

SECTION **HA**

HEATER & AIR CONDITIONING SYSTEM

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PRECAUTIONS

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PRECAUTION

PRECAUTIONS

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

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The Supplemental Restraint System such as "AIR BAG" and "SEAT BELT PRE-TENSIONER", used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. Information necessary to service the system safely is included in the SR 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 SR section.
- Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.

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

WARNING:

- When working near the Airbag Diagnosis Sensor Unit or other Airbag System sensors with the Ignition ON or engine running, DO NOT use air or electric power tools or strike near the sensor(s) with a hammer. Heavy vibration could activate the sensor(s) and deploy the air bag(s), possibly causing serious injury.
- When using air or electric power tools or hammers, always switch the Ignition OFF, disconnect the battery and wait at least three minutes before performing any service.

Precaution for Work

INFOID:000000009463909

- When removing or disassembling each component, be careful not to damage or deform it. If a component may be subject to interference, be sure to protect it with a shop cloth.
- When removing (disengaging) components with a screwdriver or similar tool, be sure to wrap the component with a shop cloth or vinyl tape to protect it.
- Protect the removed parts with a shop cloth and prevent them from being dropped.
- Replace a deformed or damaged clip.
- If a part is specified as a non-reusable part, always replace it with a new one.
- Be sure to tighten bolts and nuts securely to the specified torque.
- After installation is complete, be sure to check that each part works properly.
- Follow the steps below to clean components:
 - Water soluble dirt:
 - Dip a soft cloth into lukewarm water, wring the water out of the cloth and wipe the dirty area.
 - Then rub with a soft, dry cloth.
 - Oily dirt:
 - Dip a soft cloth into lukewarm water with mild detergent (concentration: within 2 to 3%) and wipe the dirty area.
 - Then dip a cloth into fresh water, wring the water out of the cloth and wipe the detergent off.
 - Then rub with a soft, dry cloth.
 - Do not use organic solvent such as thinner, benzene, alcohol or gasoline.
 - For genuine leather seats, use a genuine leather seat cleaner.

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

INFOID:000000009463910

WARNING:

- CFC-12 (R-12) refrigerant and HFC-134a (R-134a) refrigerant are not compatible. If the refrigerants are mixed compressor failure is likely to occur. Refer to [HA-21, "Leak Test"](#). To determine the purity of HFC-134a (R-134a) in the vehicle and recovery tank, use Refrigerant Recovery/Recycling Recharging equipment and Refrigerant Identifier.

PRECAUTIONS

< PRECAUTION >

- Use only specified oil for the HFC-134a (R-134a) A/C system and HFC-134a (R-134a) components. If oil other than that specified is used, compressor failure is likely to occur.
- The specified HFC-134a (R-134a) oil 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, do not 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 oil from a sealed container. Immediately reseal containers of oil. Without proper sealing, oil will become moisture saturated and should not be used.
 - Avoid breathing A/C refrigerant and oil vapor or mist. Exposure may irritate eyes, nose and throat. Remove HFC-134a (R-134a) from the A/C system using certified service equipment meeting requirements of SAE J2210 [HFC-134a (R-134a) recycling equipment], or J2209 [HFC-134a (R-134a) recycling equipment]. If accidental system discharge occurs, ventilate work area before resuming service. Additional health and safety information may be obtained from refrigerant and oil manufacturers.
- Do not allow A/C oil to come in contact with styrofoam parts. Damage may result.

Contaminated Refrigerant

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If a refrigerant other than pure HFC-134a (R-134a) is identified in a vehicle, your options are:

- Explain to the customer that environmental regulations prohibit the release of contaminated refrigerant into the atmosphere.
- Explain that recovery of the contaminated refrigerant could damage your service equipment and refrigerant supply.
- Suggest the customer return the vehicle to the location of previous service where the contamination may have occurred.
- If you choose to perform the repair, recover the refrigerant using only **dedicated equipment and containers. Do not recover contaminated refrigerant into your existing service equipment.** If your facility does not have dedicated recovery equipment, you may contact a local refrigerant product retailer for available service. This refrigerant must be disposed of in accordance with all federal and local regulations. In addition, replacement of all refrigerant system components on the vehicle is recommended.
- If the vehicle is within the warranty period, the air conditioner warranty is void. Please contact NISSAN Customer Affairs for further assistance.

Precaution for Leak Detection Dye

INFOID:000000009463912

- 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.
- A compressor shaft seal should not be repaired because of dye seepage. The compressor shaft seal should only be repaired after confirming the leak with an electronic refrigerant leak detector (J-41995).
- Always remove any dye from the leak area after repairs are complete to avoid a misdiagnosis during a future service.
- Do not 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.**
- Do not spray the fluorescent dye cleaning agent on hot surfaces (engine exhaust manifold, etc.).
- Do not 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 HC-12 (R-12) A/C systems are different. Do not use HFC-134a (R-134a) leak detection dye in R-12 A/C systems or HC-12 (R-12) leak detection dye in HFC-134a (R-134a) A/C systems or A/C system damage may result.
- The fluorescent properties of the dye will remain for over three (3) years unless a compressor failure occurs.

Precaution for Refrigerant Connection

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

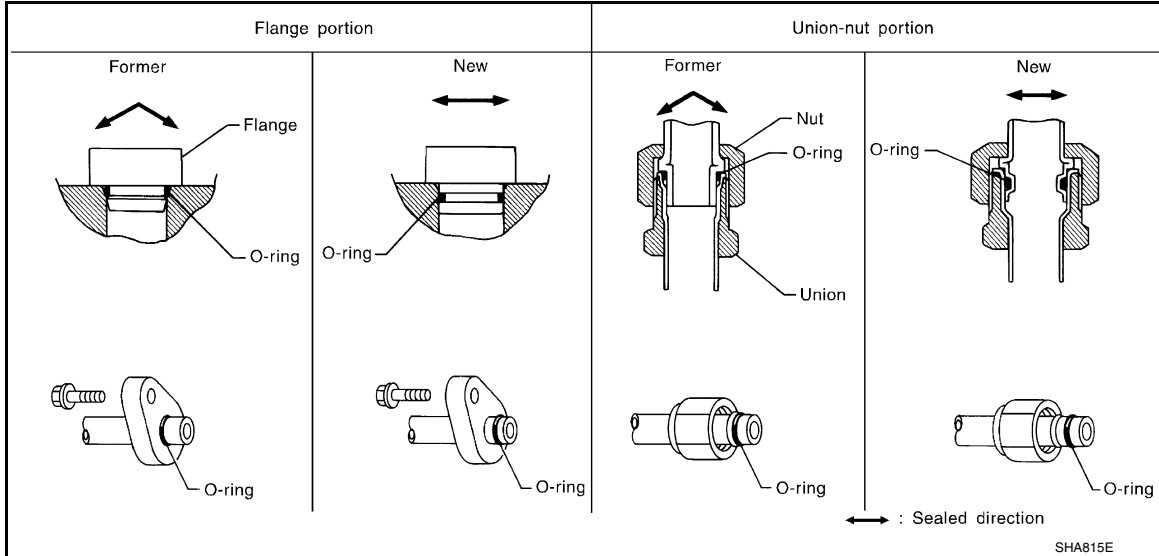
- Expansion valve to cooling unit
- Evaporator pipes to evaporator (inside cooling unit)
- Refrigerant pressure sensor

PRECAUTIONS

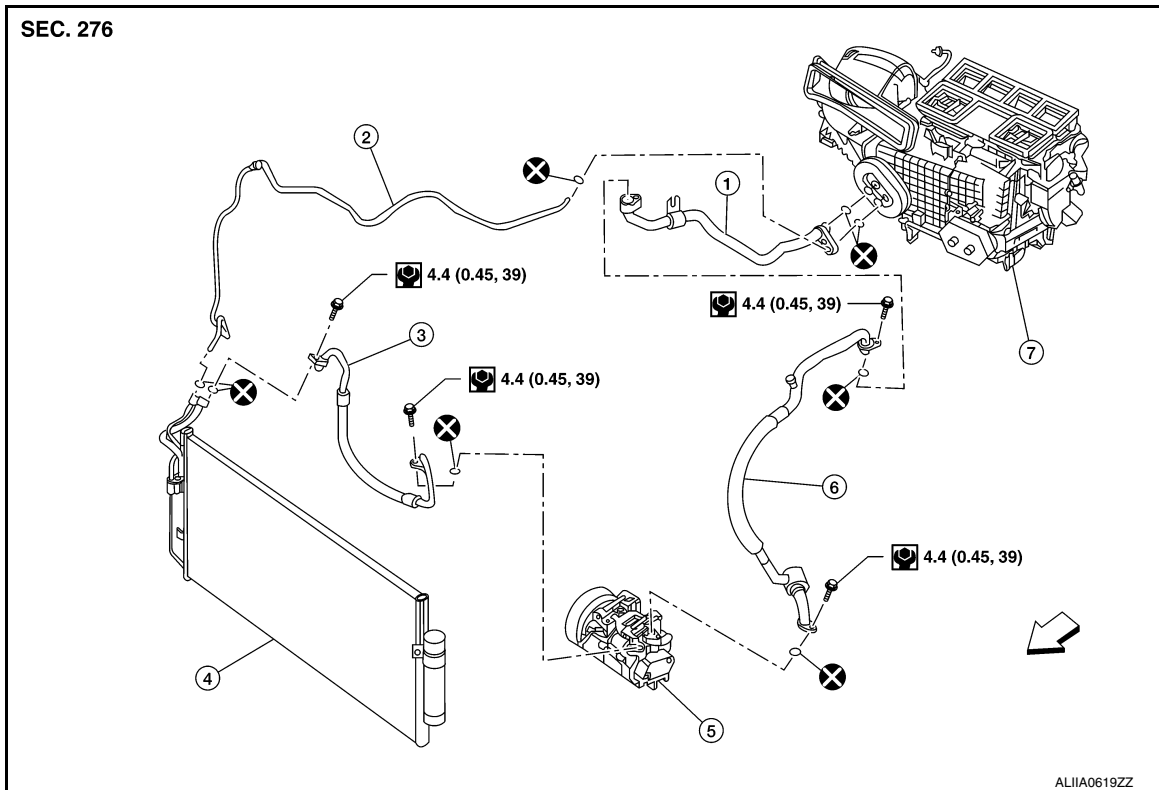
< PRECAUTION >

FEATURES OF NEW TYPE REFRIGERANT CONNECTION

- The O-ring has been relocated. It has also been provided with a groove for proper installation. This eliminates the chance of the O-ring being caught in, or damaged by, the mating part. The sealing direction of the O-ring is now set vertically in relation to the contacting surface of the mating part to improve sealing characteristics.
- The reaction force of the O-ring will not occur in the direction that causes the joint to pull out, thereby facilitating piping connections.



O-RING AND REFRIGERANT CONNECTION



- | | | |
|--------------------------------------|-----------------------|--------------------------------|
| 1. Low-pressure pipe | 2. High-pressure pipe | 3. High-pressure flexible hose |
| 4. Condenser assembly | 5. Compressor | 6. Low-pressure flexible hose |
| 7. Heating and cooling unit assembly | ↔ Front | |

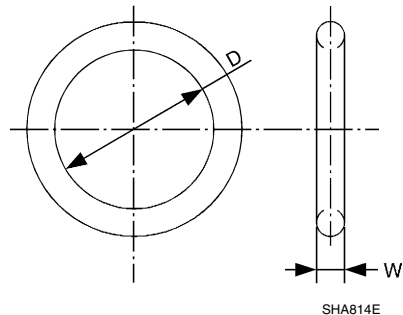
CAUTION:

PRECAUTIONS

< PRECAUTION >

The new and former refrigerant connections use different O-ring configurations. Do not confuse O-rings since they are not interchangeable. If a wrong O-ring is installed, refrigerant will leak at, or around, the connection.

O-Ring Specifications*



| Connection type | O-ring size | D mm (in) | W mm (in) |
|-----------------|-------------|----------------|---------------|
| New | 8 | 6.8 (0.268) | 1.85 (0.0728) |
| Former | 10 | 9.25 (0.3642) | 1.78 (0.0701) |
| New | 12 | 10.9 (0.429) | 2.43 (0.0957) |
| Former | | 11.0 (0.433) | 2.4 (0.094) |
| New | 16 | 13.6 (0.535) | 2.43 (0.0957) |
| Former | | 14.3 (0.563) | 2.3 (0.091) |
| New | 19 | 16.5 (0.650) | 2.43 (0.0957) |
| Former | | 17.12 (0.6740) | 1.78 (0.0701) |
| New | 24 | 21.8 (0.858) | 2.4 (0.094) |

*: Always check with the Parts Department for the latest parts information.

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:

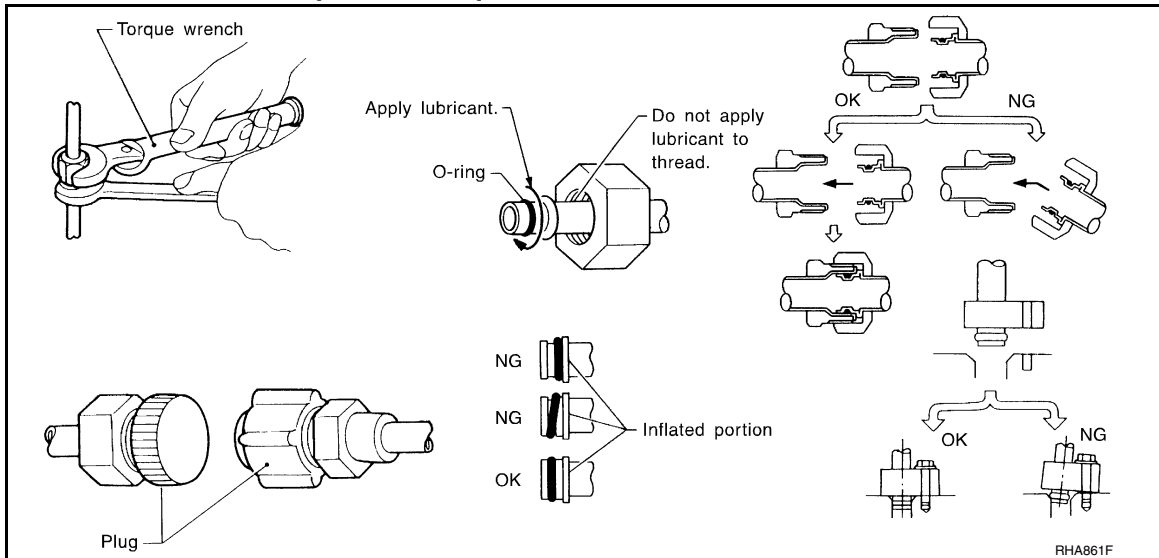
When replacing or cleaning refrigerant cycle components, observe the following.

- When the compressor is removed, store it in the same position as it is when mounted on the car. Failure to do so will cause oil to enter the low pressure chamber.
- When connecting tubes, always use a torque wrench and a back-up wrench.
- After disconnecting tubes, immediately plug all openings to prevent entry of dirt and moisture.
- When installing an air conditioner in the vehicle, connect the pipes as the final stage of the operation. Do not 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.
- Do not reuse the O-rings.
- Apply A/C compressor oil to the new O-rings for installation.
Oil name: NISSAN A/C System Oil Type S or equivalent
- O-ring must be closely attached to dented portion of tube.
- When replacing the O-ring, be careful not to damage O-ring and tube.
- Connect tube until you hear it click, then tighten the nut or bolt by hand until snug. Make sure that the O-ring is installed to tube correctly.

PRECAUTIONS

< PRECAUTION >

- After connecting line, conduct leak test and make sure that there is no leakage from connections. When the gas leaking point is found, disconnect that line and replace the O-ring. Then tighten connections of seal seat to the specified torque.



Precaution for Service Equipment

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RECOVERY/RECYCLING EQUIPMENT

Follow the manufacturer's instructions for machine operation and machine maintenance. Do not introduce any refrigerant other than that specified into the machine.

ELECTRONIC LEAK DETECTOR

Follow the manufacturer's instructions for tester operation and tester maintenance.

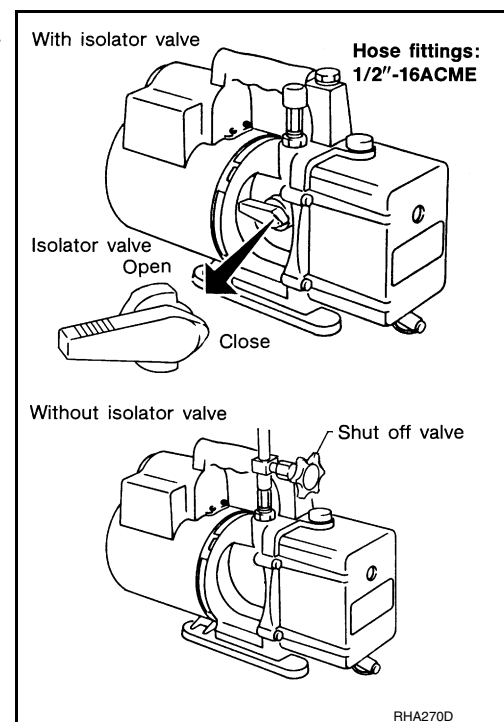
VACUUM PUMP

The oil contained inside the vacuum pump is not compatible with the specified oil for HFC-134a (R-134a) A/C systems. The vent side of the vacuum pump is exposed to atmospheric pressure so the vacuum pump oil 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 situated 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 oil may migrate.

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

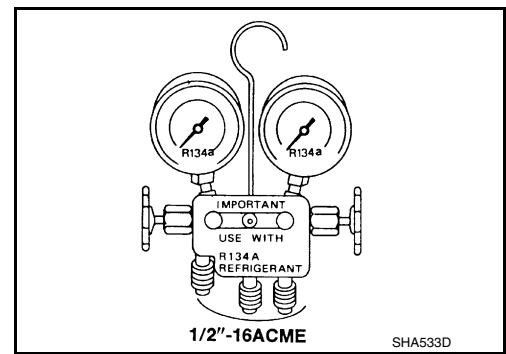


MANIFOLD GAUGE SET

PRECAUTIONS

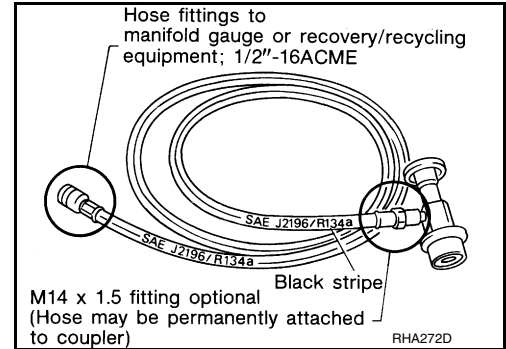
< PRECAUTION >

Be certain that the gauge face indicates R-134a or 134a. Make 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) along with specified oil.



SERVICE HOSES

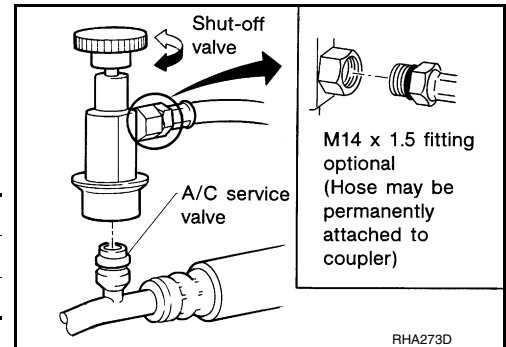
Be certain that the service hoses display the markings described (colored hose with black stripe). All hoses must include positive shut-off devices (either manual or automatic) near the end of the hoses opposite the manifold gauge.



SERVICE COUPLERS

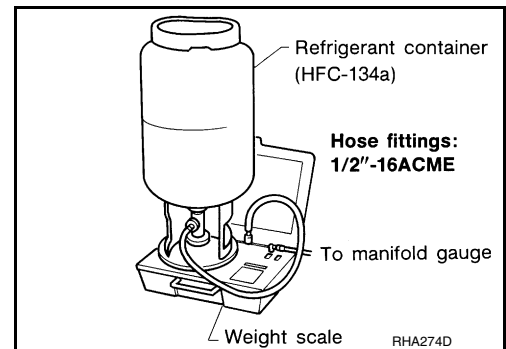
Do not attempt to connect HFC-134a (R-134a) service couplers to a CFC-12 (R-12) A/C system. The HFC-134a (R-134a) couplers will not properly connect to the CFC-12 (R-12) system. However, if an improper connection is attempted, discharging and contamination may occur.

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



REFRIGERANT WEIGHT SCALE

Verify that no refrigerant other than HFC134a (R-134a) and specified oils 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.

PREPARATION

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PREPARATION

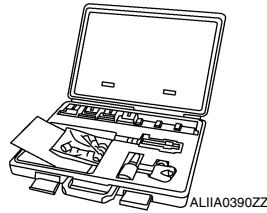
PREPARATION

Special Service Tool

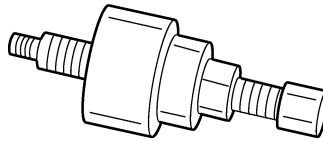
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The actual shapes of the tools may differ from those illustrated here.

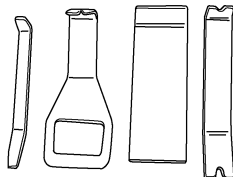
| Tool number (TechMate No.) Tool name | Description |
|--|------------------------------|
| — (J-41425-NIS) Aluminum tube repair kit | Repairing leaks in A/C tubes |
| — (J-38873-A) Drive plate installer | Installing pulley |
| — (J-46534) Trim Tool Set | Removing trim components |



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

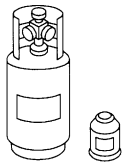

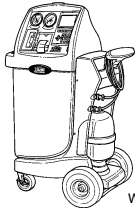
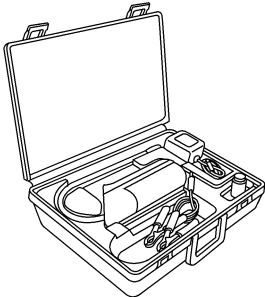
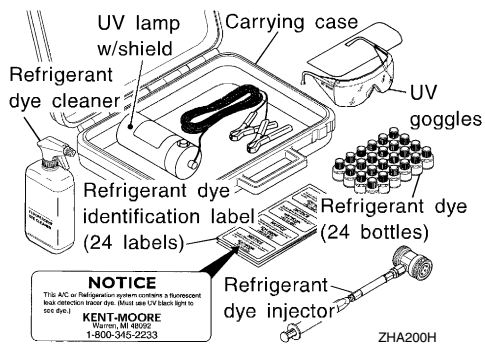
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Do not mix HFC-134a (R-134a) refrigerant and/or its specified oil with CFC-12 (R-12) refrigerant and/or its oil. Separate and non-interchangeable service equipment must be used for handling each type of refrigerant/oil. Refrigerant container fittings, service hose fittings and service equipment fittings (equipment which handles refrigerant and/or oil) are different between CFC-12 (R-12) and HFC-134a (R-134a). This is to avoid mixed use of the refrigerants/oil.

Adapters that convert one size fitting to another must not be used refrigerant/oil contamination will occur and compressor failure will result.

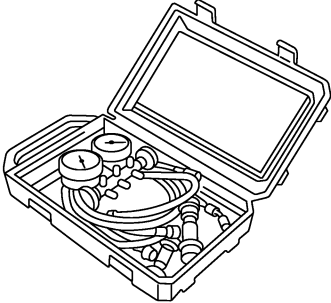
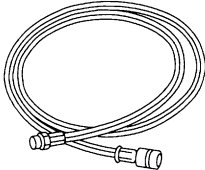
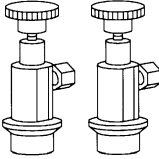
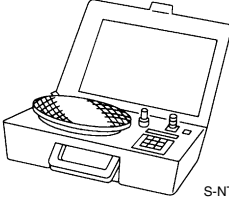
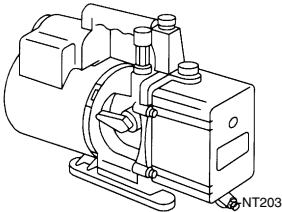
PREPARATION

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| Tool number (TechMate No.) Tool name | Description |
|---|---|
| <p>— (—) HFC-134a (R-134a) Refrigerant</p>  <p>S-NT196</p> | <p>Container color: Light blue Container marking: HFC-134a (R-134a) Fitting size: Thread size • large container 1/2"-16 ACME</p> |
| <p>— (—) NISSAN A/C System Oil Type R</p>  <p>S-NT197</p> | <p>Type: Poly alkylene glycol oil (PAG), type R Application: HFC-134a (R-134a) vane rotary compressors (NISSAN only) Lubricity: 40 mℓ (1.4 US fl oz, 1.4 Imp fl oz)</p> |
| <p>— (J-48710) NISSAN ACR2009 RRR Unit</p>  <p>WJIA0293E</p> | <p>Refrigerant recovery, recycling and re-charging</p> |
| <p>— (J-41995) Electronic refrigerant leak detector</p>  <p>AHA281A</p> | <p>Power supply: • DC 12V (battery terminal)</p> |
| <p>— (J-43926) Refrigerant dye leak detection kit Kit includes: (J-42220) UV lamp and UV safety goggles (J-41459) Refrigerant dye injector (J-41447) Fluorescent leak detection dye (box of 24, 1/4 ounce bottles) (J-43872) Refrigerant dye cleaner</p>  <p>NOTICE This A/C or Refrigeration system contains a fluorescent leak detection tracer dye. (R134a) use UV light to see dye. KENT-MOORE Warren, MI 48090 1-800-345-2233</p> <p>ZHA200H</p> | <p>Power supply: • DC 12V (battery terminal)</p> |

PREPARATION

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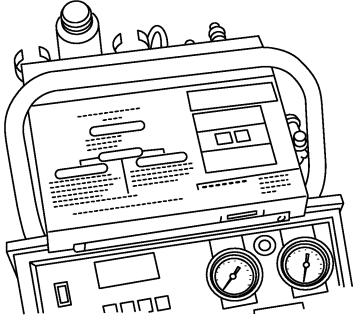

| Tool number (TechMate No.) Tool name | Description |
|--|---|
| — (J-39183-C) Manifold gauge set (with hoses and couplers) | Identification: • The gauge face indicates R-134a. Fitting size-Thread size • 1/2"-16 ACME |
|  RJI A0196E | |
| Service hoses: • High side hose (J-39500-72B) • Low side hose (J-39500-72R) • Utility hose (J-39500-72Y) | Hose color: • Low side hose: Blue with black stripe • High side hose: Red with black stripe • Utility hose: Yellow with black stripe Hose fitting to gauge: • 1/2"-16 ACME |
|  S-NT201 | |
| Service couplers • High side coupler (J-39500-20A) • Low side coupler (J-39500-24A) | Hose fitting to service hose: • M14 x 1.5 fitting is optional or permanently attached. |
|  S-NT202 | |
| — (J-39699) Refrigerant weight scale | For measuring of refrigerant Fitting size-Thread size • 1/2"-16 ACME |
|  S-NT200 | |
| — (J-39649) Vacuum pump (Including the isolator valve) | Capacity: • Air displacement: 4 CFM • Micron rating: 20 microns • Oil capacity: 482 g (17 oz) Fitting size-Thread size • 1/2"-16 ACME |
|  S-NT203 | |

Commercial Service Tool

INFOID:000000009463917

PREPARATION

< PREPARATION >

| (TechMate No.) Tool name | Description |
|--|---|
| <p data-bbox="159 226 509 306">(J-41810-NI) Refrigerant identifier equipment (R-134a)</p>  <p data-bbox="927 556 997 571">RJIA0197E</p> | <p data-bbox="1084 226 1430 279">For checking refrigerant purity and system contamination</p> |
| <p data-bbox="159 592 269 642">(—) Power tool</p>  <p data-bbox="849 808 914 823">PIIB1407E</p> | <p data-bbox="1084 592 1419 615">Loosening nuts, screws and bolts</p> |

REFRIGERATION SYSTEM

< SYSTEM DESCRIPTION >

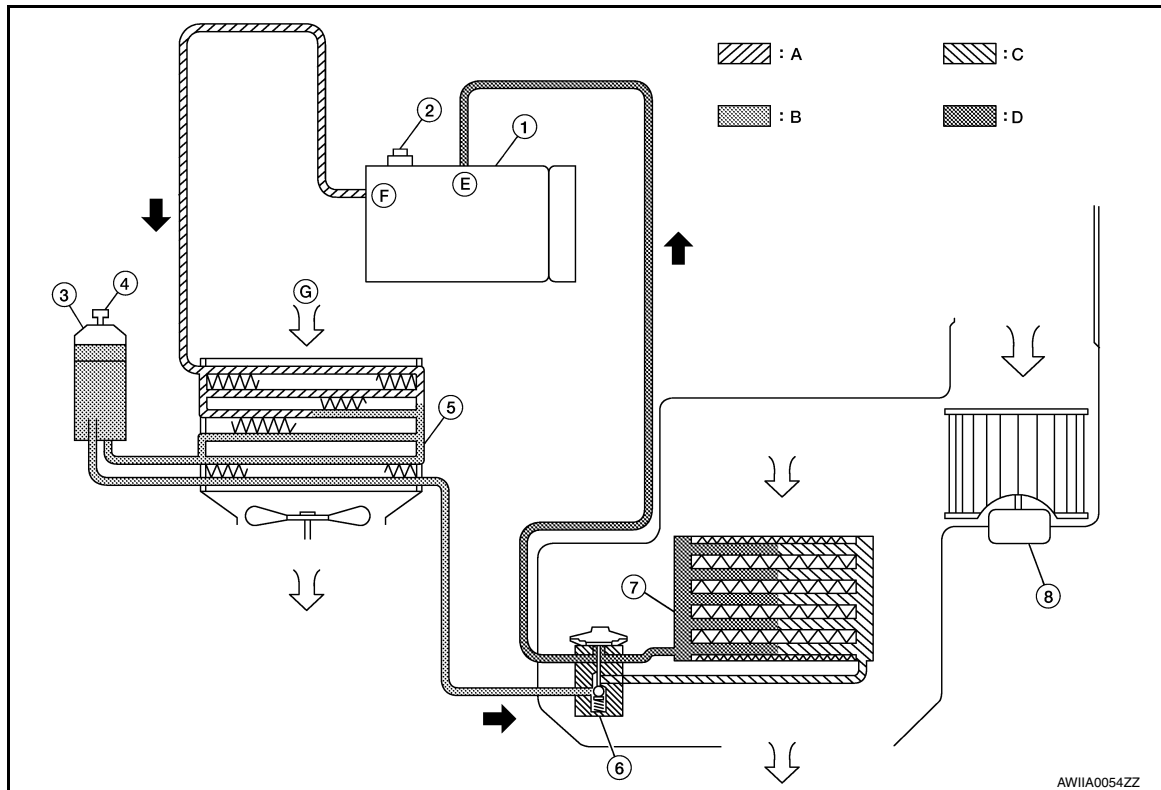
SYSTEM DESCRIPTION

REFRIGERATION SYSTEM

Refrigerant Cycle

INFOID:000000009463918

Refrigerant flow



- | | | |
|--------------------------------|--------------------------|----------------------|
| 1. Electric compressor | 2. Pressure relief valve | 3. Liquid tank |
| 4. Refrigerant pressure sensor | 5. Condenser | 6. Expansion valve |
| 7. Evaporator | 8. Blower motor | A. High-pressure gas |
| B. High-pressure liquid | C. Low-pressure liquid | D. Low-pressure gas |
| E. Suction port | F. Discharge port | G. Outside air |

Refrigerant Flow

The refrigerant from the compressor flows through the condenser with liquid tank, evaporator, and return to the compressor. The refrigerant evaporation in the evaporator is controlled by an expansion valve.

Freeze Protection

To prevent evaporator from freezing up, the evaporator air temperature is monitored and the voltage signal to the A/C auto amp. makes the A/C relay go OFF and stop the compressor.

Refrigerant System Protection

INFOID:000000009463919

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. The ECM then ceases to supply power to the A/C relay which disengages and stops the compressor when pressure on the high pressure side (as detected by refrigerant pressure sensor) is over approximately 2,746 kPa (28 kg/cm², 398 psi), or below approximately 120 kPa (1.22 kg/cm², 17.4 psi).

Pressure Relief Valve

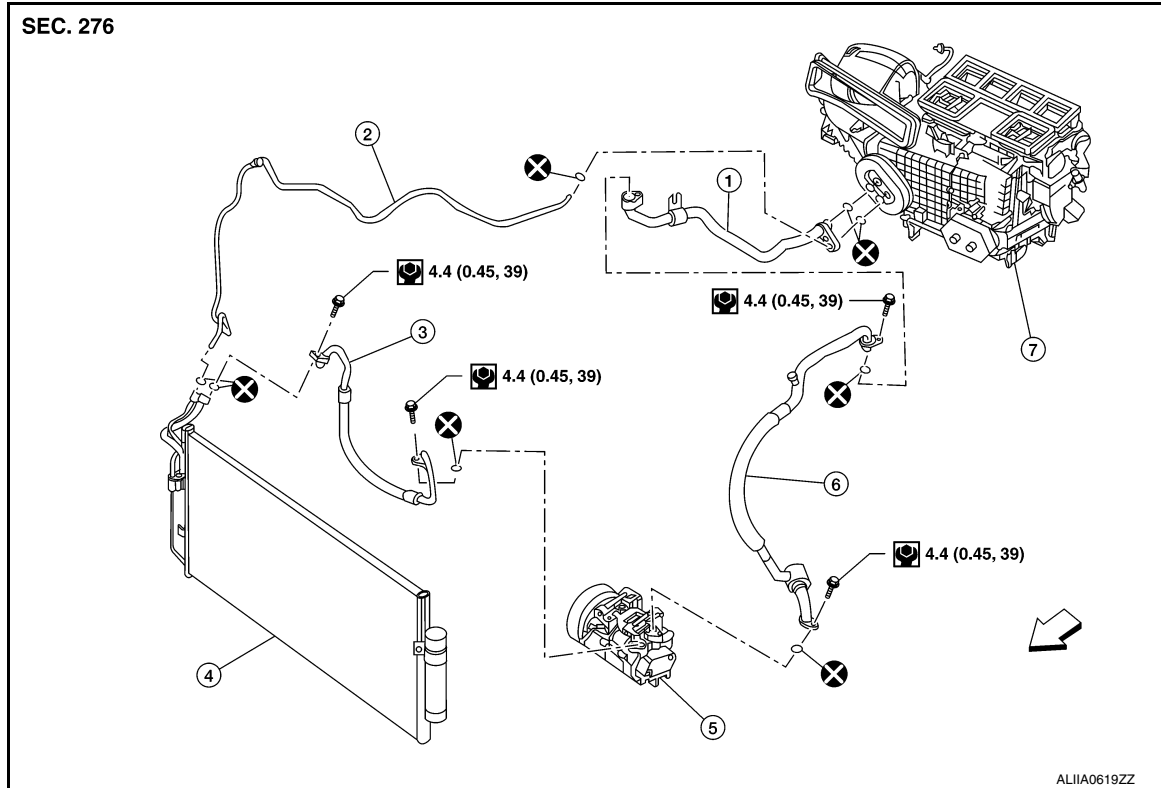
REFRIGERATION SYSTEM

< SYSTEM DESCRIPTION >

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 abnormal level [more than 3,727 kPa (38 kg/cm², 540 psi)], the release port on the pressure relief valve automatically opens and releases refrigerant into the atmosphere.

Component Part Location

INFOID:000000009463920



- | | | |
|--------------------------------------|-----------------------|--------------------------------|
| 1. Low-pressure pipe | 2. High-pressure pipe | 3. High-pressure flexible hose |
| 4. Condenser assembly | 5. Compressor | 6. Low-pressure flexible hose |
| 7. Heating and cooling unit assembly | ↔ Front | |

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

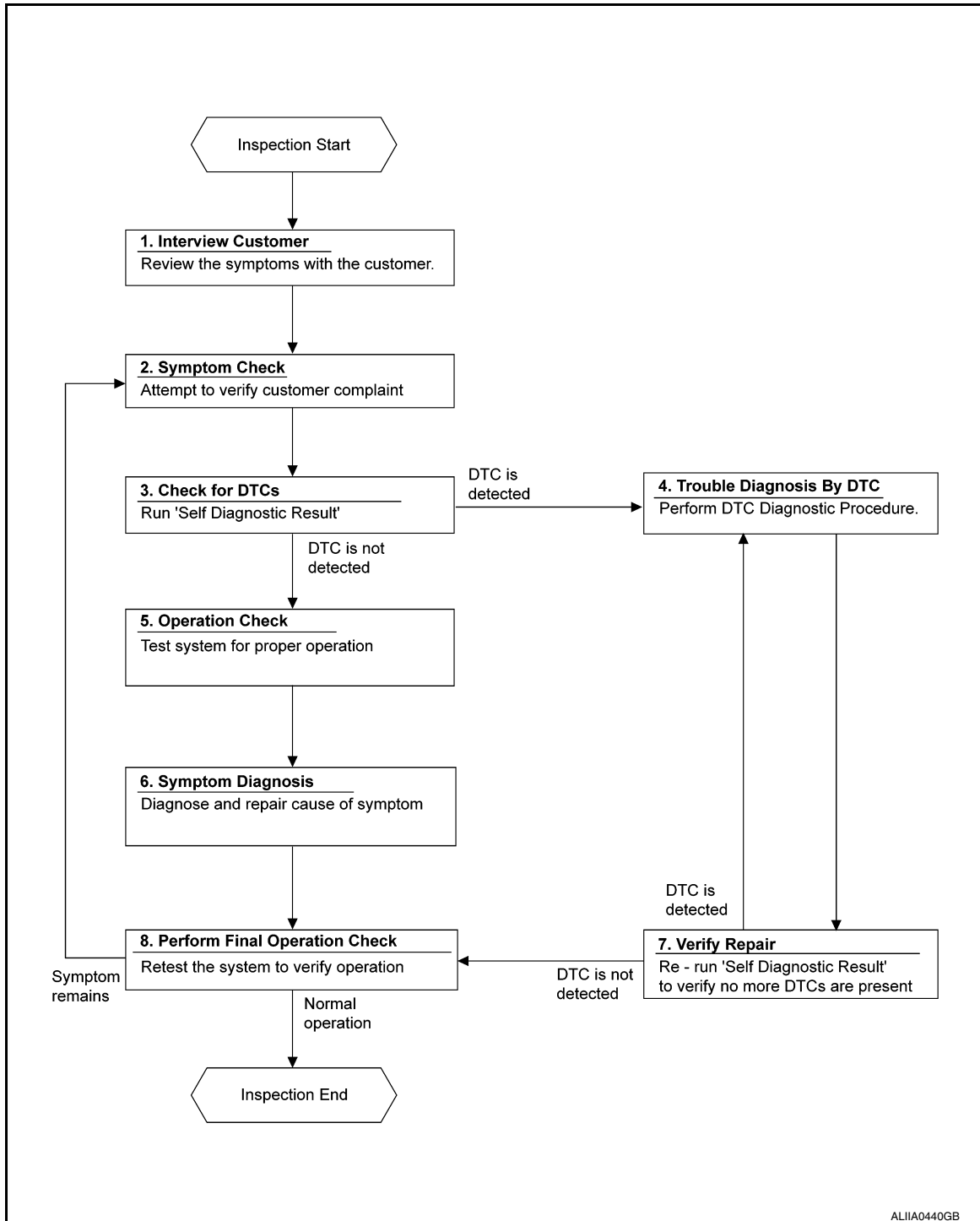
BASIC INSPECTION

DIAGNOSIS AND REPAIR WORKFLOW

Workflow

INFOID:000000009463921

OVERALL SEQUENCE



DETAILED FLOW

1. INTERVIEW CUSTOMER

Interview the customer to obtain as much information as possible about the conditions and environment under which the malfunction occurred.

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

>> GO TO 2.

2. SYMPTOM CHECK

Verify symptoms.

>> GO TO 3.

3. CHECK FOR DTCS

 With CONSULT

1. Turn ignition switch ON.
2. Select "Self Diagnostic Result" mode of "HVAC" using CONSULT.
3. Check DTC.

Is any DTC detected?

- YES >> GO TO 4.
NO >> GO TO 5.

4. PERFORM DTC DIAGNOSTIC PROCEDURE

Perform the diagnostic procedure for the detected DTC. Refer to [HAC-30, "DTC Inspection Priority Chart"](#).

>> GO TO 7.

5. OPERATION CHECK

Perform the operation check. Refer to [HAC-48, "Work Procedure"](#) (automatic A/C) or [HAC-140, "Work Procedure"](#) (manual A/C).

>> GO TO 6.

6. SYMPTOM DIAGNOSIS

Check the symptom diagnosis table. Refer to [HA-17, "Symptom Table"](#).

>> GO TO 8.

7. VERIFY REPAIR.

 With CONSULT

1. Turn ignition switch ON.
2. Select "Self Diagnostic Result" mode of "HVAC" using CONSULT.
3. Check DTC.

Is any DTC detected?

- YES >> GO TO 4.
NO >> GO TO 8.

8. PERFORM FINAL OPERATION CHECK

Perform the operation check. Refer to [HAC-48, "Work Procedure"](#) (automatic A/C) or [HAC-140, "Work Procedure"](#) (manual A/C).

Does it operate normally?

- YES >> Inspection End.
NO >> GO TO 2.

HEATER AND AIR CONDITIONING SYSTEM SYMPTOMS

< SYMPTOM DIAGNOSIS >

SYMPTOM DIAGNOSIS

HEATER AND AIR CONDITIONING SYSTEM SYMPTOMS

Symptom Table

INFOID:000000009463922

SYMPTOM TABLE

| Symptom | Reference Page | |
|--|---|---|
| A/C system does not come on. | Go to Trouble Diagnosis Procedure for A/C System. | HAC-159 (manual A/C) HAC-99 (automatic A/C) |
| A/C system cannot be controlled. | Go to Self-diagnosis Function. | HAC-139 (manual A/C) HAC-46 (automatic A/C) |
| Air outlet does not change. | Go to Trouble Diagnosis Procedure for Mode Door Motor. | HAC-142 (manual A/C) HAC-73 (automatic A/C) |
| Mode door motor is malfunctioning. | | |
| Discharge air temperature does not change. | Go to Trouble Diagnosis Procedure for Air Mix Door Motor. | HAC-144 (manual A/C) HAC-69 (automatic A/C driver side) HAC-71 (automatic A/C passenger side) |
| Air mix door motor is malfunctioning. | | |
| Intake door does not change. | Go to Trouble Diagnosis Procedure for Intake Door Motor. | HAC-146 (manual A/C) HAC-75 (automatic A/C) |
| Intake door motor is malfunctioning. | | |
| Blower motor operation is malfunctioning. | Go to Trouble Diagnosis Procedure for Blower Motor. | HAC-148 (manual A/C) HAC-84 (automatic A/C) |
| Magnet clutch does not engage. | Go to Trouble Diagnosis Procedure for Magnet Clutch. | HAC-151 (manual A/C) HAC-87 (automatic A/C) |
| Insufficient cooling. | Go to Trouble Diagnosis Procedure for Insufficient Cooling. | HAC-155 (manual A/C) HAC-96 (automatic A/C) |
| Insufficient heating. | Go to Trouble Diagnosis Procedure for Insufficient Heating. | HAC-157 (manual A/C) HAC-98 (automatic A/C) |
| Noise. | Go to Trouble Diagnosis Procedure for Noise. | HA-20 |
| A/C switch LED does not illuminate. | Go to Trouble Diagnosis Procedure for A/C System. | HAC-152 (manual A/C) HAC-83 (automatic A/C) |
| Mode button LED(s) does not illuminate. | Go to Trouble Diagnosis Procedure for A/C System. | HAC-152 (manual A/C) HAC-83 (automatic A/C) |
| Both high- and low-pressure sides are too high. | Go to Trouble Diagnosis Procedure for Abnormal Pressure. | HA-18 |
| High-pressure side is too high and low-pressure side is too low. | Go to Trouble Diagnosis Procedure for Abnormal Pressure. | HA-18 |
| High-pressure side is too low and low-pressure side is too high. | Go to Trouble Diagnosis Procedure for Abnormal Pressure. | HA-18 |
| Both high- and low-pressure side sometimes becomes negative. | Go to Trouble Diagnosis Procedure for Abnormal Pressure. | HA-18 |
| Low-pressure side sometimes becomes negative. | Go to Trouble Diagnosis Procedure for Abnormal Pressure. | HA-18 |
| Low-pressure side becomes negative. | Go to Trouble Diagnosis Procedure for Abnormal Pressure. | HA-18 |

REFRIGERATION SYSTEM SYMPTOMS

< SYMPTOM DIAGNOSIS >

REFRIGERATION SYSTEM SYMPTOMS

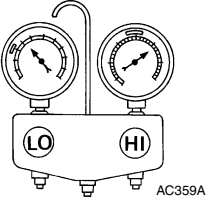
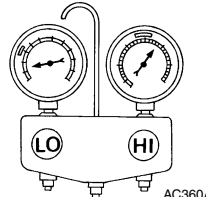
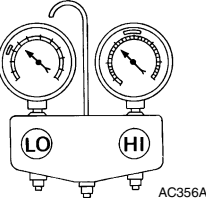
Trouble Diagnosis For Unusual Pressure

INFOID:000000009463923

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

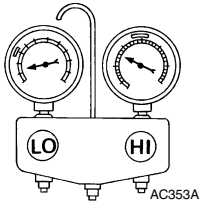
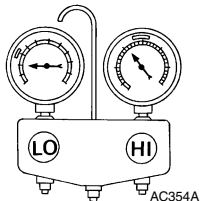
Symptom Table

INFOID:000000009463924

| Gauge indication | Refrigerant cycle | Probable cause | Corrective action |
|---|--|--|---|
| <p>Both high and low pressure sides are too high.</p>  <p>AC359A</p> | <p>The pressure returns to normal soon after sprinkling water on condenser.</p> | <p>Overfilled refrigerant.</p> | <p>Collect all refrigerant, evacuate refrigerant cycle again, and then refill it with the specified amount of refrigerant.</p> |
| | <p>Air flow to condenser is insufficient.</p> | <p>Insufficient condenser cooling performance.</p> <ul style="list-style-type: none"> • Poor fan rotation of radiator and condenser. • Improper installation of air guide. • Clogged or dirty condenser fins. | <ul style="list-style-type: none"> • Repair or replace malfunctioning parts. • Clean and repair condenser fins. |
| | <p>When compressor is stopped, a high-pressure reading quickly drops by approximately 196 kPa (2 kg/cm², 28 psi). It then gradually decreases.</p> | <p>Air mixed in refrigerant cycle.</p> | <p>Collect all refrigerant, evacuate refrigerant cycle again, and then refill it with the specified amount of refrigerant.</p> |
| | <ul style="list-style-type: none"> • Low-pressure pipe is cooler than the outlet of evaporator. • Low-pressure pipe is frosted. | <p>Expansion valve opened too much (excessive flow of refrigerant).</p> | <p>Replace expansion valve.</p> |
| <p>High-pressure side is excessively high and low-pressure side is too low.</p>  <p>AC360A</p> | <p>High-pressure pipe and upper side of condenser become hot, however, liquid tank does not become so hot.</p> | <p>Clogged or crushed high-pressure pipe located between compressor and condenser.</p> | <p>Repair or replace the malfunctioning parts.</p> |
| <p>High-pressure side is too low and low-pressure side is too high.</p>  <p>AC356A</p> | <ul style="list-style-type: none"> • The readings of both sides become equal soon after compressor operation stops. • There is no temperature difference between high- and low-pressure sides. | <p>Malfunction in compressor system (insufficient compressor pressure operation).</p> <ul style="list-style-type: none"> • Damage or breakage of valve. • Malfunctioning gaskets. | <p>Replace compressor.</p> |

REFRIGERATION SYSTEM SYMPTOMS

< SYMPTOM DIAGNOSIS >

| Gauge indication | Refrigerant cycle | Probable cause | Corrective action |
|---|---|--|---|
| <p>Both high and low pressure sides are too low.</p>  <p>AC353A</p> | <ul style="list-style-type: none"> The area around evaporator outlet does not become cold. The area around evaporator inlet becomes frosted. | <p>Clogged expansion valve.</p> <ul style="list-style-type: none"> Breakage of temperature sensor. Clogging by foreign material. | <p>Eliminate foreign material from expansion valve or replace it.</p> |
| | <ul style="list-style-type: none"> There is a temperature difference between the areas around outlet and inlet pipes of liquid tank. Liquid tank becomes frosted. | <p>Malfunction in inner liquid tank (clogged strainer).</p> | <p>Replace liquid tank.</p> |
| | <p>Evaporator becomes frosted.</p> | <p>Clogged or crushed low-pressure pipe.</p> | <p>Repair or replace malfunctioning parts.</p> |
| | | <p>Malfunction in intake air temperature sensor.</p> | <p>Check intake sensor system. Refer to HAC-64, "Component Inspection".</p> |
| | <p>There is a small temperature difference between the high and low pressure pipes for refrigerant cycle.</p> | <ul style="list-style-type: none"> Shortage of refrigerant. Leakage of refrigerant. | <ul style="list-style-type: none"> Check for leakage. Collect all refrigerant, evacuate refrigerant cycle again, and then refill it with the specified amount of refrigerant. |
| <p>Low-pressure side sometimes becomes negative.</p>  <p>AC354A</p> | <ul style="list-style-type: none"> Sometimes the area around evaporator outlet does not become cold. Sometimes the area around evaporator inlet is frosted. | <ul style="list-style-type: none"> Icing caused by the mixing of water in cooler cycle. Deteriorated dryer in liquid tank. | <ul style="list-style-type: none"> Collect all refrigerant. Evacuate refrigerant cycle completely, and then refill it with the specified amount of refrigerant. At this time, always replace liquid tank. |
| <p>Hunting in high-pressure side.</p> | <p>There is no temperature difference between high- and low-pressure sides.</p> | <p>Malfunctioning variable valve in compressor.</p> | <ul style="list-style-type: none"> Replace compressor. Check ECV system. |

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NOISE

< SYMPTOM DIAGNOSIS >

NOISE

Symptom Table

INFOID:000000009463925

| Symptom | Noise source | Probable cause | Corrective action |
|--|--|--|---|
| Unusual noise from compressor when A/C is ON. | Inside of compressor | Wear, breakage or clogging of foreign material in inner parts. | Check compressor oil. Refer to HA-25, "Inspection" . |
| | Magnet clutch | Contact of clutch disc with pulley. | Check clearance between clutch disc and pulley. |
| | Compressor body | Loosened compressor mounting bolts. | Check bolts for tightness. Refer to HA-30, "COMPRESSOR : Exploded View" . |
| Unusual noise from cooler piping. | Cooler piping (pipe and flexible hose) | Improper installation of clip and bracket. | Check the installation condition of the cooler piping. Refer to HA-34, "Exploded View" . |
| Unusual noise from expansion valve when A/C is ON. | Expansion valve | Shortage of refrigerant. | <ul style="list-style-type: none"> Check for leakage. Collect all refrigerant, evacuate refrigerant cycle again, and then refill it with the specified amount of refrigerant. |
| | | Wear, breakage or clogging of foreign material in inner parts. | Eliminate foreign material from expansion valve or replace it. |
| Unusual noise from belt. | — | Loosened belt | Check belt tension. Refer to MA-13, "DRIVE BELTS : Checking Drive Belts" (QR25DE) or MA-22, "DRIVE BELTS : Checking Drive Belts" (VQ35DE). |
| | | Internal compressor parts get locked | Replace compressor. Refer to HA-30, "COMPRESSOR : Removal and Installation" . |

REFRIGERANT

< PERIODIC MAINTENANCE >

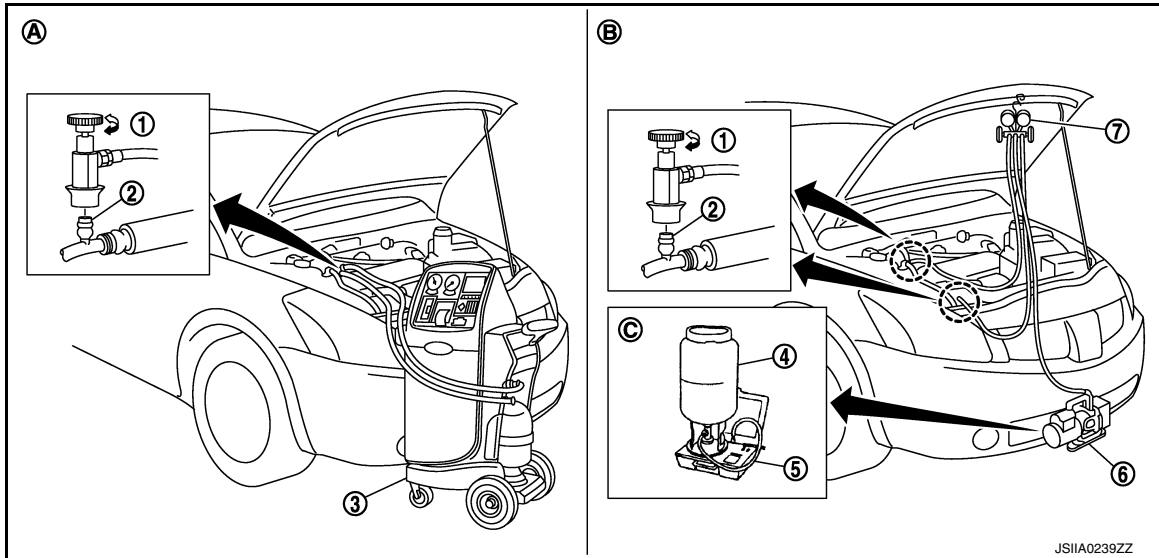
PERIODIC MAINTENANCE

REFRIGERANT

Description

INFOID:000000009463926

CONNECTION OF SERVICE TOOLS AND EQUIPMENT

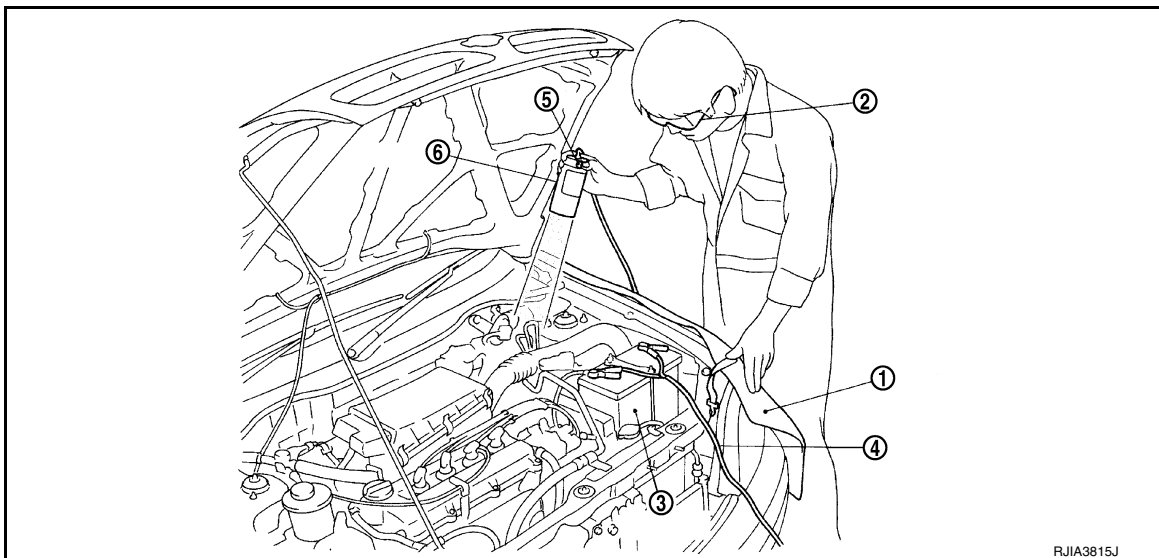


- | | | |
|-------------------------------------|---------------------------|--|
| 1. Shut-off valve | 2. A/C service valve | 3. Recovery/recycling/recharging equipment |
| 4. Refrigerant container (HFC-134a) | 5. Weight scale (J-39650) | 6. Vacuum pump (J-39649) |
| 7. Manifold gauge set (J-39183) | | |
| A. Preferred (best) method | B. Alternative method | C. For charging |

Leak Test

INFOID:000000009463927

CHECK REFRIGERANT LEAKAGE USING FLUORESCENT LEAK DETECTION DYE



1. Install a fender cover (1).
2. Wear UV safety goggles (2) provided with refrigerant dye leak detection kit (J-43926).
3. Connect power cable (4) of UV lamp (6) to positive and negative terminals of the battery (3).

REFRIGERANT

< PERIODIC MAINTENANCE >

4. Press UV lamp switch (5) and check A/C system for refrigerant leakage. (Where refrigerant leakage occurs, fluorescent leak detection dye appears in green color.)

WARNING:

Do not look directly into UV lamp light source.

NOTE:

- For continuous operating time of UV lamp, follow the manufacturer operating instructions.
- Illuminate piping joints from different angles using UV lamp and check that there is no leakage.
- Use a mirror in area that is difficult to see to check refrigerant leakage.
- Refrigerant leakage from evaporator can be detected by soaking cotton swab or a similar material with drain hose water and illuminating it using UV lamp.
- Dust, dirt and packing materials adhesive used for condenser, evaporator, and other locations may fluoresce. Be careful not to misidentify leakage.

5. Repair or replace parts where refrigerant leakage occurs and wipe off fluorescent leak detection dye.

NOTE:

Completely wipe off fluorescent leak detection dye from gaps between parts, screw threads, and others using a cotton swab or similar materials.

6. Use a UV lamp to check that no fluorescent leak detection dye remains after finishing work.

WARNING:

Do not look directly into UV lamp light source.

NOTE:

- For continuous operating time of UV lamp, follow the manufacturer operating instructions.
- Dust, dirt, and packing materials adhesive used for condenser, evaporator, and other locations may fluoresce. Be careful not to misidentify leakage.

CHECK REFRIGERANT LEAKAGE USING ELECTRICAL LEAK DETECTOR

WARNING:

Do not check refrigerant leakage while the engine is running.

CAUTION:

Be careful of the following items so that inaccurate checks or misidentifications are avoided.

- **Do not allow refrigerant vapor, shop chemical vapors, cigarette smoke or others around the vehicle.**
- **Always check refrigerant leakage in a low air flow environment so that refrigerant may not disperse when leakage occurs.**

1. Stop the engine.
2. Connect recovery/recycling/recharging equipment or manifold gauge set (J-39183-C) to A/C service valve.
3. Check that A/C refrigerant pressure is 345 kPa (3.52 kg/cm², 50 psi) or more when temperature is 16°C (61°F) or more. When pressure is lower than the specified value, recycle refrigerant completely and fill refrigerant to the specified level.

NOTE:

Leakages may not be detected if A/C refrigerant pressure is 345 kPa (3.52 kg/cm², 50 psi) or less when temperature is less than 16°C (61°F).

4. Clean area where refrigerant leakage check is performed and check refrigerant leakage along all surfaces of pipe connections and A/C system components using electrical leak detector (J-41995) probe.

CAUTION:

- **Continue checking when a leakage is found. Always continue and complete checking along all pipe connections and A/C system components for additional leakage.**
- **When a leakage is detected, clean leakage area using compressed air and check again.**
- **When checking leakage of cooling unit inside, always clean inside of drain hose so that the probe surface may not be exposed to water or dirt.**

NOTE:

- Always check leakage starting from high-pressure side and continue to low-pressure side.
- When checking leakage of cooling unit inside, operate blower fan motor for 15 minutes or more at the maximum fan speed while the engine is stopped, and then insert electrical leak detector probe into drain hose and hold for 10 minutes or more.
- When disconnecting shut-off valve that is connected to A/C service valve, always evacuate remaining refrigerant so that misidentification can be avoided.

5. Repair or replace parts where refrigerant leakage is detected. (Leakage is detected but leakage area is unknown.)

REFRIGERANT

< PERIODIC MAINTENANCE >

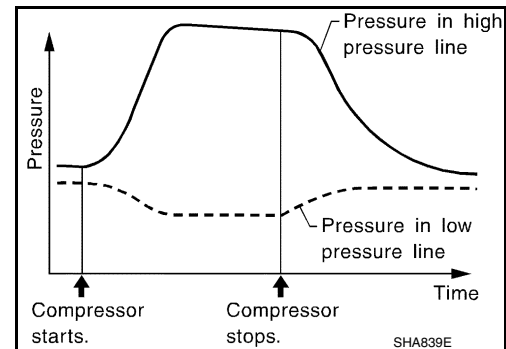
6. Start the engine and set A/C control in the following conditions.
 - A/C switch ON
 - Air flow: VENT (ventilation)
 - Intake door position: Recirculation
 - Temperature setting: Full cold
 - Fan (blower) speed: Maximum speed set
7. Run the engine at approximately 1,500 rpm for 2 minutes or more.
8. Stop the engine. Check again for refrigerant leakage. Go to step 4.

WARNING:

Be careful not to get burned when the engine is hot.

NOTE:

- Start refrigerant leakage check immediately after the engine is stopped.
- When refrigerant circulation is stopped, pressure on the low-pressure side rises gradually, and after this, pressure on the high-pressure side falls gradually.
- The higher the pressure is, the easier it is to find the refrigerant leakage.



Recycle Refrigerant

INFOID:000000009463928

WARNING:

- Always use HFC-134a for A/C refrigerant. If CFC-12 is accidentally charged, compressor is damaged due to insufficient lubrication.
- Always observe and follow precautions described on refrigerant container. Incorrect handling may result in an explosion of refrigerant container, frostbite or the loss of eyesight.
- Do not breathe A/C refrigerant and oil vapor or mist. Exposure may irritate eyes, nose, or throat.
- Do not allow HFC-134a to be exposed to an open flame or others because it generates poisonous gas when in contact with high temperature objects. Keep workshop well ventilated.

1. Perform oil return operation. Refer to [HA-25, "Perform Oil Return Operation"](#). (If refrigerant or oil leakage is detected in a large amount, omit this step, and go to step 2.)

CAUTION:

Do not perform oil return operation if a large amount of refrigerant or oil leakage is detected.

2. Check gauge pressure readings of recovery/recycling/recharging equipment. When remaining pressure exists, recycle refrigerant from high-pressure hose and low-pressure hose.

NOTE:

Follow manufacturer instructions for the handling or maintenance of the equipment. Do not fill the equipment with non-specified refrigerant.

3. Remove A/C service valve cap from the vehicle.
4. Connect recovery/recycling/recharging equipment to A/C service valve.
5. Operate recovery/recycling/recharging equipment, and recycle refrigerant from the vehicle.
6. Evacuate air for 10 minutes or more to remove any remaining refrigerant integrated to compressor oil, etc.
7. Refrigerant recycle operation is complete.

Charge Refrigerant

INFOID:000000009463929

WARNING:

- Always use HFC-134a for A/C refrigerant. If CFC-12 is accidentally charged, compressor is damaged due to insufficient lubrication.
- Always observe and follow precautions described on refrigerant container. Incorrect handling may result in an explosion of refrigerant container, frostbite, or the loss of eyesight.
- Do not breathe A/C refrigerant and oil vapor or mist. Exposure may irritate eyes, nose, or throat.
- Do not allow HFC-134a to be exposed to an open flame or others because it generates poisonous gas when in contact with high temperature objects. Keep workshop well ventilated.

REFRIGERANT

< PERIODIC MAINTENANCE >

1. Connect recovery/recycling/recharging equipment to the A/C service valve.
2. Operate recovery/recycling/recharging equipment, and evacuate air from A/C system for 25 minutes or more.
CAUTION:
Evacuate air for 15 minutes or more if the parts are replaced.
3. Check the airtightness of A/C system for 25 minutes or more. If pressure raises more than the specified level, charge A/C system with approximately 200g refrigerant and check that there is no refrigerant leakage. Refer to [HA-21, "Leak Test"](#).
CAUTION:
Check the airtightness for 15 minutes or more if the parts are replaced.
4. If parts other than compressor are replaced, fill compressor oil according to parts that are replaced.
5. Charge the specified amount of refrigerant to A/C system.
6. Check that A/C system operates normally.
7. Disconnect recovery/recycling/recharging equipment. (Collect the refrigerant from the high-pressure hose and low-pressure hose of recovery/recycling/recharging equipment.)
8. Install A/C service valve cap.
9. Refrigerant charge is complete.

OIL

< PERIODIC MAINTENANCE >

OIL

Description

INFOID:000000009463930

MAINTENANCE OF OIL LEVEL

The compressor oil is circulating in the system together with the refrigerant. It is necessary to fill compressor with oil when replacing A/C system parts or when a large amount of refrigerant leakage is detected. It is important to always maintain oil level within the specified level, otherwise the following conditions may occur:

- Insufficient oil amount: Stuck compressor
- Excessive oil amount: Insufficient cooling (caused by insufficient heat exchange)

Oil Type : A/C System Oil Type S

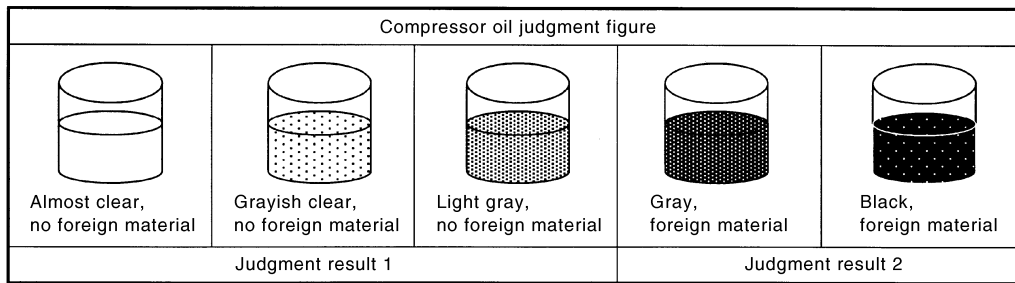
Inspection

INFOID:000000009463931

If a compressor is malfunctioning (internal noise, insufficient cooling), check the compressor oil.

1.COMPRESSOR OIL JUDGMENT

1. Remove the compressor. Refer to [HA-30, "COMPRESSOR : Removal and Installation"](#).
2. Sample compressor oil and judge below according to the figure.



Judgement result 1>>Replace compressor only.

Judgement result 2>>Replace compressor and liquid tank.

Perform Oil Return Operation

INFOID:000000009463932

CAUTION:

If a large amount of refrigerant or oil leakage is detected, do not perform oil return operation.

1. Start the engine and set to the following conditions:
 - Engine speed: Idling to 1,200 rpm
 - A/C switch: ON
 - Fan (blower) speed: Maximum speed set
 - Intake door position: Recirculation
 - Temperature setting: Full cold
2. Perform oil return operation for approximately 10 minutes.
3. Stop the engine.
4. Oil return operation is complete.

Oil Adjusting Procedure for Components Replacement Except Compressor

INFOID:000000009463933

Fill with oil for the amount that is calculated according to the following conditions.

Example: Oil amount to be added when replacing evaporator and liquid tank [m ℓ (US fl oz, Imp fl oz)] = 45 (1.5, 1.6) + 15 (0.5, 0.5) + α

| Conditions | Oil amount to be added to A/C system m ℓ (US fl oz, Imp fl oz) |
|--------------------|---|
| Replace evaporator | 75 (2.5, 2.6) |
| Replace condenser | 75 (2.5, 2.6) |

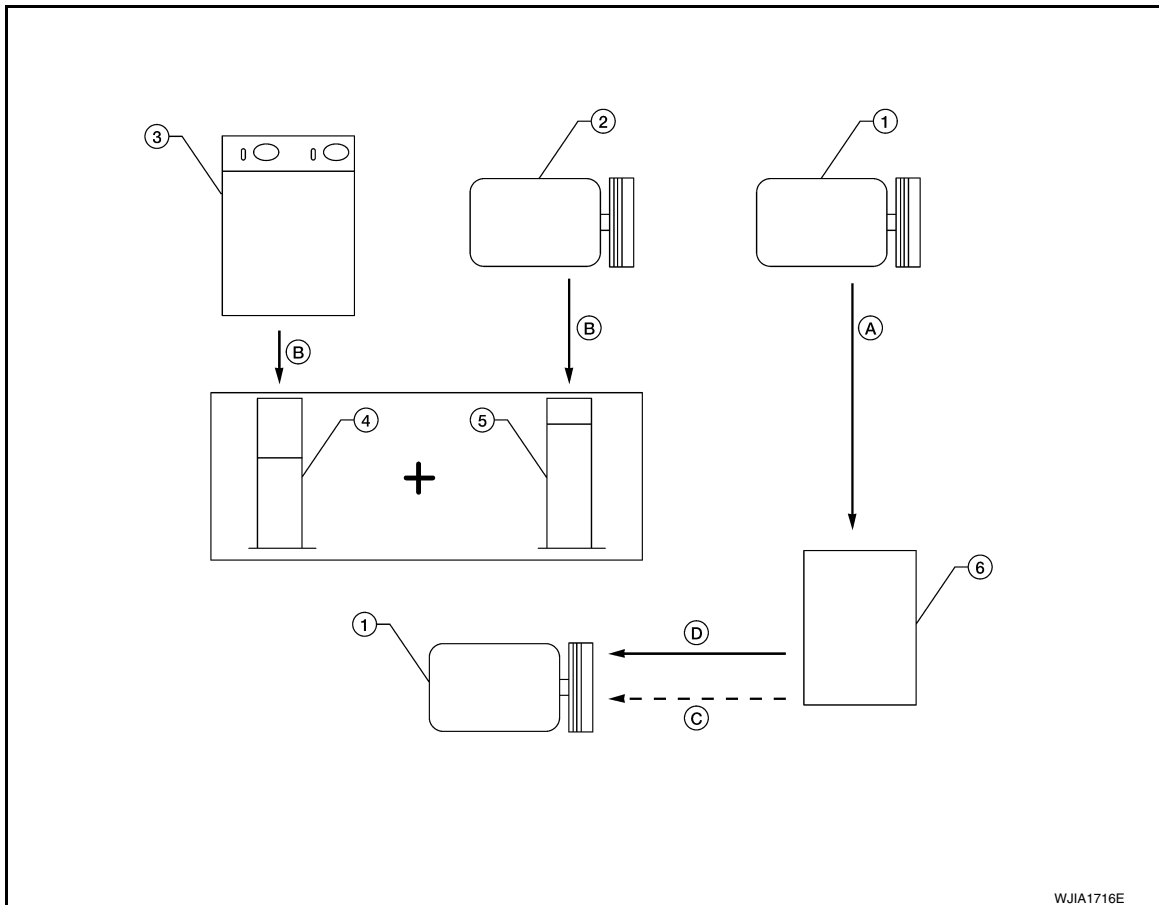
OIL

< PERIODIC MAINTENANCE >

| Conditions | | Oil amount to be added to A/C system m ℓ (US fl oz, Imp fl oz) |
|--|----------------------|---|
| Replace liquid tank | | 5 (0.2, 0.2) |
| Refrigerant leakage is detected | Large amount leakage | 30 (1.0, 1.1) |
| | Small amount leakage | — |
| Oil amount that is recycled together with refrigerant during recycle operation | | α |

Oil Adjusting Procedure for Compressor Replacement

INFOID:000000009463934



WJIA1716E

- | | | |
|---|-----------------------------------|--|
| 1. New compressor | 2. Old compressor | 3. Recovery/recycling equipment |
| 4. Measuring cup X | 5. Measuring cup Y | 6. New oil |
| A. Drain oil from the new compressor into clean container | B. Record amount of oil recovered | C. Add an additional 5 m ℓ (0.2 US fl oz, 0.2 Imp fl oz) of new oil when replacing liquid tank |
| D. Install new oil equal to recorded amounts in measuring cups X plus Y | | |

- Before connecting recovery/recycling equipment to vehicle, check recovery/recycling equipment gauges. No refrigerant pressure should be displayed. If NG, recover refrigerant from equipment lines.
- Connect recovery/recycling equipment to vehicle. Confirm refrigerant purity in supply tank using recovery/recycling equipment and refrigerant identifier. If NG, refer to [HA-3, "Precaution for Working with HFC-134a \(R-134a\)"](#).
- Confirm refrigerant purity in vehicle A/C system using recovery/recycling equipment and refrigerant identifier. If NG, refer to [HA-3, "Precaution for Working with HFC-134a \(R-134a\)"](#).
- Discharge refrigerant into the refrigerant recovery/recycling equipment. Measure oil discharged into the recovery/recycling equipment.

OIL

< PERIODIC MAINTENANCE >

5. Drain the oil from the “old” (removed) compressor into a graduated container and recover the amount of oil drained. A
6. Drain the oil from the “new” compressor into a separate, clean container.
7. Measure an amount of new oil installed equal to amount drained from “old” compressor. Add this oil to “new” compressor through the suction port opening. B
8. Measure an amount of new oil equal to the amount recovered during discharging. Add this oil to “new” compressor through the suction port opening.
9. If the liquid tank also needs to be replaced, add an additional 5 mℓ (0.2 US fl oz, 0.2 Imp fl oz) of oil at this time. C

CAUTION:

Do not add the 5 mℓ (0.2 US fl oz, 0.2 Imp fl oz) of oil if only replacing the compressor and not the liquid tank. D

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PERFORMANCE TEST

< PERIODIC MAINTENANCE >

PERFORMANCE TEST

Inspection

INFOID:000000009463935

INSPECTION PROCEDURE

1. Connect recovery/recycling/recharging equipment (for HFC-134a) or manifold gauge.
2. Start the engine, and set to the following condition.

Test condition

| Surrounding condition | | Indoors or in the shade (in a well-ventilated place) |
|-----------------------|------------------------------------|--|
| Vehicle condition | Door | Closed |
| | Door glass | Full open |
| | Hood | Open |
| | Engine speed | Idle speed |
| A/C condition | Temperature control switch or dial | Full cold |
| | A/C switch | ON |
| | Air outlet | VENT (ventilation) |
| | Intake door position | Recirculation |
| | Fan (blower) speed | Maximum speed set |

3. Maintain test condition until A/C system becomes stable. (Approximately 10 minutes)
4. Check that test results of “recirculating-to-discharge air temperature” and “ambient air temperature-to-operating pressure” are within the specified value.
5. When test results are within the specified value, inspection is complete.
If any of test result is out of the specified value, perform diagnosis by gauge pressure. Refer to [HA-17, "Symptom Table"](#).

RECIRCULATING-TO-DISCHARGE AIR TEMPERATURE TABLE

| Inside air (Recirculating air) at blower assembly inlet | | Discharge air temperature from center ventilator °C (°F) |
|---|----------------------------|---|
| Relative humidity % | Air temperature °C (°F) | |
| 50 – 60 | 20 (68) | 4.7 – 6.7 (40 – 44) |
| | 25 (77) | 8.6 – 11.1 (47 – 52) |
| | 30 (86) | 12.6 – 15.6 (55 – 60) |
| | 35 (95) | 19.0 – 22.5 (66 – 73) |
| 60 – 70 | 20 (68) | 6.7 – 8.7 (44 – 48) |
| | 25 (77) | 11.1 – 13.6 (52 – 56) |
| | 30 (86) | 15.6 – 18.6 (60 – 65) |
| | 35 (95) | 22.5 – 26.0 (73 – 79) |

AMBIENT AIR TEMPERATURE-TO-OPERATING PRESSURE TABLE

PERFORMANCE TEST

< PERIODIC MAINTENANCE >

| Fresh air | | High-pressure (Discharge side) kPa (kg/cm ² , psi) | Low-pressure (Suction side) kPa (kg/cm ² , psi) | A |
|------------------------|----------------------------|--|---|---|
| Relative humidity % | Air temperature °C (°F) | | | |
| 50 – 70 | 25 (77) | 909 – 1,112 (9.2 – 11.3, 131.8 – 161.2) | 159 – 194 (1.6 – 2.0, 23.1 – 28.1) | B |
| | 30 (86) | 1,073 – 1,312 (10.9 – 13.4, 155.6 – 190.2) | 211 – 259 (2.2 – 2.6, 30.6 – 37.6) | C |
| | 35 (95) | 1,445 – 1,766 (14.7 – 18.0, 209.5 – 256.1) | 247 – 300 (2.5 – 3.1, 35.8 – 43.5) | D |
| | 40 (104) | 1,650 – 2,017 (16.8 – 20.6, 239.3 – 292.5) | 290 – 355 (3.0 – 3.6, 42.1 – 51.5) | |

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COMPRESSOR

< REMOVAL AND INSTALLATION >

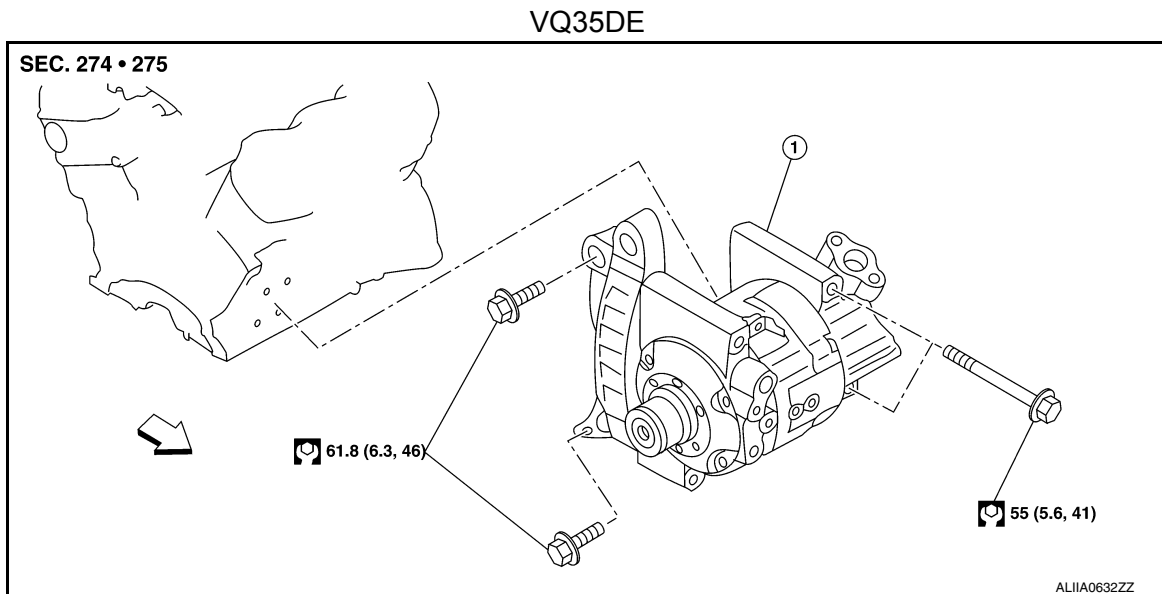
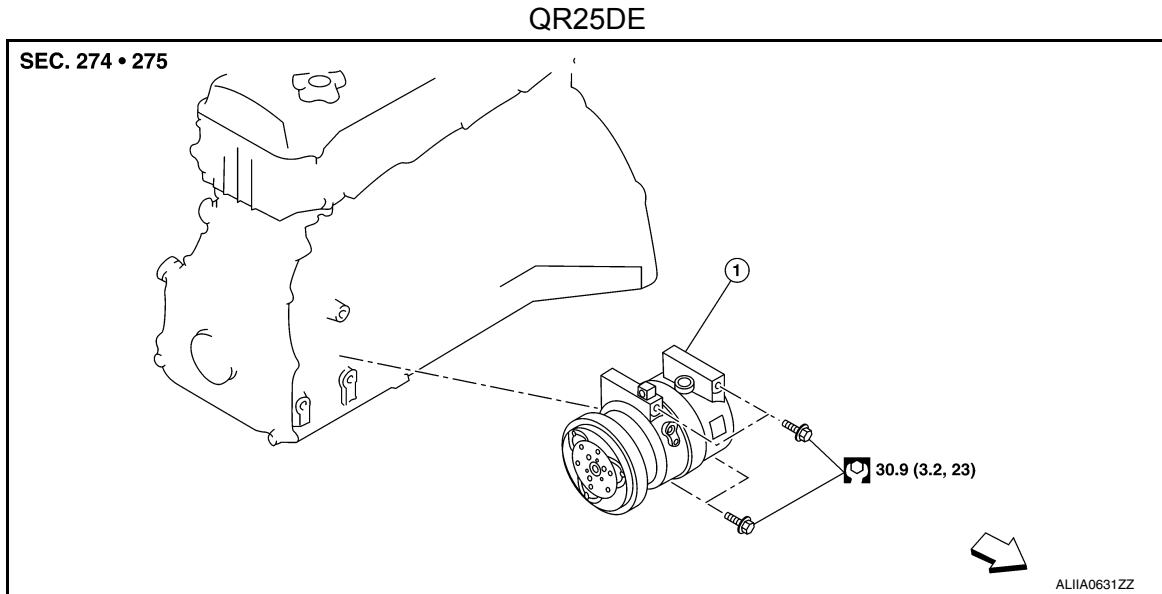
REMOVAL AND INSTALLATION

COMPRESSOR

COMPRESSOR

COMPRESSOR : Exploded View

INFOID:000000009463936



COMPRESSOR : Removal and Installation

INFOID:000000009463937

REMOVAL

1. Discharge the refrigerant. Refer to [HA-23. "Recycle Refrigerant"](#).
2. Remove the front under cover. Refer to [EXT-28. "Removal and Installation"](#).
3. Partially remove the fender protector (RH). Refer to [EXT-26. "FENDER PROTECTOR : Removal and Installation"](#).

COMPRESSOR

< REMOVAL AND INSTALLATION >

4. Remove the drive belt. Refer to [EM-19, "Removal and Installation"](#) (QR25DE), or [EM-134, "Removal and Installation"](#) (VQ35DE).
5. Reposition the power steering line. Refer to [ST-40, "Exploded View"](#).
6. Disconnect the A/C pipes from the compressor.

CAUTION:

Cap or wrap the joint of the A/C pipes with suitable material such as vinyl tape to avoid the entry of air.

7. Disconnect the harness connector from the compressor.
8. Remove the compressor bolts and the compressor.

INSTALLATION

Installation is in the reverse order of removal.

CAUTION:

- Do not reuse the O-rings.
- Apply A/C compressor oil to the new O-rings for installation.
- After charging the A/C refrigerant, check for leaks. Refer to [HA-21, "Leak Test"](#).
- Tighten the compressor bolts to specification. Refer to [HA-30, "COMPRESSOR : Exploded View"](#).

MAGNET CLUTCH

MAGNET CLUTCH : Removal and Installation

INFOID:000000009463938

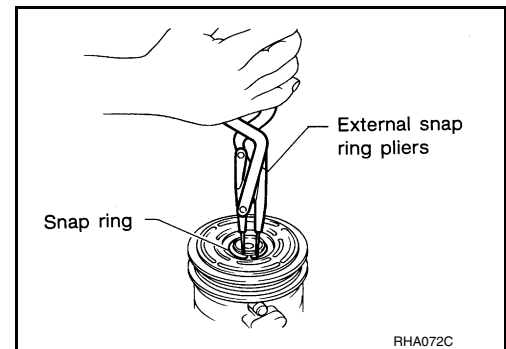
REMOVAL

1. Remove the front under cover. Refer to [EXT-28, "Removal and Installation"](#).
2. Partially remove the fender protector (RH). Refer to [EXT-26, "FENDER PROTECTOR : Removal and Installation"](#).
3. Remove the drive belt. Refer to [EM-19, "Removal and Installation"](#) (QR25DE), or [EM-134, "Removal and Installation"](#) (VQ35DE).
4. Remove the center bolt by holding the clutch disc steady using a suitable tool.
5. Remove the clutch disc and shims.

CAUTION:

Retain all the shims for installation.

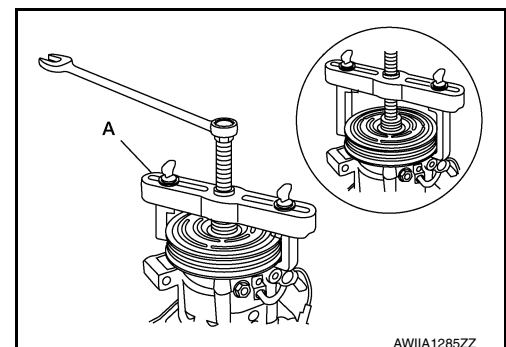
6. Remove the snap ring using a suitable tool as shown.



7. Remove the pulley assembly using a suitable tool (A) as shown.

CAUTION:

To prevent deformation of the pulley groove, the puller claws should be hooked under (not into) the pulley groove.

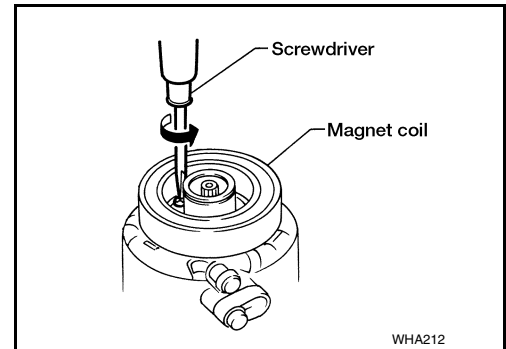


8. Disconnect the harness from the magnet coil.

COMPRESSOR

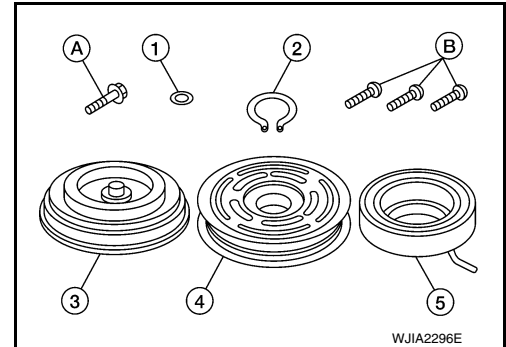
< REMOVAL AND INSTALLATION >

9. Remove the three magnet coil screws using a suitable tool as shown, then remove the magnet coil.



INSPECTION AFTER REMOVAL

- (1): Shim
- (2): Snap ring
- (3): Clutch disc
- (4): Pulley
- (5): Magnet coil
- (A): Center bolt
- (B): Magnet coil screws



Clutch Disc

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

Pulley

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

Magnet Coil

Check the magnet coil for a loose connection or cracked insulation. Replace as necessary.

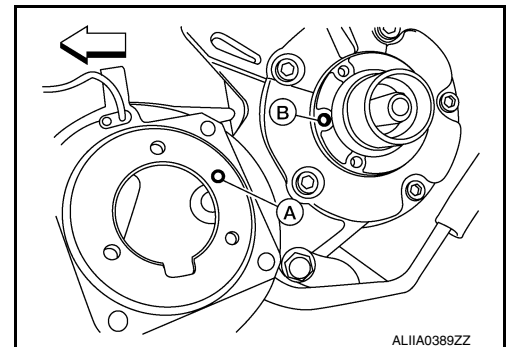
INSTALLATION

1. Install the magnet coil by aligning the magnet coil pin (A) with the hole (B) in the compressor front head as shown, then install the magnet coil screws.

- ⇐: Rear

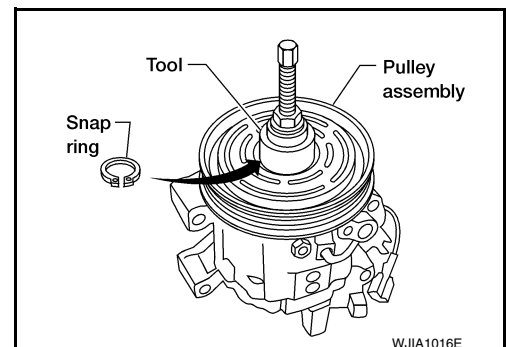
CAUTION:

Be sure to align the magnet coil pin with the hole in the compressor front head.



2. Connect the magnet coil harness.
3. Install the pulley assembly using Tool and a wrench as shown, then install the snap ring using a suitable tool.

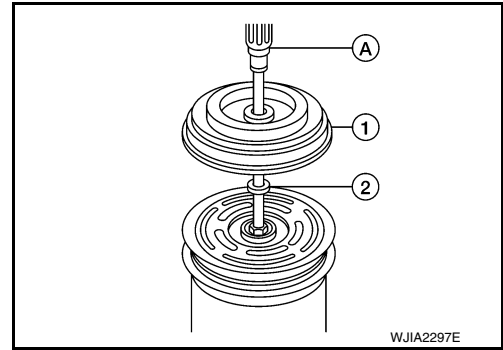
Tool number : — (J-38873-A)



COMPRESSOR

< REMOVAL AND INSTALLATION >

4. Install the clutch disc (1) on the drive shaft, together with all of the original shim(s) (2) using a suitable tool (A).



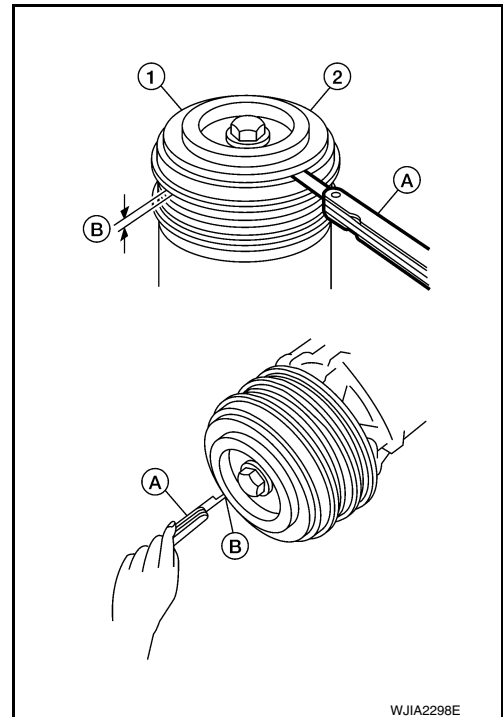
5. Install the center bolt using a suitable tool.
6. Install the drive belt. Refer to [EM-19, "Removal and Installation"](#) (QR25DE), or [EM-134, "Removal and Installation"](#) (VQ35DE).
7. Install the fender protector. Refer to [EXT-26, "FENDER PROTECTOR : Removal and Installation"](#).
8. Install the front under cover. Refer to [EXT-28, "Removal and Installation"](#).

INSPECTION AFTER INSTALLATION

Check the clearance (B) all the way around between the clutch disc (1) and pulley (2) using a suitable tool (A) as shown.

**Clutch disc-to-pulley clearance (B) : 0.3 - 0.6 mm
(0.012 - 0.024 in)**

If the specified clearance (B) is not obtained, replace the adjusting shim(s) and recheck the clearance (B) as shown.



BREAK-IN OPERATION

When replacing compressor clutch assembly, always conduct the break-in operation. This is done by engaging and disengaging the clutch about 30 times. Break-in operation raises the level of transmitted torque.

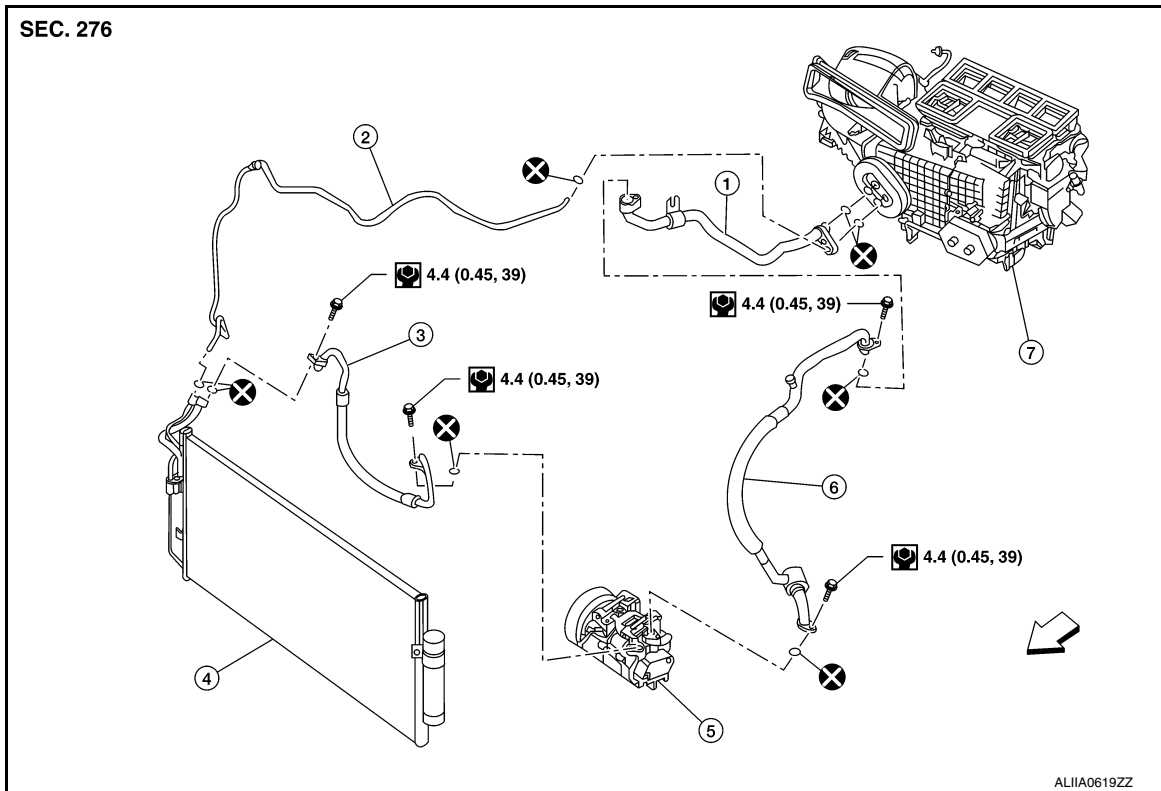
COOLER PIPE AND HOSE

< REMOVAL AND INSTALLATION >

COOLER PIPE AND HOSE

Exploded View

INFOID:000000009463939



- | | | |
|--------------------------------------|-----------------------|--------------------------------|
| 1. Low-pressure pipe | 2. High-pressure pipe | 3. High-pressure flexible hose |
| 4. Condenser | 5. Compressor | 6. Low-pressure flexible hose |
| 7. Heating and cooling unit assembly | ↔ Front | |

LOW-PRESSURE FLEXIBLE HOSE

LOW-PRESSURE FLEXIBLE HOSE : Removal and Installation

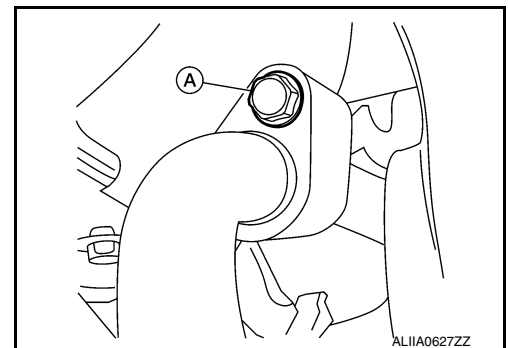
INFOID:000000009463940

REMOVAL

1. Discharge the refrigerant. Refer to [HA-23. "Recycle Refrigerant"](#).
2. Remove the bolt (A) that retains the low-pressure flexible hose to the low-pressure pipe.

CAUTION:

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



3. Disconnect the high-pressure flexible hose from the compressor.
4. Disconnect the low-pressure flexible hose from the compressor.
5. Remove the low-pressure flexible hose.

INSTALLATION

COOLER PIPE AND HOSE

< REMOVAL AND INSTALLATION >

Installation is in the reverse order of removal.

CAUTION:

- Do not reuse O-rings.
- Apply A/C oil to the new O-rings.
- After charging refrigerant, check for leaks. Refer to [HA-21, "Leak Test"](#).

HIGH-PRESSURE FLEXIBLE HOSE

HIGH-PRESSURE FLEXIBLE HOSE : Removal and Installation

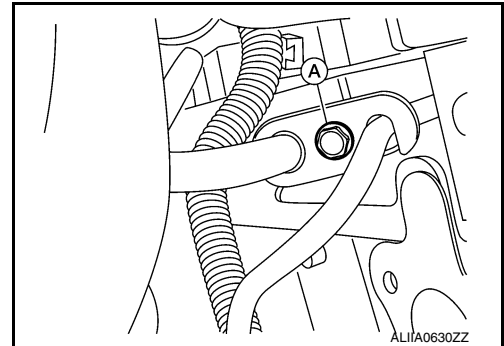
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REMOVAL

1. Discharge the refrigerant. Refer to [HA-23, "Recycle Refrigerant"](#).
2. Remove the bolt (A) that retains the high-pressure flexible hose to the condenser pipe.

CAUTION:

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



3. Disconnect the high-pressure flexible hose from the compressor.
4. Remove the high-pressure flexible hose.

INSTALLATION

Installation is in the reverse order of removal.

CAUTION:

- Do not reuse O-rings.
- Apply A/C oil to new O-rings.
- After charging refrigerant, check for leaks. Refer to [HA-21, "Leak Test"](#).

LOW-PRESSURE PIPE

LOW-PRESSURE PIPE : Removal and Installation

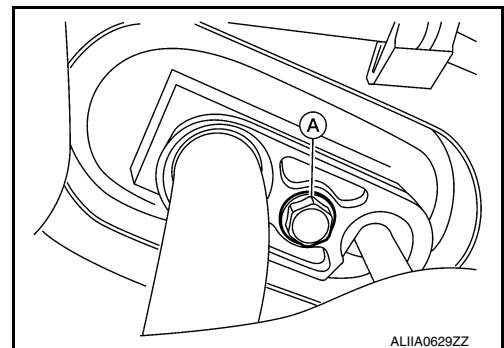
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REMOVAL

1. Discharge the refrigerant. Refer to [HA-23, "Recycle Refrigerant"](#).
2. Drain the power steering fluid. Refer to [ST-30, "Draining and Refilling"](#).
3. Remove the bolt (A) that retains the low-pressure pipe to the expansion valve.

CAUTION:

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

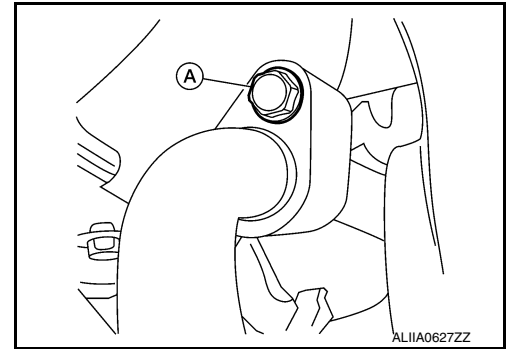


4. Remove the strut tower bar (VQ35DE only). Refer to [FSU-19, "Exploded View"](#).
5. Remove the high pressure piping upper and low pressure piping upper from the power steering pump assembly. Refer to [ST-40, "Exploded View"](#).

COOLER PIPE AND HOSE

< REMOVAL AND INSTALLATION >

6. Remove the bolt (A) that retains the low-pressure pipe to the low-pressure flexible hose.



7. Remove the low-pressure pipe.

INSTALLATION

Installation is in the reverse order of removal.

CAUTION:

- Do not reuse O-rings.
- Apply A/C oil to new O-rings.
- After charging refrigerant, check for leaks. Refer to [HA-21, "Leak Test"](#).

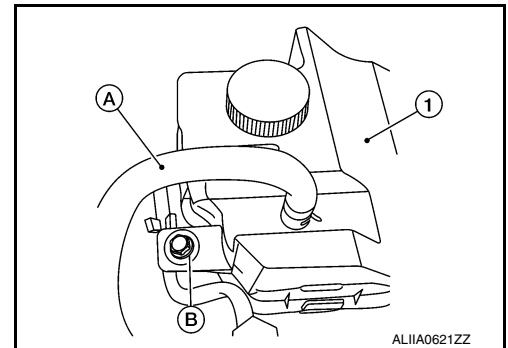
HIGH-PRESSURE PIPE

HIGH-PRESSURE PIPE : Removal and Installation

INFOID:000000009463943

REMOVAL

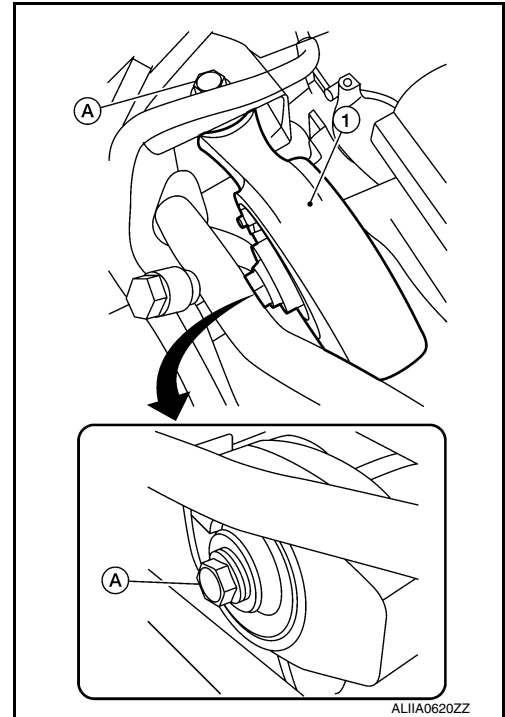
1. Discharge the refrigerant. Refer to [HA-23, "Recycle Refrigerant"](#).
2. Remove the power steering pump assembly. Refer to [ST-38, "Removal and Installation"](#).
3. Remove the strut tower bar. Refer to [FSU-19, "Exploded View"](#).
4. Remove the coolant overflow reservoir tube (A).
5. Remove the coolant overflow reservoir bolt (B).
6. Remove the coolant overflow reservoir (1).



COOLER PIPE AND HOSE

< REMOVAL AND INSTALLATION >

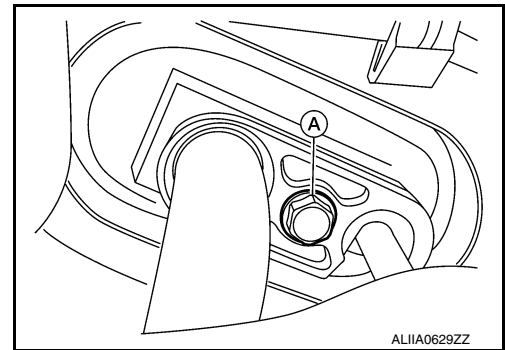
7. Remove the upper torque rod bolts (A).
8. Remove the upper torque rod (1).



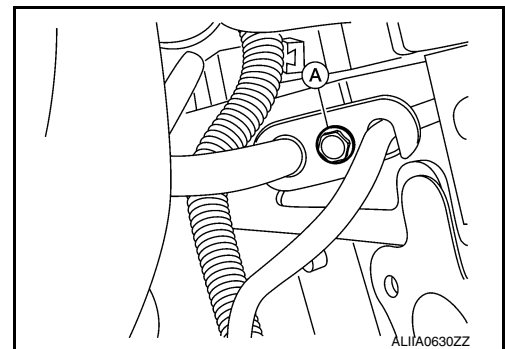
9. Remove the bolt (A) that retains the high-pressure pipe to the expansion valve.

CAUTION:

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



10. Remove the bolt (A) that retains the high-pressure pipe to the condenser pipe.



INSTALLATION

Installation is in the reverse order of removal.

CAUTION:

- Do not reuse O-rings.
- Apply A/C oil to new O-rings.
- After charging refrigerant, check for leaks. Refer to [HA-21, "Leak Test"](#).

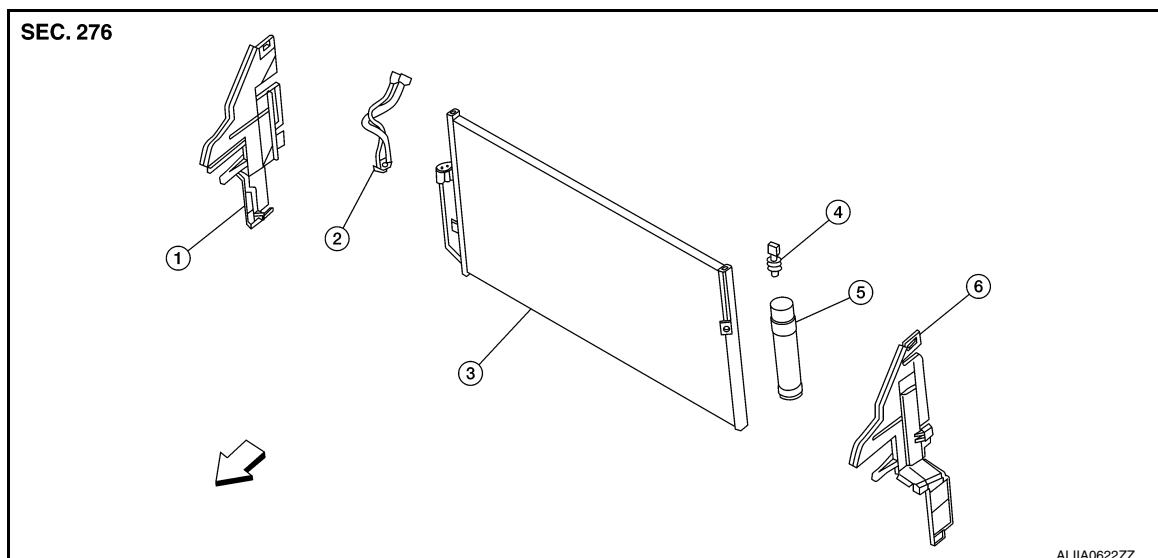
CONDENSER

< REMOVAL AND INSTALLATION >

CONDENSER

Exploded View

INFOID:000000009463944



- | | | |
|---------------------------------|----------------------------|---------------------------------|
| 1. Condenser air deflector (RH) | 2. Condenser pipe assembly | 3. Condenser |
| 4. Refrigerant pressure sensor | 5. Liquid tank | 6. Condenser air deflector (LH) |

⇐ Front

CONDENSER

CONDENSER : Removal and Installation

INFOID:000000009463945

REMOVAL

1. Discharge the refrigerant. Refer to [HA-23. "Recycle Refrigerant"](#).
2. Remove the front bumper fascia. Refer to [EXT-17. "Removal and Installation"](#).
3. Remove the front air duct. Refer to [EM-29. "Removal and Installation"](#) (QR25DE) or [EM-144. "Removal and Installation"](#) (VQ35DE).
4. Disconnect the refrigerant lines from the condenser.
5. Remove the condenser.

INSTALLATION

Installation is in the reverse order of removal.

CAUTION:

After charging refrigerant, check for leaks. Refer to [HA-21. "Leak Test"](#).

LIQUID TANK

LIQUID TANK : Removal and Installation

INFOID:000000009463946

REMOVAL

CAUTION:

Cap or wrap the joint of the hose with a suitable material such as vinyl tape to avoid the entry of contaminants.

1. Discharge the refrigerant. Refer to [HA-23. "Recycle Refrigerant"](#).
2. Remove the front fascia. Refer to [EXT-17. "Removal and Installation"](#).
3. Clean liquid tank and its surrounding area, and remove dirt and rust from liquid tank.

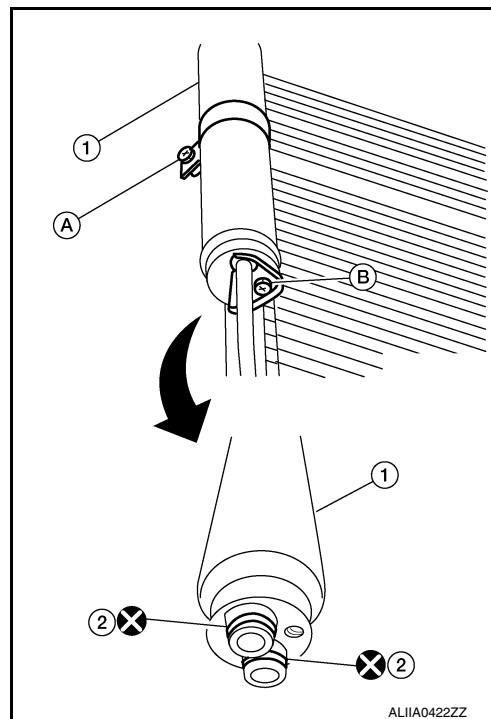
CAUTION:

Be sure to clean carefully.

CONDENSER

< REMOVAL AND INSTALLATION >

4. Disconnect the harness connector from the refrigerant pressure sensor.
5. Remove bolt (A) and bolt (B) from the liquid tank (1) bottom and bracket.
6. Remove the liquid tank (1) with the bracket and refrigerant pressure sensor as an assembly. Slide the liquid tank (1) upward to release the bracket. Discard the two O-rings (2).



7. If necessary, remove the refrigerant pressure sensor from the liquid tank.

INSTALLATION

Installation is in the reverse order of removal.

CAUTION:

- Do not reuse O-rings.
- Apply A/C oil to the O-rings of the condenser for installation.
- After charging refrigerant, check for leaks. Refer to [HA-21, "Leak Test"](#).

REFRIGERANT PRESSURE SENSOR

REFRIGERANT PRESSURE SENSOR : Removal and Installation

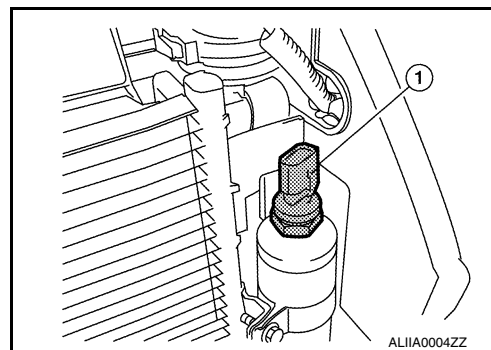
INFOID:000000009463947

REMOVAL

1. Discharge the refrigerant. Refer to [HA-23, "Recycle Refrigerant"](#).
2. Remove the front fascia. Refer to [EXT-17, "Removal and Installation"](#).
3. Remove the refrigerant pressure sensor (1) from the liquid tank on the condenser.

CAUTION:

Do not damage the condenser fins.



INSTALLATION

Installation is in the reverse order of removal.

CAUTION:

- Do not reuse the O-rings.
- Apply A/C compressor oil to the new O-rings for installation.
- After charging refrigerant, check for leaks. Refer to [HA-21, "Leak Test"](#).

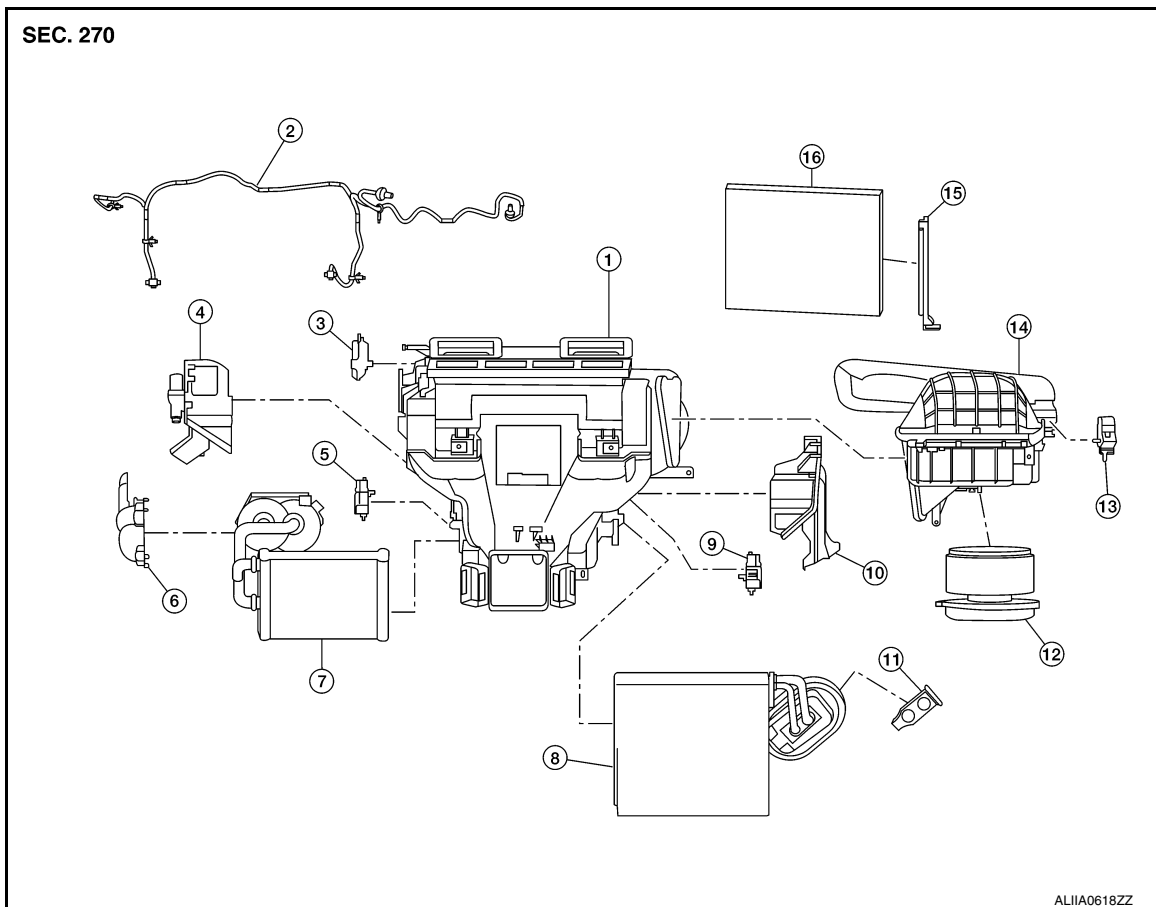
HEATING AND COOLING UNIT ASSEMBLY

< REMOVAL AND INSTALLATION >

HEATING AND COOLING UNIT ASSEMBLY

Exploded View

INFOID:000000009463948



- | | | |
|--------------------------------------|--|--------------------------------|
| 1. Heating and cooling unit assembly | 2. Harness | 3. Mode door motor |
| 4. Upper floor connecting duct (LH) | 5. Air mix door motor (passenger) (automatic A/C only) | 6. Heater core pipes cover |
| 7. Heater core | 8. Evaporator | 9. Air mix door motor (driver) |
| 10. Upper floor connecting duct (RH) | 11. Expansion valve | 12. Blower motor |
| 13. Intake door motor | 14. Blower unit | 15. Filter cover |
| 16. In-cabin microfilter | | |

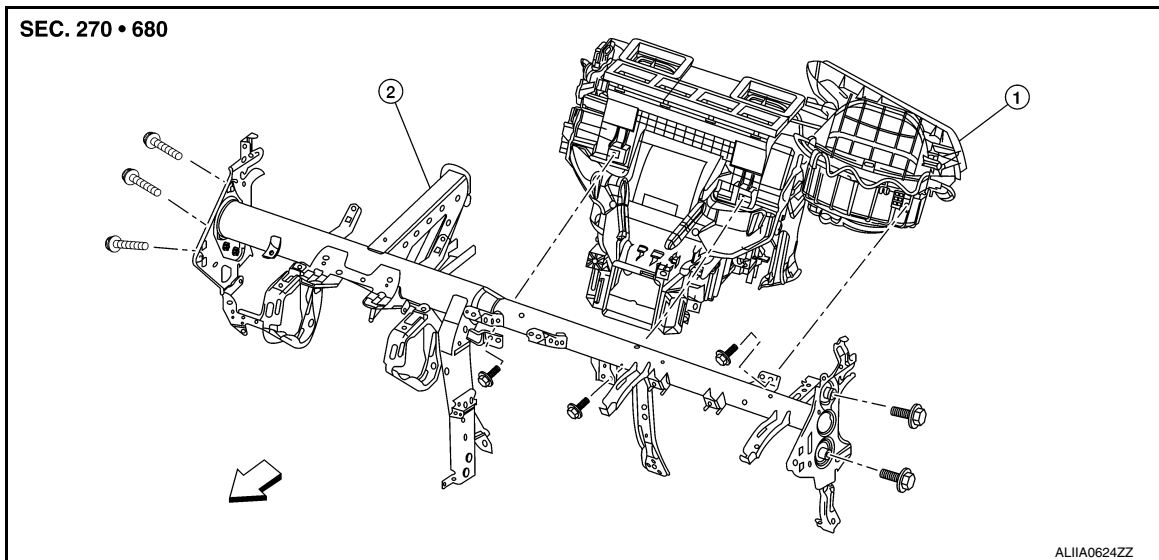
HEATING AND COOLING UNIT ASSEMBLY

HEATING AND COOLING UNIT ASSEMBLY

< REMOVAL AND INSTALLATION >

HEATING AND COOLING UNIT ASSEMBLY : Removal and Installation

INFOID:000000009463949



1. Heating and cooling unit assembly

2. Steering member

⇐ Front

REMOVAL

1. Discharge the refrigerant. Refer to [HA-23, "Recycle Refrigerant"](#).
2. Drain the cooling system. Refer to [CO-12, "Changing Engine Coolant"](#).
3. Remove the instrument panel assembly. Refer to [IP-15, "Removal and Installation"](#).
4. Remove the steering column. Refer to [ST-33, "Removal and Installation"](#).
5. Remove the strut tower brace. Refer to [FSU-19, "Exploded View"](#).
6. Disconnect the low-pressure pipe from the expansion valve.

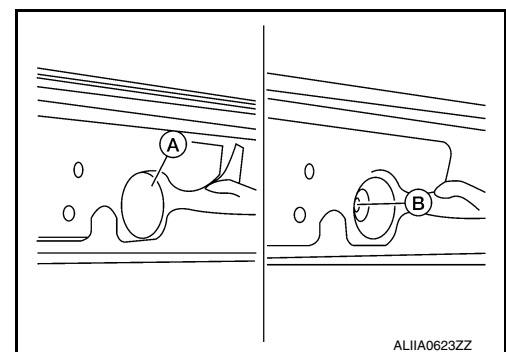
CAUTION:

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

7. Disconnect the high-pressure pipe from the expansion valve.
8. Disconnect the heater hoses from the heater core pipes.
9. Remove the steering member cover (A) and bolt (B).

NOTE:

The steering member cover (A) and bolt (B) can be found near the cowl area in the engine compartment.



10. Remove the remaining steering member bolts.
11. Disconnect the harness connectors from the heating and cooling unit assembly and steering member.
12. Remove the heating and cooling unit assembly and steering member as one assembly from the vehicle.
13. Separate the heating and cooling unit assembly from the steering member.

INSTALLATION

Installation is in the reverse order of removal.

CAUTION:

After charging refrigerant, check for leaks. Refer to [HA-21, "Leak Test"](#).

HEATER CORE

HEATING AND COOLING UNIT ASSEMBLY

< REMOVAL AND INSTALLATION >

HEATER CORE : Removal and Installation

INFOID:000000009463950

REMOVAL

1. Remove the heating and cooling unit assembly. Refer to [HA-41, "HEATING AND COOLING UNIT ASSEMBLY : Removal and Installation"](#).
2. Remove the heater core pipes cover. Refer to [HA-40, "Exploded View"](#).
3. Disconnect the harness connector from the blower motor.
4. Remove the heater core.

INSTALLATION

Installation is in the reverse order of removal.

EVAPORATOR

EVAPORATOR : Removal and Installation

INFOID:000000009463951

REMOVAL

1. Remove the heater core. Refer to [HA-42, "HEATER CORE : Removal and Installation"](#).
2. Remove the upper floor connecting duct (RH). Refer to [HA-40, "Exploded View"](#).
3. Remove the air mix door motor (driver). Refer to [HAC-109, "AIR MIX DOOR MOTOR : Removal and Installation - Air Mix Door Motor \(RH\)"](#).
4. Remove the air mix door motor (passenger) (if equipped). Refer to [HAC-109, "AIR MIX DOOR MOTOR : Removal and Installation - Air Mix Door Motor \(LH\)"](#).
5. Disconnect the harness connector from the intake sensor.
6. Remove the evaporator and expansion valve assembly.

INSTALLATION

Installation is in the reverse order of removal.

NOTE:

The evaporator can only be ordered as an assembly with the expansion valve.

EXPANSION VALVE

EXPANSION VALVE : Removal and Installation for Expansion Valve

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REMOVAL

1. Discharge the refrigerant. Refer to [HA-23, "Recycle Refrigerant"](#).
2. Remove the strut tower brace. Refer to [FSU-19, "Exploded View"](#).
3. Disconnect the low-pressure pipe from the expansion valve.
4. Disconnect the high-pressure pipe from the expansion valve.
5. Remove the expansion valve bolts.
6. Remove the expansion valve.

INSTALLATION

Installation is in the reverse order of removal.

CAUTION:

After charging refrigerant, check for leaks. Refer to [HA-21, "Leak Test"](#).

SERVICE DATA AND SPECIFICATIONS (SDS)

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SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

Service Data and Specification (SDS)

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COMPRESSOR

| | | |
|-----------------------|---|------------------|
| Model | VALEO | |
| Type | DCS-171C | |
| Displacement | 171 cm ³ (10.43 in ³) / revolution | |
| Direction of rotation | Clockwise (viewed from drive end) | |
| Drive belt | QR25DE | Poly V 6-grooves |
| | VQ35DE | Poly V 7-grooves |

OIL

| | | |
|----------|--|--|
| Name | NISSAN A/C System Oil Type S or equivalent | |
| Capacity | Total in system | 150 mℓ (5.1 US fl oz, 5.3 Imp fl oz) |
| | Compressor (service part) charging amount | Refer to HA-26, "Oil Adjusting Procedure for Compressor Replacement" . |

REFRIGERANT

| | | |
|----------|-------------------------------------|--|
| Type | HFC-134a (R-134a) | |
| Capacity | 0.525 ± 0.025 kg (1.158 ± 0.055 lb) | |