  AC359A	The pressure returns to normal is reduced soon after water is splashed on condenser.	Excessive refrigerant charge in refrigeration cycle.	Reduce refrigerant until specified pressure is obtained.
	Air suction by cooling fan is insufficient.	Insufficient condenser cooling performance. ↓ 1. Condenser fins are clogged. 2. Improper fan rotation of cooling fan.	• Clean condenser. • Check and repair cooling fan as necessary.
	• Low-pressure pipe is not cold. • When compressor is stopped high-pressure value quickly drops by approximately 196 kPa (2 kg/cm^2, 28 psi). It then decreases gradually thereafter.	Poor heat exchange in condenser (After compressor operation stops, high-pressure decreases too slowly.). ↓ Air in refrigeration cycle.	Evacuate repeatedly and recharge system.
	Engine tends to overheat.	Engine cooling systems malfunction.	Check and repair each engine cooling system.
	• An area of the low-pressure pipe is colder than areas near the evaporator outlet. • 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

HIGH-PRESSURE SIDE IS TOO HIGH AND LOW-PRESSURE SIDE IS TOO LOW :

Symptom Table

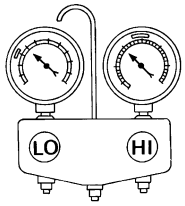
INFOID:0000000001550640

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

HIGH-PRESSURE SIDE IS TOO LOW AND LOW-PRESSURE SIDE IS TOO HIGH : Symptom Table

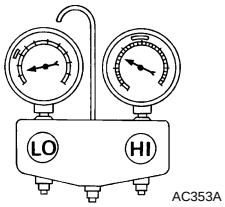
INFOID:0000000001550641

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

BOTH HIGH- AND LOW-PRESSURE SIDES ARE TOO LOW : Symptom Table

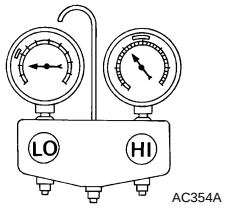
INFOID:0000000001550642

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 HA-294, "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.	• Replace compressor. • Repair evaporator fins. • Replace evaporator. • Refer to HAC-164, "Diagnosis Procedure".

LOW-PRESSURE SIDE SOMETIMES BECOMES NEGATIVE

LOW-PRESSURE SIDE SOMETIMES BECOMES NEGATIVE : Symptom Table

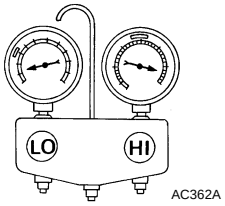
INFOID:0000000001550643

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

LOW-PRESSURE SIDE BECOMES NEGATIVE : Symptom Table

INFOID:0000000001550644

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.

PRECAUTION

PRECAUTIONS

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

INFOID:0000000001550645

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 SRC 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 SRC 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.**

Precaution Necessary for Steering Wheel Rotation After Battery Disconnect

INFOID:0000000001550646

NOTE:

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

For models equipped with the Intelligent Key system and NATS, an electrically controlled steering lock mechanism is adopted on the key cylinder.
For this reason, if the battery is disconnected or if the battery is discharged, the steering wheel will lock and steering wheel rotation will become impossible.
If steering wheel rotation is required when battery power is interrupted, follow the procedure below before starting the repair operation.

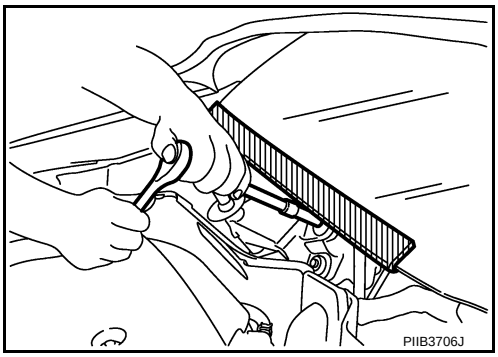
OPERATION PROCEDURE

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

Precaution for Procedure without Cowl Top Cover

INFOID:0000000001550647

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



Precautions For Xenon Headlamp Service

INFOID:0000000001550648

WARNING:

Comply with the following warnings to prevent any serious accident.

- **Disconnect the battery cable (negative terminal) or the power supply fuse before installing, removing, or touching the xenon headlamp (bulb included). The xenon headlamp contains high-voltage generated parts.**
- **Never work with wet hands.**
- **Check the xenon headlamp ON-OFF status after assembling it to the vehicle. Never turn the xenon headlamp ON in other conditions. Connect the power supply to the vehicle-side connector. (Turning it ON outside the lamp case may cause fire or visual impairments.)**
- **Never touch the bulb glass immediately after turning it OFF. It is extremely hot.**

CAUTION:

Comply with the following cautions to prevent any error and malfunction.

- **Install the xenon bulb securely. (Insufficient bulb socket installation may melt the bulb, the connector, the housing, etc. by high-voltage leakage or corona discharge.)**
- **Never perform HID circuit inspection with a tester.**
- **Never touch the xenon bulb glass with hands. Never put oil and grease on it.**
- **Dispose of the used xenon bulb after packing it in thick vinyl without breaking it.**
- **Never wipe out dirt and contamination with organic solvent (thinner, gasoline, etc.).**

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

INFOID:0000000001550649

CAUTION:

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

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

General Refrigerant Precaution

INFOID:0000000001550650

WARNING:

- **Avoid breathing A/C refrigerant and lubricant vapor or mist. Exposure may irritate eyes, nose and throat. Use only approved recovery/recycling equipment to discharge HFC-134a (R-134a) refrigerant.**

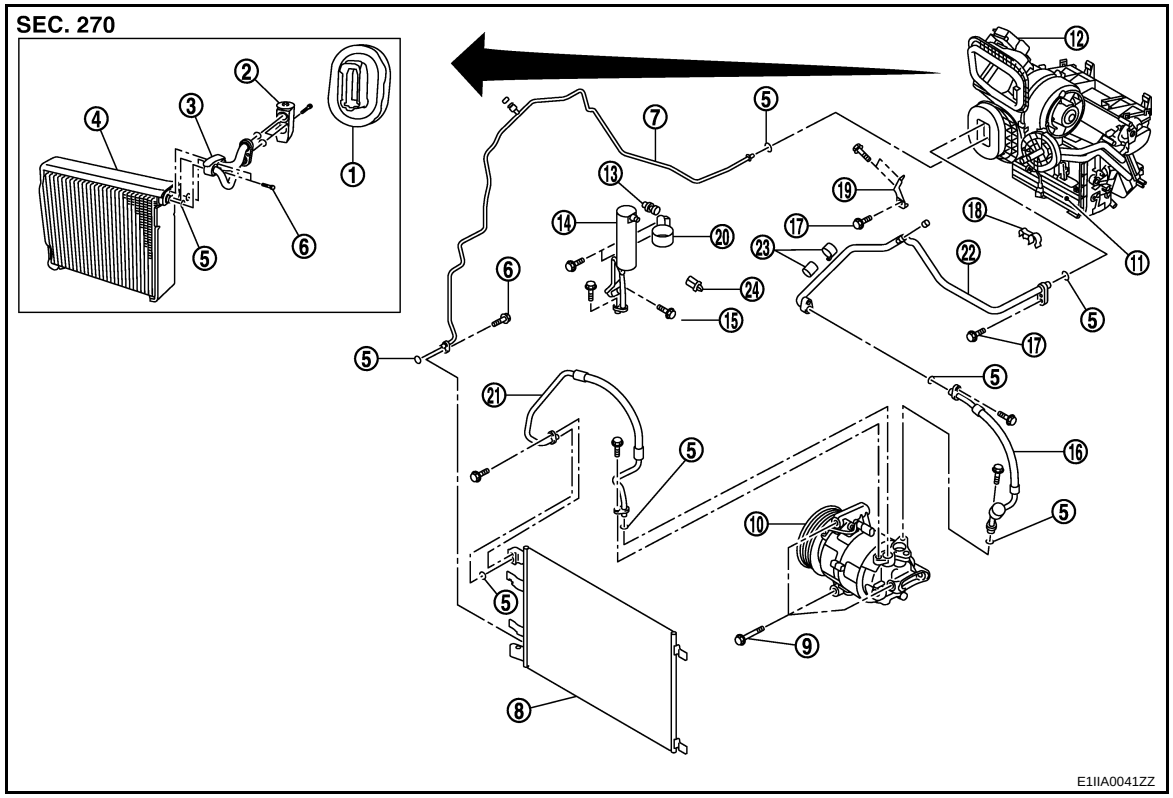
If accidental system discharge occurs, ventilate work area before resuming service. Additional health and safety information may be obtained from refrigerant and lubricant manufacturers.
- **Never release refrigerant into the air. Use approved recovery/recycling equipment to capture the refrigerant every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

Refrigerant Connection

INFOID:0000000001550651

A new type refrigerant connection has been introduced to all refrigerant lines except the following location.
- Expansion valve to evaporator
- Refrigerant pressure sensor to liquid tank

O-RING AND REFRIGERANT CONNECTION



1. Heater sealing	2. Expansion valve	3. Low pressure pipe 1 and high pressure pipe 2 assembly
4. Evaporator	5. O-ring	6. Connector pipe fixing bolt
7. High pressure pipe 1	8. Condenser assembly	9. Fixing bolt
10. Compressor	11. Heater & cooling unit assembly	12. Heater & blower unit assembly
13. Refrigerant pressure sensor	14. Liquid tank	15. Liquid tank fixing screw
16. Low pressure flexible hose	17. Fixing bolt	18. Pipes fixing clip

19. Low & high pressure pipe bracket
20. Liquid tank fixing bracket
21. High pressure flexible hose
22. Low pressure pipe 2
23. Low pressure pipe fixing clamp assembly
24. Pipe mantening clip

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

O-Ring Part Numbers and Specifications

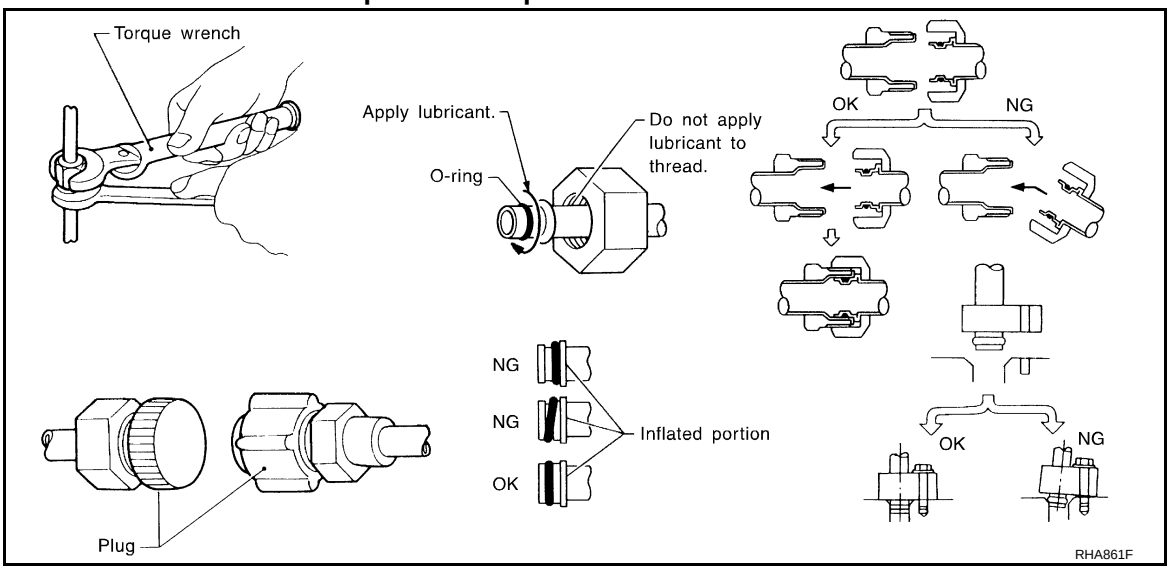
Connection type	Piping connection point		Part number	QTY	O-ring size
New	Low pressure pipe 2 to expansion valve		92473 N8210	1	16
	High pressure flexible pipe 1 to condenser		92472 N8210	1	12
	High pressure pipe 1 to expansion valve		92471 N8210	1	8
	Low pressure pipe 1 and high pressure	Inlet	92475 71L00	1	12
	pipe 2 assembly to expansion valve	Outlet	92475 72L00	1	16
	Low pressure pipe 1 and high pressure	Inlet	92475 71L00	1	12
	pipe 2 assembly to evaporator	Outlet	92475 72L00	1	16
	High pressure pipe 1 to liquid tank		92471 N8210	1	8
	Compressor to low pressure flexible hose		92474 N8210	1	16
	Compressor to high pressure flexible hose		92472 N8210	1	12
	Liquid tank to condenser		92473 N8210	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 tube, 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 portion of tube.**
- **When replacing the O-ring, be careful not to damage O-ring and tube.**
- **Connect tube until a click can be heard, then tighten the nut or bolt by hand. 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.**



Service Equipment

INFOID:0000000001550652

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.

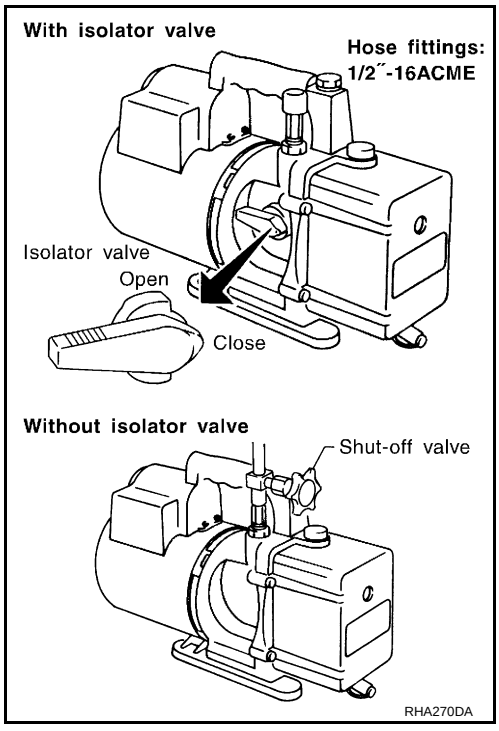
VACUUM PUMP

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.

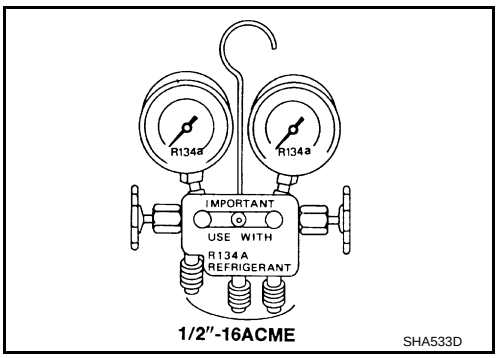
- Usually vacuum pumps have a manual isolator valve as part of the pump. Close this valve to isolate the service hose from the pump.
- For pumps without an isolator, use a hose equipped with a manual shut-off valve near the pump end. Close the valve to isolate the hose from the pump.
- If the hose has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



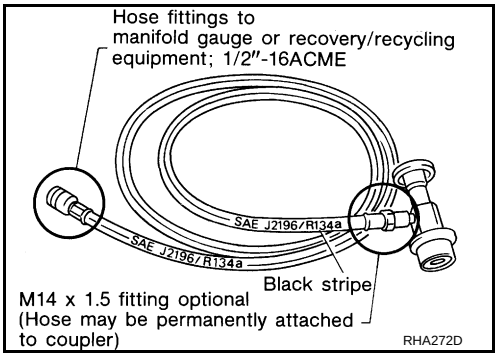
MANIFOLD GAUGE SET

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

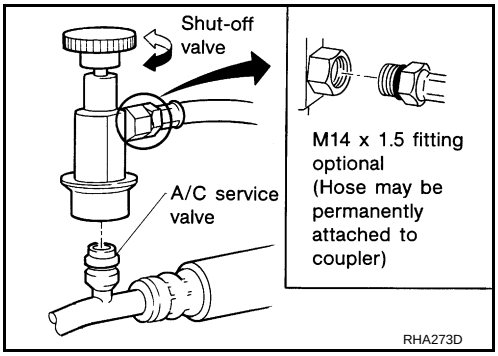
Be certain that the service hoses display the markings described (colored hose with black stripe). All hoses must include positive shut-off devices (either manual or automatic) near the end of the hoses opposite to the manifold gauge.



SERVICE COUPLERS

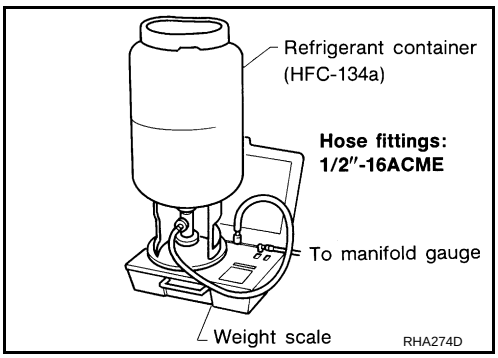
Never attempt to connect HFC-134a (R-134a) service couplers to a CFC-12 (R-12) A/C system. The HFC-134a (R-134a) couplers will not properly connect to the CFC-12 (R-12) system. However, if an improper connection is attempted, discharging and contamination may occur.

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 electronic scale or of quality recycle/recharge equipment.

COMPRESSOR

General Precautions

INFOID:0000000001550653

CAUTION:

- **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 HA-290, "Adjustment".**
- **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.**

LEAK DETECTION DYE

General Precautions

INFOID:0000000001550654

CAUTION:

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

IDENTIFICATION

NOTE:

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

IDENTIFICATION LABEL FOR VEHICLE

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

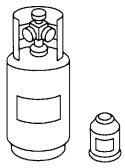
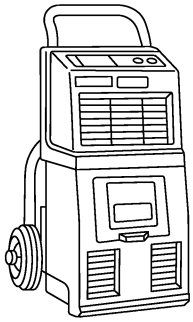
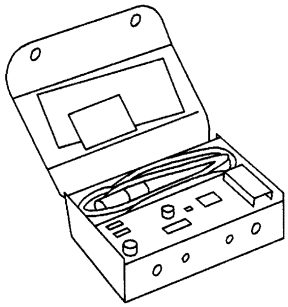
PREPARATION

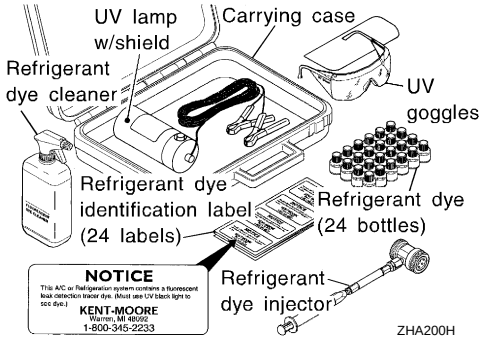
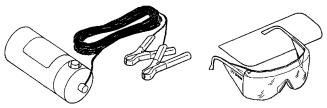
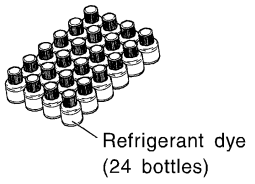
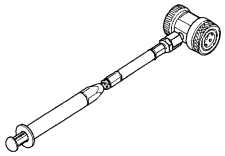
PREPARATION

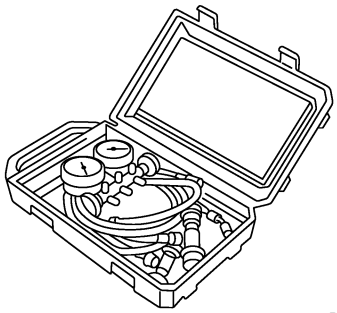
HFC-134a (R-134a) Service Tools and Equipment

INFOID:0000000001550655

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.
Adapters that convert one size fitting to another must never be used: refrigerant/lubricant contamination will occur and compressor malfunction will result.

Tool number Tool name		Description
HFC-134a (R-134a) refrigerant	 S-NT196	Container color: Light blue Container marking: HFC-134a (R-134a) Fitting size: Thread size • Large container 1/2″-16 ACME
KLH00-PAGS0 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) Lubricity: 40 m ℓ (1.4 Imp fl oz.)
Recovery/Recycling/ Recharging equipment (ACR4)	 RJIA0195E	Function: Refrigerant recovery and recycling and recharging
Electrical leak detector	 A/C leak detector SHA705EB	Power supply: DC 12V (Cigarette lighter)

Tool number Tool name		Description
(J-43926) Refrigerant dye leak detection kit Kit includes: (J-42220) UV lamp and UV safety goggles (J-41459) HFC-134a (R-134a) dye injector Use with J-41447, 1/4 ounce bottle (J-41447) HFC-134a (R-134a) fluorescent leak detection dye (Box of 24, 1/4 ounce bottles) (J-43872) Refrigerant dye cleaner		Power supply: DC 12 V (Battery terminal)
(J-42220) UV lamp and UV safety goggles		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)		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		For injecting 1/4 ounce of fluorescent leak detection dye into A/C system

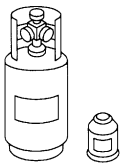
Tool number Tool name		Description
(J-43872) Refrigerant dye cleaner	 SHA441F	For cleaning dye spills
(J-39183) Manifold gauge set (with hoses and couplers)	 RJIA0196E	Identification: • The gauge face indicates HFC-134a (R-134a). Fitting size: Thread size • 1/2″-16 ACME

Sealant or/and Lubricant

INFOID:0000000001550656

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

- 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 name		Description
HFC-134a (R-134a) refrigerant	 S-NT196	Container color: Light blue Container marking: HFC-134a (R-134a) Fitting size: Thread size • Large container 1/2″-16 ACME
Nissan A/C System Oil Type S (DH-PS)	 S-NT197	Type: Polyalkylene glycol oil (PAG), type S (DH-PS) Application: HFC-134a (R-134a) swash plate compressors (Nissan only) Capacity: 40 m ℓ (1.4 US fl oz., 1.4 Imp fl oz.)

ON-VEHICLE MAINTENANCE

LUBRICANT

Adjustment

INFOID:0000000001550657

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.

Is it successful?

YES >> GO TO 2.
NO >> 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 >> Refer to "LUBRICANT ADJUSTING PROCEDURE FOR COMPRESSOR REPLACEMENT".
NO >> Refer to "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:

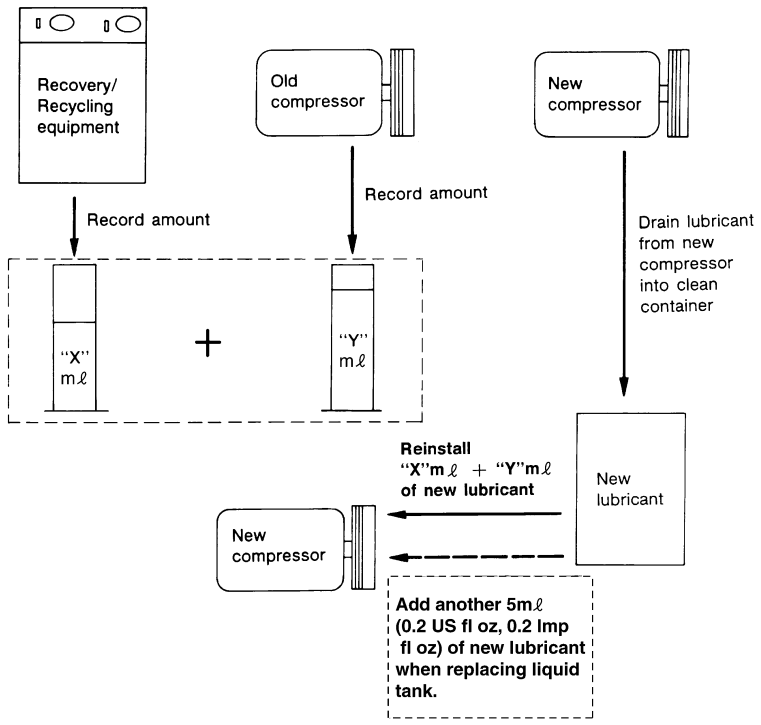
Part replaced	Lubricant to be added to system	Remarks
	Amount of lubricant mℓ (US fl oz., Imp fl oz.)	
Evaporator	75 (2.5, 2.6)	—
Condenser	35 (1.2, 1.2)	—
Liquid tank	10 (0.3, 0.4)	—
In case of refrigerant leak	30 (1.0, 1.1)	Large leak
	—	Small leak *1

*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 HA-280, "Working with HFC-134a (R-134a)".
3. Confirm refrigerant purity in vehicle A/C system using recovery/recycling recharging equipment and refrigerant identifier. If NG, refer to HA-280, "Working with HFC-134a (R-134a)".
4. Discharge refrigerant into the refrigerant recovery/recycling equipment. Measure lubricant discharged into the recovery/recycling equipment.
5. Drain the lubricant from the old (removed) compressor into a graduated container and recover the amount of lubricant drained.
6. Drain the lubricant from the new compressor into a separate, clean container.
7. Measure an amount of new lubricant installed equal to amount drained from old compressor. Add this lubricant to new compressor through the suction port opening.
8. Measure an amount of new lubricant equal to the amount recovered during discharging. Add this lubricant to new compressor through the suction port opening.
9. If the liquid tank also needs to be replaced, add another 5 m ℓ (0.2 US fl oz., 0.2 Imp fl oz.) of lubricant at this time.
   Do not add this 5 m ℓ (0.2 US fl oz., 0.2 Imp fl oz.) of lubricant when replaces the compressor only.

Lubricant adjusting procedure for compressor replacement

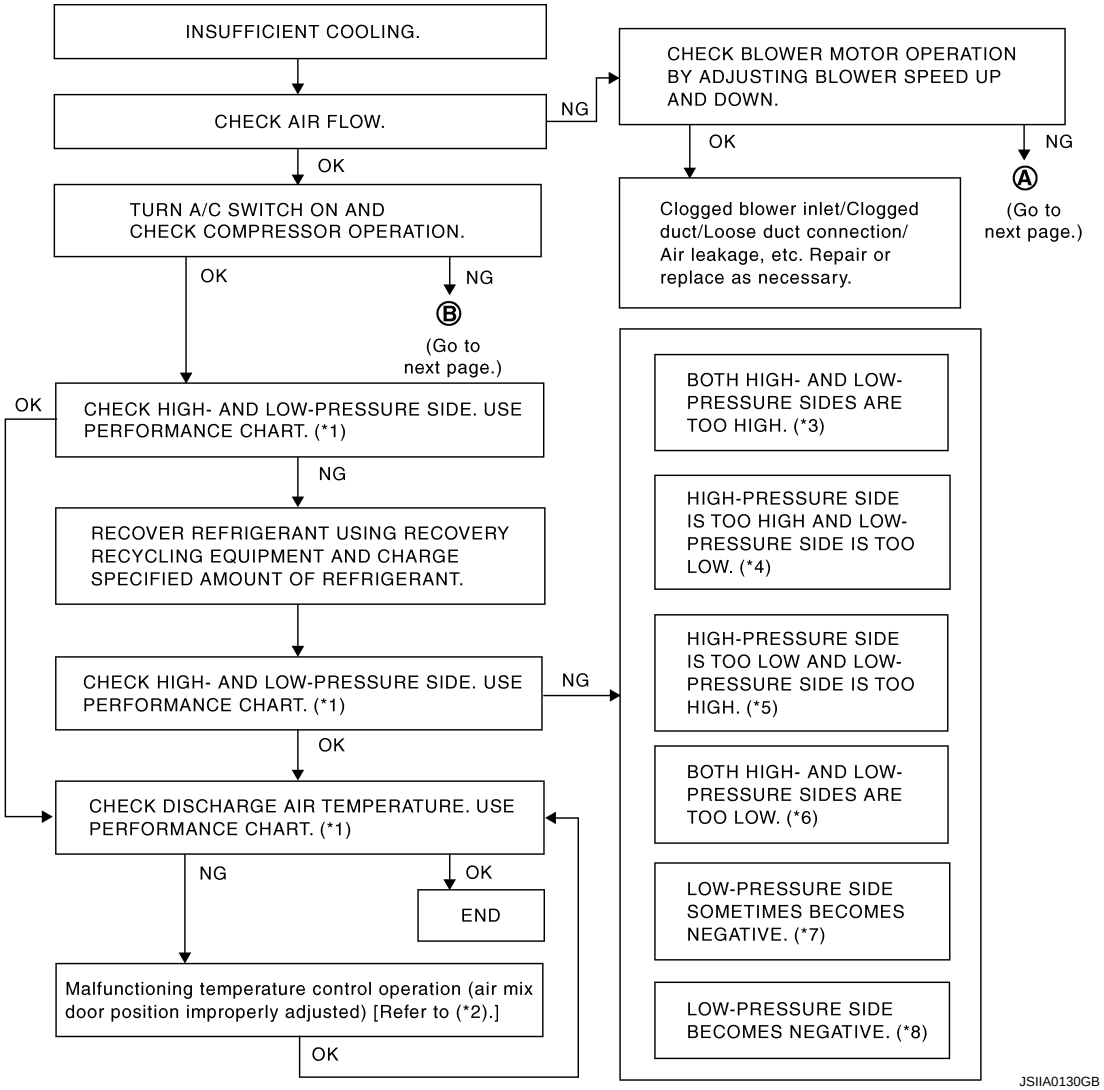


REFRIGERATION SYSTEM

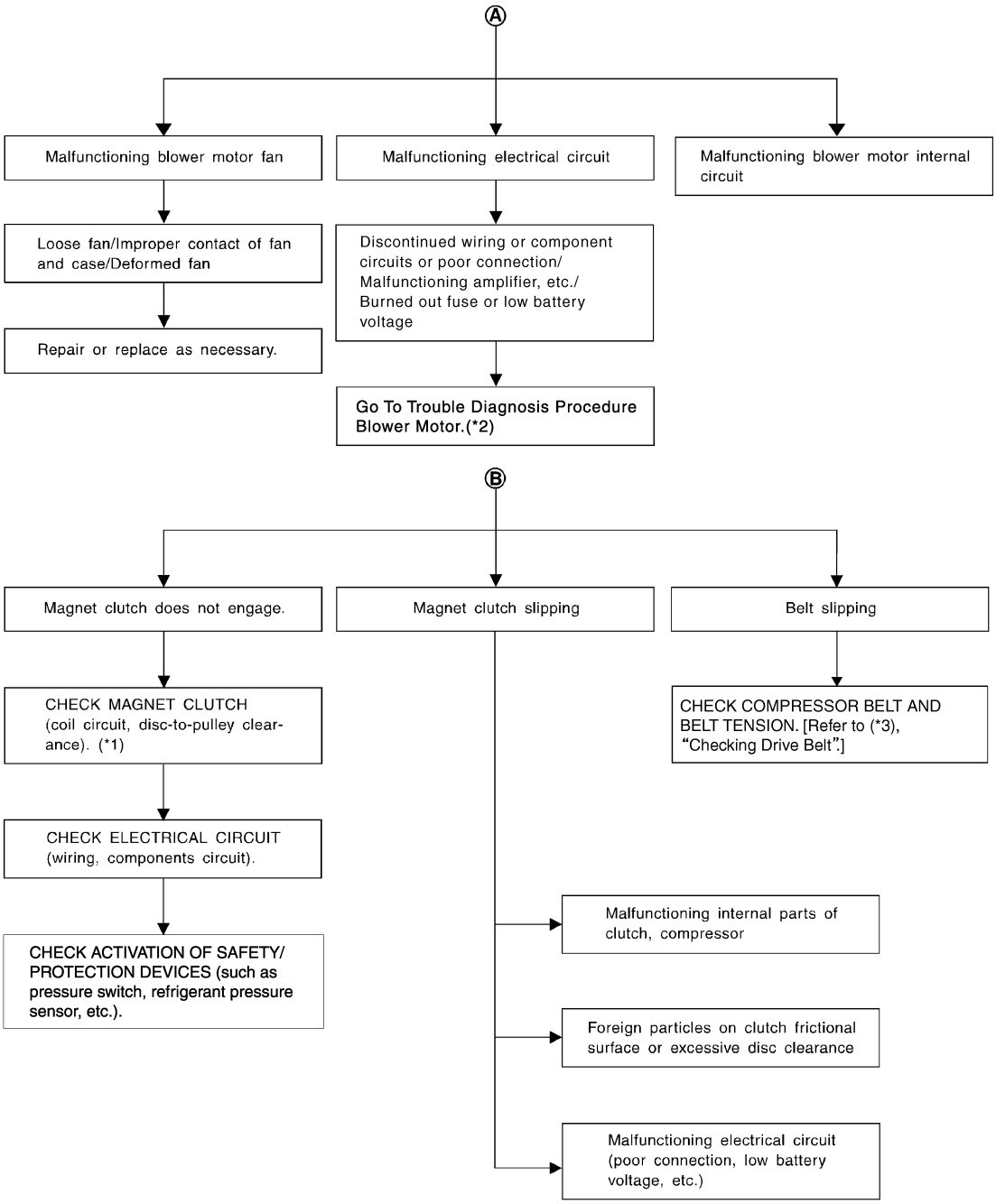
Inspection

INFOID:0000000001550658

PERFORMANCE TEST DIAGNOSIS



*1 HA-293, "Performance Chart"
*2 HAC-212, "Diagnosis Chart By Symptom"
*3 HA-275, "BOTH HIGH- AND LOW-PRESSURE SIDES ARE TOO HIGH : Symptom Table"
*4 HA-275, "HIGH-PRESSURE SIDE IS TOO HIGH AND LOW-PRESSURE SIDE IS TOO LOW : Symptom Table"
*5 HA-276, "HIGH-PRESSURE SIDE IS TOO LOW AND LOW-PRESSURE SIDE IS TOO HIGH : Symptom Table"
*6 HA-277, "BOTH HIGH- AND LOW-PRESSURE SIDES ARE TOO LOW : Symptom Table"
*7 HA-277, "LOW-PRESSURE SIDE SOMETIMES BECOMES NEGATIVE : Symptom Table"
*8 HA-278, "LOW-PRESSURE SIDE BECOMES NEGATIVE : Symptom Table"



SJIA1642E

*1 HA-292, "Inspection" *2 HAC-164, "Diagnosis Procedure" *3 EM-260, "Inspection and Adjustment"

Performance Chart

INFOID:0000000001555638

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

Vehicle condition	Indoors or in the shade (in a well-ventilated place)
Hood	Open
TEMP.	Max. COLD
Mode switch	(Ventilation) set
Intake switch	(Recirculation) set
Fan (blower) speed	Max. speed set
Engine speed	Idle speed
Operate the air conditioning system for 10 minutes before taking measurements.	

TEST READING

Recirculating-to-discharge Air Temperature Table

Inside air (Recirculating air) at blower assembly inlet		Discharge air temperature at center ventilator °C (°F)
Relative humidity %	Air temperature °C (°F)	
50 - 60	20 (68)	7.0 - 7.3 (44.6 - 45.1)
	25 (77)	8.9 - 10.0 (48.0 - 50.0)
	30 (86)	10.9 - 13.1 (51.6 - 55.6)
	35 (95)	17.8 - 19.3 (64.0 - 66.7)
60 - 70	20 (68)	7.3 - 7.6 (45.1 - 45.7)
	25 (77)	10.0 - 11.0 (50.0 - 51.8)
	30 (86)	13.1 - 15.2 (55.6 - 59.4)
	35 (95)	19.3 - 20.8 (66.7 - 69.4)

Ambient Air Temperature-to-operating Pressure Table

Ambient air		High-pressure (Discharge side)							
Relative humidity %	Air temperature °C (°F)	Bar		kPa		kg/cm^2		psi	
		From	to	From	to	From	to	From	to
50 - 70	20 (68)	9.3	11.2	930.0	1120.0	9.5	11.4	134.9	162.4
	25 (77)	12.7	14.4	1270.0	1440.0	13.0	14.7	184.2	208.8
	30 (86)	14.5	17.8	1450.0	1780.0	14.8	18.2	210.3	258.1
	35 (95)	17.3	19.5	1730.0	1950.0	17.6	19.9	250.9	282.8
	40 (104)	17.5	19.4	1750.0	1940.0	17.8	19.8	253.8	281.3

Ambient Air Temperature-to-operating Pressure Table

Ambient air		Low pressure (Suction side)							
Relative humidity %	Air temperature °C (°F)	Bar		kPa		kg/cm^2		psi	
		From	to	From	to	From	to	From	to
50 - 70	20 (68)	2.1	2.2	210.0	220.0	2.1	2.2	30.5	31.9
	25 (77)	2.5	2.5	250.0	250.0	2.5	2.5	36.3	36.3
	30 (86)	2.5	3.1	250.0	310.0	2.5	3.2	36.3	45.0
	35 (95)	3.2	3.6	320.0	360.0	3.3	3.7	46.4	52.2
	40 (104)	3.6	4.0	360.0	400.0	3.7	4.1	52.2	58.0

Refrigerant Leaks

INFOID:0000000001550659

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.

FLUORESCENT LEAK DETECTOR

Inspection

INFOID:0000000001550660

CHECKING SYSTEM FOR LEAKS USING THE FLUORESCENT LEAK DETECTOR

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

(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.

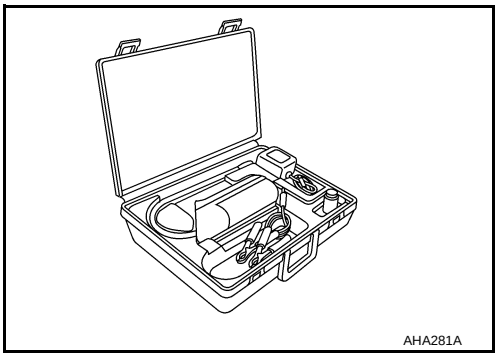
ELECTRICAL LEAK DETECTOR

Inspection

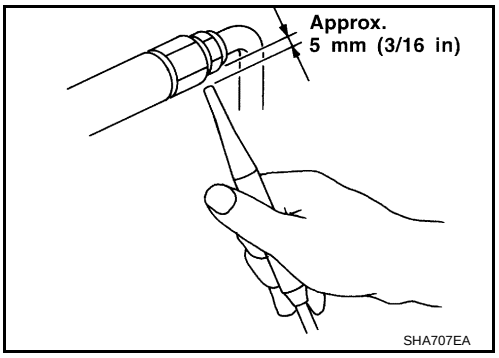
INFOID:0000000001550661

PRECAUTIONS FOR HANDLING LEAK DETECTOR

When performing a refrigerant leak check, use an electrical leak detector (SST: J-41995) 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.

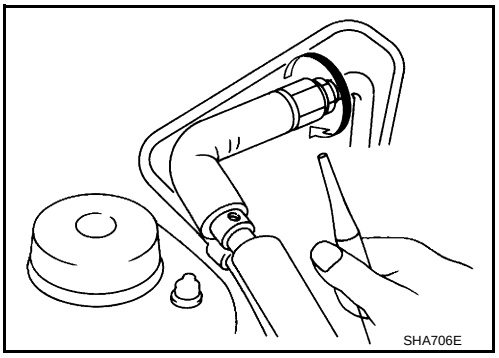

AHA281A

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

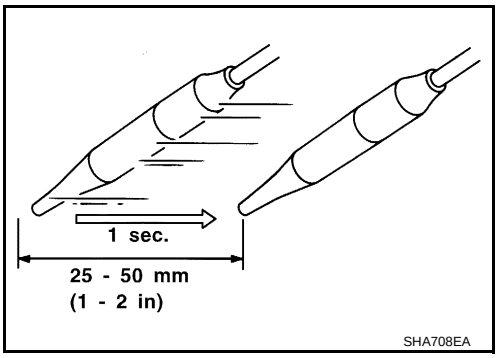


SHA707EA

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


SHA706E

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



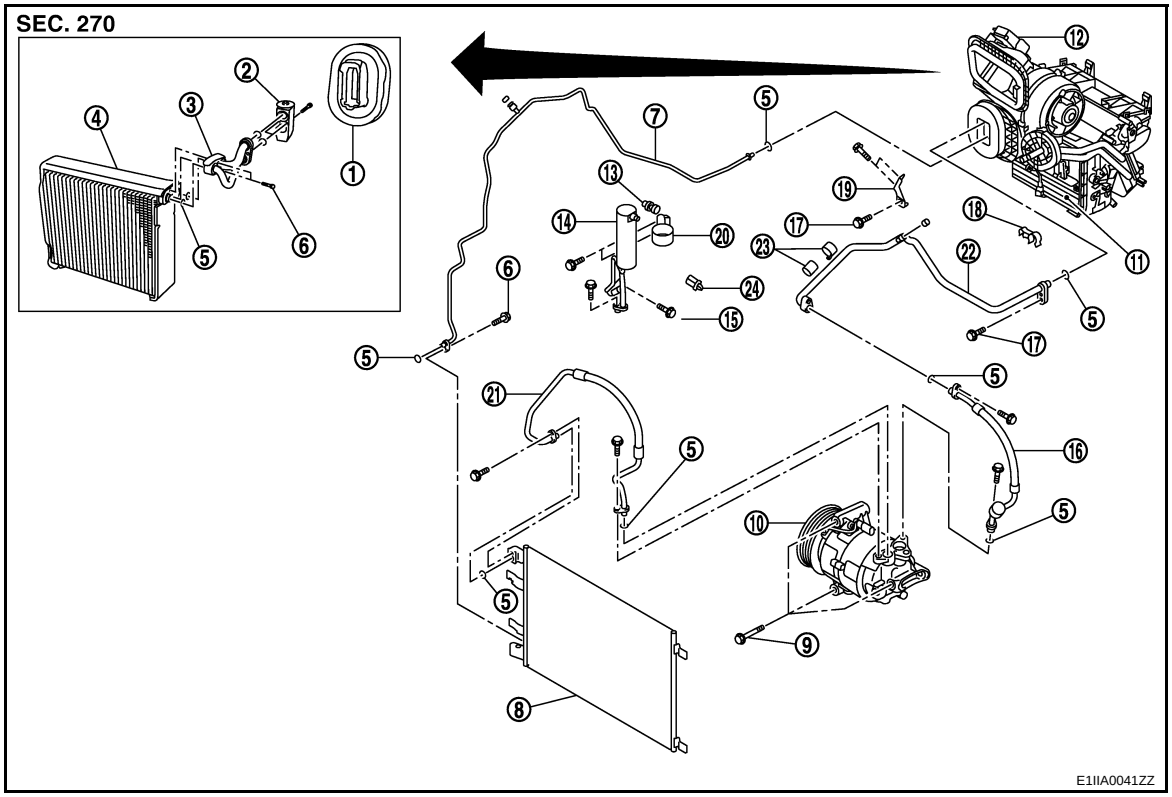
SHA708EA

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 j) to the low-pressure side (evaporator drain hose k to shaft seal p). 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.



1. Heater sealing
2. Expansion valve
3. Low pressure pipe 1 and high pressure pipe 2 assembly
4. Evaporator
5. O-ring
6. Connector pipe fixing bolt
7. High pressure pipe 1
8. Condenser assembly
9. Fixing bolt
10. Compressor
11. Heater & cooling unit assembly
12. Heater & blower unit assembly
13. Refrigerant pressure sensor
14. Liquid tank
15. Liquid tank fixing screw
16. Low pressure flexible hose
17. Fixing bolt
18. Pipes fixing clip
19. Low & high pressure pipe bracket
20. Liquid tank fixing bracket
21. High pressure flexible hose
22. Low pressure pipe 2
23. Low pressure pipe fixing clamp assembly
24. Pipe mantening clip

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

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

Cooling unit (Evaporator)

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

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

5. If a leak detector detects a leak, verify at least once by blowing compressed air into area of suspected leak, then repeat check as outlined above.
6. Do not stop when one leak is found. Continue to check for additional leaks at all system components. If no leaks are found, perform steps 7 - 10.
7. Start the engine.
8. Set the A/C control as follows;

a. A/C switch: ON

b. MODE door position: VENT (Ventilation)

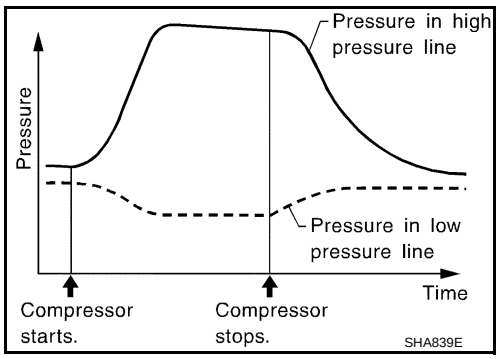
c. Intake door position: Recirculation

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.

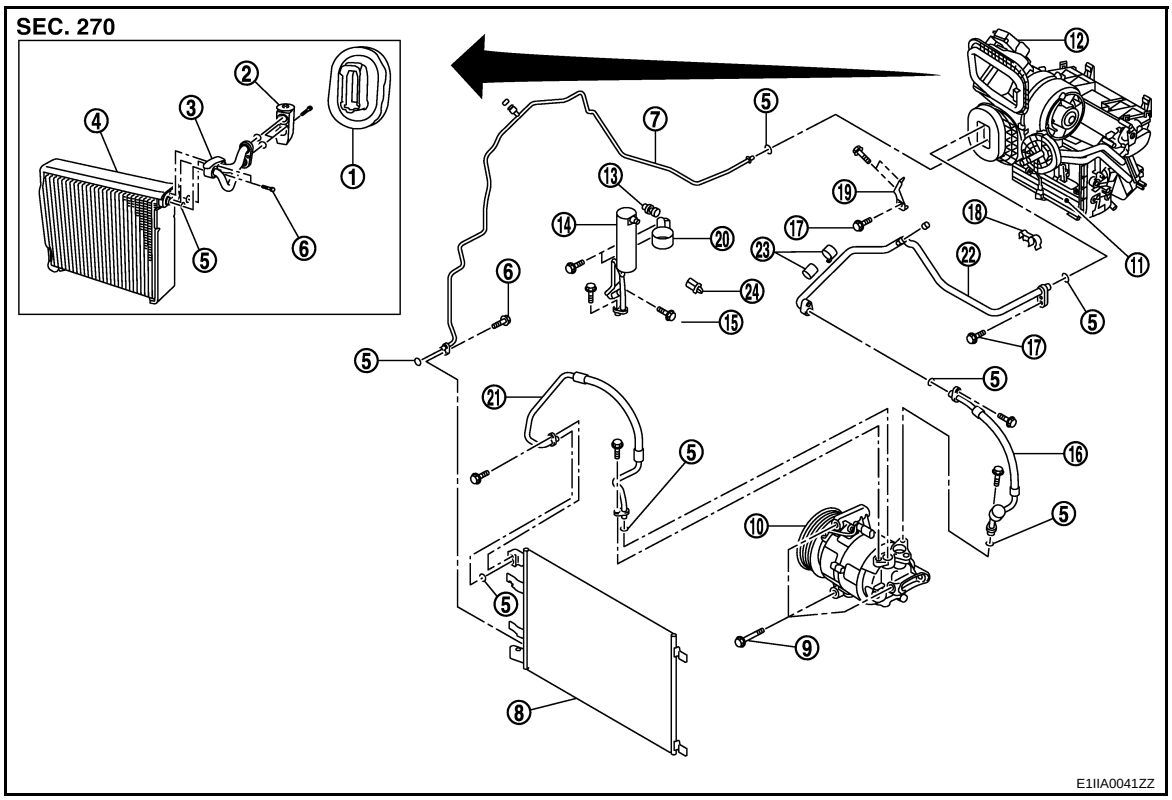
ON-VEHICLE REPAIR

REFRIGERATION SYSTEM

Exploded View

INFOID:0000000001550662

Refer to HA-281, "Refrigerant Connection".



1. Heater sealing
2. Expansion valve
3. Low pressure pipe 1 and high pressure pipe 2 assembly
4. Evaporator
5. O-ring
6. Connector pipe fixing bolt
7. High pressure pipe 1
8. Condenser assembly
9. Fixing bolt
10. Compressor
11. Heater & cooling unit assembly
12. Heater & blower unit assembly
13. Refrigerant pressure sensor
14. Liquid tank
15. Liquid tank fixing screw
16. Low pressure flexible hose
17. Fixing bolt
18. Pipes fixing clip
19. Low & high pressure pipe bracket
20. Liquid tank fixing bracket
21. High pressure flexible hose
22. Low pressure pipe 2
23. Low pressure pipe fixing clamp assembly
24. Pipe mantening clip

Inspection After Installation

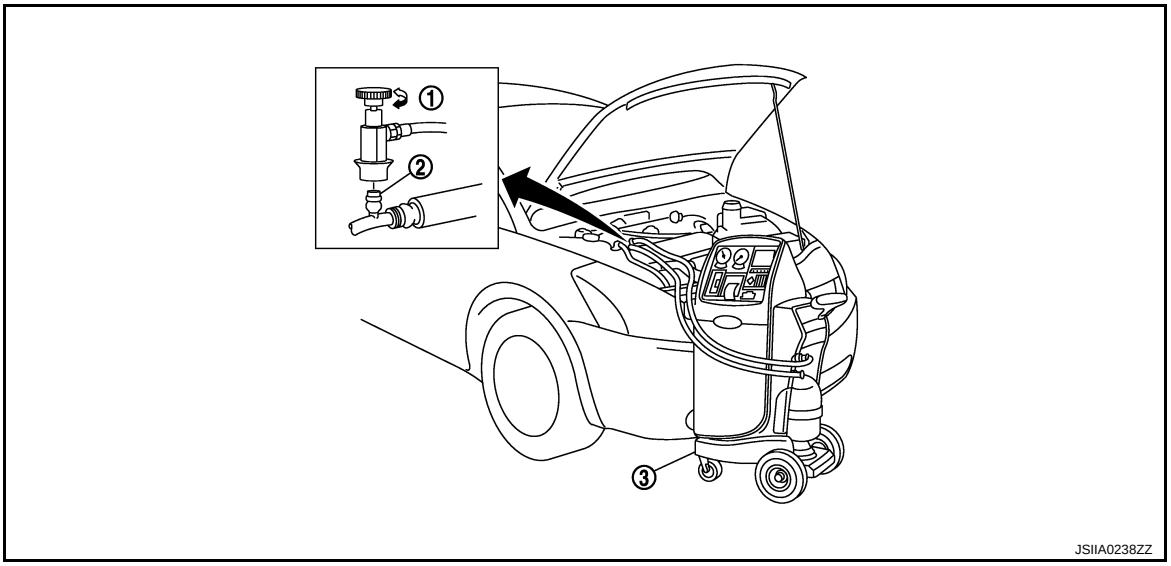
INFOID:0000000001550663

SETTING OF SERVICE TOOLS AND EQUIPMENT

Discharging Refrigerant

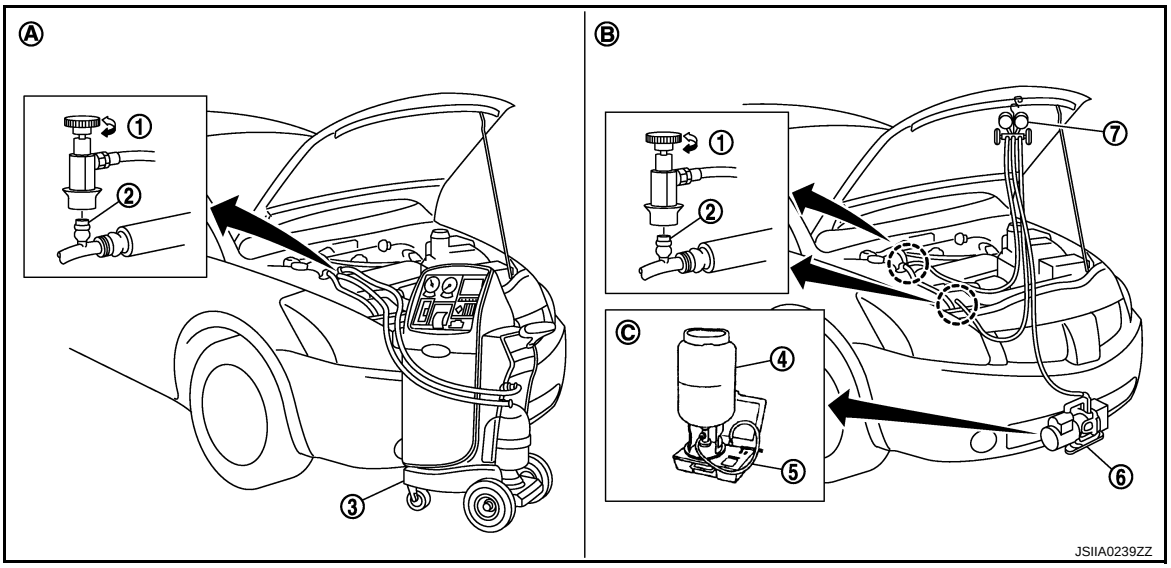
WARNING:

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.



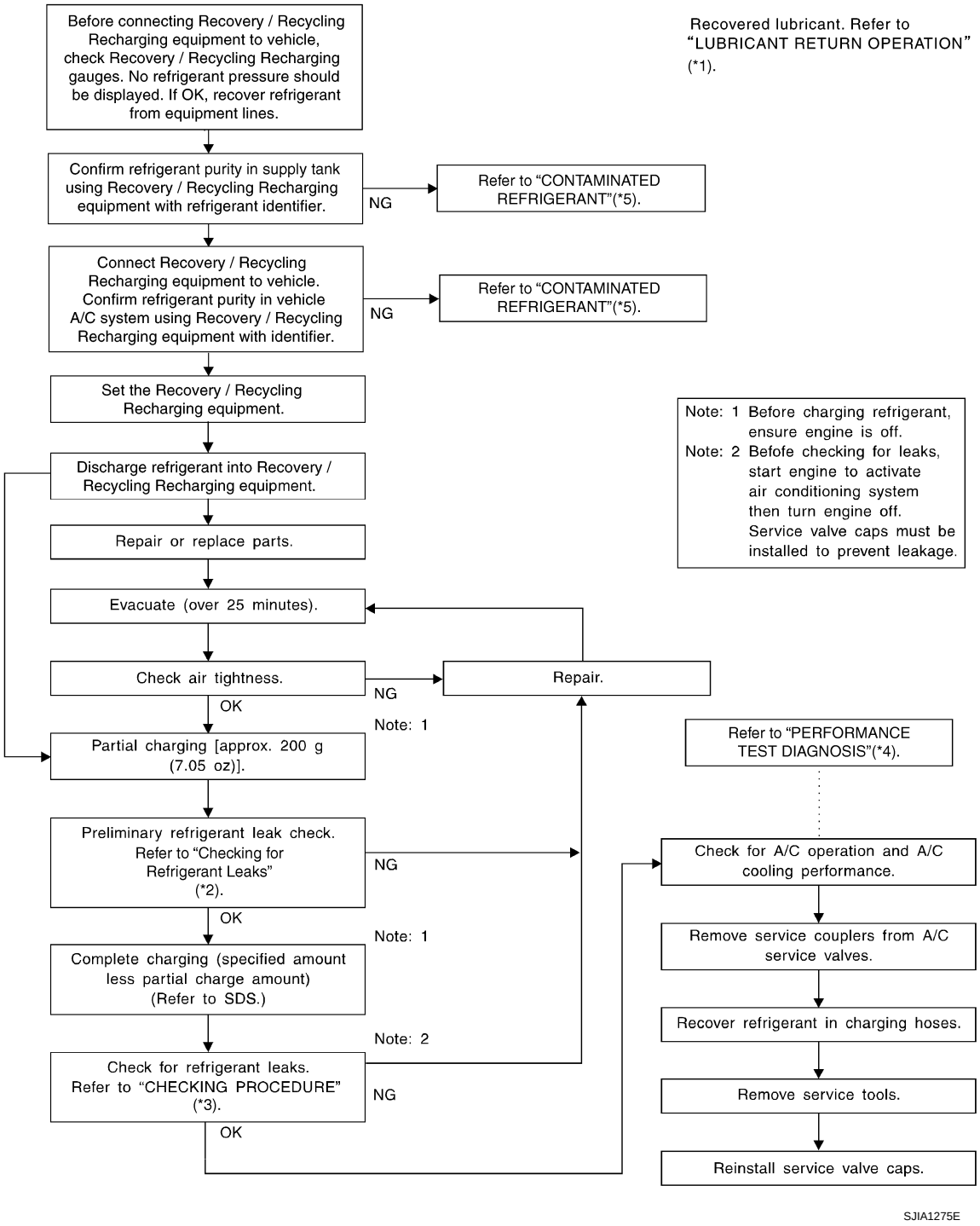
1. Shut-off valve
2. A/C service valve
3. Recovery/Recycling/Recharging equipment

Evacuating System and Charging Refrigerant



1. Shut-off valve
2. A/C service valve
3. Recovery/Recycling/Recharging equipment
4. Refrigerant container (HFC-134a)
5. Weight scale (J-39650)
6. Vacuum pump (J-39649)
7. Manifold gauge set (J-39183)

A. Preferred (best) method
B. Alternative method
C. For charging



*1 HA-290, "Adjustment"

*2 "REFRIGERANT LEAKS" in HA-294, "Refrigerant Leaks".

*3 "CHECKING PROCEDURE" in HA-292, "Inspection".

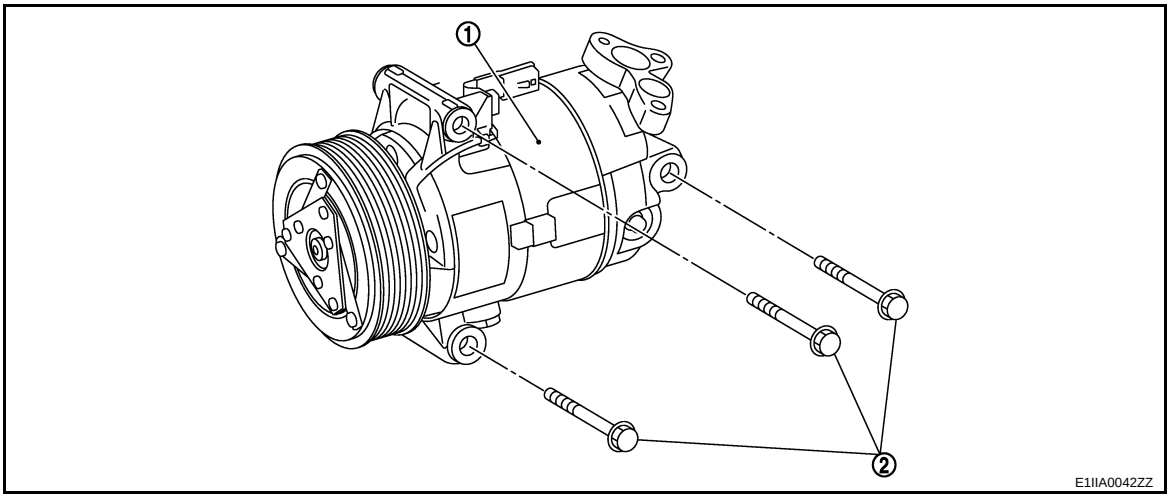
*4 "PERFORMANCE TEST DIAGNOSIS" in HA-292, "Inspection".

*5 "CONTAMINATED REFRIGERANT" in HA-280, "Working with HFC-134a (R-134a)".

COMPRESSOR

Exploded View

INFOID:0000000001550664



1. Compressor
2. Compressor fixing bolt

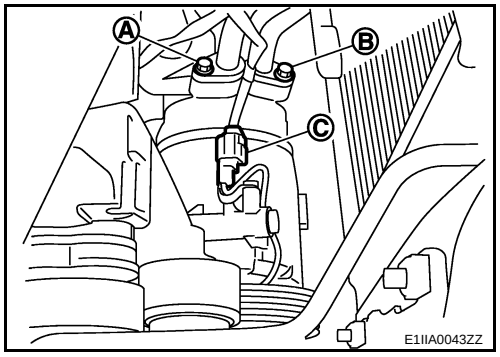
Refer to GI-4, "Components" for symbols in the figure.

Removal and Installation

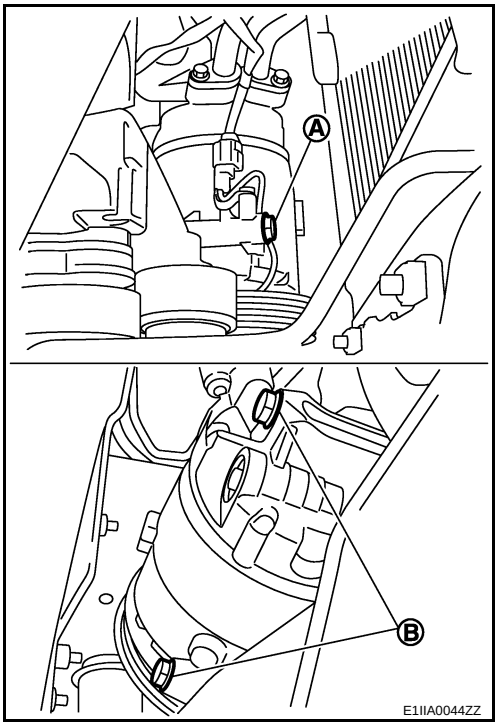
INFOID:0000000001550665

REMOVAL

1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
2. Remove engine cover ornament.
3. Remove cooling fan. Refer to CO-77, "Exploded View".
4. Remove drive belt. Refer to EM-348, "Exploded View".
5. Remove alternator. Refer to CHG-23, "M9R MODELS : Exploded View".
6. Remove low pressure flexible hose fixing bolt (A) from compressor and high pressure flexible hose fixing bolt (B) from compressor.
   Remove compressor harness connector (C).
   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. Remove engine undercover.

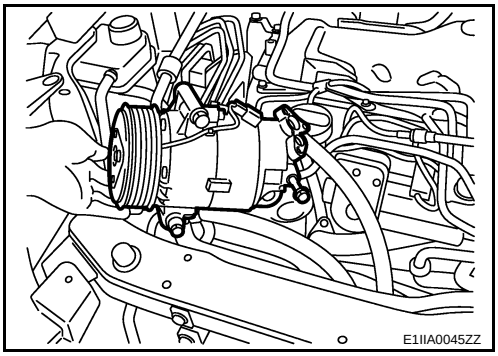


8. Remove mounting bolts (A) and (B) from compressor.



9. Remove the compressor from the vehicle.

Compressor fixing bolt : 25 N.m (2.6 kg-m, 18 ft-lb)



INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

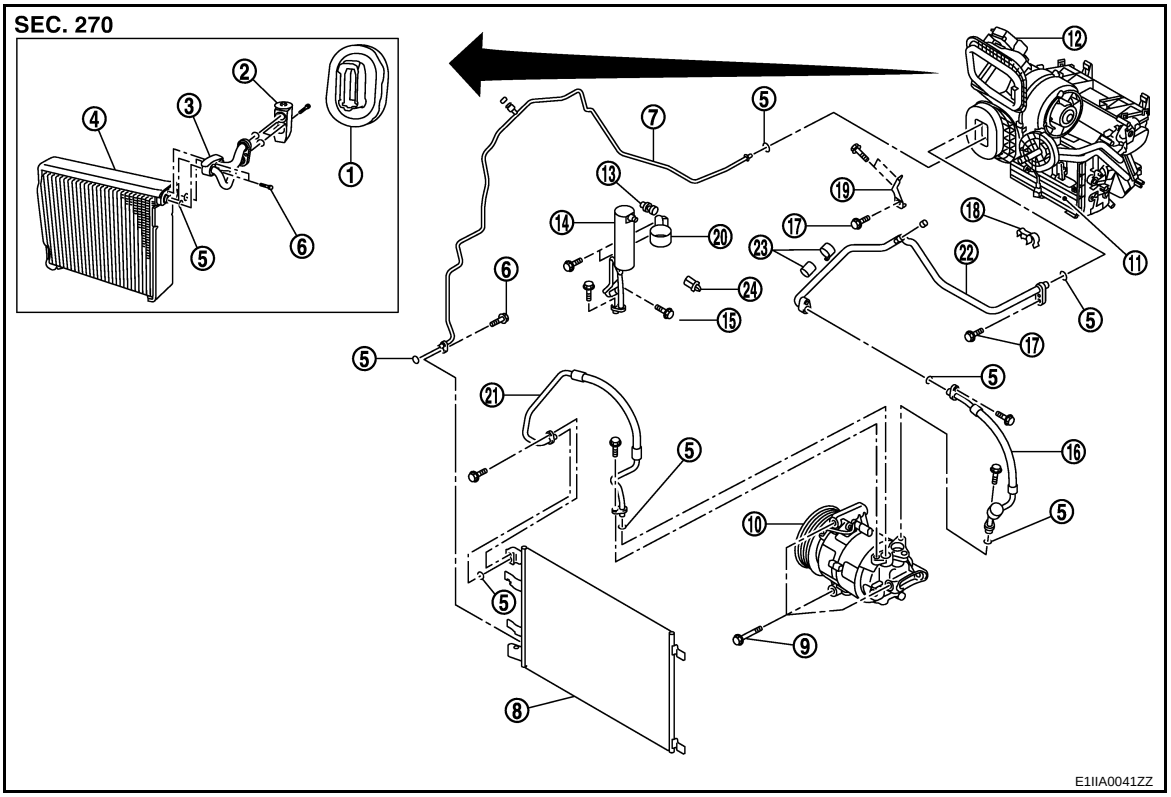
- **Replace O-rings of low-pressure flexible hose and high-pressure flexible hose with new ones, and then apply compressor oil to it when installing it.**
- **When recharging refrigerant, check for leaks.**

LOW-PRESSURE FLEXIBLE HOSE AND PIPE 2

Exploded View

INFOID:0000000001550666

Refer to HA-281, "Refrigerant Connection".



1. Heater sealing
2. Expansion valve
3. Low pressure pipe 1 and high pressure pipe 2 assembly
4. Evaporator
5. O-ring
6. Connector pipe fixing bolt
7. High pressure pipe 1
8. Condenser assembly
9. Fixing bolt
10. Compressor
11. Heater & cooling unit assembly
12. Heater & blower unit assembly
13. Refrigerant pressure sensor
14. Liquid tank
15. Liquid tank fixing screw
16. Low pressure flexible hose
17. Fixing bolt
18. Pipes fixing clip
19. Low & high pressure pipe bracket
20. Liquid tank fixing bracket
21. High pressure flexible hose
22. Low pressure pipe 2
23. Low pressure pipe fixing clamp assembly
24. Pipe mantening clip

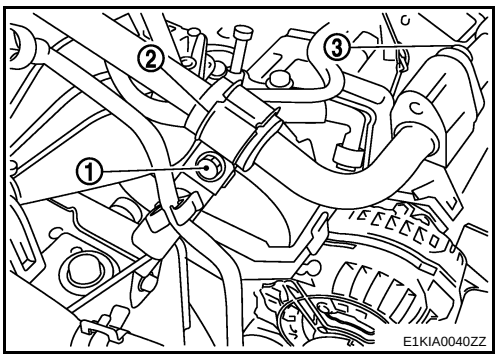
Removal and Installation

INFOID:0000000001550667

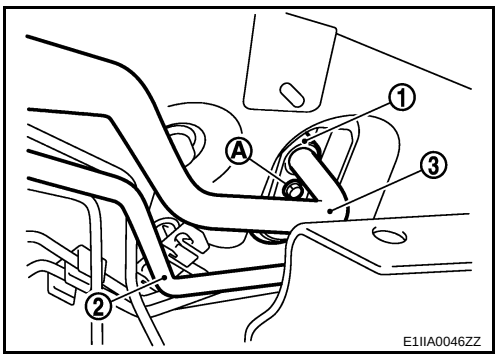
REMOVAL

1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
2. Remove upper engine cover ornament. Refer to EM-267, "Removal and Installation".

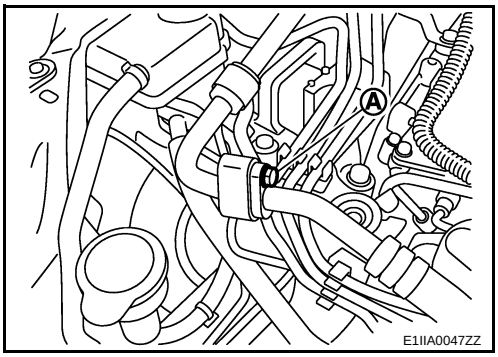
3. Remove mounting bolt (1) and clamp (2), from low pressure pipe bracket support.
4. Remove low and high-pressure maintaining clip, from both pipes, then remove fixing bolt (3) from low-pressure flexible hose and low-pressure pipe 2.
5. Remove engine room insulator fixing clip from cowl top.



6. Pull dash lower insulator (upper), then remove pipes bracket fixing bolt (A), from expansion valve, and release pipes fixing bracket (1) from high pressure pipe 1 (2), to remove low pressure pipe 2 (3) from expansion valve.
CAUTION:
Cap or wrap the joint of the low pressure flexible hose and pipe, and extension valve exit with suitable material such as vinyl tape to avoid the entry of air.

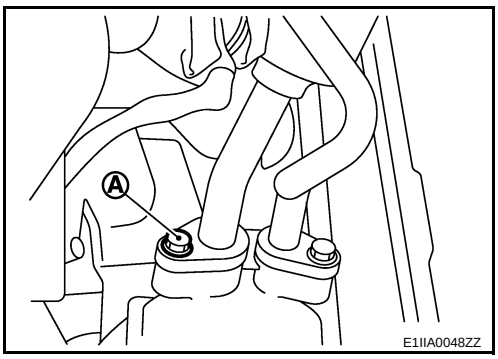


7. Remove low pressure pipe connector fixing bolt (A), with suitable tools, then remove low pressure pipe from low pressure flexible hose.
CAUTION:
Cap or wrap the joint of the low pressure pipe connector, and low pressure flexible hose, with suitable material such as vinyl tape to avoid the entry of air.



8. Remove low pressure flexible hose fixing bolt (A), from air conditioner compressor, and remove low pressure flexible hose.
CAUTION:
Cap or wrap the joint of low pressure flexible hose with suitable material such as vinyl tape to avoid the entry of air.

Pipe bracket fixing bolt to expansion valve
: 4.4 N·m (0.45 kg-m, 39 in-lb)
Low pressure flexible pipe fixing bolt to compressor
: 4.4 N·m (0.45 kg-m, 39 in-lb)



INSTALLATION

Installation is basically the reverse order of removal.

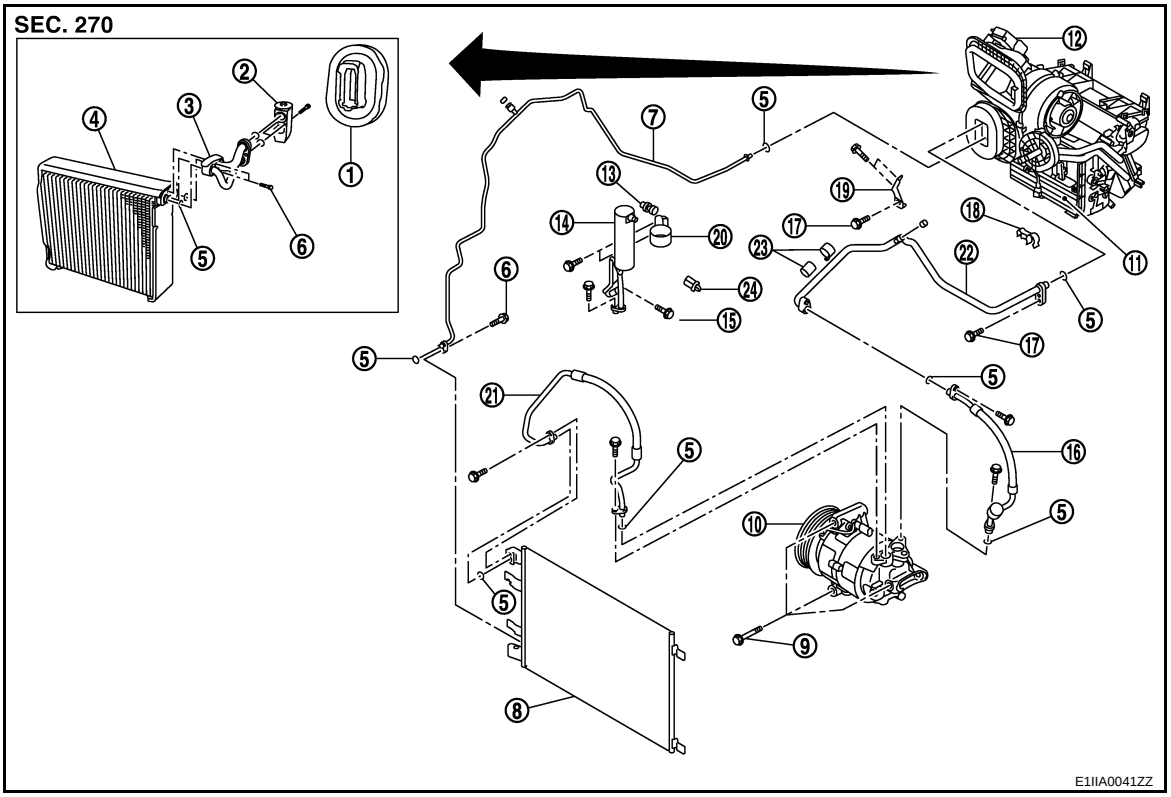
CAUTION:
- **Replace O-rings of low-pressure flexible hose and low-pressure pipe 2 with new ones, and then apply compressor oil to it when installing it.**
- **Female-side piping connection is thin and easy to deform. Slowly insert the male-side piping straight in axial direction.**
- **Insert piping 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.**

HIGH-PRESSURE FLEXIBLE HOSE

Exploded View

INFOID:0000000001550668

Refer to HA-281, "Refrigerant Connection".



1. Heater sealing
2. Expansion valve
3. Low pressure pipe 1 and high pressure pipe 2 assembly
4. Evaporator
5. O-ring
6. Connector pipe fixing bolt
7. High pressure pipe 1
8. Condenser assembly
9. Fixing bolt
10. Compressor
11. Heater & cooling unit assembly
12. Heater & blower unit assembly
13. Refrigerant pressure sensor
14. Liquid tank
15. Liquid tank fixing screw
16. Low pressure flexible hose
17. Fixing bolt
18. Pipes fixing clip
19. Low & high pressure pipe bracket
20. Liquid tank fixing bracket
21. High pressure flexible hose
22. Low pressure pipe 2
23. Low pressure pipe fixing clamp assembly
24. Pipe mantening clip

Removal and Installation

INFOID:0000000001550669

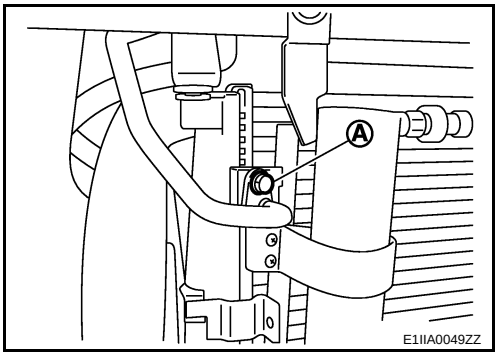
REMOVAL

1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
2. Remove engine cover ornament. Refer to EM-267, "Removal and Installation".
3. Remove front grille. Refer to EXT-17, "Exploded View".
4. Remove radiator shroud.

5. Remove high pressure flexible hose fixing bolt (A) from condenser, then pull high pressure flexible hose to remove it from condenser.

CAUTION:

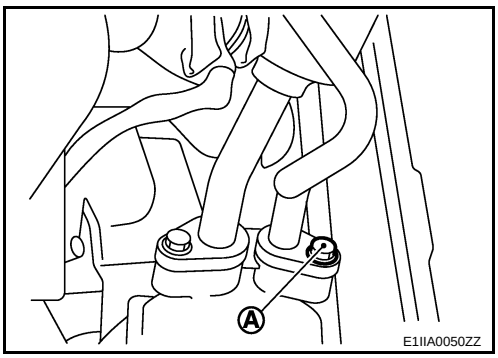
Cap or wrap the joint of high pressure flexible hose and condenser assembly with suitable material such as vinyl tape to avoid the entry of air.



6. Remove high pressure flexible hose fixing bolt (A) from compressor, then pull high pressure flexible hose to remove it from compressor.
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.



High pressure fixing bolt to condenser

: 4.4 N·m (0.45 kg-m, 39 in-lb)

High pressure fixing bolt to compressor

: 4.4 N·m (0.45 kg-m, 39 in-lb)

INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

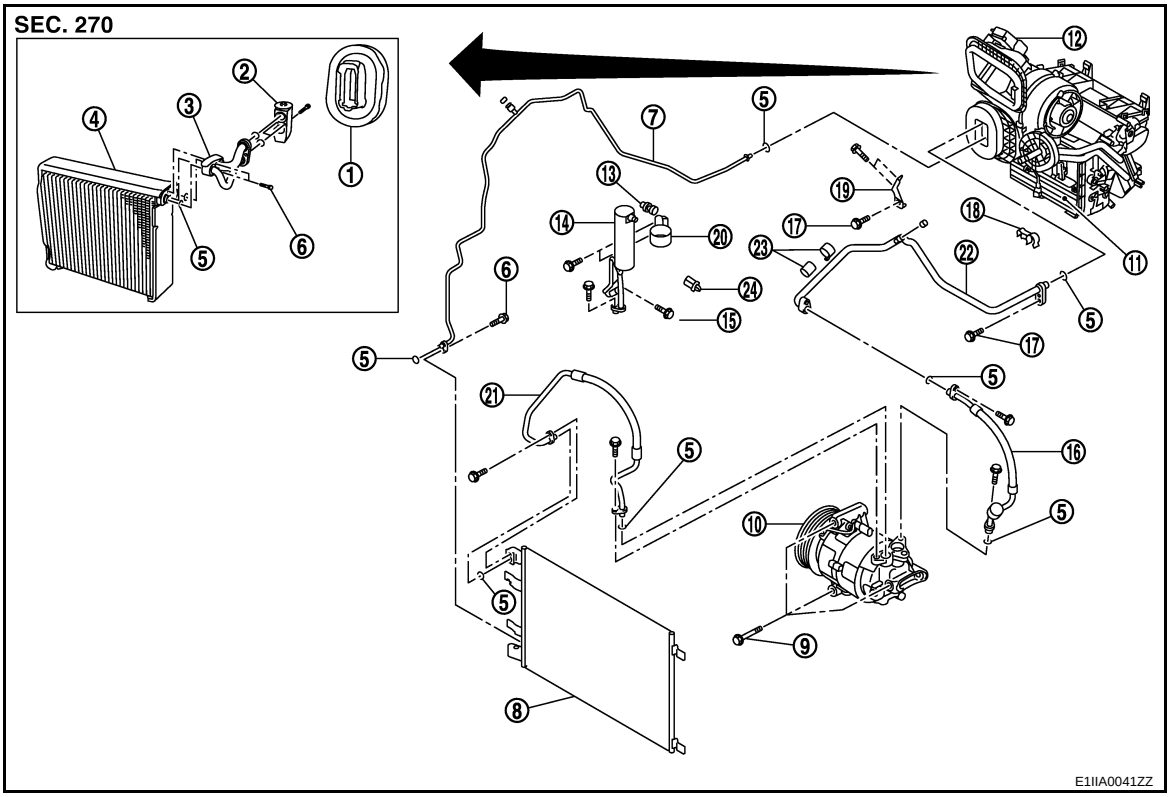
- **Replace O-rings of high-pressure flexible hose with new ones, and then apply compressor oil to it when installing it.**
- **Female-side piping connection is thin and easy to deform. Slowly insert the male-side piping straight in axial direction.**
- **Insert piping securely until a click is heard.**
- **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 PIPE 1 (ENGINE COMPARTMENT)

Exploded View

INFOID:0000000001550670

Refer to HA-281, "Refrigerant Connection".



1. Heater sealing
2. Expansion valve
3. Low pressure pipe 1 and high pressure pipe 2 assembly
4. Evaporator
5. O-ring
6. Connector pipe fixing bolt
7. High pressure pipe 1
8. Condenser assembly
9. Fixing bolt
10. Compressor
11. Heater & cooling unit assembly
12. Heater & blower unit assembly
13. Refrigerant pressure sensor
14. Liquid tank
15. Liquid tank fixing screw
16. Low pressure flexible hose
17. Fixing bolt
18. Pipes fixing clip
19. Low & high pressure pipe bracket
20. Liquid tank fixing bracket
21. High pressure flexible hose
22. Low pressure pipe 2
23. Low pressure pipe fixing clamp assembly
24. Pipe mantening clip

Removal and Installation

INFOID:0000000001550671

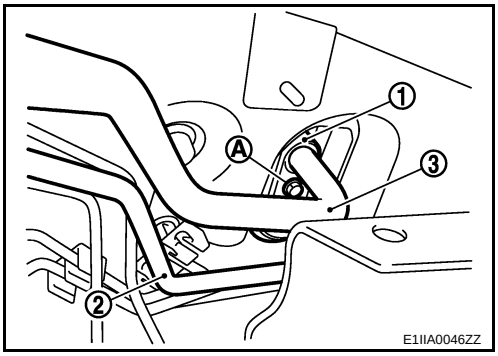
REMOVAL

1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
2. Remove engine cover ornament. Refer to EM-267, "Removal and Installation".

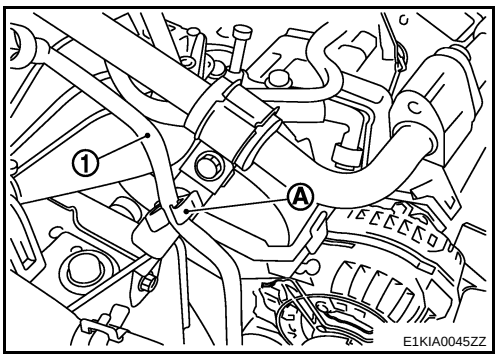
3. Pull dash lower insulator (upper), then remove pipes bracket fixing bolt (A), from expansion valve, and release pipes fixing bracket (1) from high pressure pipe 1 (2), to remove low pressure pipe 2 (3) from expansion valve.

CAUTION:

Cap or wrap the joint of the low pressure flexible hose and pipe, and extension valve exit with suitable material such as vinyl tape.



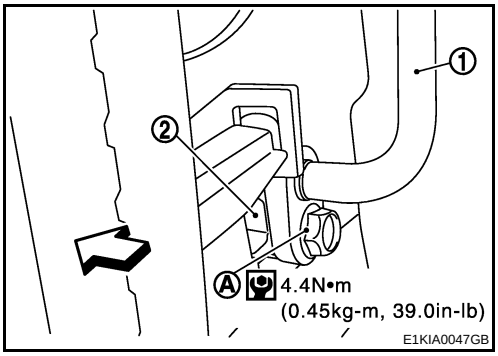
4. Remove high pressure pipe 1 (1) from clip (A).



- Remove high-pressure pipe 1 mounting bolt (A) from condenser (2).
- Remove high pressure pipe 1 (1).

CAUTION:

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



INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

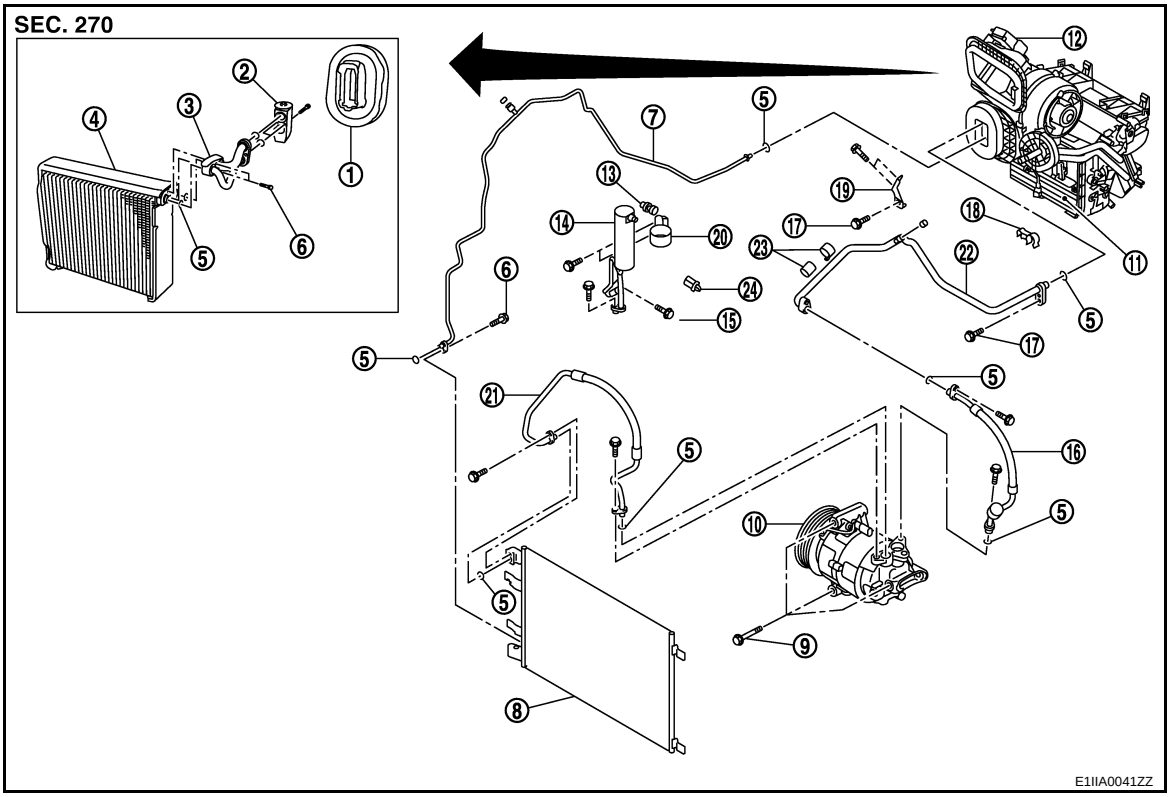
- **Replace O-rings of high-pressure pipe 1 with new ones, and then apply compressor oil to it when installing it.**
- **Female-side piping connection is thin and easy to deform. Slowly insert the male-side piping straight in axial direction.**
- **Insert piping securely until a click is heard.**
- **After 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 PIPE 1 AND HIGH-PRESSURE PIPE 2

Exploded View

INFOID:0000000001550672

Refer to HA-281, "Refrigerant Connection".



1. Heater sealing
2. Expansion valve
3. Low pressure pipe 1 and high pressure pipe 2 assembly
4. Evaporator
5. O-ring
6. Connector pipe fixing bolt
7. High pressure pipe 1
8. Condenser assembly
9. Fixing bolt
10. Compressor
11. Heater & cooling unit assembly
12. Heater & blower unit assembly
13. Refrigerant pressure sensor
14. Liquid tank
15. Liquid tank fixing screw
16. Low pressure flexible hose
17. Fixing bolt
18. Pipes fixing clip
19. Low & high pressure pipe bracket
20. Liquid tank fixing bracket
21. High pressure flexible hose
22. Low pressure pipe 2
23. Low pressure pipe fixing clamp assembly
24. Pipe mantening clip

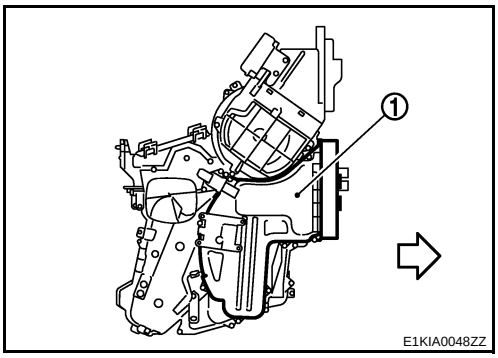
Removal and Installation

INFOID:0000000001550673

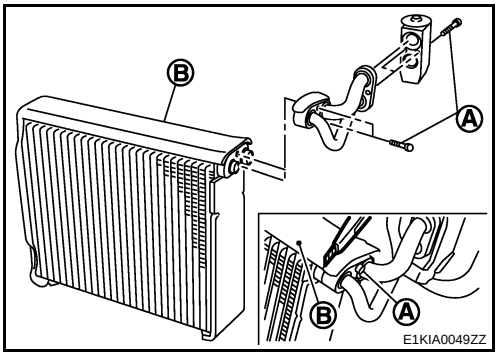
REMOVAL

1. Set the temperature at 18°C (60°F), and then disconnect the battery cable from the negative terminal.
2. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
3. Remove engine cover ornament. Refer to EM-267, "Removal and Installation".
4. Remove high-pressure pipe 1 and low pressure pipe 2 from expansion valve. Refer to HA-305, "Removal and Installation" and HA-309, "Removal and Installation".
   CAUTION:
   Cap or wrap the joint of the, high-pressure pipe 1, low-pressure pipe 2, and the expansion valve with suitable material such as vinyl tape to avoid the entry of air.
5. Remove instrument panel.Refer to IP-12, "Removal and Installation".
6. Remove foot duct (RH / LH). Refer to VTL-112, "FLOOR DUCT : Removal and Installation".
7. Remove steering column. Refer to ST-10, "Removal and Installation".

8. Remove steering member. Refer to ST-15, "Removal and Installation".
9. Remove heater and cooling assembly. Refer to VTL-91, "Removal and Installation".
10. Remove mounting screws, and then remove evaporator cover (1).



11. Using a thin cutter, cut the evaporator insulator (B), and remove fixing bolt (A) then remove low-pressure pipe 1 and high-pressure pipe 2 assembly.
CAUTION:
Cap or wrap the joint of expansion valve, high-pressure pipe 2 and low-pressure pipe 1 with suitable material such as vinyl tape to avoid the entry of air.



INSTALLATION

Installation is basically the reverse order of removal.

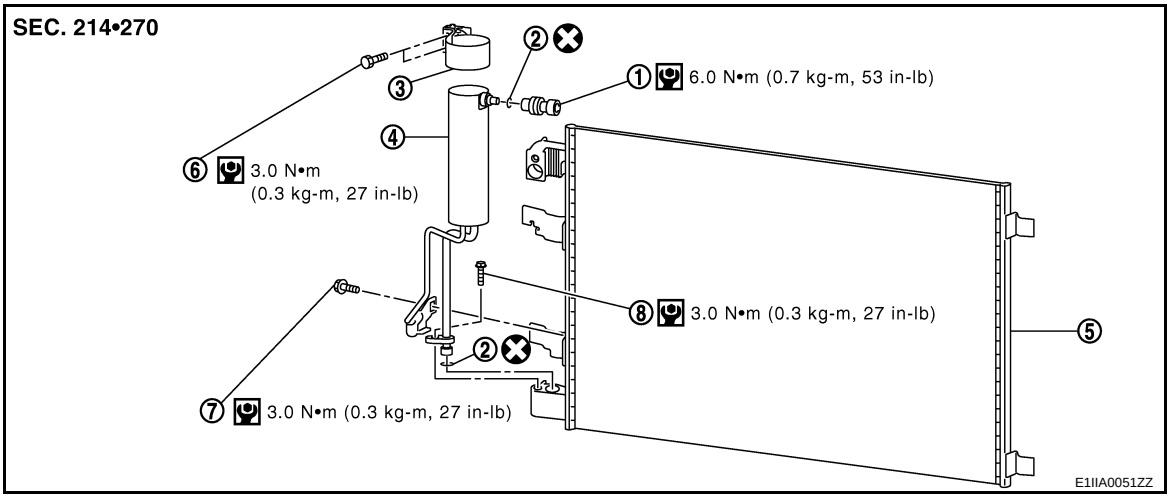
CAUTION:

- **Replace O-rings of high-pressure pipe 1, 2 and low-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.**

CONDENSER

Exploded View

INFOID:0000000001550674



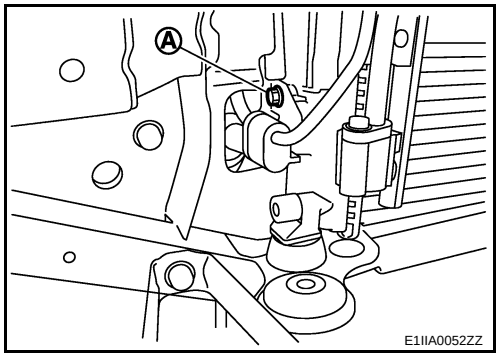
1. Refrigerant pressure sensor
2. O-ring
3. Liquid tank bracket
4. Liquid tank
5. Condensor
6. Liquid tank fixing screw
7. Liquid tank pipe fixing screw
8. Liquid tank pipe fixing bolt

Removal and Installation

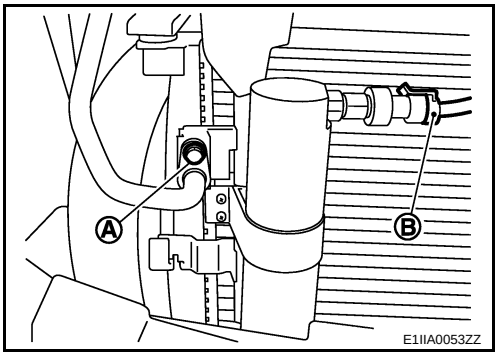
INFOID:0000000001550675

REMOVAL

1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
2. Remove front grille. Refer to EXT-17, "Exploded View".
3. Remove front bumper fascia. Refer to EXT-11, "Exploded View".
4. Remove engine undercover.
5. Remove radiator shroud.
6. Remove charge air cooler. Refer to EM-357, "Exploded View".
7. Remove high pressure pipe fixing bolt from liquid tank.
   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.
8. Remove liquid tank pipe fixing screw (A) from radiator.



9. Remove high pressure flexible hose fixing bolt (A) from condenser.
   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.
   Disconnect refrigerant pressure sensor harness connector (B).



10. Remove the condenser from the vehicle.
    CAUTION:
    Take care do not damaged condenser or radiator.

INSTALLATION

Installation is basically the reverse order of removal.

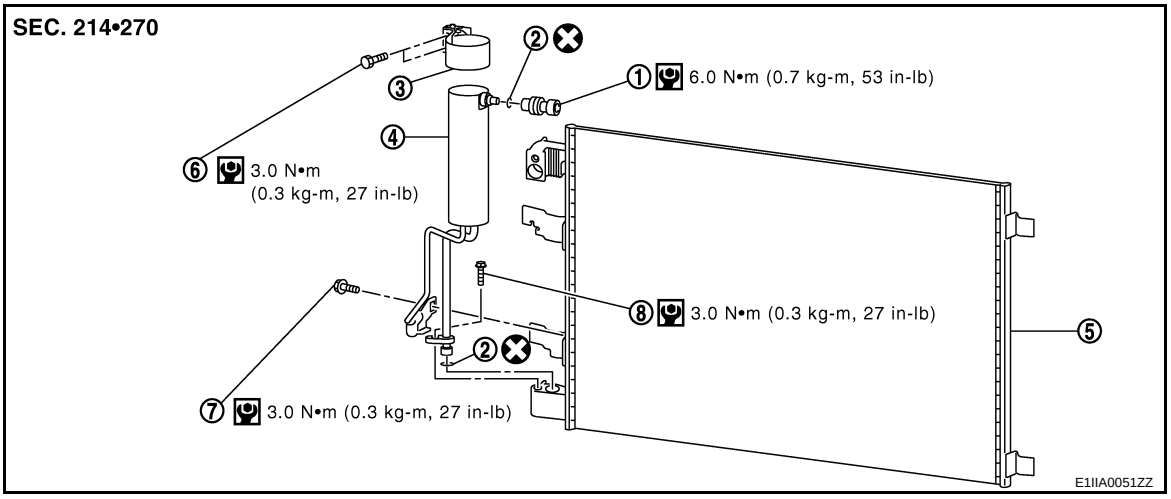
CAUTION:

- **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.**

LIQUID TANK

Exploded View

INFOID:0000000001550676



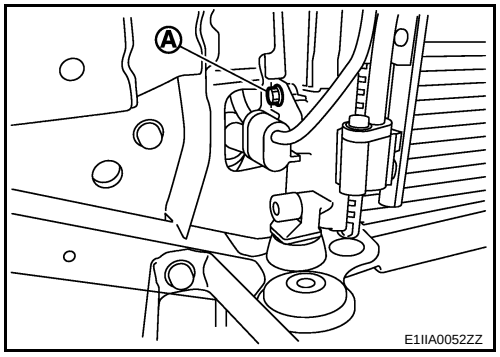
1. Refrigerant pressure sensor
2. O-ring
3. Liquid tank bracket
4. Liquid tank
5. Condensor
6. Liquid tank fixing screw
7. Liquid tank pipe fixing screw
8. Liquid tank pipe fixing bolt

Removal and Installation

INFOID:0000000001550677

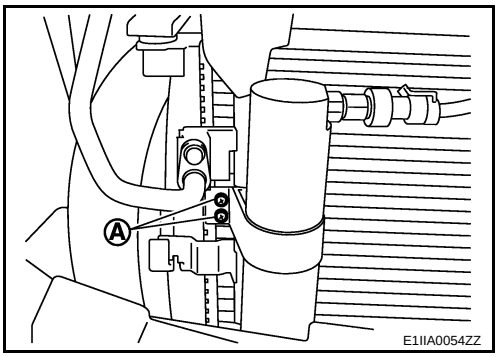
REMOVAL

1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
2. Remove engine cover ornament. Refer to EM-267, "Removal and Installation".
3. Remove front grille. Refer to EXT-17, "Removal and Installation".
4. Remove front bumper fascia. Refer to EXT-11, "Exploded View".
5. Remove engine undercover.
6. Remove radiator shroud.
7. Remove charge air cooler. Refer to EM-357, "Exploded View".
8. Disconnect refrigerant pressure sensor harness connector.
9. Remove high pressure pipe fixing bolt from liquid tank pipe.
   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.
10. Remove liquid tank pipe fixing screw (A) from radiator.



11. Remove liquid tank pipe fixing bolt from condenser.
    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.

12. Remove liquid tank pipe bracket fixing screws (A).



13. Remove the liquid tank assembly.

INSTALLATION

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

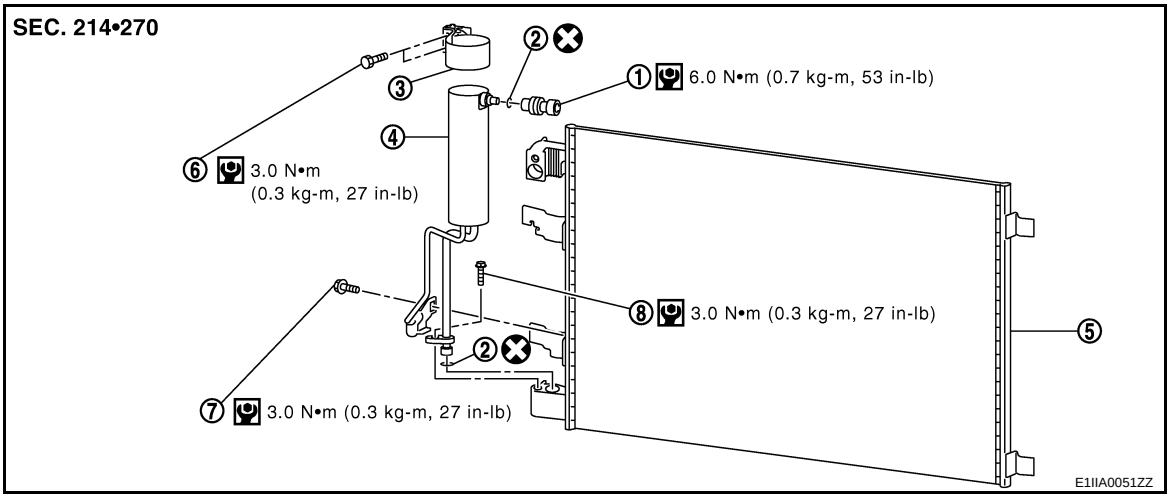
CAUTION:

- **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.**

REFRIGERANT PRESSURE SENSOR

Exploded View

INFOID:0000000001550678



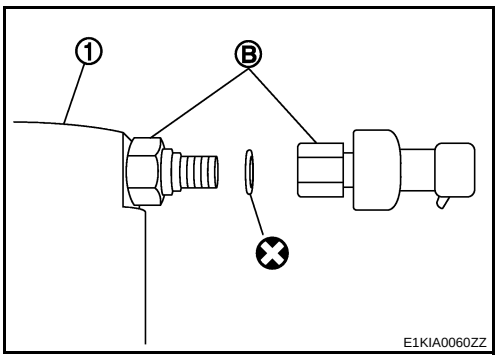
1. Refrigerant pressure sensor
2. O-ring
3. Liquid tank bracket
4. Liquid tank
5. Condensor
6. Liquid tank fixing screw
7. Liquid tank pipe fixing screw
8. Liquid tank pipe fixing bolt

Removal and Installation

INFOID:0000000001550679

REMOVAL

1. Remove liquid tank. Refer to HA-315, "Exploded View".
2. Fix the liquid tank (1) with a vise. Remove the refrigerant pressure sensor from liquid tank adaptator with a wrench (B).
   CAUTION:
   Be careful not to damage liquid tank.



INSTALLATION

Installation is basically the reverse order of removal.

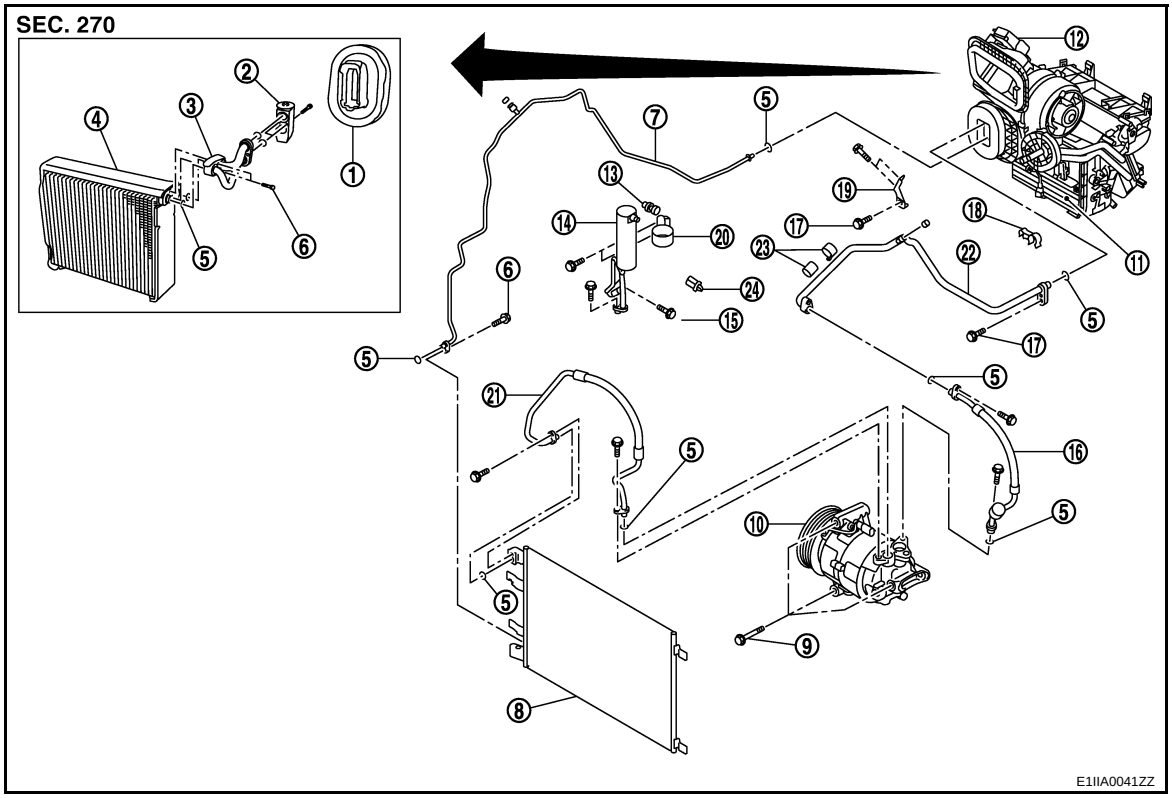
CAUTION:

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

EVAPORATOR

Exploded View

INFOID:0000000001550680



1. Heater sealing
2. Expansion valve
3. Low pressure pipe 1 and high pressure pipe 2 assembly
4. Evaporator
5. O-ring
6. Connector pipe fixing bolt
7. High pressure pipe 1
8. Condenser assembly
9. Fixing bolt
10. Compressor
11. Heater & cooling unit assembly
12. Heater & blower unit assembly
13. Refrigerant pressure sensor
14. Liquid tank
15. Liquid tank fixing screw
16. Low pressure flexible hose
17. Fixing bolt
18. Pipes fixing clip
19. Low & high pressure pipe bracket
20. Liquid tank fixing bracket
21. High pressure flexible hose
22. Low pressure pipe 2
23. Low pressure pipe fixing clamp assembly
24. Pipe mantening clip

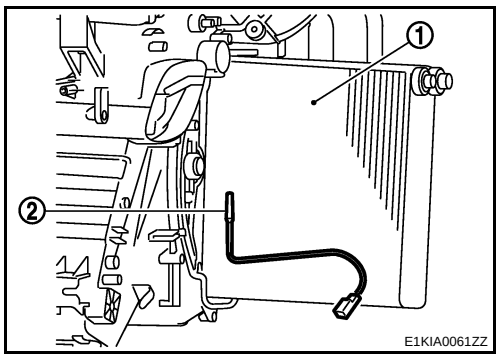
Removal and Installation

INFOID:0000000001550681

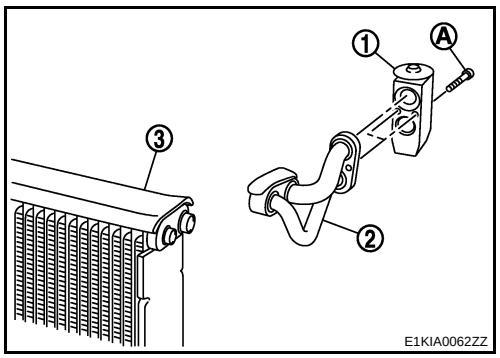
REMOVAL

1. Remove low-pressure pipe 2 and high-pressure pipe 1 from expansion valve. Refer to HA-305, "Removal and Installation". Refer to HA-309, "Removal and Installation".
   CAUTION:
   Cap or wrap the joint of expansion valve, low-pressure pipe 2 and high-pressure pipe 1 with suitable material such as vinyl tape to avoid the entry of air.
2. Remove heater and cooling unit assembly. Refer to VTL-91, "Removal and Installation".
3. Remove evaporator cover fixing screws and cover. Refer to HA-318, "Removal and Installation".

4. Slide evaporator (1) from heater and cooling unit assembly.



5. Cut upper insulator (3) and remove mounting bolt (A), (1) expansion valve and pressure pipe assembly (2), from evaporator.
6. Remove evaporator.



INSTALLATION

Installation is basically the reverse order of removal.

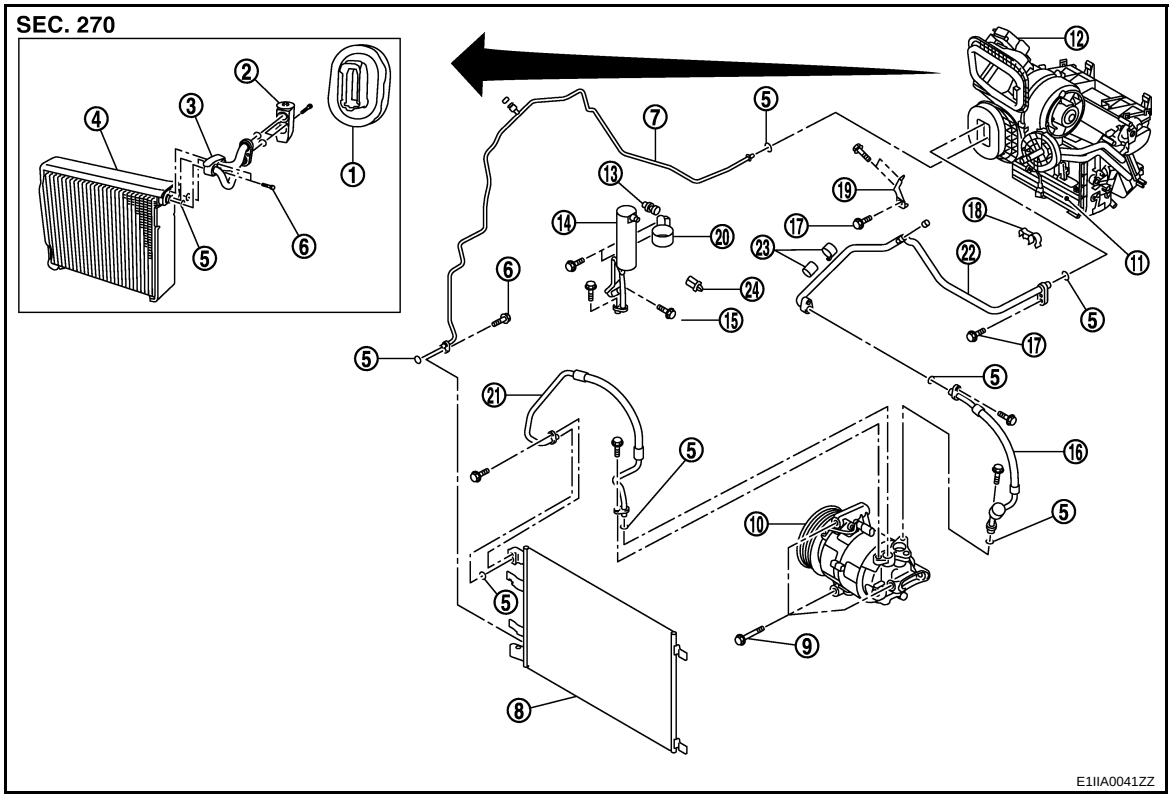
CAUTION:

- **Replace O-rings of low-pressure pipe 1 and high-pressure pipe 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 flexible hose (high-pressure pipe 1) and low-pressure pipe 1 (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.**

EXPANSION VALVE

Exploded View

INFOID:0000000001550682



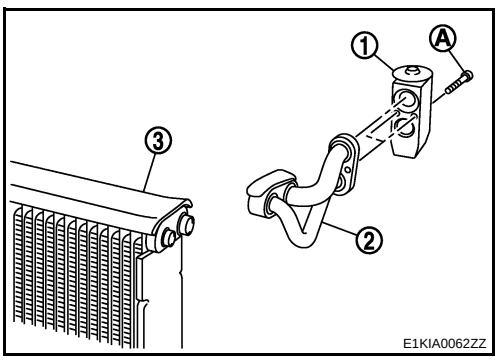
1. Heater sealing
2. Expansion valve
3. Low pressure pipe 1 and high pressure pipe 2 assembly
4. Evaporator
5. O-ring
6. Connector pipe fixing bolt
7. High pressure pipe 1
8. Condenser assembly
9. Fixing bolt
10. Compressor
11. Heater & cooling unit assembly
12. Heater & blower unit assembly
13. Refrigerant pressure sensor
14. Liquid tank
15. Liquid tank fixing screw
16. Low pressure flexible hose
17. Fixing bolt
18. Pipes fixing clip
19. Low & high pressure pipe bracket
20. Liquid tank fixing bracket
21. High pressure flexible hose
22. Low pressure pipe 2
23. Low pressure pipe fixing clamp assembly
24. Pipe mantening clip

Removal and Installation

INFOID:0000000001550683

REMOVAL

1. Remove evaporator (3). Refer to HA-318, "Removal and Installation".
2. Remove low pressure pipe 1 and high pressure pipe 2 assembly (2). Refer to HA-311, "Removal and Installation".
3. Remove mounting bolts (A), and then remove expansion valve (1) from low and high pressure pipe assembly (2).
   CAUTION:
   Cap or wrap the joint of expansion valve, low and high pressure pipe assembly, evaporator and 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 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.**

SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

Compressor

INFOID:0000000001550684

Model		DELPHI THERMAL HUNGARY make 5 CVC
Type		Variable displacement swash plate
Displacement cm^3 (cu in)/rev	Max.	120 (7.32)
Cylinder bore × stroke (Max.) mm (in.)		-
Direction of rotation		Clockwise (viewed from clutch)
Drive belt		Poly V
Disc to pulley clearance	Standard	-

Lubricant

INFOID:0000000001550685

Model		DELPHI THERMAL HUNGARY make 5 CVC
Name		Nissan A/C System Oil Type S (DH-PS)
Capacity m ℓ (US fl oz, lmp fl oz)	Total in system	150 (5.03, 5.3)
	Compressor (Service part) charging amount	150 (5.03, 5.3)

Refrigerant

INFOID:0000000001550686

Type	HFC-134a (R-134a)
Capacity kg (lb)	0.45 ± 0.025 (0.99 ± 0.055)

Engine Idling Speed

INFOID:0000000001550687

Refer to ECK-231, "Idle Speed".

Belt Tension

INFOID:0000000001550688

Refer to EM-260, "Inspection and Adjustment".