

SECTION **HA**

HEATER & AIR CONDITIONING SYSTEM

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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. 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 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 3 minutes before performing any service.

Precaution for Work

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- 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 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, and wring the water out of the cloth to wipe the dirty area.
Then rub with a soft and 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, and wring the water out of the cloth to wipe the detergent off. Then rub with a soft and dry cloth.
- Do not use organic solvent such as thinner, benzene, alcohol, or gasoline.
- For genuine leather seats, use a genuine leather seat cleaner.

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

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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-40, "HFC-134a \(R-134a\) Service Proce-](#)

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pure". To determine the purity of HFC-134a (R-134a) in the vehicle and recovery tank, use Refrigerant Recovery/Recycling Recharging equipment and Refrigerant Identifier.

- Use only specified 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

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.

General Refrigerant Precaution

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WARNING:

- Do not 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.
- Do not store or heat refrigerant containers above 52°C (125°F).
- Do not heat a refrigerant container with an open flame; if container warming is required, place the bottom of the container in a pail of warm water.
- Do not 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.
- Do not 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

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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)

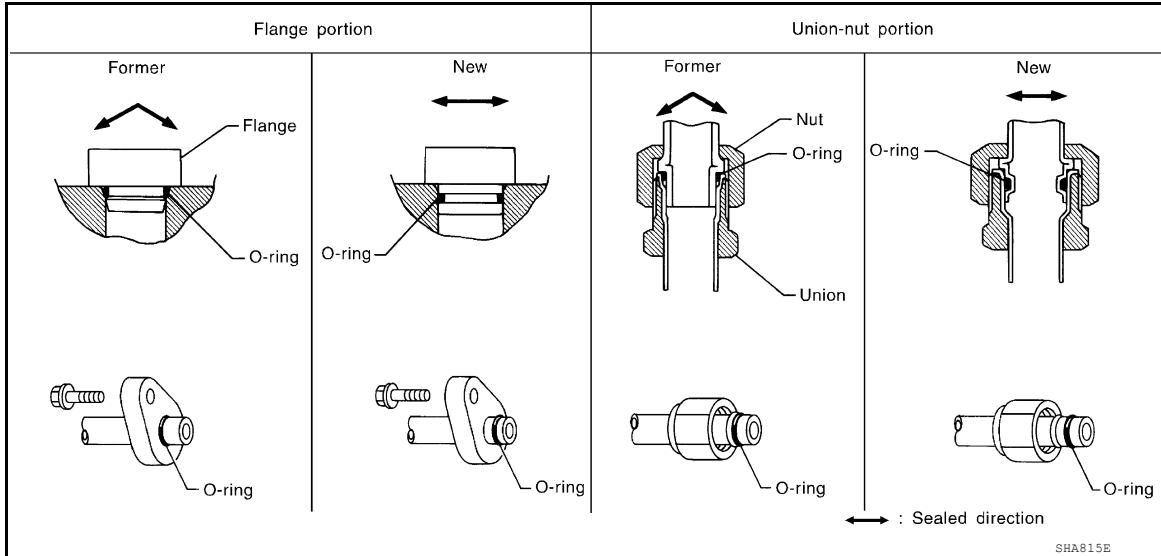
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- Refrigerant pressure sensor

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.



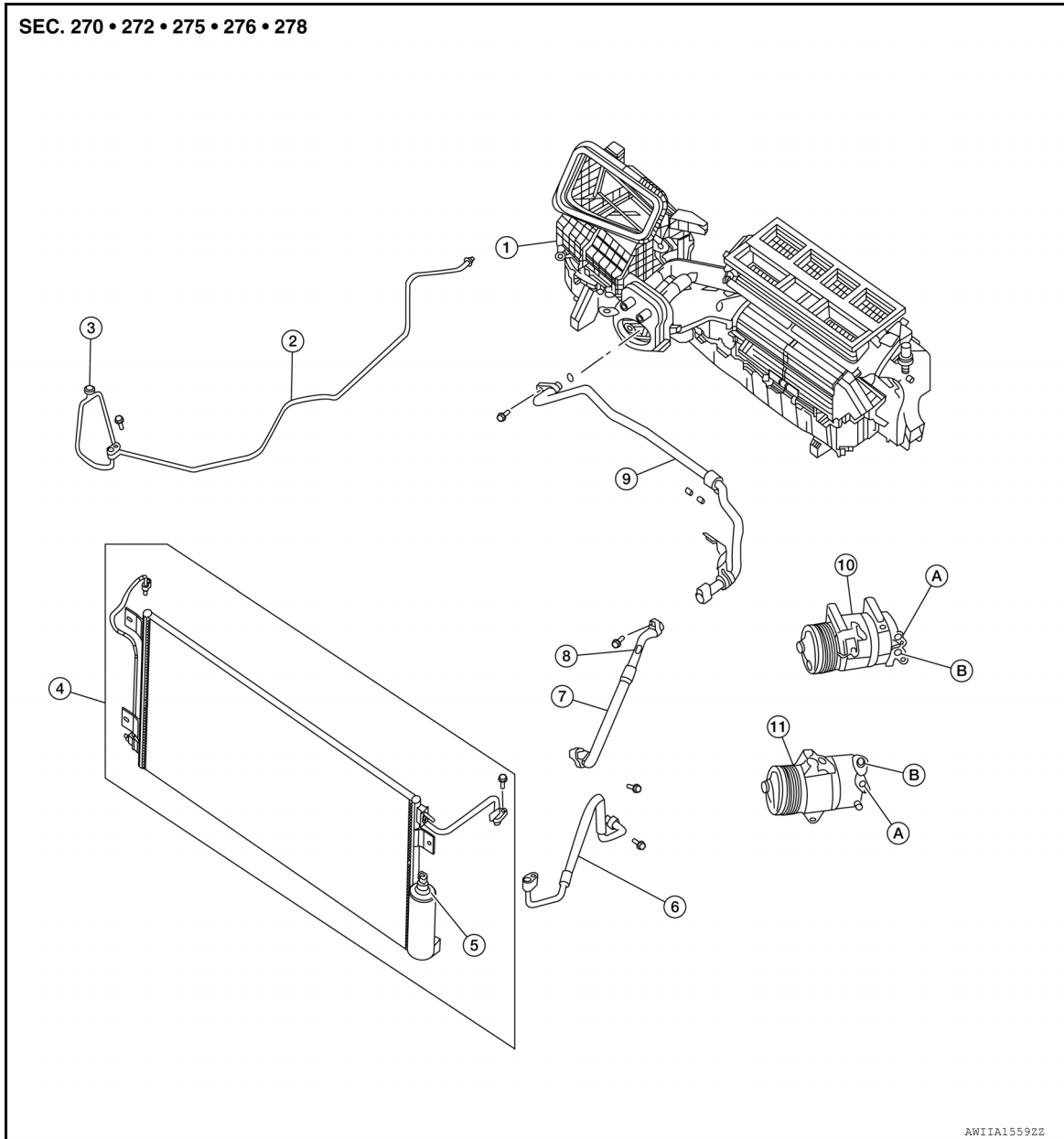
O-RING AND REFRIGERANT CONNECTION

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Front - Without Rear A/C

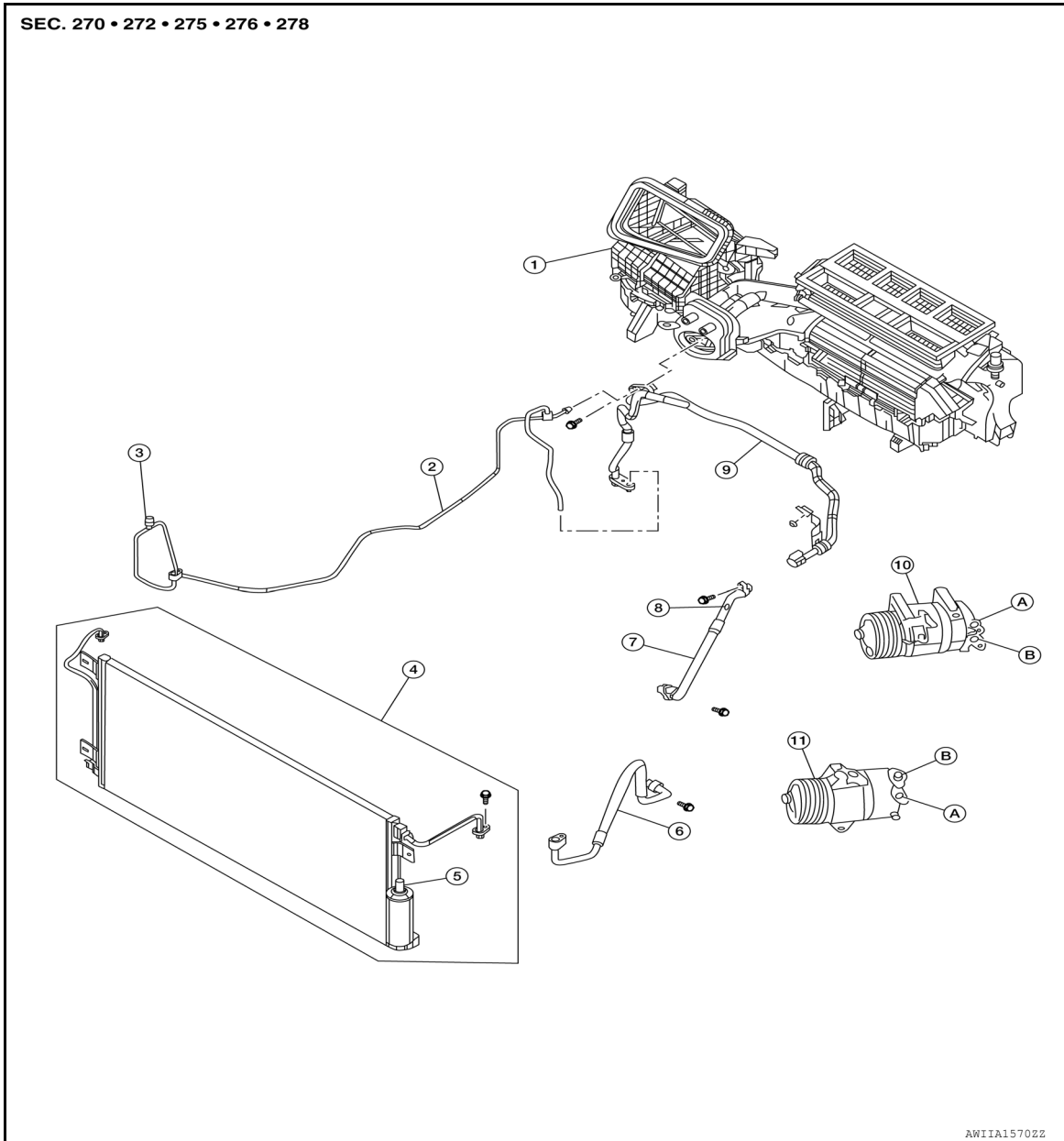


- | | | |
|---|-----------------------------------|---|
| 1. Front heater and cooling unit assembly | 2. High-pressure pipe | 3. High-pressure A/C service valve |
| 4. Condenser and liquid tank | 5. Refrigerant pressure sensor | 6. High-pressure flexible hose |
| 7. Low-pressure flexible hose | 8. Low-pressure A/C service valve | 9. Low-pressure pipe |
| 10. A/C Compressor (VK56DE) | 11. A/C Compressor (VQ40DE) | A. High-pressure flexible hose connection |
| B. Low-pressure flexible hose connection | | |

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Front - With Rear A/C (If Equipped)



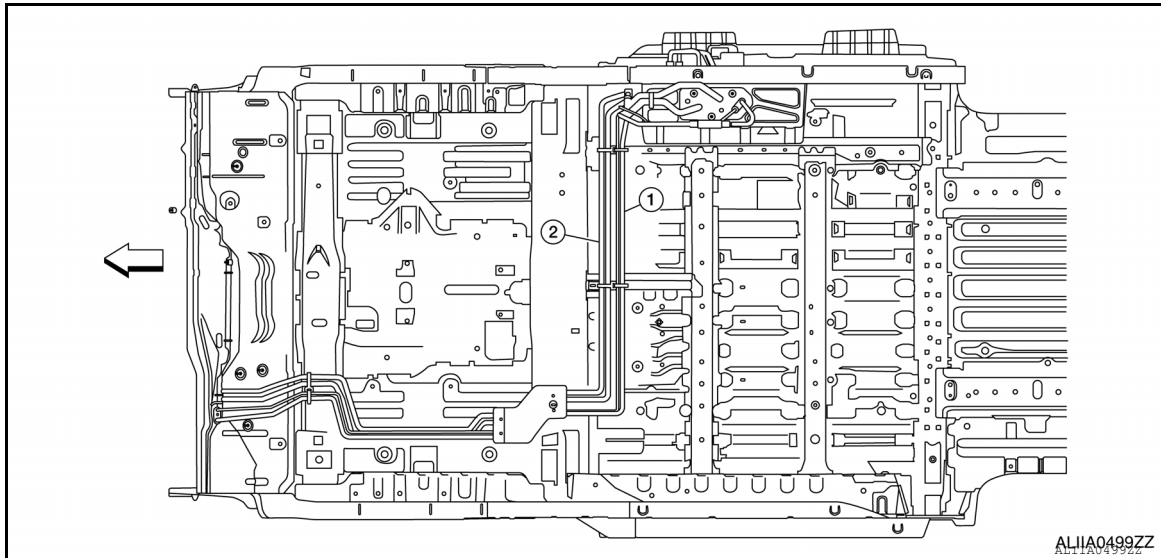
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|---|-----------------------------------|---|
| 1. Front heater and cooling unit assembly | 2. High-pressure pipe | 3. High-pressure A/C service valve |
| 4. Condenser and liquid tank | 5. Refrigerant pressure sensor | 6. High-pressure flexible hose |
| 7. Low-pressure flexible hose | 8. Low-pressure A/C service valve | 9. Low-pressure pipe |
| 10. A/C compressor (VK56DE) | 11. A/C compressor (VQ40DE) | A. High-pressure flexible hose connection |
| B. Low-pressure flexible hose connection | | |

PRECAUTIONS

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Rear (If Equipped)



1. Underfloor rear A/C pipes

2. Underfloor rear heater core hoses

← Front

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:

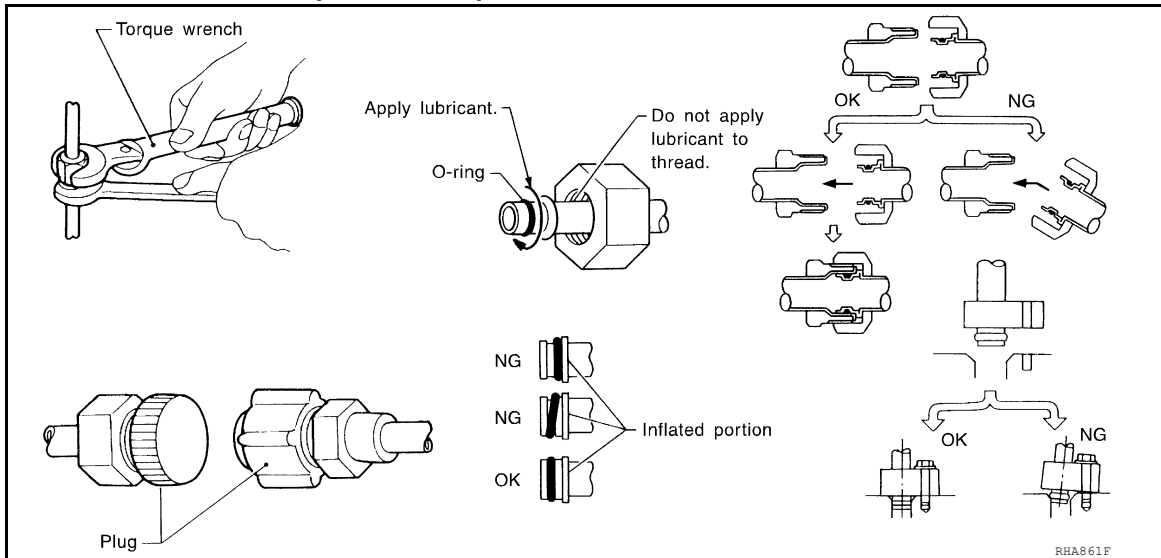
When replacing or cleaning refrigerant cycle components, observe the following.

- 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.
- When connecting tube, apply oil to circle of the O-rings shown in illustration. Be careful not to apply oil to threaded portion.
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

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- 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.



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.

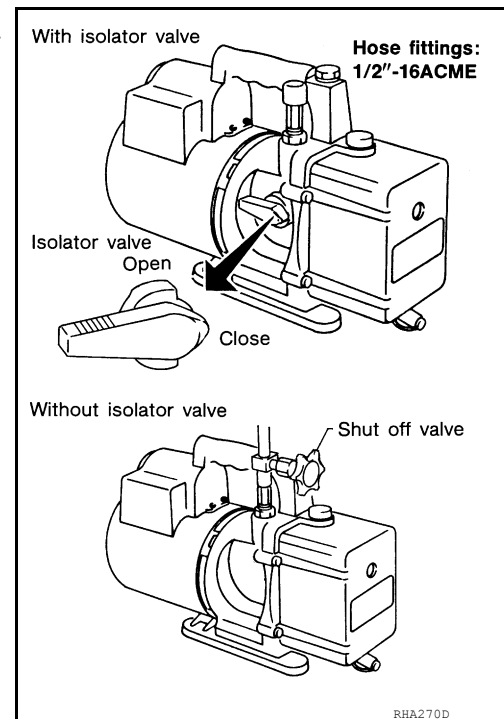
VACUUM PUMP

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 lubricating 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.

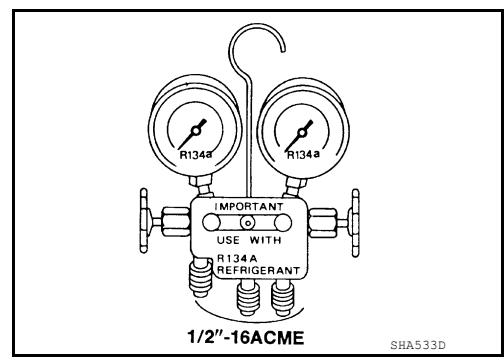


MANIFOLD GAUGE SET

PRECAUTIONS

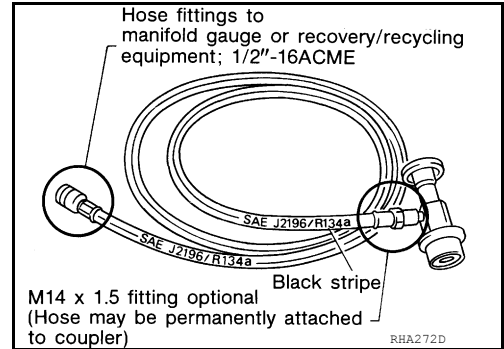
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Be certain that the gauge face indicates R-134a or 134a. Make sure the gauge set has 1/2"-16 ACME threaded connections for service hoses. Confirm the set has been used only with refrigerant HFC-134a (R-134a) along with specified oil.



SERVICE HOSES

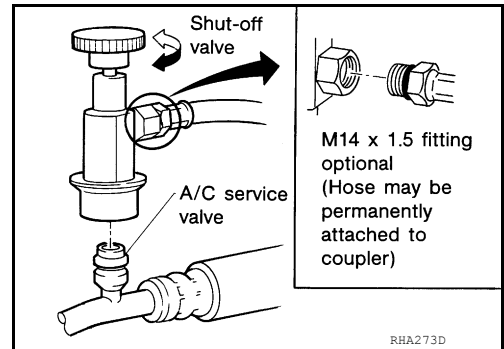
Be certain that the service hoses display the markings described (colored hose with black stripe). All hoses must include positive shut-off devices (either manual or automatic) near the end of the hoses opposite the manifold gauge.



SERVICE COUPLERS

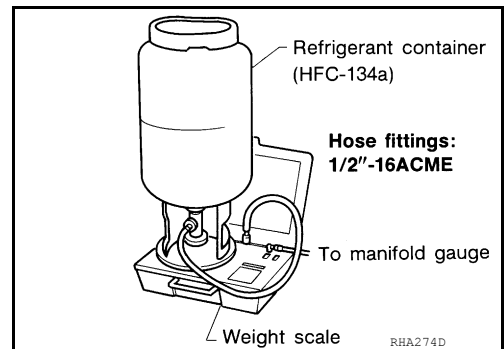
Do not attempt to connect HFC-134a (R-134a) service couplers to a CFC-12 (R-12) A/C system. The HFC-134a (R-134a) couplers will not properly connect to the CFC-12 (R-12) system. However, if an improper connection is attempted, discharging and contamination may occur.

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



WEIGHT SCALE

Verify that no refrigerant other than HFC-134a (R-134a) and specified oils have been used with the weight scale. If the weight 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

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COMPRESSOR

General Precautions

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- Plug all openings to prevent moisture and foreign matter from entering.
- When the compressor is removed, store it in the same position as it is when mounted on the car.
- When replacing or repairing compressor, follow "Maintenance of Oil Quantity in Compressor" exactly. Refer to [HA-42, "Maintenance of Oil Quantity in Compressor"](#).
- Keep friction surfaces between clutch and pulley clean. If the surface is contaminated with oil, wipe it off by using a clean waste cloth moistened with thinner.
- After compressor service operation, turn the compressor shaft by hand more than 5 turns in both directions. This will equally distribute oil inside the compressor. After the compressor is installed, let the engine idle and operate the compressor for 1 hour.
- After replacing the compressor magnet clutch, apply voltage to the new one and check for normal operation.

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LEAK DETECTION DYE

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LEAK DETECTION DYE

General Precautions

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- 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 years unless a compressor failure occurs.

IDENTIFICATION

Vehicles with factory installed fluorescent dye have a green label.

IDENTIFICATION LABEL FOR VEHICLE

Vehicles with factory installed fluorescent dye have this identification label on the underside of hood.

PREPARATION

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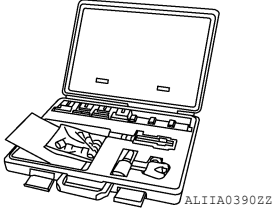
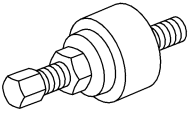
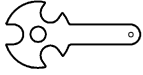
PREPARATION

PREPARATION

Special Service Tool

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

Tool number (Kent-Moore No.) Tool name	Description
<p>— (J-41425-NIS) AL Tubing Repair Kit</p>  <p>ALI IA03902Z</p>	<p>Repairing leaks in A/C tubes</p>
<p>— (J-38873-A) Drive Plate Installer</p>  <p>LHA171</p>	<p>Installing pulley</p>
<p>— (J-44614) A/C Comp Clutch</p>  <p>WHA230</p>	<p>Clutch disc holding tool</p>

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

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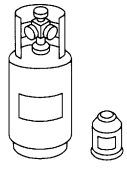


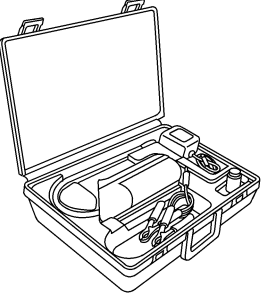
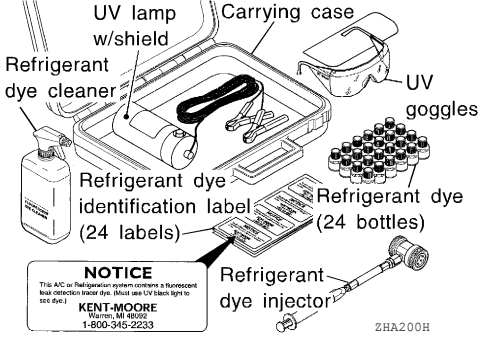
Do not mix HFC-134a (R-134a) refrigerant and/or the specified oil with CFC-12 (R-12) refrigerant and/or the oil.

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 or refrigerant/oil contamination will occur and compressor failure will result.

PREPARATION

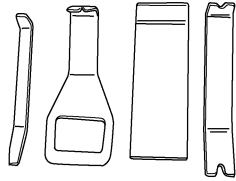
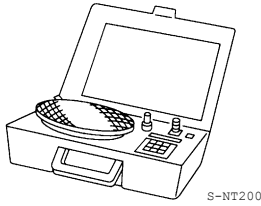
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Tool number (Kent-Moore No.) Tool name	Description
<p>— (—) HFC-134a (R-134a) Refrigerant</p>  <p style="text-align: center;">S-NT196</p>	<p>Container color: Light blue Container marking: HFC-134a (R-134a) Fitting size: Thread size • large container 1/2"-16 ACME</p>
<p>— (—) NISSAN A/C System Oil Type S</p>  <p style="text-align: center;">S-NT197</p>	<p>Type: Poly alkylene glycol oil (PAG), type S Application: HFC-134a (R-134a) swash plate compressors (NISSAN only) Lubricity: 40 m ℓ (1.4 US fl oz, 1.4 Imp fl oz)</p>
<p>— (J-48710) NISSAN ACR2009 RRR Unit</p>  <p style="text-align: center;">WJIA0293E</p>	<p>Refrigerant recovery, recycling and re-charging</p>
<p>— (J-41995) Electronic refrigerant leak detector</p>  <p style="text-align: center;">AHA281A</p>	<p>Power supply: • DC 12V (battery terminal)</p>
<p>— (J-43926) A/C Leak Detection</p>  <p style="text-align: center;">ZHA200H</p>	<p>Power supply: • DC 12V (battery terminal)</p>

PREPARATION

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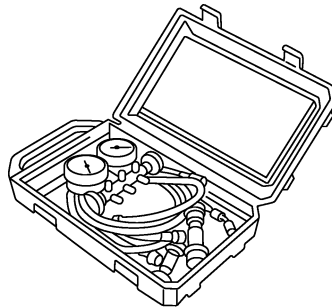
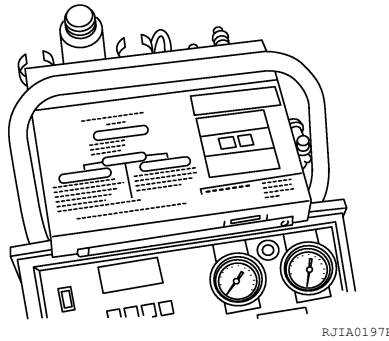
Tool number (Kent-Moore No.) Tool name	Description
— (J-39699) Refrigerant weight scale	For measuring of refrigerant Fitting size-Thread size • 1/2"-16 ACME
— (J-46534) Trim Tool Set	Removing trim components



Commercial Service Tool

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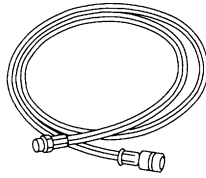
Tool name	Description
Refrigerant identifier equipment (R-134a)	For checking refrigerant purity and system contamination
Power tool	Loosening nuts, bolts and screws
Manifold gauge set (with hoses and couplers)	Identification: • The gauge face indicates R-134a. Fitting size-Thread size • 1/2"-16 ACME



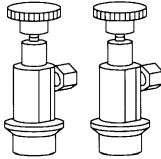
PREPARATION

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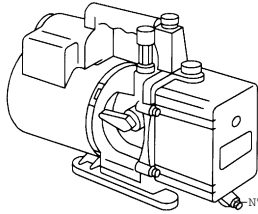
Tool name	Description
<p>Service hoses:</p> <ul style="list-style-type: none"> • High side hose • Low side hose • Utility hose 	<p>Hose color:</p> <ul style="list-style-type: none"> • Low side hose: Blue with black stripe • High side hose: Red with black stripe • Utility hose: Yellow with black stripe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



S-NT201



S-NT202



NT203

COMPONENT PARTS

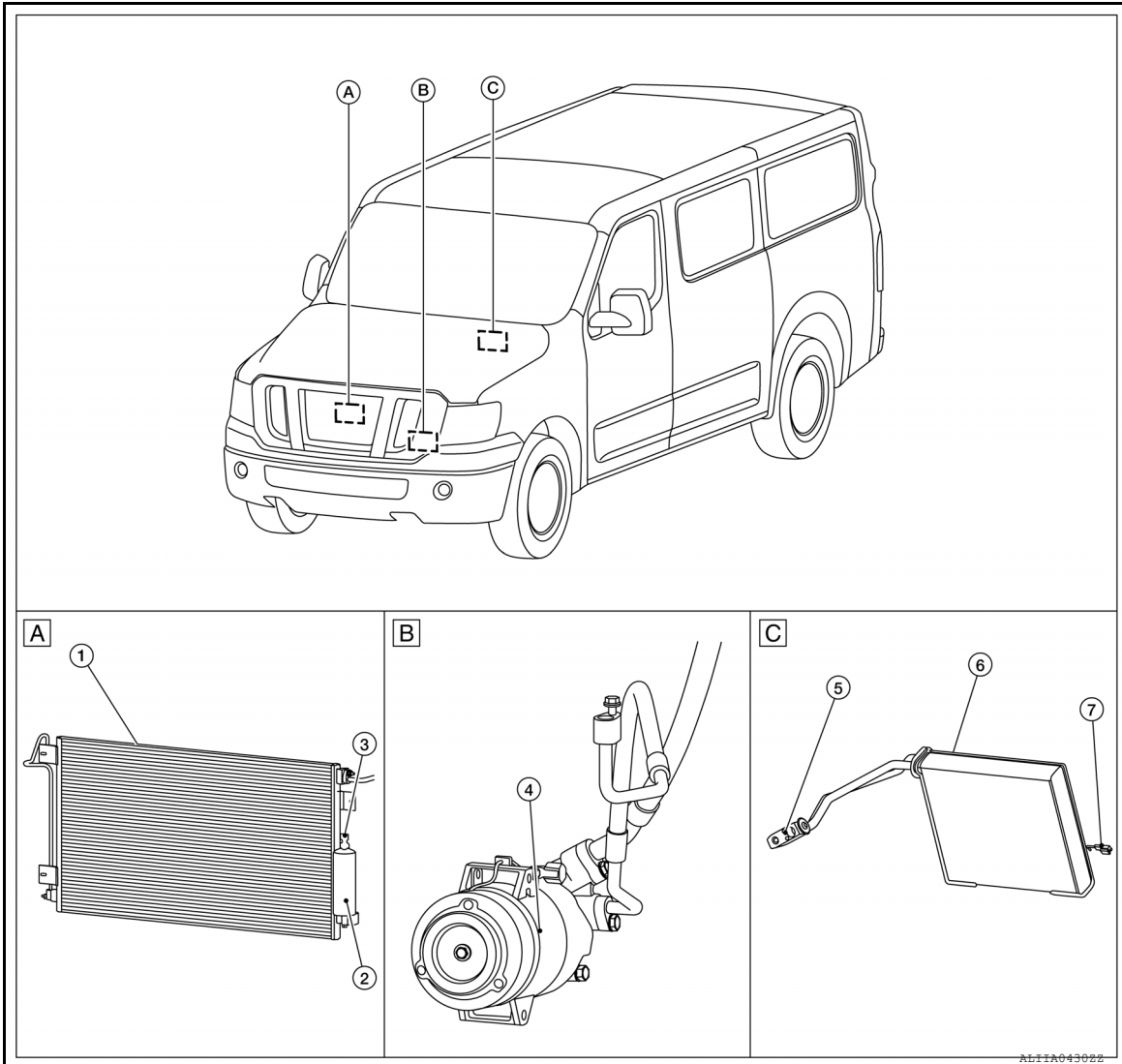
< SYSTEM DESCRIPTION >

SYSTEM DESCRIPTION

COMPONENT PARTS REFRIGERATION SYSTEM

REFRIGERATION SYSTEM : Component Parts Location

INFOID:000000006921764



- | | | |
|-------------------|--------------------|--------------------------------|
| 1. Condenser | 2. Liquid tank | 3. Refrigerant pressure sensor |
| 4. A/C compressor | 5. Expansion valve | 6. Evaporator |
| 7. Intake sensor | | |

REFRIGERATION SYSTEM : Component Description

INFOID:000000006921765

Component	Description
A/C compressor	Vaporized refrigerant is drawn into the A/C compressor from the evaporator, where it is compressed to a high pressure, high temperature vapor. The hot, compressed vapor is then discharged to the condenser.
Condenser	Hot, highly pressurized vapor is routed through the condenser where it is cooled and condensed into a liquid. Heat from the circulating refrigerant is carried away by cool air flowing through the condenser.

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COMPONENT PARTS

< SYSTEM DESCRIPTION >

Component	Description
Liquid tank	Refrigerant flows through the liquid tank to eliminate foreign matter or moisture in the refrigerant. The refrigerant pressure sensor is installed on the liquid tank.
Expansion valve	The condensed liquid refrigerant is routed through the expansion valve where it undergoes an abrupt reduction in pressure. The flash expansion of part of the liquid refrigerant lowers the temperature of the liquid and vapor mixture to where it is colder than the space to be cooled.
Evaporator	The cold mixture of liquid and vapor enters the evaporator where the blower motor circulates air across the cooling tubes. That air evaporates the liquid part of the cold mixture cooling the air, transferring heat to the refrigerant. This heated, vaporized refrigerant returns to the compressor to complete the refrigeration cycle.
Intake sensor	The intake sensor measures the temperature of the front evaporator fin temperature. The sensor uses a thermistor which is sensitive to the change in temperature. The electrical resistance of the thermistor decreases as temperature increases.
Refrigerant pressure sensor	Refer to HA-17. "REFRIGERATION SYSTEM : Component Description" for VQ40DE and HA-17. "REFRIGERATION SYSTEM : Component Description" for VK56DE.

REFRIGERANT AND COMPRESSOR OIL

REFRIGERANT AND COMPRESSOR OIL : Refrigerant And Compressor Oil

INFOID:000000006749333

SPECIFICATIONS

The oil in the compressor circulates through the system with the refrigerant. Add oil to compressor when replacing any component or after a large refrigerant leakage has occurred. It is important to maintain the specified amount. Refer to [HA-42. "Maintenance of Oil Quantity in Compressor"](#).

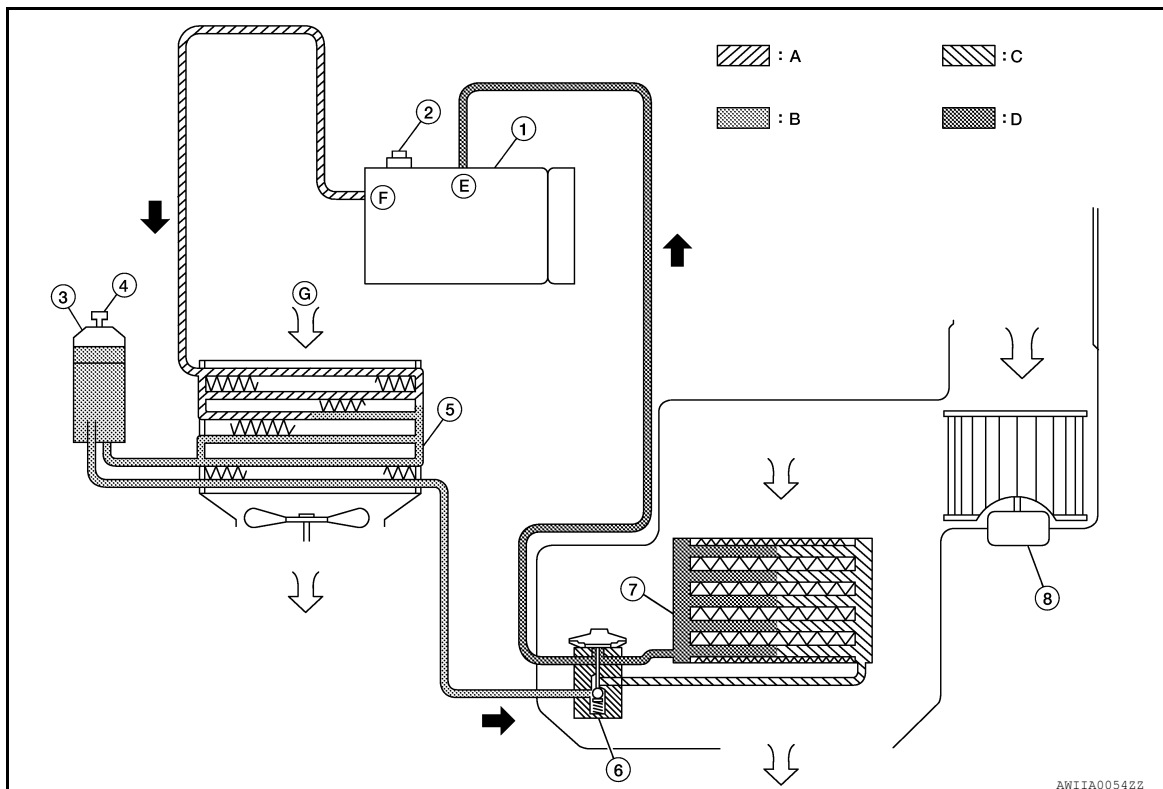
If oil quantity is not maintained properly, the following malfunctions may result:

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

REFRIGERANT AND COMPRESSOR OIL : Refrigerant Cycle

INFOID:000000006953164

REFRIGERANT FLOW



COMPONENT PARTS

< SYSTEM DESCRIPTION >

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

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

REFRIGERANT AND COMPRESSOR OIL : Refrigerant System Protection

INFOID:000000006953165

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, 27.56 bar), or below approximately 120 kPa (1.22 kg/cm², 17.4 psi, 1.2 bar).

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 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.

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DIAGNOSIS AND REPAIR WORKFLOW

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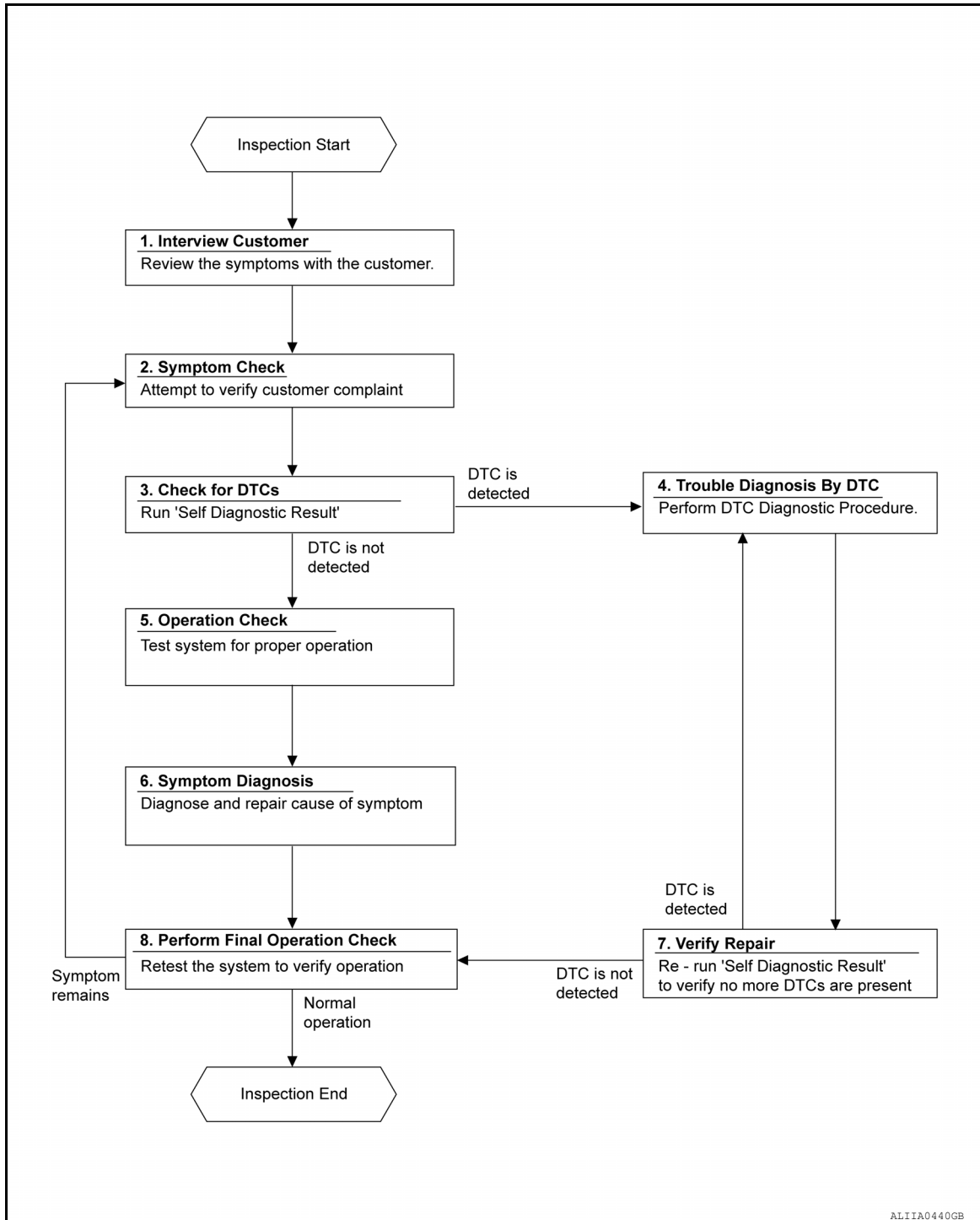
BASIC INSPECTION

DIAGNOSIS AND REPAIR WORKFLOW

Workflow

INFOID:000000007274281

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

④With 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-145. "DTC Inspection Priority Chart"](#).

>> GO TO 7.

5.OPERATION CHECK

Perform the operation check. Refer to [HAC-164. "FRONT MANUAL AIR CONDITIONING SYSTEM : Work Procedure"](#).

>> GO TO 6.

6.SYMPTOM DIAGNOSIS

Check the symptom diagnosis table. Refer to [HAC-207. "Symptom Table"](#).

>> GO TO 8.

7.VERIFY REPAIR.

④With 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-164. "FRONT MANUAL AIR CONDITIONING SYSTEM : Work Procedure"](#).

Does it operate normally?

YES >> Inspection End.

NO >> GO TO 2.

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REFRIGERANT

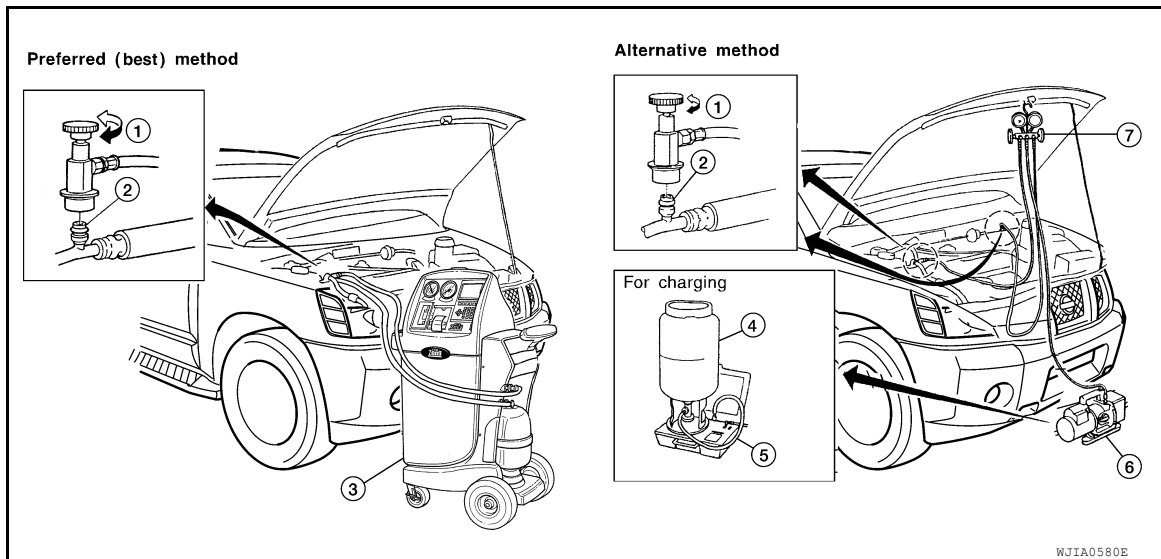
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REFRIGERANT

Description

INFOID:000000006923501

CONNECTION OF SERVICE TOOLS AND EQUIPMENT

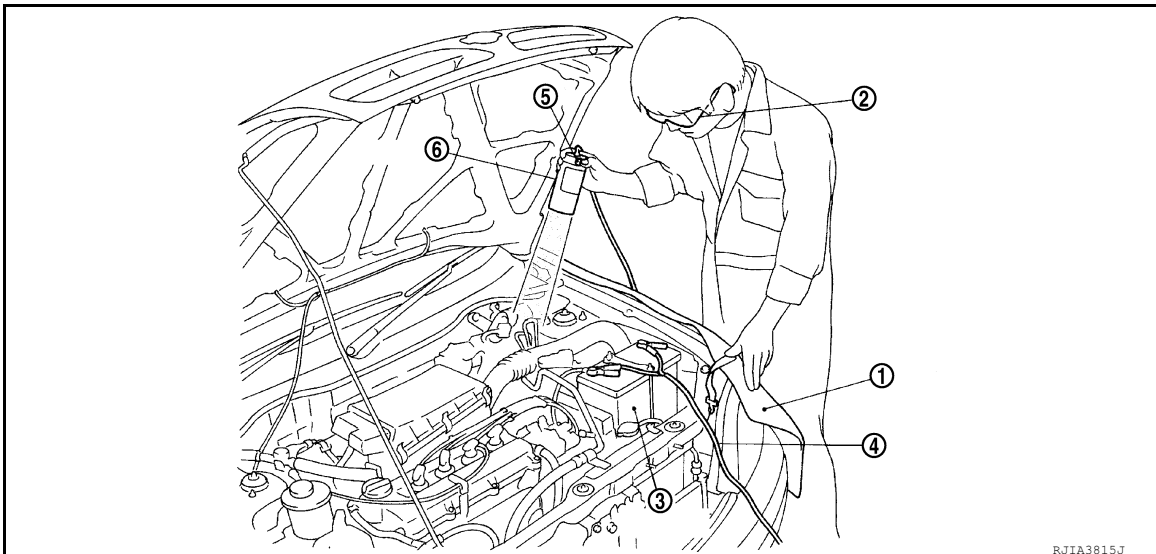


1. Shut-off valve
2. A/C service valve
3. Recovery/recycling equipment
4. Refrigerant container (HFC-134a)
5. Weight scale
6. Evacuating vacuum pump
7. Manifold gauge set

Leak Test

INFOID:000000006923502

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.
3. Connect power cable (4) of UV lamp (6) to positive and negative terminals of the battery (3).
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:

REFRIGERANT

< BASIC INSPECTION >

- 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 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 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. GO TO 6.)
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 speed: Maximum speed set

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REFRIGERANT

< BASIC INSPECTION >

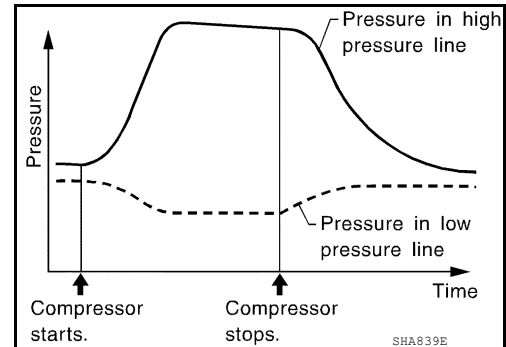
7. Run the engine at approximately 1,500 rpm for 2 minutes or more.
8. Stop the engine. Check again for refrigerant leakage. GO TO 4.

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:000000006923503

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 lubricant 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 lubricant return operation. Refer to [HA-26. "Perform Oil Return Operation"](#). (If refrigerant or lubricant leakage is detected in a large amount, omit this step, and then GO TO 2.)

CAUTION:

Do not perform lubricant return operation if a large amount of refrigerant or lubricant 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 lubricant, etc.
7. Refrigerant recycle operation is complete.

Charge Refrigerant

INFOID:000000006923504

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 lubricant 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. Connect recovery/recycling/recharging equipment to the A/C service valve.

REFRIGERANT

< BASIC INSPECTION >

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 rises more than the specified level, charge A/C system with approximately 200 g (0.4 lb) refrigerant and check that there is no refrigerant leakage. Refer to [HA-22. "Leak Test"](#).
CAUTION:
Check the air tightness for 15 minutes or more if the parts are replaced.
4. If parts other than compressor are replaced, fill compressor lubricant 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.

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OIL

< BASIC INSPECTION >

OIL

Description

INFOID:000000006923505

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)

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

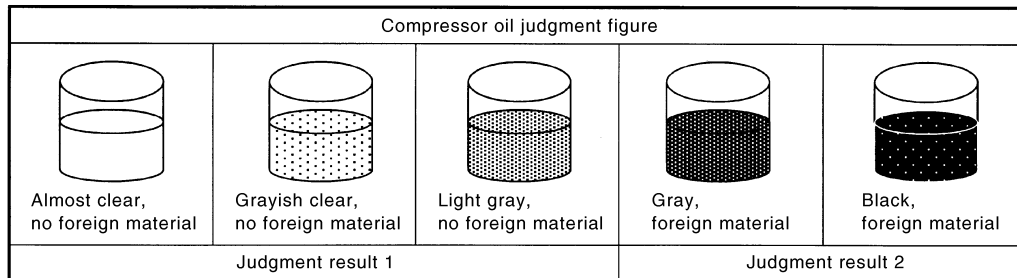
Inspection

INFOID:000000006923506

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

1. COMPRESSOR OIL JUDGMENT

1. Remove the compressor. Refer to [HA-50, "Removal and Installation for A/C Compressor - VQ40DE"](#) or [HA-54, "Removal and Installation for A/C Compressor - VK56DE"](#).
2. Sample a compressor oil and judge on the figure.



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Judgement result 1>>Replace compressor only.

Judgement result 2>>Replace compressor and liquid tank.

Perform Oil Return Operation

INFOID:000000006923507

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 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:000000006923508

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 [mℓ (US fl oz, Imp fl oz)] = 35
(1.2, 1.2) + 20 (0.7, 0.7) + 5 (0.2, 0.2) + α

OIL

< BASIC INSPECTION >

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

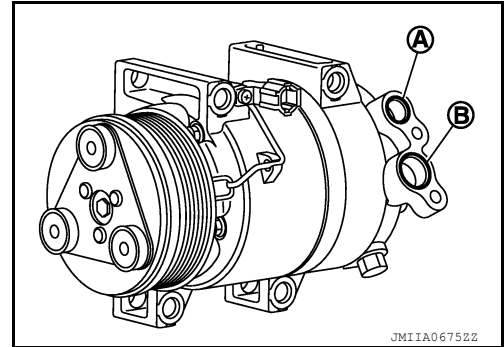
Oil Adjusting Procedure for Compressor Replacement

INFOID:000000006923509

1. Drain oil from removed compressor and measure oil amount.
 1. Drain oil from high-pressure port (A) and low-pressure port (B) while rotating magnet clutch.
 2. Measure total amount of oil that is drained from removed compressor.

NOTE:

VK56DE shown, VQ40DE similar.



2. Drain oil from a new compressor that is calculated according to the following conditions.

Amount to be drained (A) [m ℓ (US fl oz, Imp fl oz)]
 $= F - (D + S + R + \alpha)$

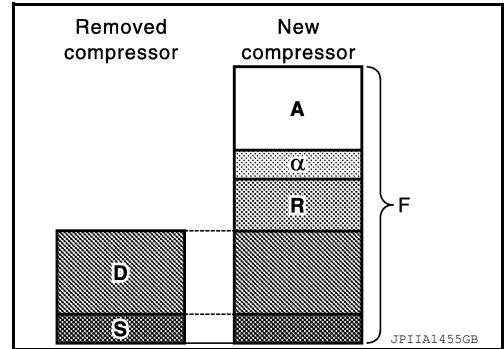
F : Oil amount that a new compressor contains
 [210 (7.1)]

D : Oil amount that is drained from removed compressor

S : Oil amount that remains inside of removed compressor [20 (0.7)]

R : Oil amount to be added according to components that are removed except compressor

α : Oil amount that is recycled together with refrigerant during recycle operation



CAUTION:

If oil amount that is drained from removed compressor is less than 60 m ℓ (2.0 US fl oz, 2.1 Imp fl oz), perform calculation by setting "D" as 40 m ℓ (1.4 US fl oz, 1.4 Imp fl oz).

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)
Replace liquid tank	5 (0.2, 0.2)

Example: Oil amount to be drained from a new compressor when replacing compressor and liquid tank [m ℓ (US fl oz, Imp fl oz)] [D = 60 (2.0, 2.1), α = 5 (0.2, 0.2)]
 $210 (7.1, 7.4) - [60 (2.0, 2.1) + 20 (0.7, 0.7) + 5 (0.2) + 5 (0.2, 0.2)] = 120 (4.1, 4.2)$

3. Install compressor and check the operation.

PERFORMANCE TEST

< BASIC INSPECTION >

PERFORMANCE TEST

Inspection

INFOID:000000006923510

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 (front)	Temperature control switch or dial	Full cold
	A/C switch	ON
	Air outlet	VENT (ventilation)
	Intake door position	Recirculation
	Fan 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-28, "Inspection"](#).

RECIRCULATING-TO-DISCHARGE AIR TEMPERATURE TABLE

FRONT

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)	6.8 - 8.8 (44 - 48)
	25 (77)	10.4 - 12.9 (51 - 55)
	30 (86)	13.9 - 16.9 (57 - 63)
	35 (95)	17.3 - 20.8 (63 - 70)
60 – 70	20 (68)	8.8 - 10.8 (48 - 52)
	25 (77)	12.9 - 15.4 (55 - 60)
	30 (86)	16.9 - 19.9 (63 - 68)
	35 (95)	20.8 - 24.3 (70 - 76)

AMBIENT AIR TEMPERATURE-TO-OPERATING PRESSURE TABLE

PERFORMANCE TEST

< BASIC INSPECTION >

Fresh air		High-pressure (Discharge side) kPa (kg/cm ² , psi)	Low-pressure (Suction side) kPa (kg/cm ² , psi)
Relative humidity %	Air temperature °C (°F)		
50 – 70	25 (77)	1,106 - 1,351 (11.28 - 13.79, 160.3 - 196)	243 - 297 (2.48 - 3.03, 35.3 - 43.1)
	30 (86)	1,306 - 1,596 (13.32 - 16.28, 189.4 - 231.5)	280 - 342 (2.86 - 3.49, 40.6 - 49.6)
	35 (95)	1,555 - 1,900 (15.86 - 19.38, 225.4 - 275.5)	323 - 394 (3.29 - 4.02, 46.8 - 57.2)
	40 (104)	1,734 - 2,119 (17.68 - 21.61, 251.4 - 307.2)	348 - 425 (3.55 - 4.33, 50.4 - 61.6)

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HEATER AND AIR CONDITIONING SYSTEM SYMPTOMS

< SYMPTOM DIAGNOSIS >

SYMPTOM DIAGNOSIS

HEATER AND AIR CONDITIONING SYSTEM SYMPTOMS

Symptom Table

INFOID:000000007274914

SYMPTOM TABLE

Symptom	Reference Page
A/C system does not come on.	Go to Trouble Diagnosis Procedure for A/C System. HAC-205 (manual A/C) HAC-102 (automatic A/C)
A/C system cannot be controlled.	Go to Self-diagnosis Function. HAC-162 (manual A/C) HAC-50 (automatic A/C)
Front air outlet does not change.	Go to Trouble Diagnosis Procedure for Front Mode Door Motor. HAC-179 (manual A/C) HAC-76 (automatic A/C)
Front mode door motor is malfunctioning.	
Rear air outlet does not change.	Go to Trouble Diagnosis Procedure for Rear Mode Door Motor. HAC-188 (manual A/C) HAC-85 (automatic A/C)
Rear mode door motor is malfunctioning.	
Front discharge air temperature does not change.	Go to Trouble Diagnosis Procedure for Front Air Mix Door Motor. HAC-176 (manual A/C) HAC-71 (automatic A/C driver side) HAC-73 (automatic A/C passenger side)
Front air mix door motor is malfunctioning.	
Rear discharge air temperature does not change.	Go to Trouble Diagnosis Procedure for Rear Air Mix Door Motor. HAC-186 (manual A/C) HAC-83 (automatic A/C)
Rear air mix door motor is malfunctioning.	
Intake door does not change.	Go to Trouble Diagnosis Procedure for Intake Door Motor. HAC-180 (manual A/C) HAC-77 (automatic A/C)
Intake door motor is malfunctioning.	
Front blower motor operation is malfunctioning.	Go to Trouble Diagnosis Procedure for Front Blower Motor. HAC-190 (manual A/C) HAC-87 (automatic A/C)
Rear blower motor operation is malfunctioning.	Go to Trouble Diagnosis Procedure for Rear Blower Motor. HAC-195 (manual A/C) HAC-92 (automatic A/C)
Magnet clutch does not engage.	Go to Trouble Diagnosis Procedure for Magnet Clutch. HAC-203 (manual A/C) HAC-100 (automatic A/C)
Insufficient cooling.	Go to Trouble Diagnosis Procedure for Insufficient Cooling. HAC-208 (manual A/C) HAC-106 (automatic A/C)
Insufficient heating.	Go to Trouble Diagnosis Procedure for Insufficient Heating. HAC-210 (manual A/C) HAC-108 (automatic A/C)
Noise.	Go to Trouble Diagnosis Procedure for Noise. HA-38
A/C switch LED does not illuminate.	Go to Trouble Diagnosis Procedure for A/C System. HAC-205 (manual A/C) HAC-102 (automatic A/C)
Front air control mode button LED(s) does not illuminate.	Go to Trouble Diagnosis Procedure for A/C System. HAC-205 (manual A/C) HAC-102 (automatic A/C)
REC button LED does not illuminate.	Go to Trouble Diagnosis Procedure for A/C System. HAC-205 (manual A/C) HAC-102 (automatic A/C)
REC or FRE button LED does not illuminate.	Go to Trouble Diagnosis Procedure for A/C System. HAC-205 (manual A/C) HAC-102 (automatic A/C)
All LEDs and illumination lamps are at full brightness.	Go to Trouble Diagnosis Procedure for A/C System. HAC-205 (manual A/C) HAC-205 (automatic A/C)
Both high- and low-pressure sides are too high.	Go to Trouble Diagnosis Procedure for Abnormal Pressure. HA-32
High-pressure side is too high and low-pressure side is too low.	Go to Trouble Diagnosis Procedure for Abnormal Pressure. HA-33

HEATER AND AIR CONDITIONING SYSTEM SYMPTOMS

< SYMPTOM DIAGNOSIS >

Symptom	Reference Page	
High-pressure side is too low and low-pressure side is too high.	Go to Trouble Diagnosis Procedure for Abnormal Pressure.	HA-34
Both high- and low-pressure side sometimes becomes negative.	Go to Trouble Diagnosis Procedure for Abnormal Pressure.	HA-35
Low-pressure side sometimes becomes negative.	Go to Trouble Diagnosis Procedure for Abnormal Pressure.	HA-36
Low-pressure side becomes negative.	Go to Trouble Diagnosis Procedure for Abnormal Pressure.	HA-37

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HA

BOTH HIGH- AND LOW-PRESSURE SIDES ARE TOO HIGH

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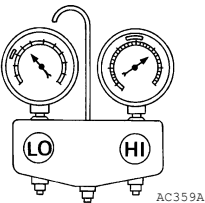
BOTH HIGH- AND LOW-PRESSURE SIDES ARE TOO HIGH

Component Function Check

INFOID:000000007005659

Whenever system's high and/or low side pressure is abnormal, 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 [HA-28. "Inspection"](#) (Ambient air temperature-to-operating pressure table).

Both High- and Low-pressure Sides are Too High

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
<p>A Both high- and low-pressure sides are too high.</p> 	<p>Pressure is reduced soon after water is splashed on condenser.</p>	<p>Excessive refrigerant charge in refrigeration cycle</p>	<p>Reduce refrigerant until specified pressure is obtained.</p>
	<p>Air suction by cooling fan is insufficient.</p>	<p>Insufficient condenser cooling performance ↓ 1. Condenser fins are clogged. 2. Improper fan rotation of cooling fan</p>	<ul style="list-style-type: none"> • Clean condenser. • Check and repair cooling fan if necessary.
	<ul style="list-style-type: none"> • Low-pressure pipe is not cold. • When A/C compressor is stopped high-pressure value quickly drops by approximately 196 kPa (2 kg/cm², 28 psi). It then decreases gradually thereafter. 	<p>Poor heat exchange in condenser (After A/C compressor operation stops, high-pressure decreases too slowly.) ↓ Air in refrigeration cycle</p>	<p>Evacuate and recharge system.</p>
	<p>Engine tends to overheat.</p>	<p>Engine cooling systems malfunction.</p>	<p>Check and repair engine cooling system.</p>
	<ul style="list-style-type: none"> • An area of the low-pressure pipe is colder than areas near the evaporator outlet. • Plates are sometimes covered with frost. 	<ul style="list-style-type: none"> • Excessive liquid refrigerant on low-pressure side • Excessive refrigerant discharge flow • Expansion valve is open a little compared with the specification. <p>↓ Improper expansion valve adjustment</p>	<p>Replace expansion valve. Refer to HA-75. "Removal and Installation - Front Expansion Valve".</p>

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

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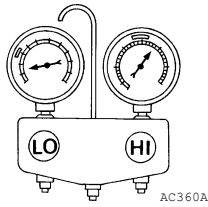
HIGH-PRESSURE SIDE IS TOO HIGH AND LOW-PRESSURE SIDE IS TOO LOW

Component Function Check

INFOID:000000007005661

Whenever system's high and/or low side pressure is abnormal, 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 [HA-28. "Inspection"](#) (Ambient air temperature-to-operating pressure table).

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

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

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HA

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

< SYMPTOM DIAGNOSIS >

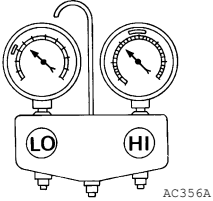
HIGH-PRESSURE SIDE IS TOO LOW AND LOW-PRESSURE SIDE IS TOO HIGH

Component Function Check

INFOID:000000007005662

Whenever system's high and/or low side pressure is abnormal, 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 [HA-28. "Inspection"](#) (Ambient air temperature-to-operating pressure table).

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

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
<p>C High-pressure side is too low and low-pressure side is too high.</p>  <p>AC356A</p>	<p>High- and low-pressure sides become equal soon after A/C compressor operation stops.</p>	<p>A/C compressor pressure operation is improper. ↓ Damaged inside A/C compressor packings.</p>	<p>Replace A/C compressor. Refer to HA-50. "Removal and Installation for A/C Compressor - VQ40DE" or HA-54. "Removal and Installation for A/C Compressor - VK56DE".</p>
	<p>No temperature difference between high- and low-pressure sides.</p>	<p>A/C compressor pressure operation is improper. ↓ Damaged inside A/C compressor packings.</p>	<p>Replace A/C compressor. Refer to HA-50. "Removal and Installation for A/C Compressor - VQ40DE" or HA-54. "Removal and Installation for A/C Compressor - VK56DE".</p>

BOTH HIGH- AND LOW-PRESSURE SIDES ARE TOO LOW

< SYMPTOM DIAGNOSIS >

BOTH HIGH- AND LOW-PRESSURE SIDES ARE TOO LOW

Component Function Check

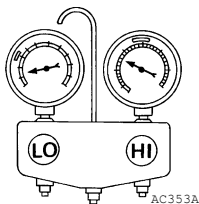
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Whenever system's high and/or low side pressure is abnormal, diagnose using a manifold gauge. The marker above the gauge scale in the following tables indicates the standard (usual) pressure range. Since the standard (usual) pressure, however, differs from vehicle to vehicle, refer to [HA-28. "Inspection"](#) (Ambient air temperature-to-operating pressure table).

Both High- and Low-pressure Sides are Too Low

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
	<ul style="list-style-type: none"> There is a big temperature difference between liquid tank outlet and inlet. Outlet temperature is extremely low. Liquid tank inlet and expansion valve are frosted. 	Liquid tank inside is slightly clogged.	<ul style="list-style-type: none"> Replace liquid tank. Refer to HA-72. "Removal and Installation". Check oil for contamination.
	<ul style="list-style-type: none"> Temperature of expansion valve inlet is extremely low as compared with areas near liquid tank. Expansion valve inlet may be frosted. Temperature difference occurs somewhere in high-pressure side. 	High-pressure pipe located between liquid tank and expansion valve is clogged.	<ul style="list-style-type: none"> Check and repair malfunctioning parts. Check oil for contamination.
	Expansion valve and liquid tank are warm or only cool when touched.	Low refrigerant charge. ↓ Leaking fittings or components.	Check refrigerant system for leaks. Refer to HA-22. "Leak Test" .
	There is a big temperature difference between expansion valve inlet and outlet while the valve itself is frosted.	Expansion valve closes a little compared with the specification. ↓ 1. Improper expansion valve adjustment. 2. Malfunctioning expansion valve. 3. Outlet and inlet may be clogged.	<ul style="list-style-type: none"> Remove foreign particles by using compressed air. Check oil for contamination.
	An area of the low-pressure pipe is colder than areas near the evaporator outlet.	Low-pressure pipe is clogged or crushed.	<ul style="list-style-type: none"> Check and repair malfunctioning parts. Check oil for contamination.
	Airflow volume is too low.	Evaporator is frozen.	<ul style="list-style-type: none"> Check intake sensor circuit. Refer to HAC-148. "Wiring Diagram". Repair evaporator fins. Replace evaporator. Refer to HA-73. "Removal and Installation - Front Evaporator".

D
Both high- and low-pressure sides are too low.



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LOW-PRESSURE SIDE SOMETIMES BECOMES NEGATIVE

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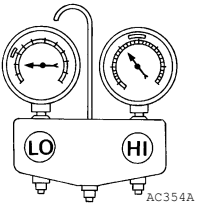
LOW-PRESSURE SIDE SOMETIMES BECOMES NEGATIVE

Component Function Check

INFOID:000000007005663

Whenever system's high and/or low side pressure is abnormal, 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 [HA-28. "Inspection"](#) (Ambient air temperature-to-operating pressure table).

Low-pressure Side Sometimes Becomes Negative

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
<p>E Low-pressure side sometimes becomes negative.</p>  <p>AC354A</p>	<ul style="list-style-type: none"> • Air conditioning system does not function and does not cyclically cool the compartment air. • The system constantly functions for a certain period of time after A/C compressor is stopped and restarted. 	<p>Refrigerant does not discharge cyclically.</p> <p>↓</p> <p>Moisture is frozen at expansion valve outlet and inlet.</p> <p>↓</p> <p>Water is mixed with refrigerant.</p>	<ul style="list-style-type: none"> • Drain water from refrigerant or replace refrigerant. • Replace liquid tank. Refer to HA-72. "Removal and Installation".

LOW-PRESSURE SIDE BECOMES NEGATIVE

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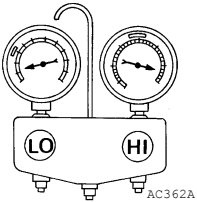
LOW-PRESSURE SIDE BECOMES NEGATIVE

Component Function Check

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Whenever system's high and/or low side pressure is abnormal, 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 [HA-28. "Inspection"](#) (Ambient air temperature-to-operating pressure table).

Low-pressure Side Becomes Negative

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
<p>F Low-pressure side becomes negative.</p>  <p>AC362A</p>	<p>Liquid tank or front/rear side of expansion valve's pipe is frosted or dewed.</p>	<p>High-pressure side is closed and refrigerant does not flow. ↓ Expansion valve or liquid tank is frosted.</p>	<p>Leave the system at rest until no frost is present. Start it again to check whether or not the malfunction is caused by water or foreign particles.</p> <ul style="list-style-type: none"> If water is the cause, initially cooling is okay. Then the water freezes causing a blockage. Drain water from refrigerant or replace refrigerant. If due to foreign particles, remove expansion valve and remove the particles with dry and compressed air (not shop air). If either of the above methods cannot correct the malfunction, replace expansion valve. Replace liquid tank. Refer to HA-72. "Removal and Installation". Check oil for contamination.

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NOISE

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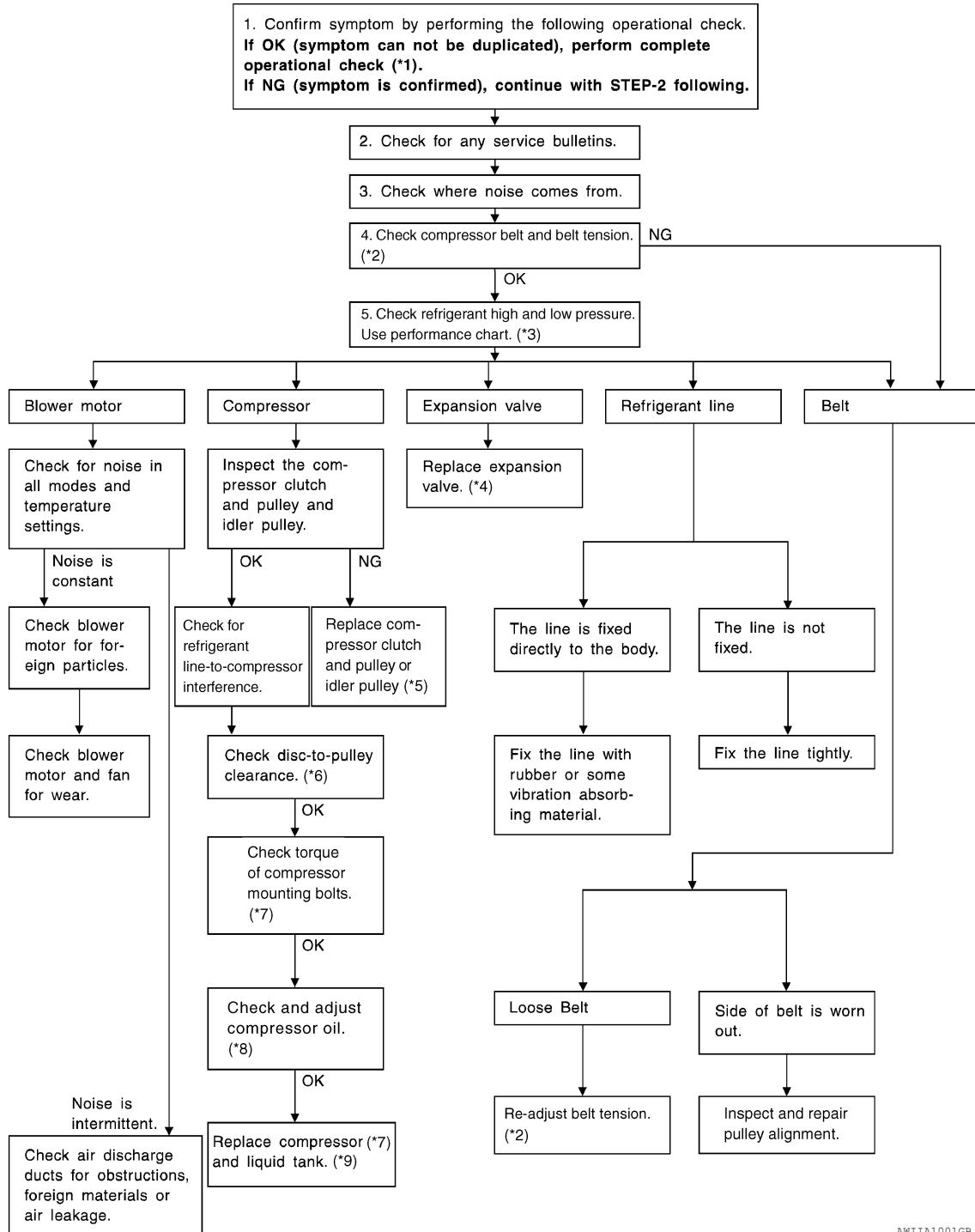
NOISE

Component Function Check

INFOID:000000006921759

SYMPTOM: Noise

INSPECTION FLOW



AWI1A1001GB

NOISE

< SYMPTOM DIAGNOSIS >

*1	HAC-164. "FRONT MANUAL AIR CONDITIONING SYSTEM : Work Procedure"	*2	EM-13. "Checking Drive Belts" (VQ40DE) or EM-152. "Checking Drive Belts" (VK56DE).EM-152. "Checking Drive Belts".	*3	EM-13. "Checking Drive Belts" (VQ40DE) or EM-152. "Checking Drive Belts" (VK56DE).EM-152. "Checking Drive Belts".	A
*4	HA-75. "Removal and Installation - Front Expansion Valve"	*5	HA-51. "Removal and Installation for Compressor Clutch - VQ40DE" or HA-56. "Removal and Installation for Compressor Clutch - VK56DE".	*6	HA-51. "Removal and Installation for Compressor Clutch - VQ40DE" or HA-56. "Removal and Installation for Compressor Clutch - VK56DE"	B
*7	HA-50. "Removal and Installation for A/C Compressor - VQ40DE" or HA-54. "Removal and Installation for A/C Compressor - VK56DE".	*8	HA-50. "Removal and Installation for A/C Compressor - VQ40DE" or HA-54. "Removal and Installation for A/C Compressor - VK56DE".	*9	HA-70. "CONDENSER : Removal and Installation"	C
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REFRIGERATION SYSTEM

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PERIODIC MAINTENANCE

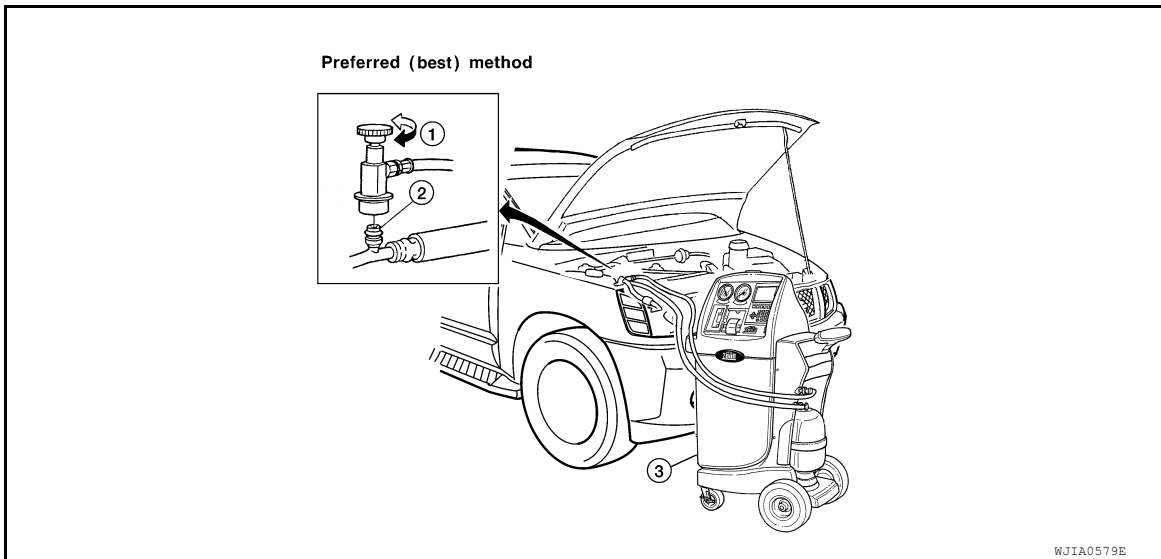
REFRIGERATION SYSTEM

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

INFOID:000000006749334

SETTING OF SERVICE TOOLS AND EQUIPMENT

Discharging Refrigerant



1. Shut-off valve

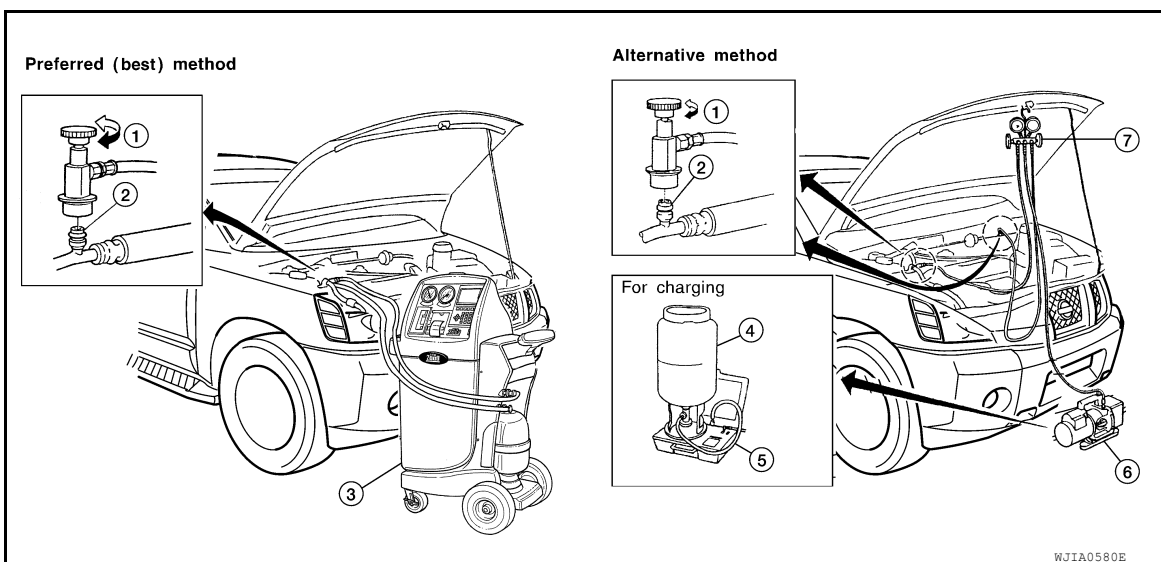
2. A/C service valve

3. Recovery/recycling equipment

WARNING:

Avoid breathing A/C refrigerant and oil vapor or mist. Exposure may irritate eyes, nose and throat. Remove HFC-134a (R-134a) refrigerant from the A/C system using certified service equipment meeting requirements of SAE J2210 HFC-134a (R-134a) recycling equipment or SAE J2201 HFC-134a (R-134a) recovery equipment. If an accidental system discharge occurs, ventilate the work area before resuming service. Additional health and safety information may be obtained from the refrigerant and oil manufacturers.

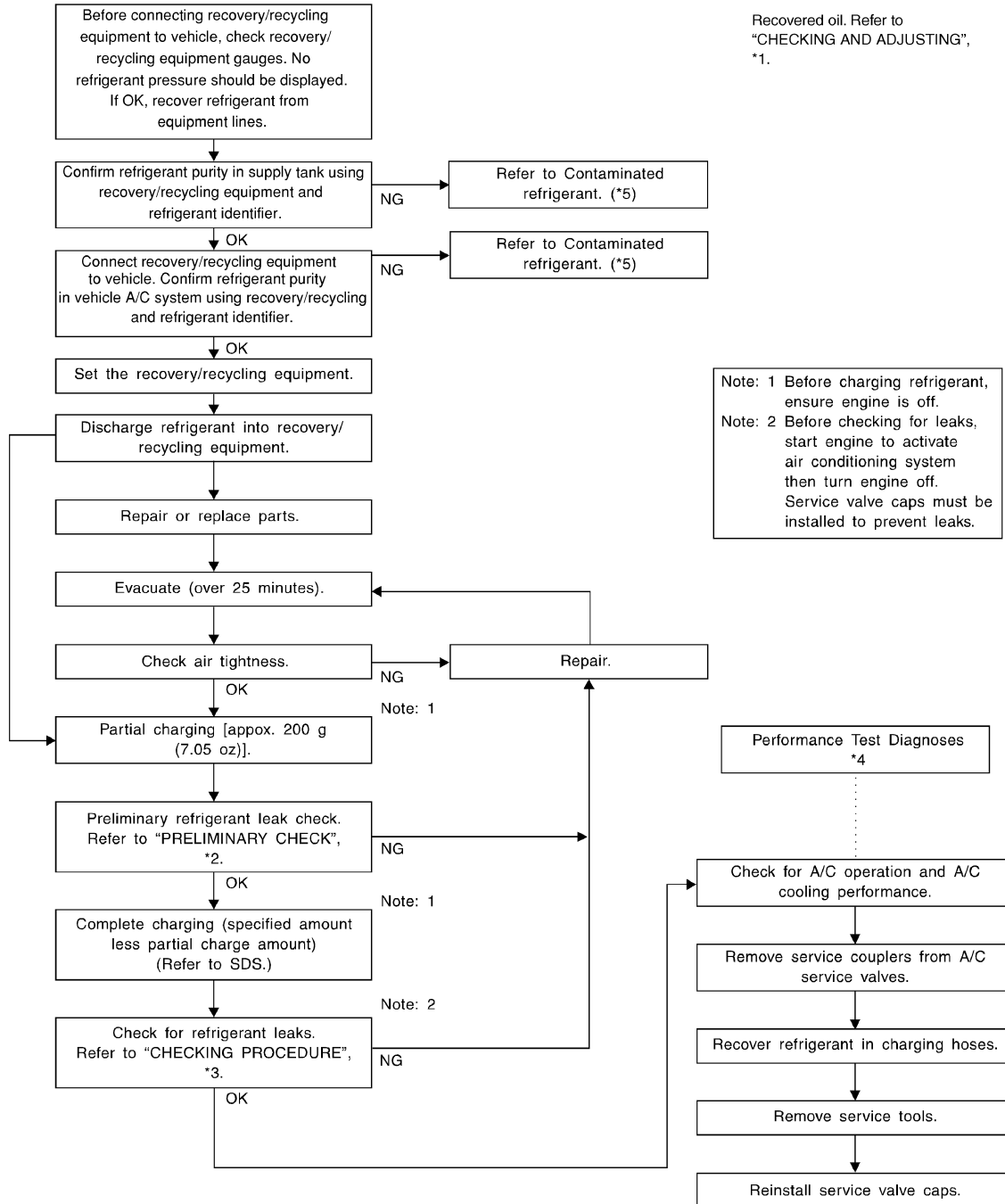
Evacuating System and Charging Refrigerant



REFRIGERATION SYSTEM

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| 1. Shut-off valve | 2. A/C service valve | 3. Recovery/recycling equipment |
| 4. Refrigerant container (HFC-134a) | 5. Weight scale | 6. Evacuating vacuum pump |
| 7. Manifold gauge set | | |



*1 [HA-42. "Maintenance of Oil Quantity in Compressor"](#)

*2 [HA-45. "Checking of Refrigerant Leaks"](#)

*3 [HA-45. "Checking of Refrigerant Leaks"](#)

*4 [HA-30. "Symptom Table"](#)

*5 [HA-26. "Inspection"](#)

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OIL

< PERIODIC MAINTENANCE >

OIL

Maintenance of Oil Quantity in Compressor

INFOID:000000006749335

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

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

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

OIL

Name: NISSAN A/C System Oil Type S or equivalent


CHECKING AND ADJUSTING

CAUTION:

If excessive oil leakage is noted, do not perform the oil return operation.

Start the engine and set the following conditions:

Test Condition

- **Engine speed: Idling to 1,200 rpm**
- **A/C switch: On**
- **Blower fan speed: MAX position**
- **Temp. control: Optional [Set so that intake air temperature is 25° to 30° C (77° to 86°F)]**
- **Intake position: Recirculation ()**
- **Perform oil return operation for about ten minutes**

Adjust the oil quantity according to the following table.

Oil Adjusting Procedure for Components Replacement Except Compressor

After replacing any of the following major components, add the correct amount of oil to the system.

Amount of Oil to be Added

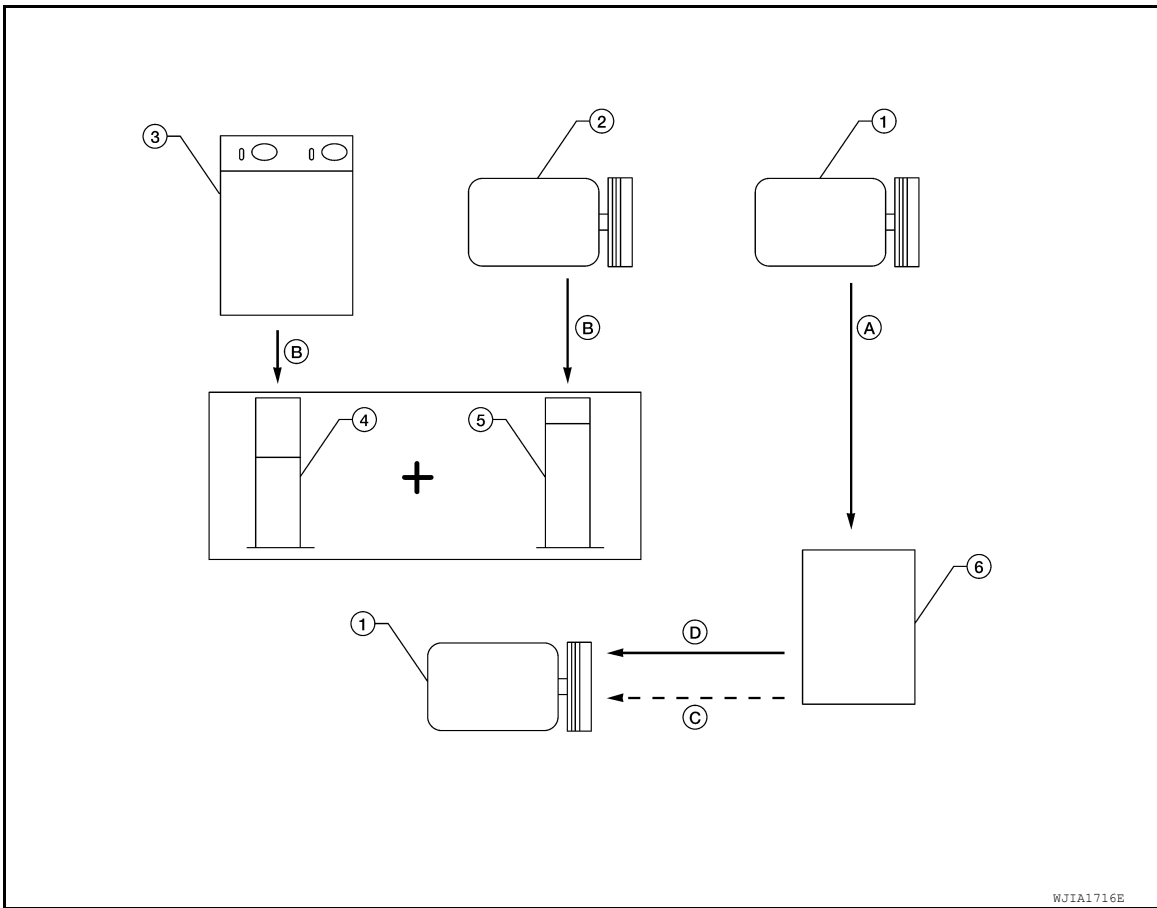
Part replaced	Oil to be added to system	Remarks
	Amount of oil mℓ (US fl oz, Imp fl oz)	
Evaporator	75 (2.5, 2.6)	—
Condenser	75 (2.5, 2.6)	—
Liquid tank	5 (0.2, 0.2)	Add if compressor is not replaced.
In case of refrigerant leak	30 (1.0, 1.1)	Large leak
	—	Small leak *1

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

Oil Adjustment Procedure for Compressor Replacement

OIL

< PERIODIC MAINTENANCE >



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|---|-----------------------------------|---|
| 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 mℓ (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 | | |

1. 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.
2. Connect recovery/recycling equipment to vehicle. Confirm refrigerant purity in supply tank using recovery/recycling equipment and refrigerant identifier. If NG, refer to [HA-42. "Maintenance of Oil Quantity in Compressor"](#).
3. Confirm refrigerant purity in vehicle A/C system using recovery/recycling equipment and refrigerant identifier. If NG, refer to [HA-42. "Maintenance of Oil Quantity in Compressor"](#).
4. Discharge refrigerant into the refrigerant recovery/recycling equipment. Measure oil discharged into the recovery/recycling equipment.
5. Drain the oil from the "old" (removed) compressor into a graduated container and recover the amount of oil drained.
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.
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.

CAUTION:

OIL

< PERIODIC MAINTENANCE >

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

FLUORESCENT LEAK DETECTOR

< PERIODIC MAINTENANCE >

FLUORESCENT LEAK DETECTOR

Checking of Refrigerant Leaks

INFOID:000000006749336

PRELIMINARY CHECK

Perform a visual inspection of all refrigeration parts, fittings, hoses and components for signs of A/C oil leakage, damage, and corrosion. Any A/C oil leakage may indicate an area of refrigerant leakage. Allow extra inspection time in these areas when using either an electronic refrigerant leak detector (J-41995) or fluorescent dye leak detector (J-42220).

If any dye is observed using a fluorescent dye leak detector (J-42220), confirm the leak using a electronic refrigerant leak detector (J-41995). It is possible that the dye is from a prior leak that was repaired and not properly cleaned.

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

When searching for refrigerant leaks using an electronic refrigerant leak detector (J-41995), move the probe along the suspected leak area at 25 - 50 mm (1 - 2 in) per second and no further than 6 mm (1/4 in) from the component.

CAUTION:

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

Checking System for Leaks Using the Fluorescent Dye Leak Detector

INFOID:000000006749337

1. Check the A/C system for leaks using the fluorescent dye leak detector and safety goggles (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 leak (tubes, core or expansion valve).
2. If the suspected area is difficult to see, use an adjustable mirror or wipe the area with a clean shop rag or cloth, then inspect the shop rag or cloth with the fluorescent dye leak detector (J-42220) for dye residue.
3. After the leak is repaired, remove any residual dye using refrigerant dye cleaner (J-43872) to prevent future misdiagnosis.
4. Perform a system performance check and then verify the leak repair using a electronic refrigerant leak detector (J-41995).

NOTE:

- Other gases in the work area or substances on the A/C components, for example, anti-freeze, windshield washer fluid, solvents and oils, 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 electronic refrigerant leak detector (J-41995) to contact with any substance. This can also cause false readings and may damage the detector.

Dye Injection

INFOID:000000006749338

NOTE:

This procedure is only necessary when recharging the system or when the compressor has seized and must be replaced.

1. Check the A/C system static (at rest) pressure. Pressure must be at least 345 kPa (3.52 kg/cm², 50 psi).
2. Pour one bottle 7.4 cc (1/4 ounce) of the HFC-134a (R-134a) fluorescent leak detection dye (J-41447) into the HFC-134a (R-134a) dye injector (J-41459).

CAUTION:

If repairing the A/C system or replacing a component, pour the HFC-134a (R-134a) fluorescent leak detection dye (J-41447) directly into the open system connection and proceed with the service procedures.

3. Connect the refrigerant dye injector (J-41459) to the low-pressure service valve.
4. Start the engine and switch the A/C system ON.
5. When the A/C system is operating (compressor running), inject one bottle 7.4 cc (1/4 ounce) of HFC-134a (R-134a) fluorescent leak detection dye (J-41447) through the low-pressure service valve using HFC-134a (R-134a) dye injector (J-41459). Refer to the manufacturer's operating instructions.

FLUORESCENT LEAK DETECTOR

< PERIODIC MAINTENANCE >

6. With the engine still running, disconnect the HFC-134a (R-134a) dye injector (J-41459) from the low-pressure service valve.
7. Operate the A/C system for a minimum of 20 minutes to mix the HFC-134a (R-134a) fluorescent leak detection dye (J-41447) with the A/C system oil. Depending on the leak size, operating conditions and location of the leak, it may take from minutes to days for the HFC-134a (R-134a) fluorescent leak detection dye to penetrate an A/C system leak and become visible.

ELECTRICAL LEAK DETECTOR

< PERIODIC MAINTENANCE >

ELECTRICAL LEAK DETECTOR

Checking of Refrigerant Leaks

INFOID:000000006749339

PRELIMINARY CHECK

Perform a visual inspection of all refrigeration parts, fittings, hoses and components for signs of A/C oil leakage, damage, and corrosion. Any A/C oil leakage may indicate an area of refrigerant leakage. Allow extra inspection time in these areas when using either an electronic refrigerant leak detector (J-41995) or fluorescent dye leak detector (J-42220).

If any dye is observed using a fluorescent dye leak detector (J-42220), confirm the leak using a electronic refrigerant leak detector (J-41995). It is possible that the dye is from a prior leak that was repaired and not properly cleaned.

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

When searching for refrigerant leaks using an electronic refrigerant leak detector (J-41995), move the probe along the suspected leak area at 25 - 50 mm (1 - 2 in) per second and no further than 6 mm (1/4 in) from the component.

CAUTION:

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

Electronic Refrigerant Leak Detector

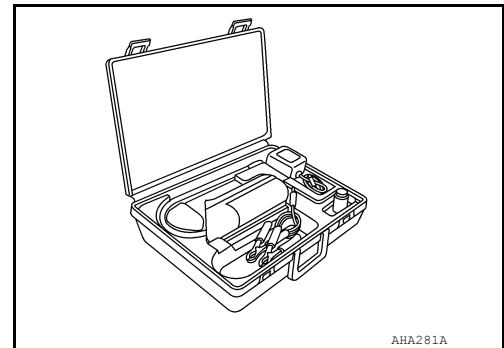
INFOID:000000006749340

PRECAUTIONS FOR HANDLING LEAK DETECTOR

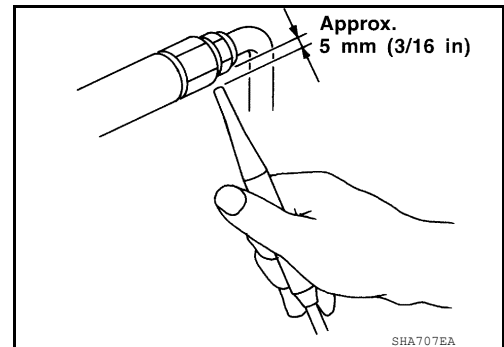
NOTE:

When performing a refrigerant leak check, use a electronic refrigerant leak detector (J-41995) or equivalent. Ensure that the electronic refrigerant leak detector (J-41995) is calibrated and set properly according to the manufacturer's operating instructions.

The electronic refrigerant leak detector (J-41995) is a delicate device. To use the electronic refrigerant leak detector (J-41995) properly, read the manufacturer's operating instructions and perform any specified maintenance.



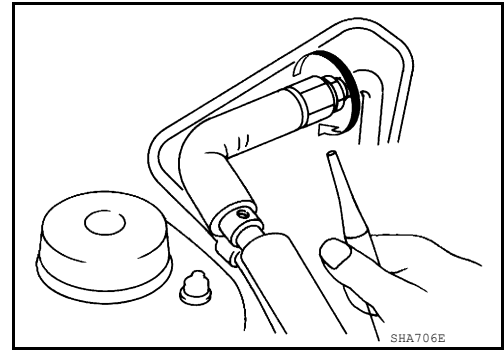
1. Position the probe approximately 5 mm (3/16 in) away from the point to be checked as shown.



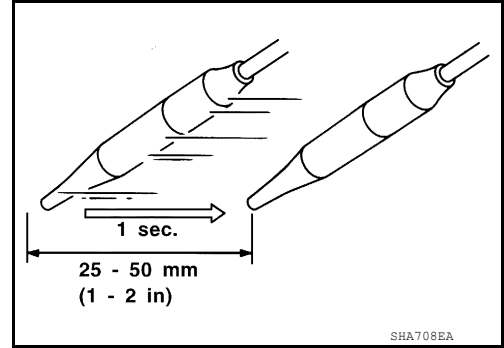
ELECTRICAL LEAK DETECTOR

< PERIODIC MAINTENANCE >

- When checking for leaks, circle each fitting completely with the probe as shown.



- Move the probe along each component at a speed of approximately 25 - 50 mm (1 - 2 in)/second as shown.



CHECKING PROCEDURE

NOTE:

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 a calm area (low air/wind movement) so that the leaking refrigerant is not dispersed.

- Turn the engine OFF.
- Connect the manifold gauge set to the A/C service ports. Refer to [HA-24, "Charge Refrigerant"](#).
- Check if the A/C refrigerant pressure is at least 345 kPa (3.52 kg/cm², 50 psi) above a temperature of 16°C (61°F). If less than specification, recover/evacuate and recharge the system with the specified amount of refrigerant. Refer to [HA-40, "HFC-134a \(R-134a\) Service Procedure"](#).

NOTE:

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

- Perform the leak test from the high-pressure side (A/C compressor discharge to evaporator inlet) to the low-pressure side (A/C evaporator drain hose to shaft seal). Refer to [HA-28, "Inspection"](#). Clean the component to be checked and carefully move the electronic refrigerant leak detector probe completely around the following connections and components.
 - Check the compressor shaft seal
 - Check the high and low-pressure pipe and hose fittings, relief valve, and compressor shaft seal
 - Check the liquid tank
 - Check the refrigerant pressure sensor
 - Check all around the service valves. Check that the service valve caps are screwed tightly on the service valves (to prevent leaks).

NOTE:

After removing manifold gauge set from the service valves, wipe any residue from the service valves to prevent any false readings by the electronic refrigerant leak detector (J-41995).

- Evaporator

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

NOTE:

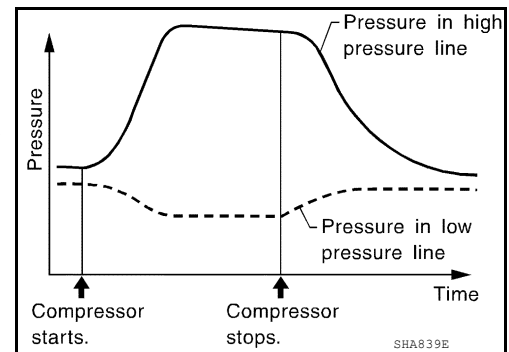
Keep the probe inserted for at least 10 seconds. Use caution not to contaminate the probe tip with water or dirt that may be in the drain hose.

ELECTRICAL LEAK DETECTOR

< PERIODIC MAINTENANCE >

5. If a leak is detected, verify at least once by blowing compressed air into the area of the suspected leak, then repeat the leak check.
6. Do not stop when one leak is found. Continue to check for additional leaks at all system components and connections.
7. If no leaks are found, perform steps 8 - 11.
8. Start the engine.
9. Set the heater A/C controls as follows:
NOTE:
For the automatic system, turn OFF the automatic controls and set the heater A/C controls manually.
 - a. A/C switch to ON
 - b. Air flow to VENT mode
 - c. Intake position to RECIRCULATION mode
 - d. Temperature to MAX cold
 - e. Blower fan speed to HIGH
10. Run the engine at 1,500 rpm for at least 2 minutes.

11. Turn the engine OFF and perform the leak check again following steps 4 through 6 above.
Refrigerant leaks should be checked immediately after turning the engine OFF. Begin with the leak detector at the compressor. The pressure on the high pressure side will gradually drop after the 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 the pressure is high.



12. Before connecting the recovery/recycling equipment to the vehicle, check the recovery/recycling equipment gauges. No refrigerant pressure should be displayed. If pressure is displayed, recover the refrigerant from the equipment lines and then check the refrigerant purity.
13. Confirm refrigerant purity in supply tank using recovery/recycling equipment and refrigerant identifier equipment (J-41810-NI).
14. Confirm the refrigerant purity in the vehicle's A/C system using recovery/recycling equipment and refrigerant identifier equipment (J-41810-NI).
15. Discharge the A/C system using recovery/recycling equipment. Repair the leaking fitting or component as necessary.
16. Evacuate and recharge the A/C system and perform the leak test to confirm that there are no refrigerant leaks.
17. Conduct the Operational Check to ensure system works properly. Refer to [HA-20, "Workflow"](#).

COMPRESSOR

< REMOVAL AND INSTALLATION >

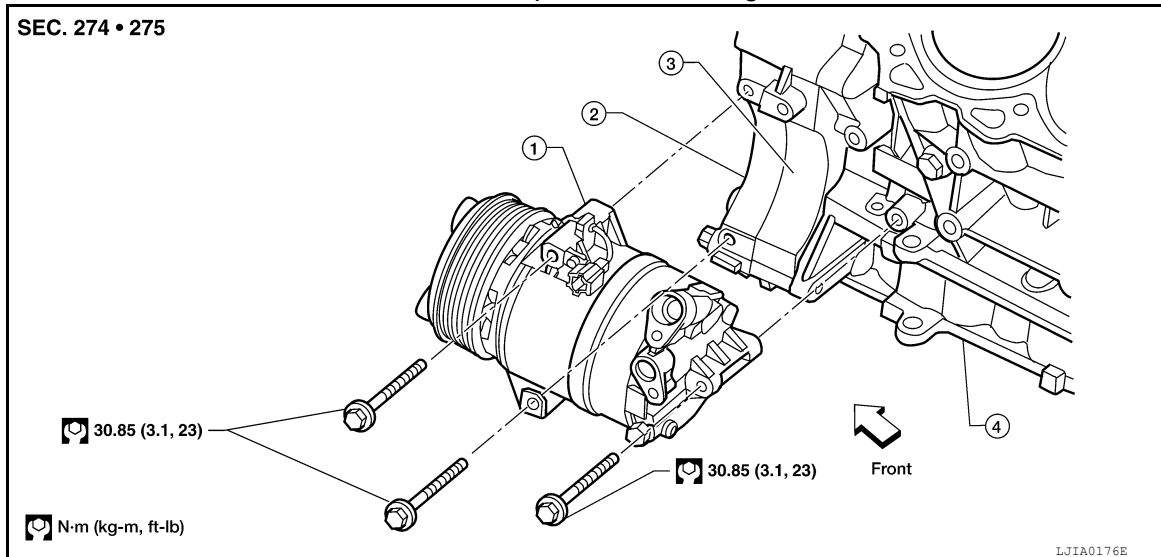
REMOVAL AND INSTALLATION

COMPRESSOR

Removal and Installation for A/C Compressor - VQ40DE

INFOID:000000006749342

A/C Compressor Mounting



1. Compressor
2. Front timing chain case
3. Rear timing chain case
4. Cylinder block

REMOVAL

1. Discharge the refrigerant. Refer to [HA-40. "HFC-134a \(R-134a\) Service Procedure"](#).
2. Release the drive belt from the A/C pulley. Refer to [EM-13. "Removal and Installation"](#).
3. Disconnect the high-pressure flexible hose from the compressor.

NOTE:

To prevent contamination, cap the high-pressure flexible hose and port on compressor.

4. Disconnect the harness connector from the compressor.
5. Remove the three compressor bolts using power tools.
6. Remove the compressor.

INSTALLATION

Installation is in the reverse order of removal.

CAUTION:

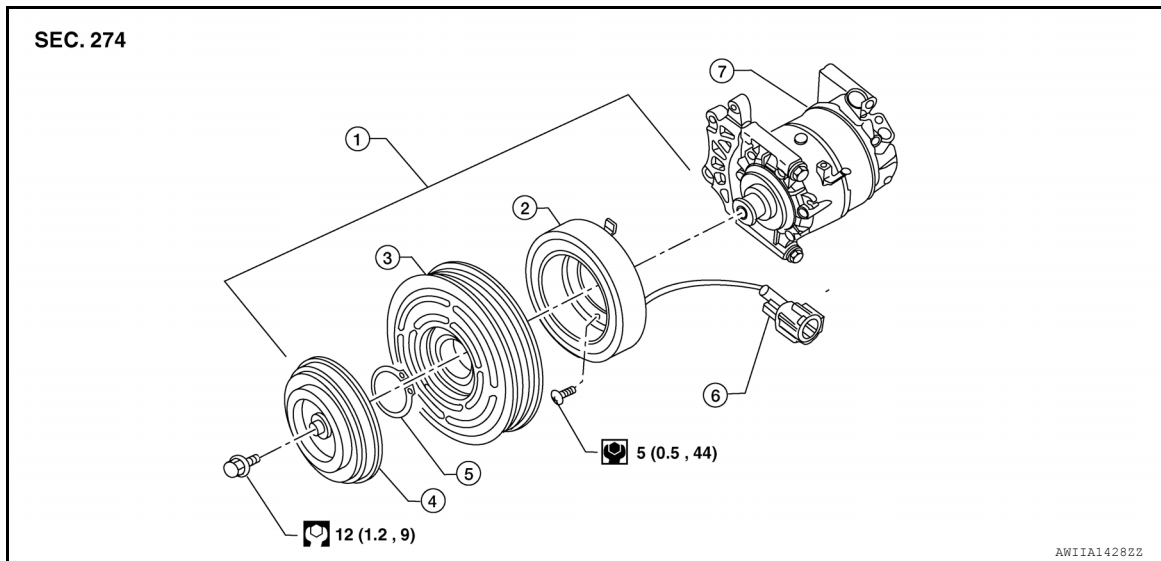
- Do not reuse the O-rings.
- Apply A/C oil to the new O-rings for installation.
- After recharging the A/C system with refrigerant, check for leaks.

COMPRESSOR

< REMOVAL AND INSTALLATION >

Removal and Installation for Compressor Clutch - VQ40DE

INFOID:000000006978679



- | | | |
|---------------------------|----------------|---------------------------------|
| 1. Magnet clutch assembly | 2. Magnet coil | 3. Pulley |
| 4. Clutch disc | 5. Snap ring | 6. Thermal protector (built in) |
| 7. Compressor | | |

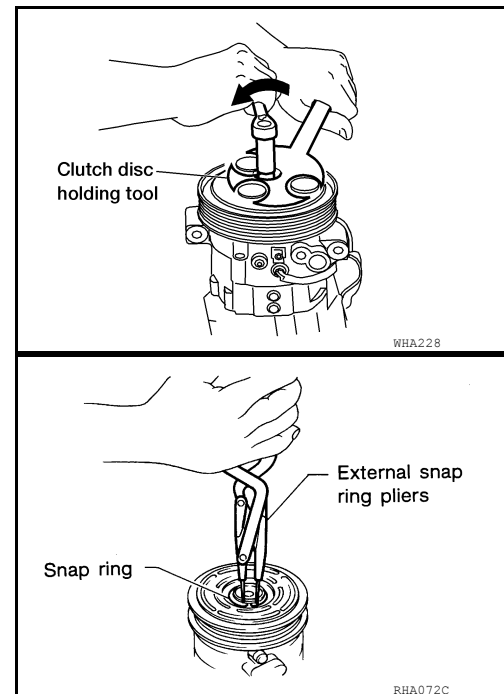
REMOVAL

1. Remove the compressor. Refer to [HA-50, "Removal and Installation for A/C Compressor - VQ40DE"](#).
2. Remove the center bolt while holding the clutch disc stationary using Tool as shown.

Tool number : — (J-44614)

3. Remove the clutch disc and shims.
CAUTION:
Retain all the shims for installation.

4. Remove the snap ring using a suitable tool.



COMPRESSOR

< REMOVAL AND INSTALLATION >

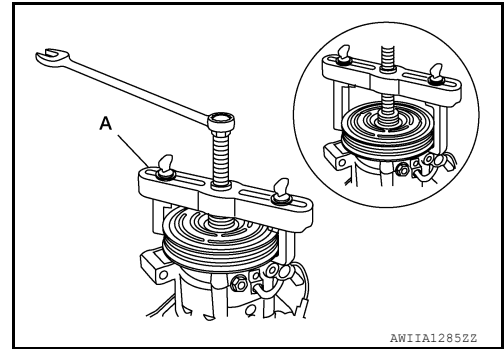
5. Remove the pulley assembly using a suitable tool (A) as shown.

CAUTION:

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

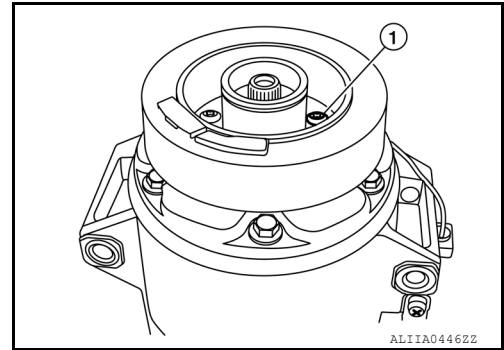
CAUTION:

Make sure the puller claws are only on the pulley, not under the magnetic coil.



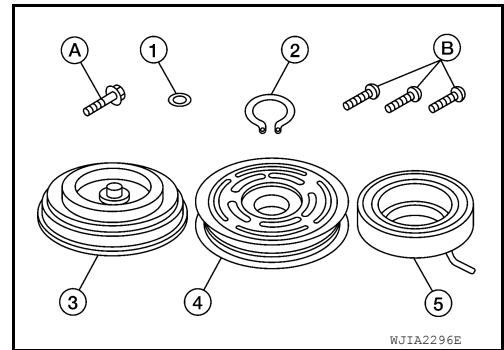
6. Disconnect the magnet coil harness from the compressor body.

7. Remove the three magnet coil screws (1) and the magnet coil.



INSPECTION AFTER REMOVAL

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



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

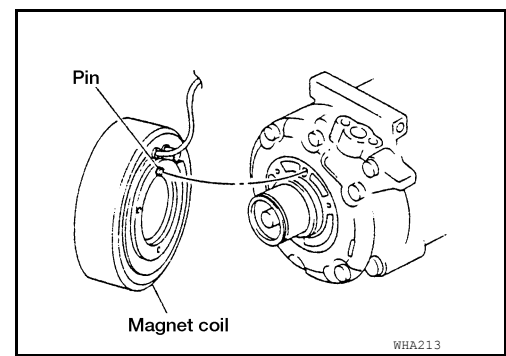
COMPRESSOR

< REMOVAL AND INSTALLATION >

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

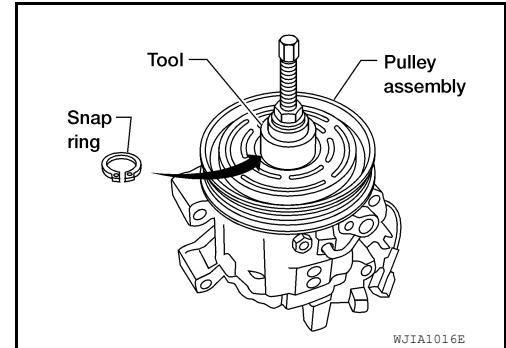
CAUTION:

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

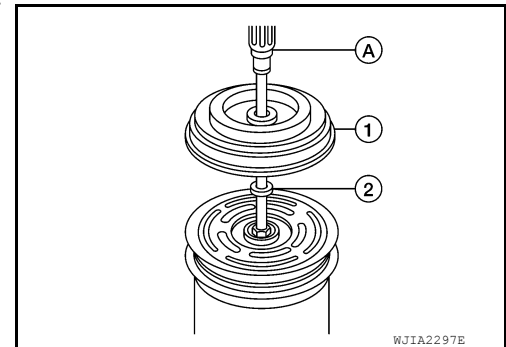


2. Connect the magnet coil harness to the compressor body.
3. Install the pulley assembly using Tool and a wrench, then install the snap ring using a suitable tool.

Tool number (A) : — (J-38873-A)



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

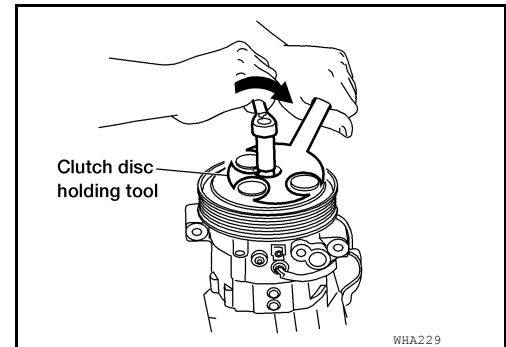


5. Install the clutch pulley bolt while using Tool to prevent the clutch disc from turning and tighten the bolt to specification.

Tool number : — (J-44614)

CAUTION:

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



6. Install the compressor.
7. Install the drive belt back onto the A/C pulley. Refer to [EM-13, "Removal and Installation"](#).

INSPECTION AFTER INSTALLATION

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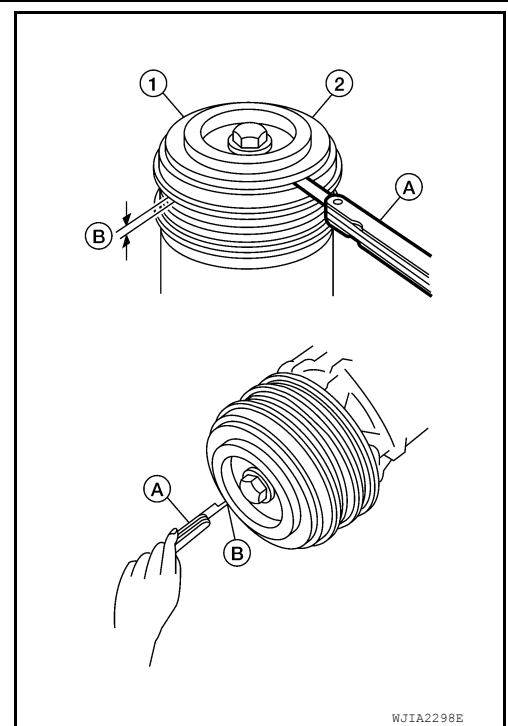
COMPRESSOR

< REMOVAL AND 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.

Removal and Installation for A/C Compressor - VK56DE

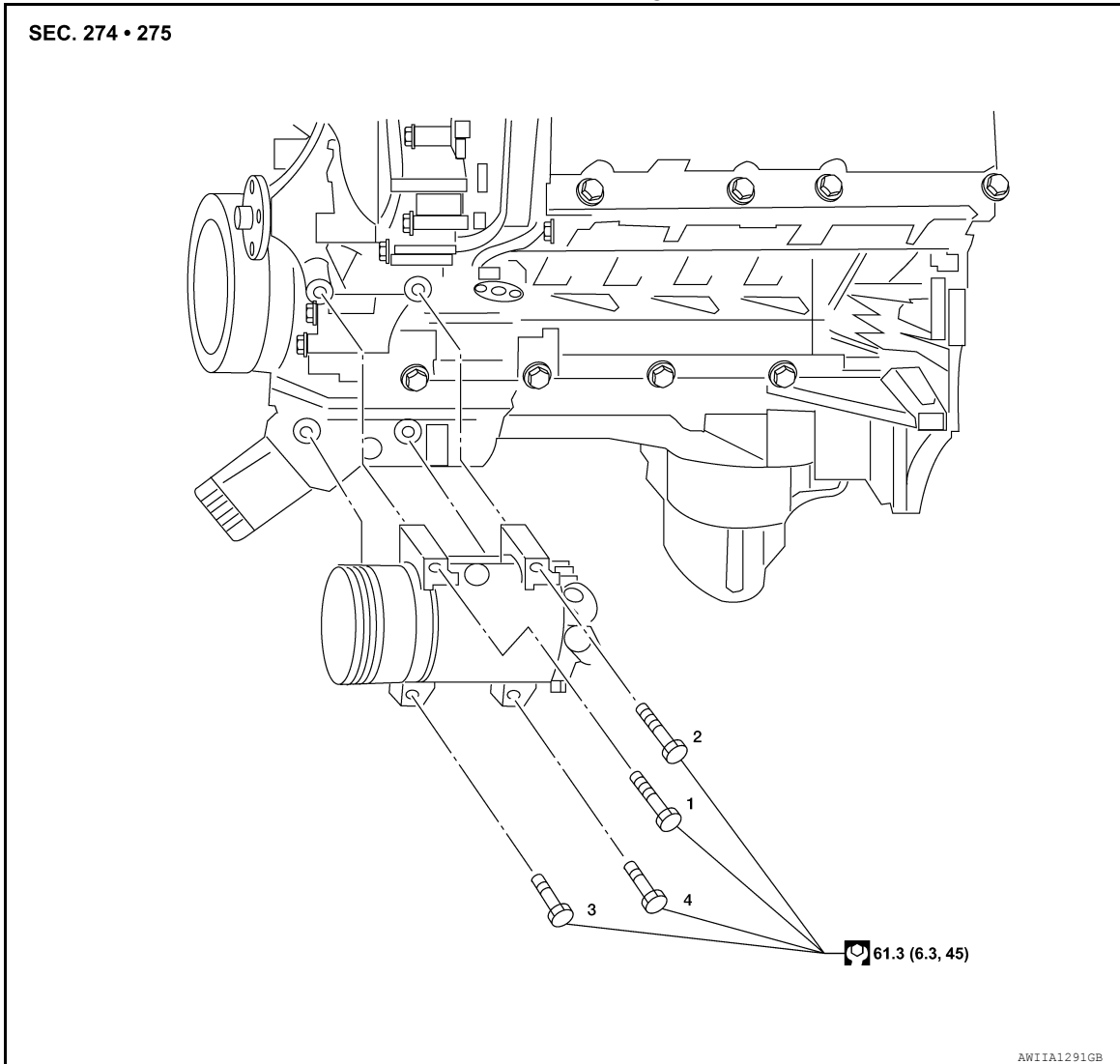
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COMPONENTS

COMPRESSOR

< REMOVAL AND INSTALLATION >

A/C Compressor Mounting - VK56DE



REMOVAL

1. Discharge the A/C refrigerant. Refer to [HA-40. "HFC-134a \(R-134a\) Service Procedure"](#).
2. Remove the drive belt. Refer to [EM-152. "Removal and Installation"](#).
3. Disconnect the harness connector from the compressor.
4. Disconnect the high-pressure flexible hose from the compressor.
5. Disconnect the low-pressure flexible hose from the compressor.
NOTE:
To prevent contamination, cap the high and low-pressure flexible hose.
6. Remove the four compressor bolts using power tools.
NOTE:
To prevent contamination, cap the low-pressure flexible hose port and the high-pressure flexible hose port.
7. Disconnect the steering column shaft from the steering gear. Refer to [ST-12. "Removal and Installation"](#).
8. Remove the four compressor bolts.
9. Remove the compressor.

INSTALLATION

Installation is in the reverse order of removal.

CAUTION:

- For installation, tighten the compressor bolts in the order shown above.
- Do not reuse the O-rings.

COMPRESSOR

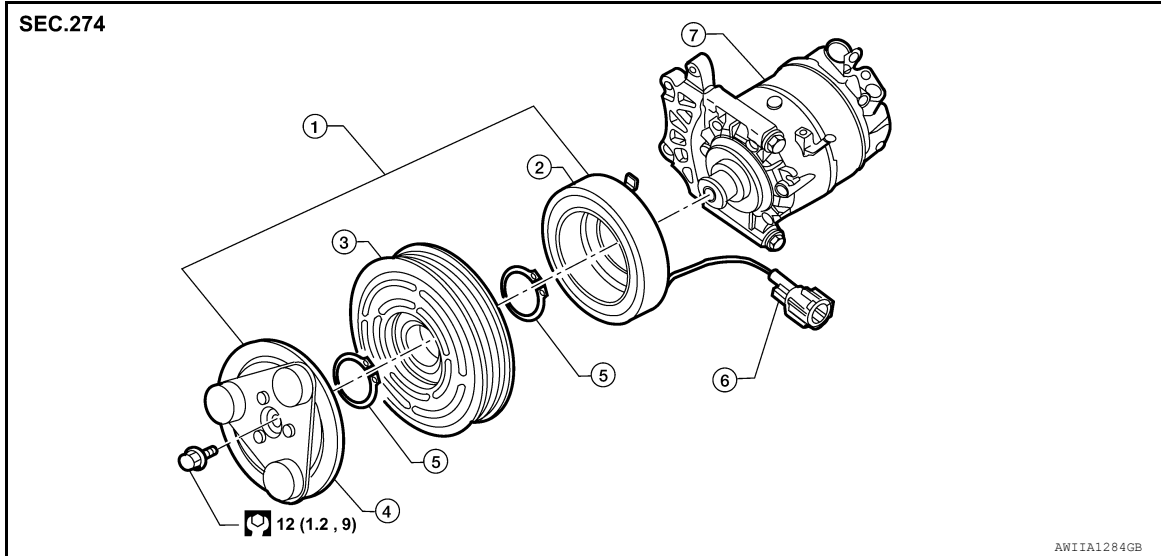
< REMOVAL AND INSTALLATION >

- Apply A/C oil to the new O-rings for installation.
- After recharging the A/C system with refrigerant, check for leaks. Refer to [HA-47, "Checking of Refrigerant Leaks"](#).

Removal and Installation for Compressor Clutch - VK56DE

INFOID:000000006968461

Magnet Clutch Assembly



- | | | |
|---------------------------|----------------|---------------------------------|
| 1. Magnet clutch assembly | 2. Magnet coil | 3. Pulley |
| 4. Clutch disc | 5. Snap ring | 6. Thermal protector (built in) |
| 7. Compressor | | |

REMOVAL

1. Remove the compressor. Refer to [HA-54, "Removal and Installation for A/C Compressor - VK56DE"](#).
2. Remove the center bolt while holding the clutch disc stationary using Tool as shown.

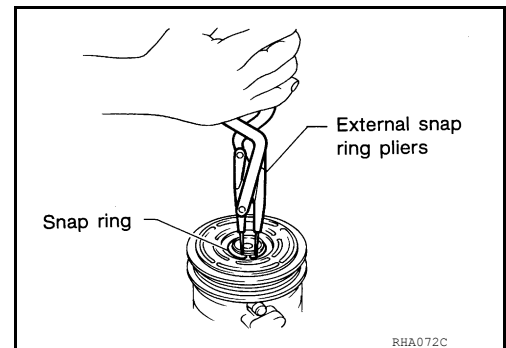
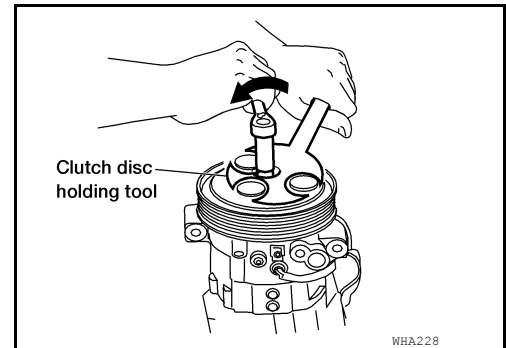
Tool number : — (J-44614)

3. Remove the clutch disc and shims.

CAUTION:

Retain the shims for installation.

4. Remove the snap ring using a suitable tool.



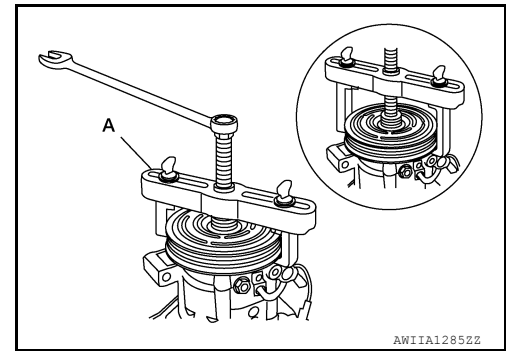
COMPRESSOR

< REMOVAL AND INSTALLATION >

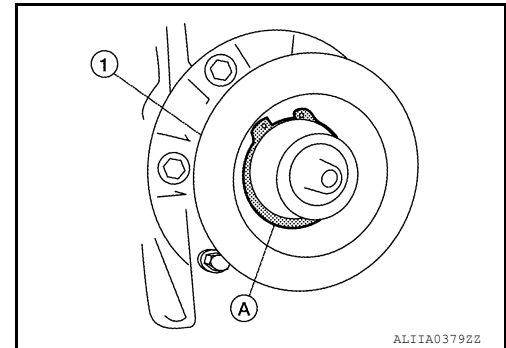
5. Remove the pulley using suitable tool (A).

CAUTION:

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



6. Remove the magnet coil snap ring (A) using a suitable tool and remove the magnet coil (1).



INSPECTION

Clutch Disc

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

Pulley

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

Coil

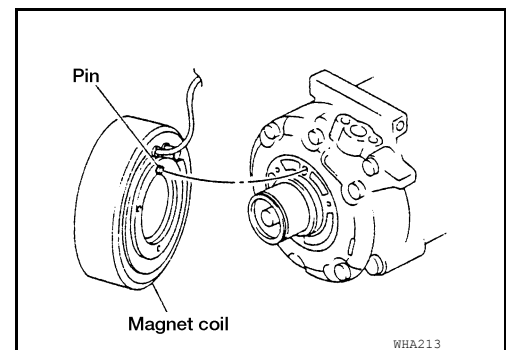
Check magnet coil for loose connections or any cracked insulation. Replace as necessary.

INSTALLATION

1. Install the magnet coil and snap ring using a suitable tool.

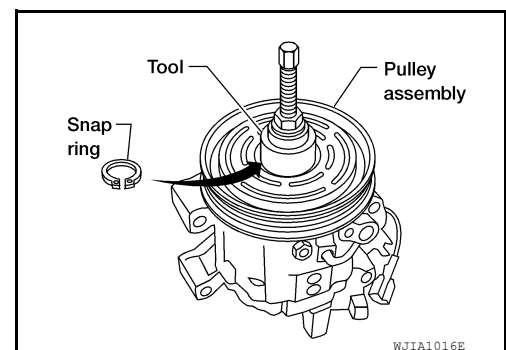
CAUTION:

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



2. Install the pulley assembly using Tool and a wrench, then install the snap ring using a suitable tool.

Tool number : — (J-38873-A)

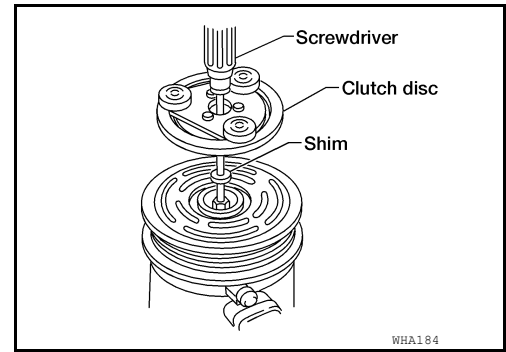


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COMPRESSOR

< REMOVAL AND INSTALLATION >

3. Install the clutch disc on the compressor shaft, together with all of the original shim(s) using a suitable tool. Press the clutch disc in by hand.

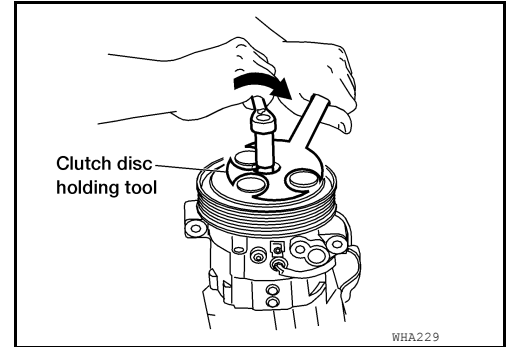


4. Install the clutch pulley bolt while using Tool to prevent the clutch disc from turning and tighten the bolt to specification.

Tool number : — (J-44614)

CAUTION:

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



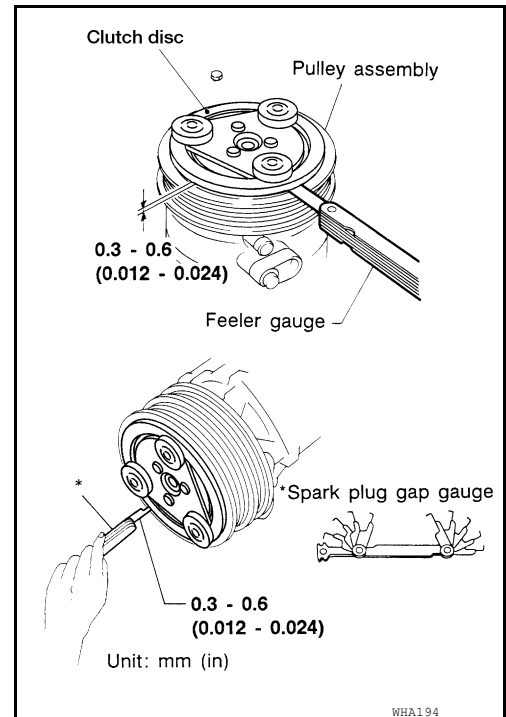
5. Install the compressor.

INSPECTION AFTER INSTALLATION

1. Check the pulley clearance all the way around the clutch disc as shown.

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

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



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 >

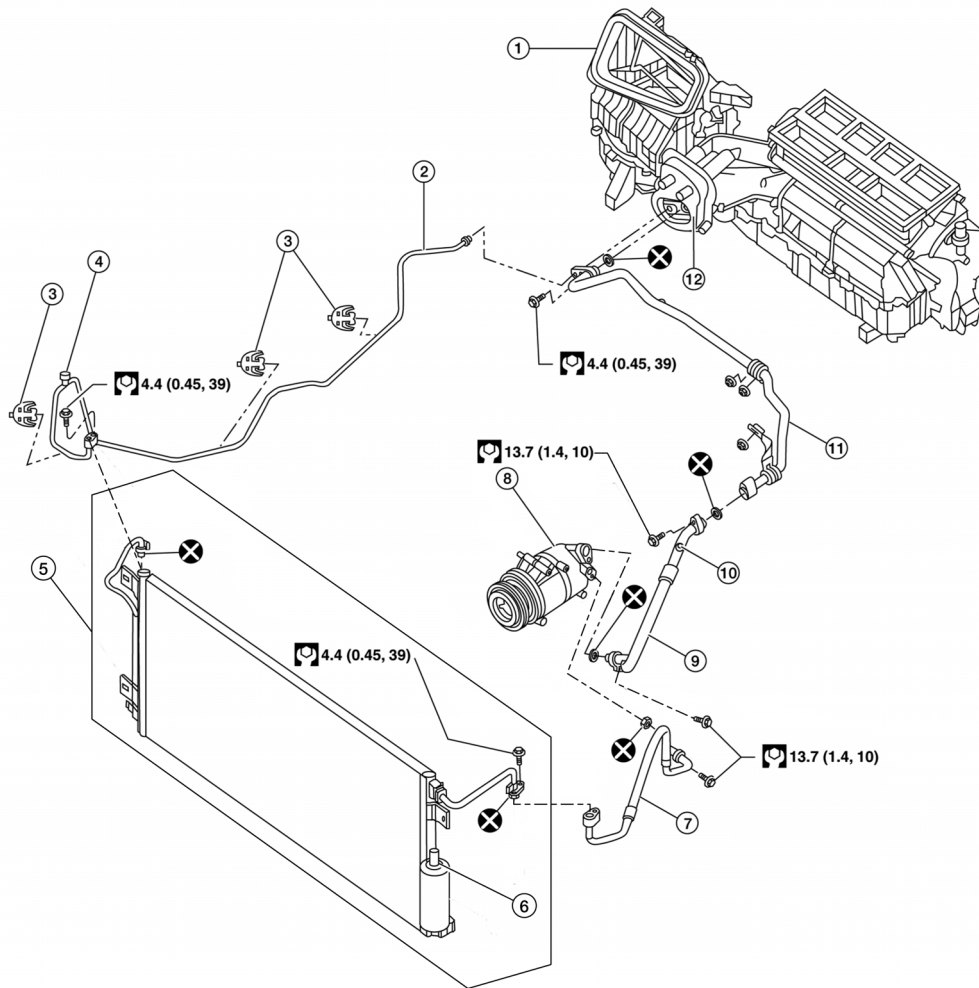
COOLER PIPE AND HOSE

Exploded View

INFOID:000000006933496

A/C Compressor and Condenser - VQ40DE Without Rear A/C

SEC.214.271.274.276



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- 1. Front heating and cooling unit assembly
- 2. High-pressure pipe
- 3. High-pressure pipe clips
- 4. High-pressure A/C service valve
- 5. Condenser and liquid tank
- 6. Refrigerant pressure sensor

AWIIA1560GB

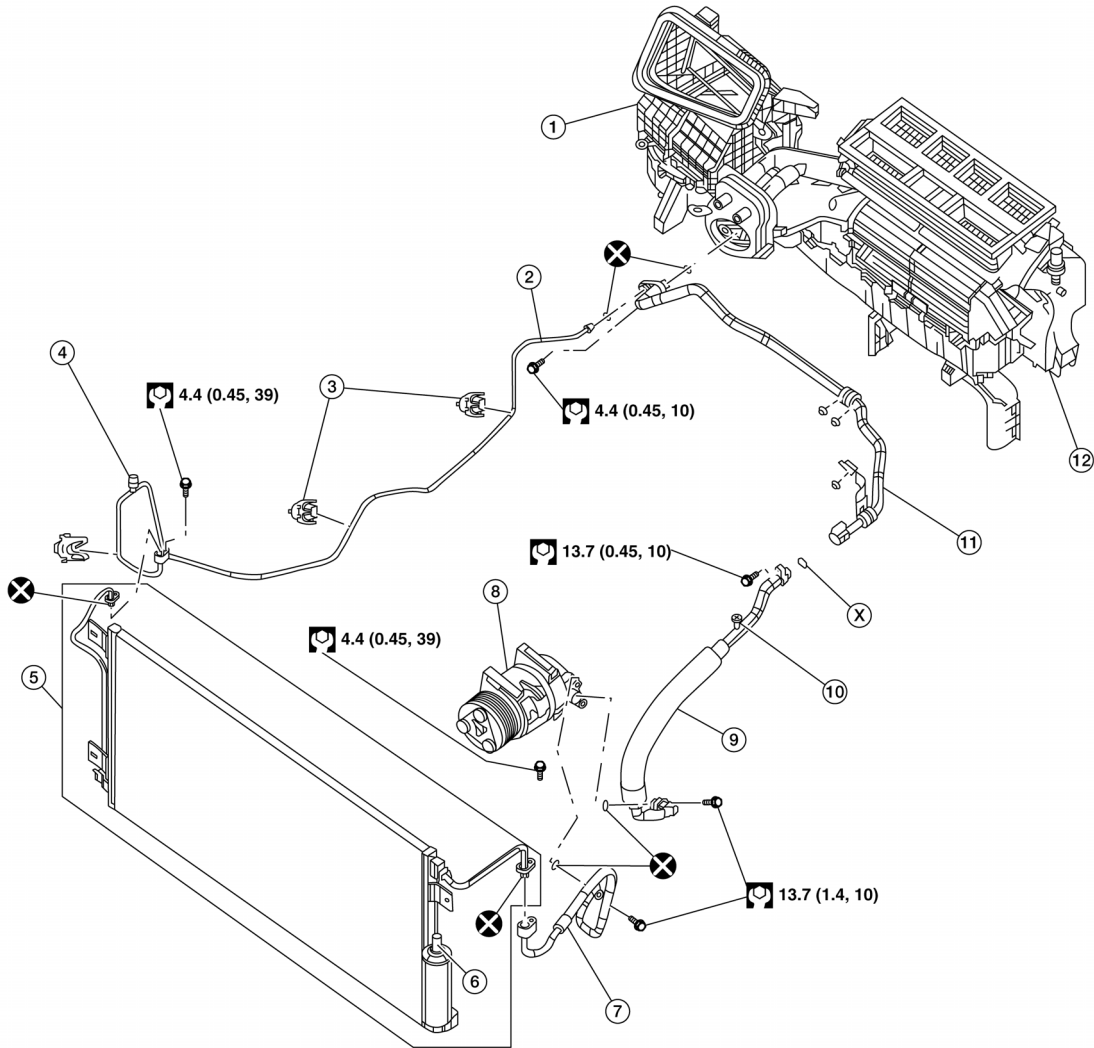
COOLER PIPE AND HOSE

< REMOVAL AND INSTALLATION >

- | | | |
|------------------------------------|-----------------------|-------------------------------|
| 7. High-pressure flexible hose | 8. Compressor | 9. Low-pressure flexible hose |
| 10. Low-pressure A/C service valve | 11. Low-pressure pipe | 12. Front expansion valve |

A/C Compressor and Condenser - VK56DE Without Rear A/C

SEC.214.271.274.276



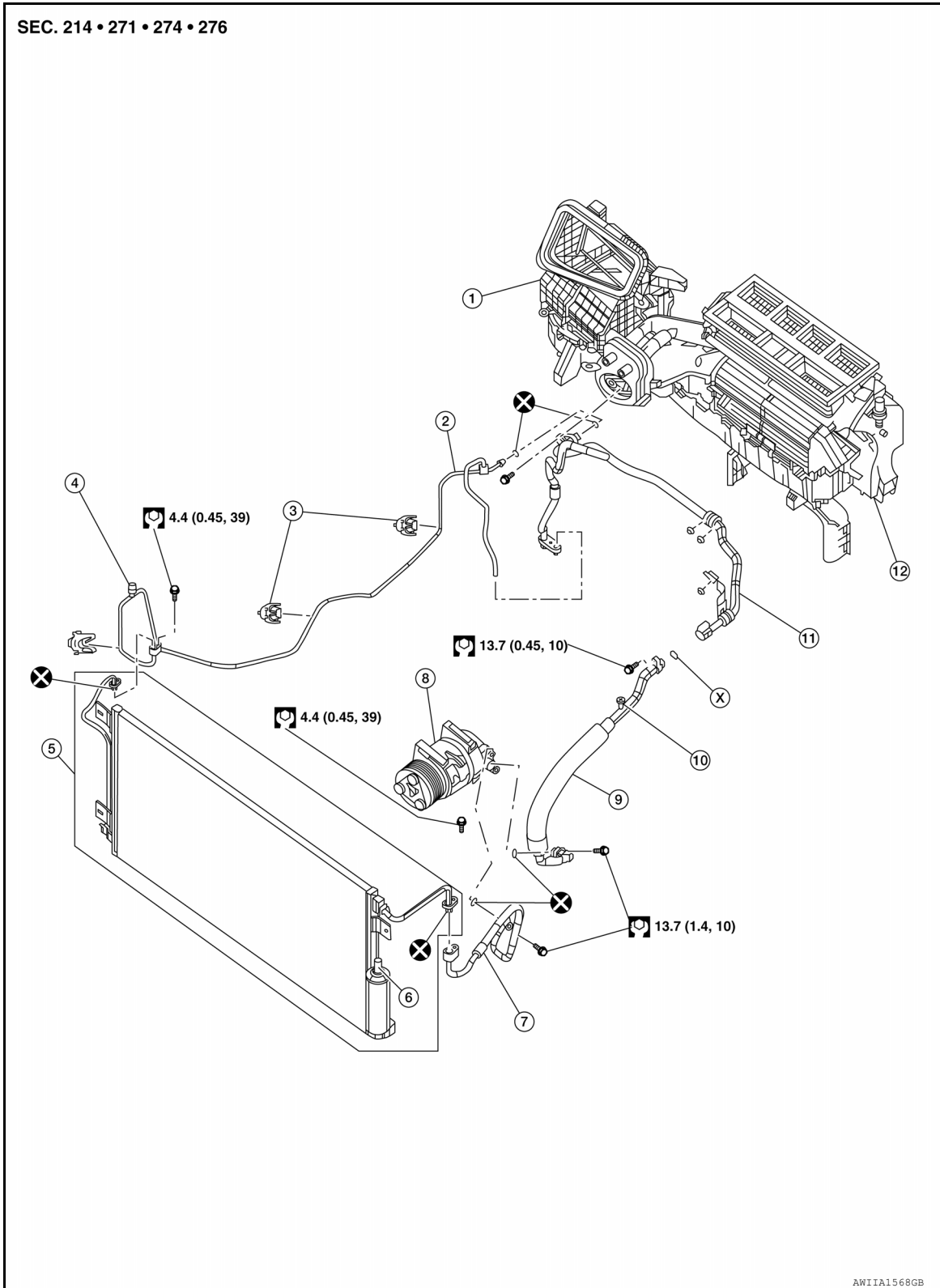
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- | | | |
|--|------------------------------|--------------------------------|
| 1. Front heating and cooling unit assembly | 2. High-pressure pipe | 3. High-pressure pipe clips |
| 4. High-pressure A/C service valve | 5. Condenser and liquid tank | 6. Refrigerant pressure sensor |
| 7. High-pressure flexible hose | 8. Compressor | 9. Low-pressure flexible hose |
| 10. Low-pressure A/C service valve | 11. Low-pressure pipe | 12. Front expansion valve |

COOLER PIPE AND HOSE

< REMOVAL AND INSTALLATION >

A/C Compressor and Condenser - VQ40DE/VK56DE With Rear A/C



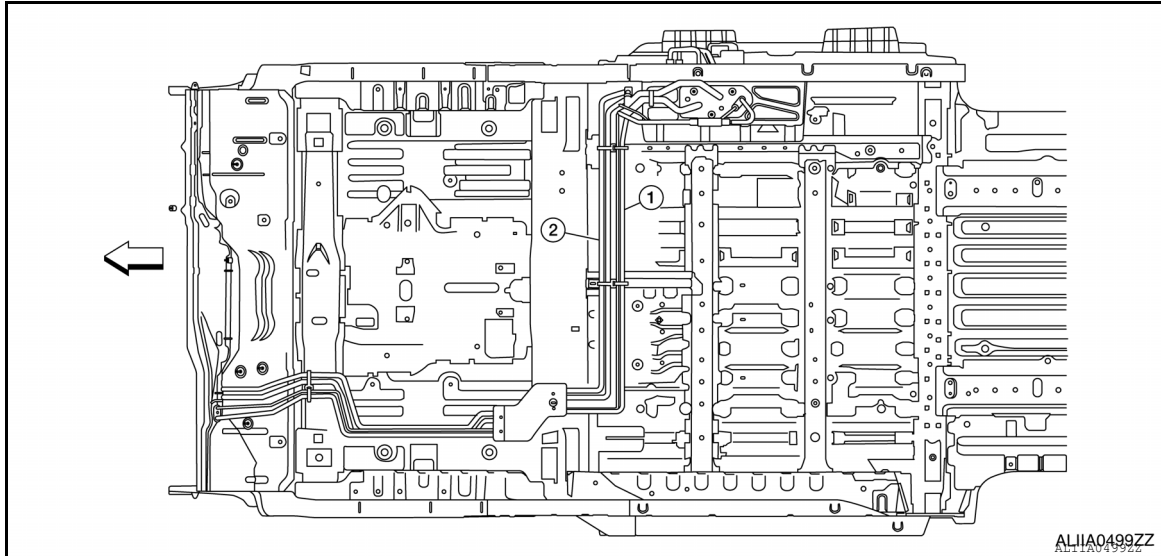
- | | | |
|--|------------------------------|--------------------------------|
| 1. Front heating and cooling unit assembly | 2. High-pressure pipe | 3. High-pressure pipe clips |
| 4. High-pressure A/C service valve | 5. Condenser and liquid tank | 6. Refrigerant pressure sensor |
| 7. High-pressure flexible hose | 8. Compressor | 9. Low-pressure flexible hose |
| 10. Low-pressure A/C service valve | 11. Low-pressure pipe | 12. Front expansion valve |

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COOLER PIPE AND HOSE

< REMOVAL AND INSTALLATION >

Rear Underfloor High- and Low-Pressure A/C and Heater Core Pipes (If Equipped)



1. Underfloor rear high- and low-pressure A/C pipes 2. Underfloor rear heater core hoses ← Front

LOW-PRESSURE FLEXIBLE HOSE

LOW-PRESSURE FLEXIBLE HOSE : Removal and Installation

INFOID:000000006933497

REMOVAL

1. Discharge the refrigerant. Refer to [HA-40, "HFC-134a \(R-134a\) Service Procedure"](#).
2. Disconnect the low pressure flexible hose from the low pressure pipe.
3. Disconnect the low-pressure flexible hose from the compressor.
NOTE:
Cap the low-pressure flexible hose and port on the compressor to prevent contamination.
4. Remove the low-pressure flexible hose.

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 recharging the refrigerant, check for leaks. Refer to [HA-47, "Checking of Refrigerant Leaks"](#).

LOW-PRESSURE PIPE

LOW-PRESSURE PIPE : Removal and Installation - Low Pressure Pipe

INFOID:000000006933498

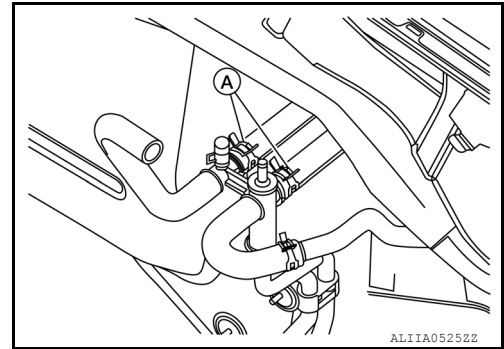
REMOVAL

1. Discharge the refrigerant. Refer to [HA-40, "HFC-134a \(R-134a\) Service Procedure"](#).
2. Drain the engine coolant (VQ40DE/VK56DE With Rear A/C only). Refer to [CO-44, "Changing Engine Coolant"](#).
3. Disconnect the low-pressure pipe from the low-pressure flexible hose.
NOTE:
Cap the low-pressure pipe and low-pressure flexible hose to prevent contamination.
4. Remove the low pressure pipe bracket nuts.
5. Remove the heater pump. Refer to [HA-68, "Removal and Installation"](#).

COOLER PIPE AND HOSE

< REMOVAL AND INSTALLATION >

6. Disconnect the hose clamps (A) from the heater inlet/outlet pipes (VQ40DE/VK56DE With Rear A/C only).



7. Disconnect the low-pressure pipe from the expansion valve.

NOTE:

Cap the low-pressure pipe to prevent contamination.

8. Remove the low-pressure pipe.

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 recharging the refrigerant, check for leaks. Refer to [HA-40, "HFC-134a \(R-134a\) Service Procedure"](#).

LOW-PRESSURE PIPE : Removal and Installation - Underfloor Rear High- and Low-Pressure A/C and Heater Core Pipes

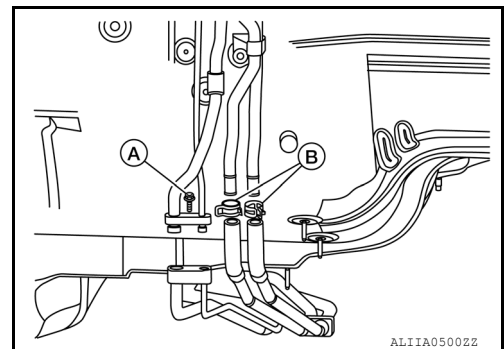
INFOID:000000007970673

REMOVAL

NOTE:

When removing components such as hoses, lines/tubes, etc., cap or plug openings to prevent fluid from spilling.

1. Remove the air cleaner case (upper). Refer to [EM-24, "Exploded View"](#).
2. Remove seat rail 5 and seat rail 6. Refer to [SE-40, "Removal and Installation"](#).
3. Disconnect the steering intermediate shaft from the steering column assembly. Refer to [ST-12, "Exploded View"](#).
4. Remove the front driver and passenger side fender protector. Refer to [EXT-33, "Removal and Installation"](#).
5. Remove the fuel tank. Refer to [FL-6, "Removal and Installation"](#).
6. Remove the propeller shaft. Refer to [DLN-7, "Removal and Installation"](#) (3S1355) or [DLN-20, "Removal and Installation"](#) (3S1415).
7. Remove the bolt (A) connecting the underfloor rear high- and low-pressure A/C lines to the high and low-pressure A/C pipes.
8. Remove the hose clamps (B) holding the underfloor rear heater core pipes to the heater inlet/outlet pipes.



COOLER PIPE AND HOSE

< REMOVAL AND INSTALLATION >

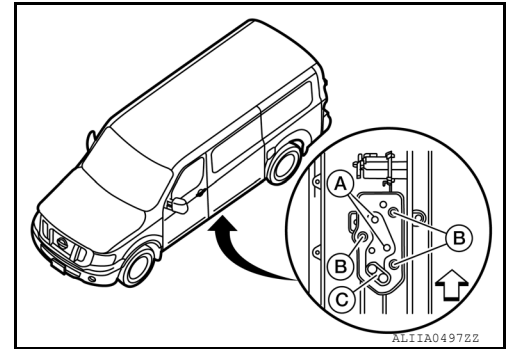
9. Disconnect the underfloor rear high- and low-pressure A/C pipes and heater core pipes from the rear heating and cooling unit assembly.

A : Underfloor rear heater core pipes connection

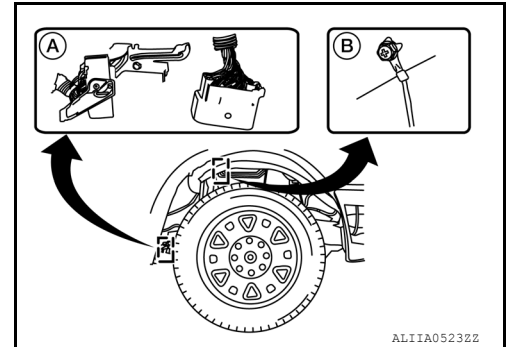
B : Underfloor rear hose bracket bolts

C : Underfloor rear high and low-pressure A/C pipes connection

↔ : Front



10. Disconnect the upper and lower radiator hoses from the radiator. Refer to [CO-18, "Exploded View"](#) (VQ40DE) or [CO-49, "Exploded View"](#) (VK56DE).
11. Disconnect the fan shroud from the body. Refer to [CO-21, "Exploded View"](#) (VQ40DE) or [CO-52, "Exploded View"](#) (VK56DE).
12. Disconnect the rear brake lines from the front brake lines through the drivers side wheel well.
13. Disconnect the transmission control cable from the transmission. Refer to [TM-163, "Exploded View"](#).
14. Disconnect the body harness connector from the passenger side wheel well (A).
15. Disconnect the body ground cable (B) from the passenger side wheel well.



16. Remove the rear parking brake cable (LH/RH) two rear most mounts from under the vehicle.
17. Support the body with jack stands.
18. Remove the body bolts.
19. Lower the chassis from the body until there is enough clearance to remove the underfloor rear high and low-pressure A/C and heater core pipes.
- CAUTION:**
Use care not to damage any vehicle components while splitting the body from the chassis.
20. Remove the underfloor rear high- and low-pressure A/C and heater core pipes.

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 refrigerant, check for leaks. Refer to [HA-40, "HFC-134a \(R-134a\) Service Procedure"](#).

HIGH-PRESSURE FLEXIBLE HOSE

HIGH-PRESSURE FLEXIBLE HOSE : Removal and Installation

INFOID:000000006933499

REMOVAL

1. Discharge the refrigerant. Refer to [HA-40, "HFC-134a \(R-134a\) Service Procedure"](#).
2. Disconnect the high-pressure flexible hose from the condenser.
3. Disconnect the high-pressure flexible hose from the A/C compressor.

NOTE:

Cap the high-pressure flexible hose to prevent contamination.

4. Remove the high-pressure flexible hose.

COOLER PIPE AND HOSE

< REMOVAL AND INSTALLATION >

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 refrigerant, check for leaks. Refer to [HA-40, "HFC-134a \(R-134a\) Service Procedure"](#).

HIGH-PRESSURE PIPE

HIGH-PRESSURE PIPE : Removal and Installation

INFOID:000000006933500

REMOVAL

NOTE:

When removing components such as hoses, tubes/lines, etc., cap or plug openings to prevent fluid from spilling.

1. Discharge the refrigerant. Refer to [HA-40, "HFC-134a \(R-134a\) Service Procedure"](#).
2. Remove the passenger side wheel and tire assembly (VQ40DE/VK56DE With Rear A/C only).
3. Remove the passenger side front fender protector (VQ40DE/VK56DE With Rear A/C only). Refer to [EXT-33, "Exploded View"](#).
4. Remove the engine ground bolt from the wheel well (VQ40DE/VK56DE With Rear A/C only).
5. Disconnect the high-pressure pipe from the underfloor rear high- and low-pressure pipes (VQ40DE/VK56DE With Rear A/C only).
6. Disconnect the high-pressure pipe from the expansion valve.
7. Disconnect the high-pressure pipe from the condenser.
8. Remove the engine ground bolt from aside the battery tray (VQ40DE/VK56DE With Rear A/C only).
9. Remove the coolant overflow tube (VQ40DE/VK56DE With Rear A/C only). Refer to [CO-49, "Exploded View"](#).
10. Reposition the power steering reservoir out of the way without disconnecting the hose.
11. Disconnect the high-pressure pipe from the three high-pressure pipe to frame retainer clips.

NOTE:

Cap the high-pressure pipe to prevent contamination.

12. Remove the high-pressure pipe.

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 refrigerant, check for leaks. Refer to [HA-40, "HFC-134a \(R-134a\) Service Procedure"](#).

HIGH-PRESSURE PIPE : Removal and Installation - Underfloor Rear High- and Low-Pressure A/C and Heater Core Pipes

INFOID:000000007970674

REMOVAL

NOTE:

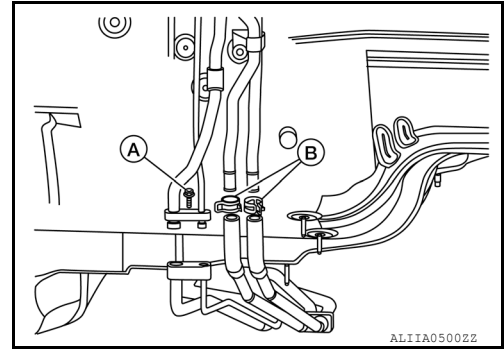
When removing components such as hoses, lines/tubes, etc., cap or plug openings to prevent fluid from spilling.

1. Remove the air cleaner case (upper). Refer to [EM-24, "Exploded View"](#).
2. Remove seat rail 5 and seat rail 6. Refer to [SE-40, "Removal and Installation"](#).
3. Disconnect the steering intermediate shaft from the steering column assembly. Refer to [ST-12, "Exploded View"](#).
4. Remove the front driver and passenger side fender protector. Refer to [EXT-33, "Removal and Installation"](#).
5. Remove the fuel tank. Refer to [FL-6, "Removal and Installation"](#).

COOLER PIPE AND HOSE

< REMOVAL AND INSTALLATION >

6. Remove the propeller shaft. Refer to [DLN-7. "Removal and Installation"](#) (3S1355) or [DLN-20. "Removal and Installation"](#) (3S1415).
7. Remove the bolt (A) connecting the underfloor rear high and low-pressure A/C lines to the high- and low-pressure A/C pipes.
8. Remove the hose clamps (B) holding the underfloor rear heater core pipes to the heater inlet/outlet pipes.



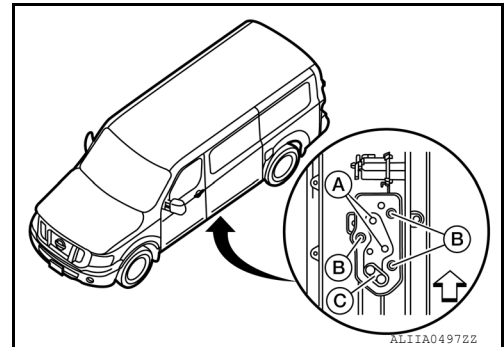
9. Disconnect the underfloor rear high- and low-pressure A/C pipes and heater core pipes from the rear heating and cooling unit assembly.

A : Underfloor rear heater core pipes connection

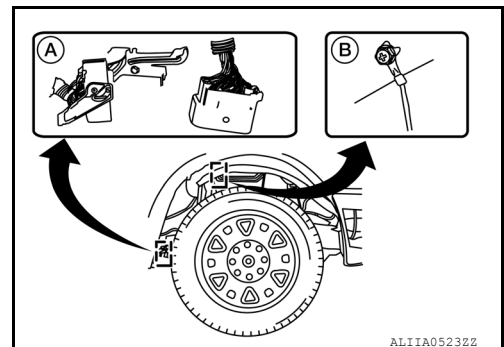
B : Underfloor rear hose bracket bolts

C : Underfloor rear high and low-pressure A/C pipes connection

↔ : Front



10. Disconnect the upper and lower radiator hoses from the radiator. Refer to [CO-18. "Exploded View"](#) (VQ40DE) or [CO-49. "Exploded View"](#) (VK56DE).
11. Disconnect the fan shroud from the body. Refer to [CO-21. "Exploded View"](#) (VQ40DE) or [CO-52. "Exploded View"](#) (VK56DE).
12. Disconnect the rear brake lines from the front brake lines through the drivers side wheel well.
13. Disconnect the transmission control cable from the transmission. Refer to [TM-163. "Exploded View"](#).
14. Disconnect the body harness connector from the passenger side wheel well (A).
15. Disconnect the body ground cable (B) from the passenger side wheel well.



16. Remove the rear parking brake cable (LH/RH) two rear most mounts from under the vehicle.
17. Support the body with jack stands.
18. Remove the body bolts.
19. Lower the chassis from the body until there is enough clearance to remove the underfloor rear high- and low-pressure A/C and heater core pipes.
CAUTION:
Use care not to damage any vehicle components while splitting the body from the chassis.
20. Remove the underfloor rear high and low-pressure A/C and heater core pipes.

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.

COOLER PIPE AND HOSE

< REMOVAL AND INSTALLATION >

- After charging the refrigerant, check for leaks. Refer to [HA-40, "HFC-134a \(R-134a\) Service Procedure"](#).

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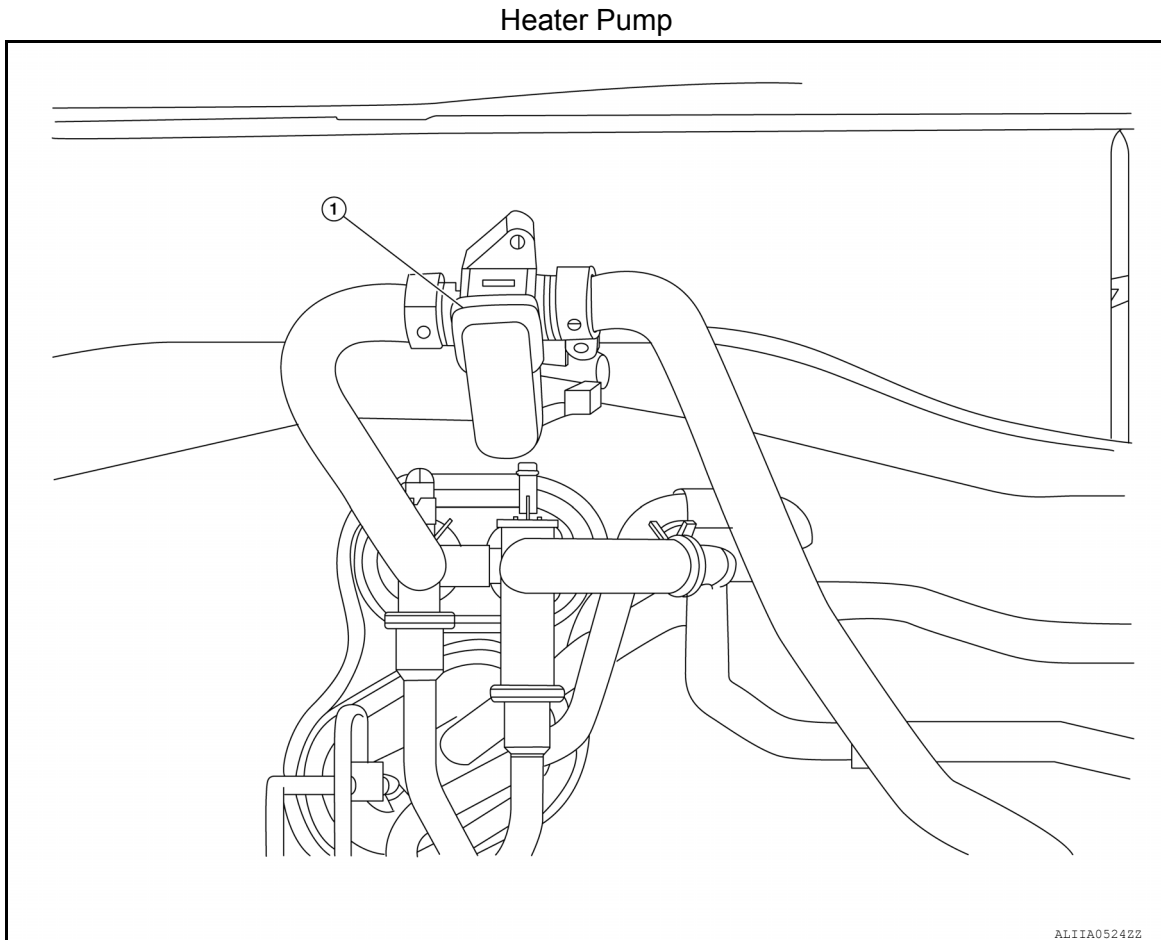
HEATER PUMP

< REMOVAL AND INSTALLATION >

HEATER PUMP

Removal and Installation

INFOID:000000008130129



1. Heater pump

NOTE:

When removing components such as hoses, lines/tubes, etc., cap or plug openings to prevent fluid from spilling.

REMOVAL

1. Partially drain the engine cooling system. Refer to [CO-12. "Changing Engine Coolant"](#) (VQ40DE) or [CO-44. "Changing Engine Coolant"](#) (VK56DE).
2. Disconnect the harness connector from the heater pump.
3. Disconnect the two heater hoses.
4. Remove the heater pump fasteners, then remove the heater pump.

CAUTION:

Do not disassemble the heater pump, replace the heater pump as an assembly.

INSTALLATION

Installation is in the reverse order of removal.

WATER CONTROL VALVE

< REMOVAL AND INSTALLATION >

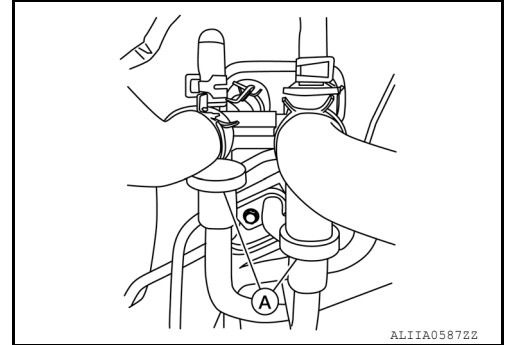
WATER CONTROL VALVE

Removal and Installation

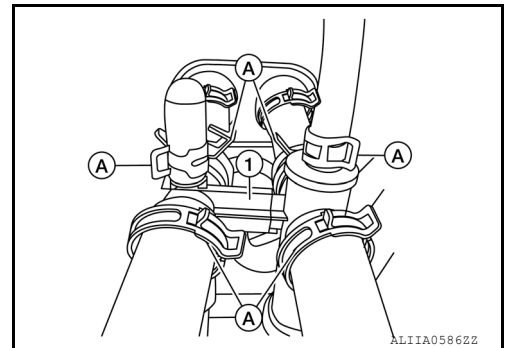
INFOID:00000008472313

REMOVAL

1. Drain the cooling system. Refer to [CO-12. "Changing Engine Coolant"](#) (VQ40DE) or [CO-44. "Changing Engine Coolant"](#) (VK56DE).
2. Disconnect the underfloor rear heater core pipes (A) from the coolant valve.



3. Disconnect the heater hoses (A) from the coolant valve (1).



4. Remove the coolant valve.

INSTALLATION

Installation is in the reverse order of removal.

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CONDENSER

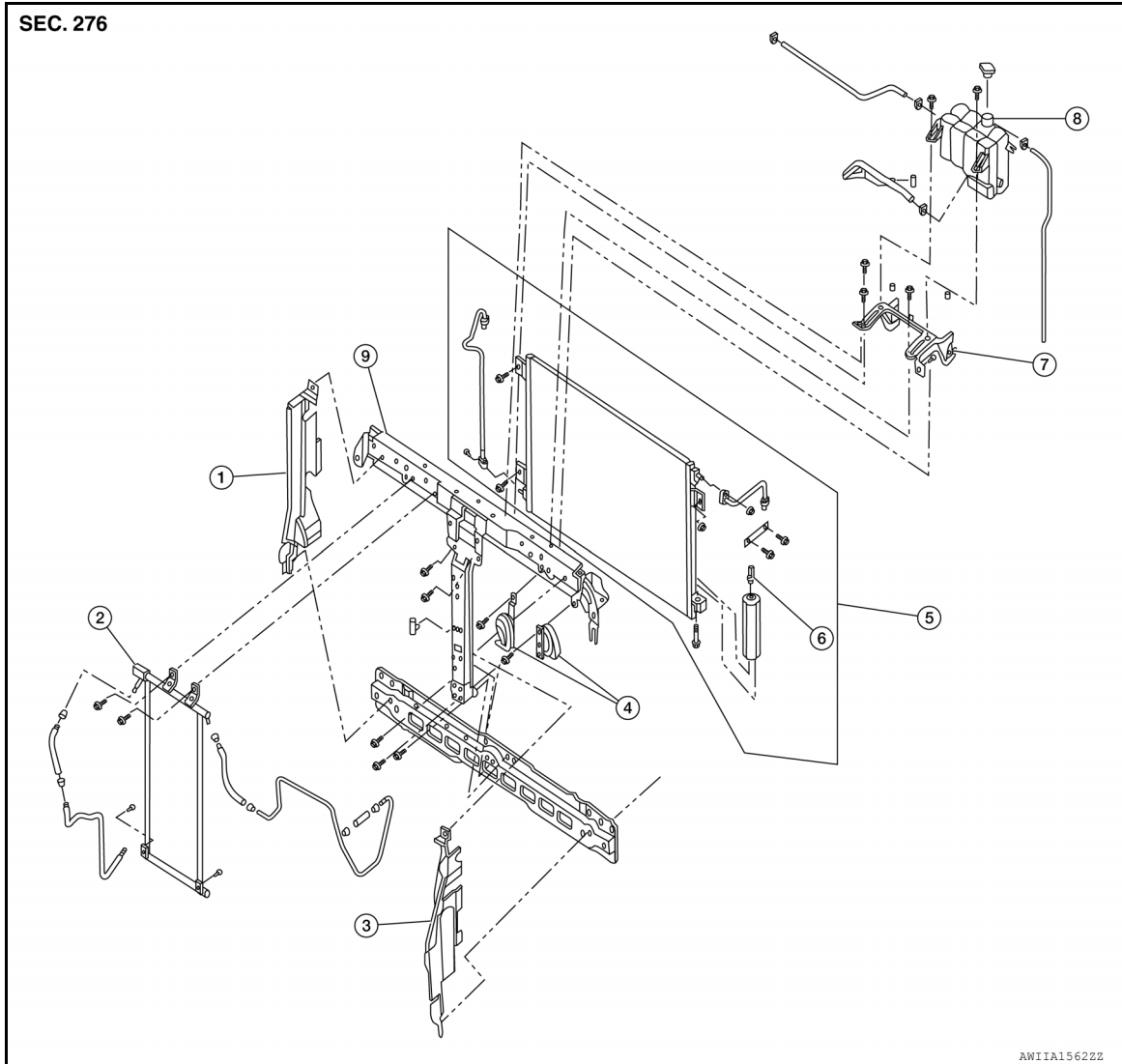
< REMOVAL AND INSTALLATION >

CONDENSER

CONDENSER

CONDENSER : Removal and Installation

INFOID:000000006933501



- | | | |
|------------------------------|------------------------------|--------------------------------|
| 1. RH air guide | 2. Transmission cooler | 3. LH air guide |
| 4. Horns | 5. Condenser and liquid tank | 6. Refrigerant pressure sensor |
| 7. Coolant reservoir bracket | 8. Coolant reservoir | 9. Upper crossmember |

REMOVAL

NOTE:

When removing components such as hoses, tubes/lines, etc., cap or plug openings to prevent fluid from spilling.

1. Discharge the refrigerant. Refer to [HA-40, "HFC-134a \(R-134a\) Service Procedure"](#).
2. Remove the front grille. Refer to [EXT-28, "Removal and Installation"](#).
3. Disconnect the high-pressure pipe from the condenser.
4. Disconnect the high-pressure flexible hose from the condenser.
5. Remove the RH air guide and LH air guide.
6. Remove the three condenser bolts.

CONDENSER

< REMOVAL AND INSTALLATION >

7. Remove the four coolant reservoir and bracket bolts and position the coolant reservoir with the bracket aside without disconnecting the hose. A
8. Disconnect the refrigerant pressure sensor connector and remove the refrigerant pressure sensor as necessary to transfer to the new condenser and liquid tank. B
9. Remove the two transmission cooler upper bolts. C
10. Remove the two radiator upper bolts. D
11. Remove the seven upper crossmember bolts. E
12. Disconnect the harness connectors from the horn. F
13. Remove the horns. G
14. Remove the upper crossmember. H
15. Lifting up on the RH side first, remove the condenser from the vehicle. I

CAUTION:

Use care not to damage the condenser fins.

INSTALLATION

Installation is in the reverse order of removal.

CAUTION:

- Do not reuse the O-rings. A
- Apply compressor oil to the new O-rings for installation. B
- Do not damage the condenser fins. C
- After charging refrigerant, check for leaks. Refer to [HA-40, "HFC-134a \(R-134a\) Service Procedure"](#). D

REFRIGERANT PRESSURE SENSOR

REFRIGERANT PRESSURE SENSOR : Removal and Installation

INFOID:000000006933503 H

Removal

1. Remove the front grille. Refer to [EXT-28, "Removal and Installation"](#). HA
2. Disconnect the harness connector from the refrigerant pressure sensor.
3. Remove the refrigerant pressure sensor. J

Installation

Installation is in the reverse order of removal. K

LIQUID TANK

< REMOVAL AND INSTALLATION >

LIQUID TANK

Removal and Installation

INFOID:000000006991357

The liquid tank is serviced as part of the condenser and are replaced as an assembly. Refer to [HA-70. "CONDENSER : Removal and Installation"](#).

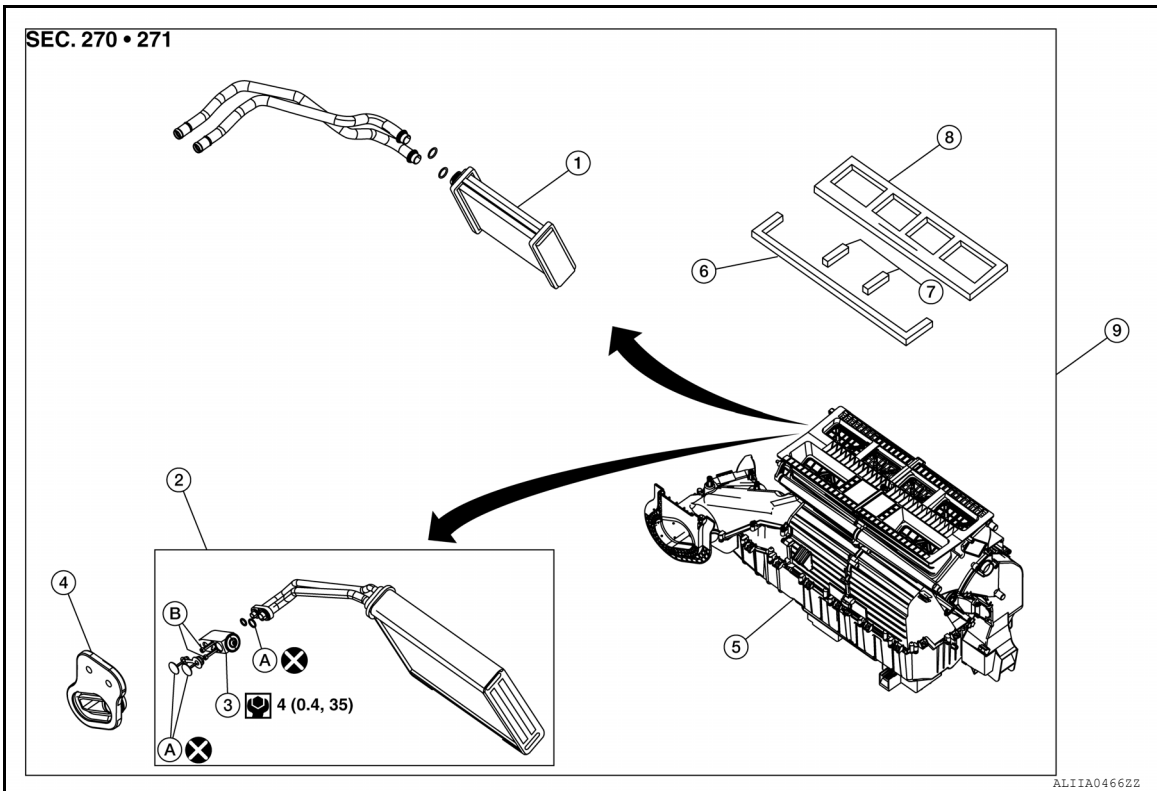
EVAPORATOR

< REMOVAL AND INSTALLATION >

EVAPORATOR

Removal and Installation - Front Evaporator

INFOID:000000007239083



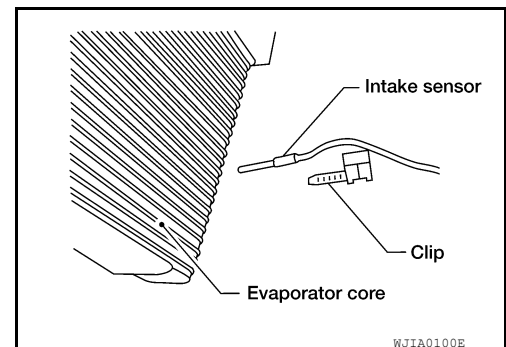
- | | | |
|--|--|---|
| 1. Front heater core | 2. Front evaporator | 3. Front expansion valve |
| 4. Heater core pipes and evaporator grommet | 5. Front heater and cooling unit case | 6. Front heater and cooling unit case rear seal |
| 7. Front heater and cooling unit case center seals | 8. Front heater and cooling unit case front seal | 9. Front heater and cooling unit assembly |
| A. O-rings | B. Front expansion valve bolts | |

REMOVAL

1. Remove the front heater and cooling unit assembly. Refer to [HA-79. "HEATER & COOLING UNIT ASSEMBLY : Removal and Installation - Front Heating and Cooling Unit"](#).
2. Separate the blower motor housing from the front heater and cooling unit.
3. Remove the heater core pipe cover and the front heater case side cover.
4. Remove the front evaporator cover.
5. Remove the front heater case lower cover.
6. Remove the intake sensor from the evaporator.

CAUTION:

Mark the mounting position of the intake sensor.



EVAPORATOR

< REMOVAL AND INSTALLATION >

7. Remove the front evaporator.

CAUTION:

Do not damage the evaporator fins.

8. Remove the front expansion valve.

INSTALLATION

Installation is in the reverse order of removal.

NOTE:

Install the intake sensor in it's original position.

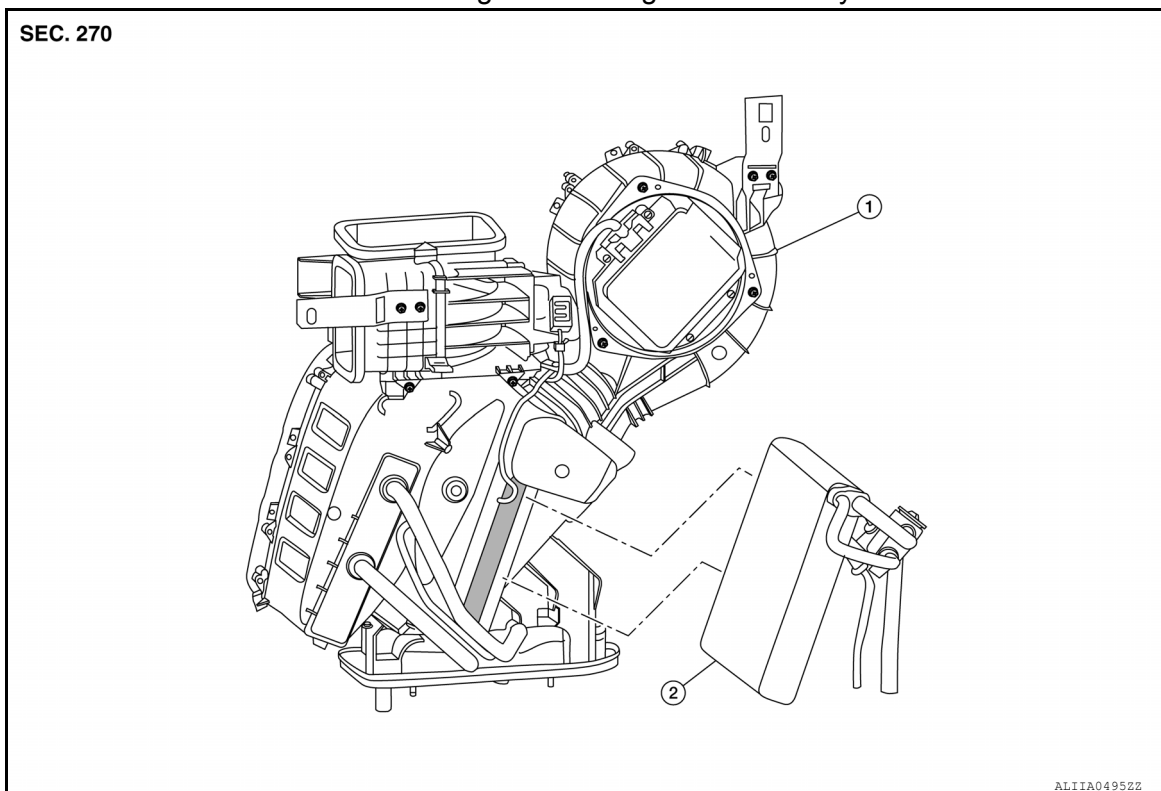
CAUTION:

- Do not reuse the O-rings.
- Apply A/C oil to the new O-rings for installation.
- Keep the O-rings free from any lint or dirt. Contamination will affect the O-ring seal and cause a leak.
- After charging refrigerant, check for leaks. Refer to [HA-22, "Leak Test"](#).

Removal and Installation - Rear Evaporator

INFOID:000000007968373

Rear Heating and Cooling Unit Assembly



1. Rear heating and cooling unit assembly
2. Rear evaporator

REMOVAL

1. Remove the rear heating and cooling unit assembly. Refer to [HA-80, "HEATER & COOLING UNIT ASSEMBLY : Removal and Installation - Rear Heating and Cooling Unit"](#).
2. Split the rear heating and cooling unit assembly to access the rear evaporator.
3. Remove the rear evaporator.

INSTALLATION

Installation is in the reverse order of removal.

CAUTION:

- Do not reuse O-rings.
- Apply A/C oil to the new O-rings for installation.
- After charging refrigerant, check for leaks. Refer to [HA-22, "Leak Test"](#).

NOTE:

The evaporator is only available as an assembly with the expansion valve.

EXPANSION VALVE

< REMOVAL AND INSTALLATION >

EXPANSION VALVE

Removal and Installation - Front Expansion Valve

INFOID:000000007239086

REMOVAL

NOTE:

When removing components such as hoses, tubes/lines, etc., cap or plug openings to prevent fluid from spilling.

1. Discharge the refrigerant. Refer to [HA-40. "HFC-134a \(R-134a\) Service Procedure"](#).
2. Disconnect the high-pressure pipe and the low-pressure pipe from the expansion valve.
3. Remove the front heater core pipes and evaporator grommet.
4. Remove the expansion valve.

INSTALLATION

Installation is in the reverse order of removal.

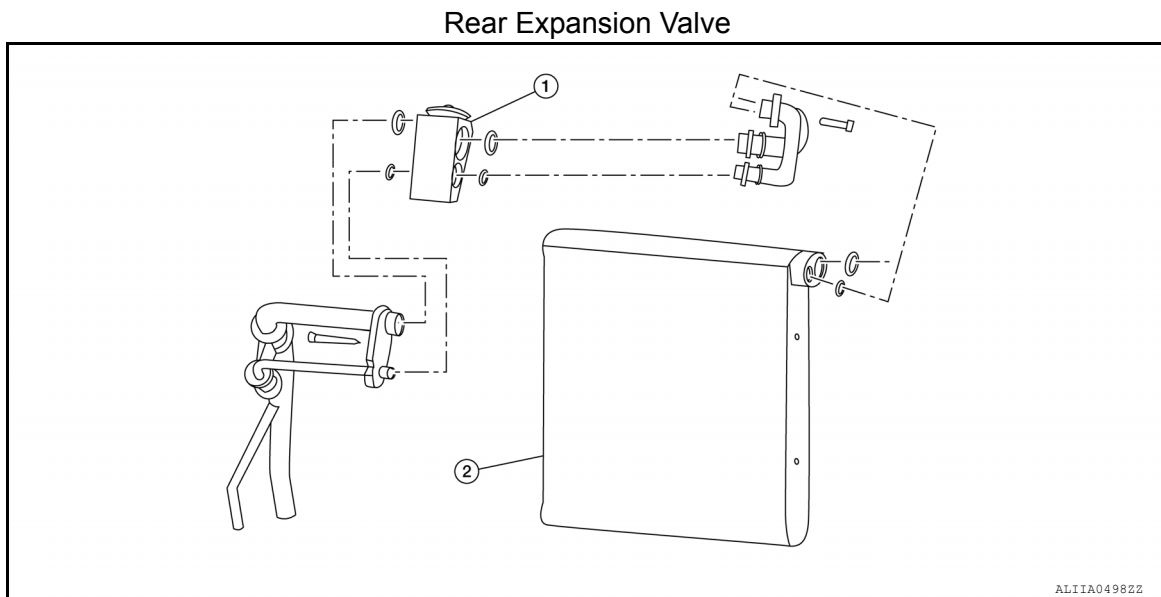
Expansion valve bolts : 4 Nm (0.4 kg-m, 35 in-lb)

CAUTION:

- Do not reuse the O-rings.
- Apply compressor oil to the new O-rings for installation.
- Keep the O-rings free from any lint or dirt. Contamination will affect the O-ring seal and can cause a leak.
- After charging refrigerant, check for leaks.

Removal and Installation - Rear Expansion Valve

INFOID:000000007981541



1. Rear expansion valve
2. Rear evaporator

REMOVAL

1. Discharge the refrigerant system. Refer to [HA-40. "HFC-134a \(R-134a\) Service Procedure"](#).
2. Remove the rear evaporator. Refer to [HA-74. "Removal and Installation - Rear Evaporator"](#).
3. Remove the rear expansion valve from the rear evaporator.

INSTALLATION

Installation is in the reverse order of removal.

CAUTION:

- Do not reuse the O-rings.
- Apply compressor oil to the new O-rings for installation.

EXPANSION VALVE

< REMOVAL AND INSTALLATION >

- **Keep the O-rings free from any lint or dirt. Contamination will affect the O-ring seal and can cause a leak.**
- **After charging refrigerant, check for leaks.**

HEATER CORE

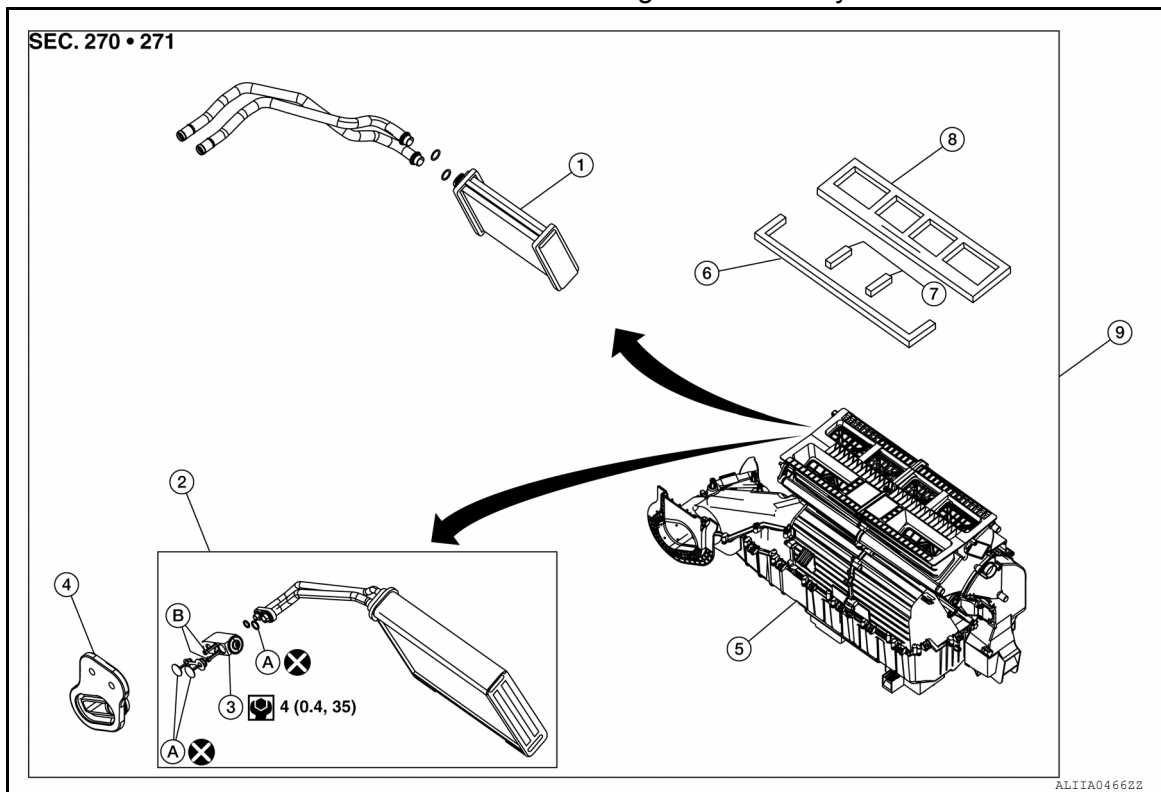
< REMOVAL AND INSTALLATION >

HEATER CORE

Removal and Installation - Front Heater Core

INFOID:000000007239085

Front Heater and Cooling Unit Assembly



- | | | |
|--|--|---|
| 1. Heater core | 2. Evaporator | 3. Expansion valve |
| 4. Heater core pipes and evaporator grommet | 5. Heater and cooling unit case | 6. Heater and cooling unit case rear seal |
| 7. Heater and cooling unit case center seals | 8. Heater and cooling unit case front seal | 9. Heater and cooling unit assembly |
| A. O-rings | B. Expansion valve bolts | |

FRONT HEATER CORE

NOTE:

When removing components such as hoses, tubes/lines, etc., cap or plug openings to prevent fluid from spilling.

Removal

1. Remove the front heater and cooling unit assembly. Refer to [HA-79. "HEATER & COOLING UNIT ASSEMBLY : Removal and Installation - Front Heating and Cooling Unit"](#).
2. Separate the blower motor housing from the heater and cooling unit.
3. Remove the heater core pipe cover.
4. Remove the heater case side cover.
5. Remove the heater core.

NOTE:

If the in-cabin microfilters are contaminated from coolant leaking from the front heater core, replace the in-cabin microfilters with new ones before installing the new front heater core.

Installation

Installation is in the reverse order of removal.

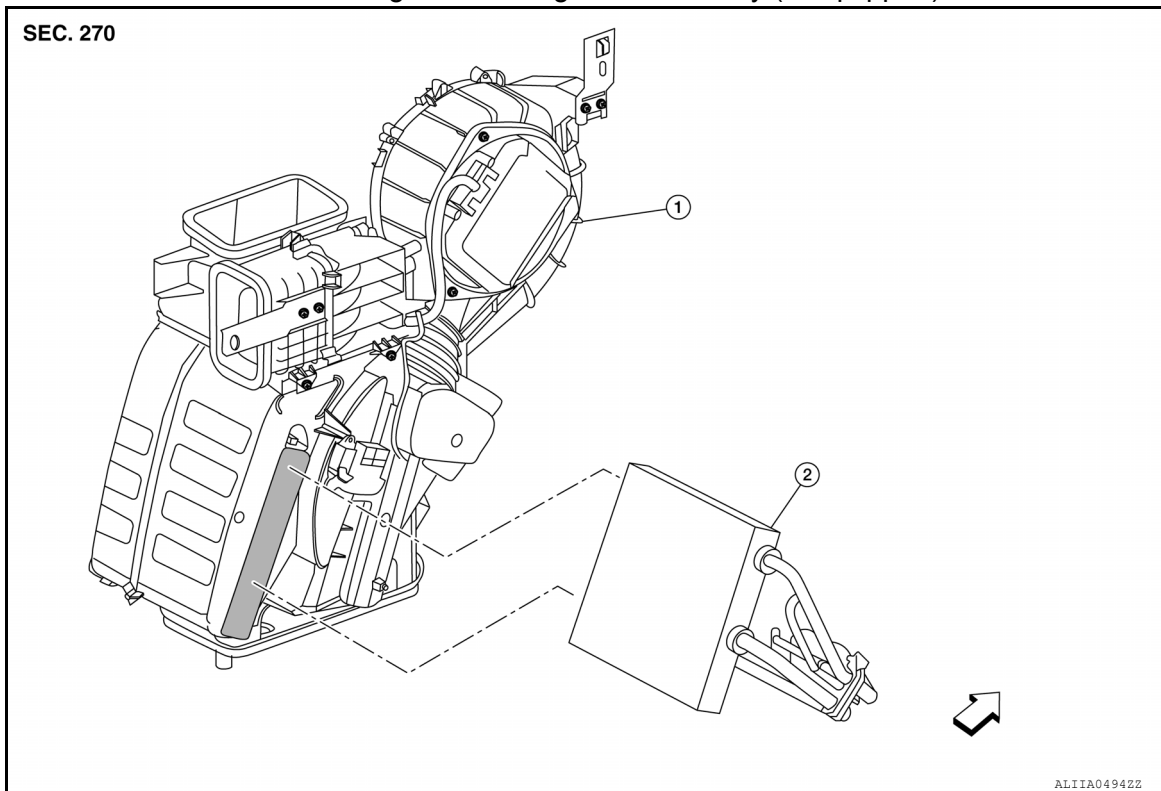
HEATER CORE

< REMOVAL AND INSTALLATION >

Removal and Installation - Rear Heater Core

INFOID:000000007968375

Rear Heating and Cooling Unit Assembly (If Equipped)



1. Rear heating and cooling unit assembly 2. Rear heater core

← Front

REMOVAL

NOTE:

When removing components such as hoses, lines/tubes, etc., cap or plug openings to prevent fluid from spilling.

1. Remove the rear heating and cooling unit assembly. Refer to [HA-80, "HEATER & COOLING UNIT ASSEMBLY : Removal and Installation - Rear Heating and Cooling Unit"](#).
2. Remove the rear heater core.

INSTALLATION

Installation is in the reverse order of removal.

NOTE:

The rear heater core is only available as part of the rear heating and cooling unit assembly.

HEATER & COOLING UNIT ASSEMBLY

< REMOVAL AND INSTALLATION >

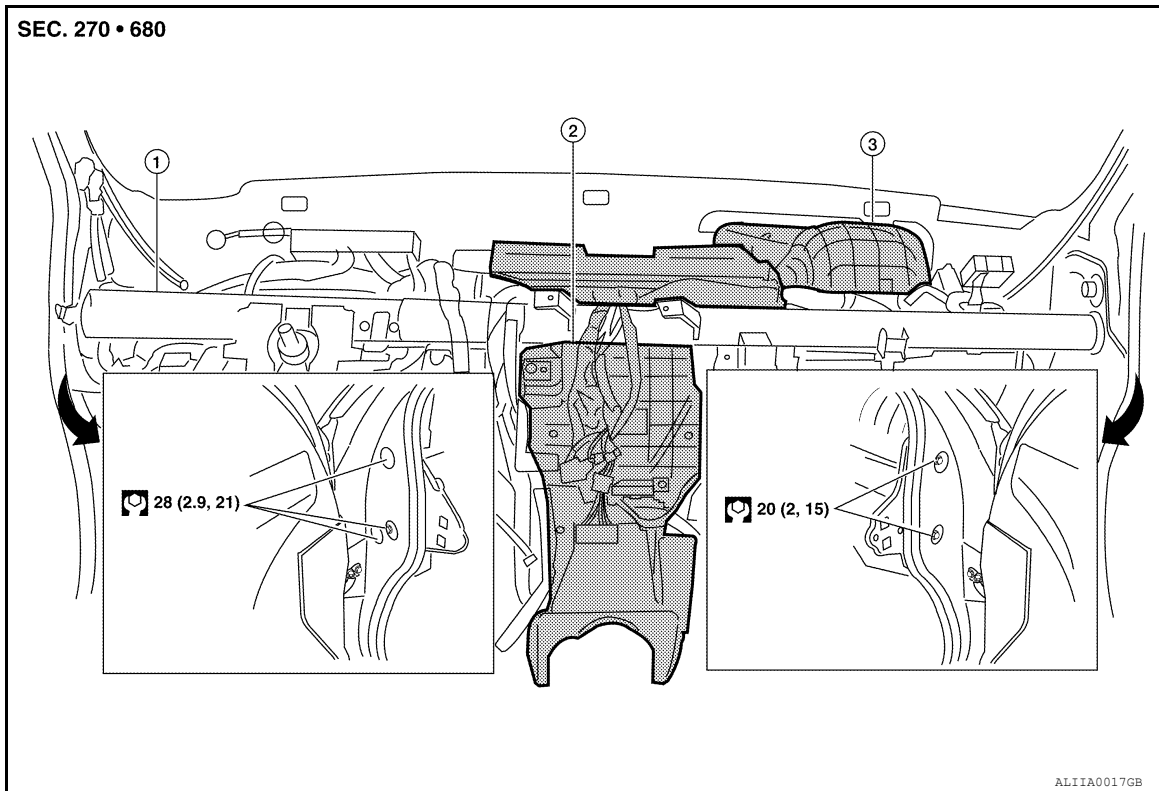
HEATER & COOLING UNIT ASSEMBLY

HEATER & COOLING UNIT ASSEMBLY

HEATER & COOLING UNIT ASSEMBLY : Removal and Installation - Front Heating and Cooling Unit

INFOID:000000006933504

COMPONENTS



1. Steering member

2. Front heating and cooling unit assembly

3. Front blower unit

REMOVAL

CAUTION:

Before servicing, turn the ignition switch off, disconnect both battery terminals and wait at least three minutes.

NOTE:

When removing components such as hoses, tubes/lines, etc., cap or plug openings to prevent fluid from spilling.

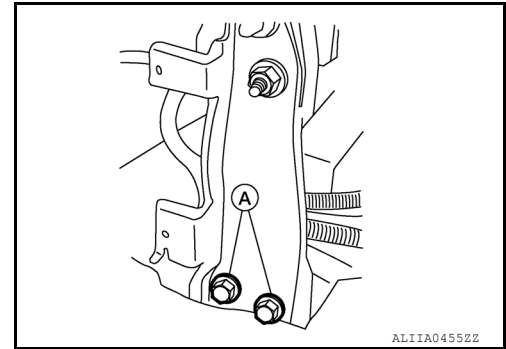
1. Discharge the refrigerant from the A/C system. Refer to [HA-40, "HFC-134a \(R-134a\) Service Procedure"](#).
2. Drain the engine coolant from the cooling system. Refer to [CO-12, "Changing Engine Coolant"](#).
3. Disconnect the battery negative and positive terminals and wait at least three minutes.
4. Disconnect the heater hoses from the heater core pipes.
5. Disconnect the refrigerant lines from the front expansion valve. Refer to [HA-59, "Exploded View"](#).
6. Remove the instrument panel assembly. Refer to [IP-15, "Removal and Installation"](#).
7. Remove the steering column assembly. Refer to [ST-12, "Removal and Installation"](#).
8. Disconnect the drain hose.
9. Disconnect all necessary harness connectors.

HEATER & COOLING UNIT ASSEMBLY

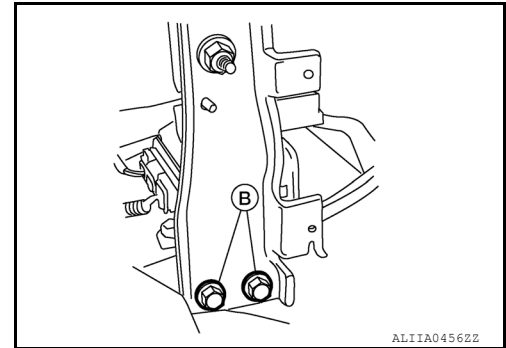
< REMOVAL AND INSTALLATION >

10. Remove the steering member bolts:

- LH center bolt.
- Three LH steering member to cowl bolts.
- Two RH steering member to cowl bolts.
- Two LH center steering member to floor bolts (A).



- Two RH center steering member to floor bolts (B).
- Four upper bolts and brackets.



11. Lift upward and remove the front heater and cooling unit assembly attached to the steering member as one assembly from the vehicle.

12. Separate the front heater and cooling unit assembly from the steering member.

INSTALLATION

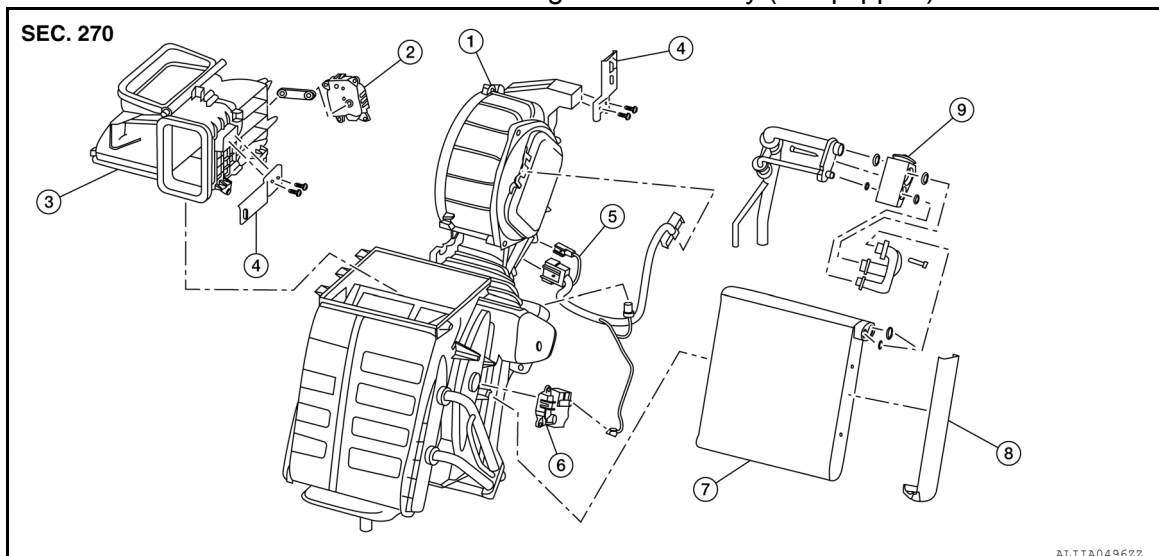
Installation is in the reverse order of removal.

- Fill the radiator with the specified water and coolant mixture. Refer to [CO-34, "Standard and Limit"](#) (VQ40DE) or [CO-59, "Standard and Limit"](#) (VK56DE).
- Recharge the A/C system. Refer to [HA-40, "HFC-134a \(R-134a\) Service Procedure"](#).

HEATER & COOLING UNIT ASSEMBLY : Removal and Installation - Rear Heating and Cooling Unit

INFOID:000000007969767

Rear Heater and Cooling Unit Assembly (If Equipped)



1. Rear heater and cooling unit assembly 2. Rear mode door motor 3. Rear upper distribution module

HEATER & COOLING UNIT ASSEMBLY

< REMOVAL AND INSTALLATION >

- | | | |
|----------------------|--------------------------------|----------------------------|
| 4. Rear case bracket | 5. Rear HVAC jumper harness | 6. Rear air mix door motor |
| 7. Rear evaporator | 8. Rear heater case side cover | 9. Rear expansion valve |

REMOVAL

NOTE:

When removing components such as hoses, tubes/lines, etc., cap or plug openings to prevent fluid from spilling.

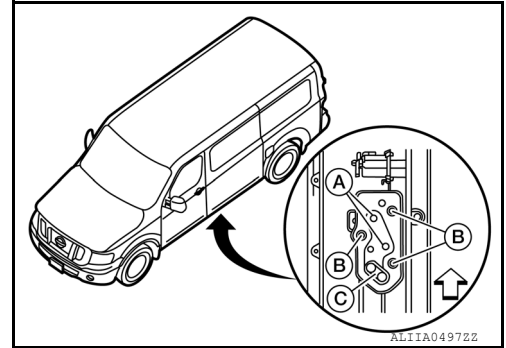
1. Discharge the refrigerant. Refer to [HA-40, "HFC-134a \(R-134a\) Service Procedure"](#).
2. Drain the coolant from the vehicle. Refer to [CO-44, "Changing Engine Coolant"](#).
3. Disconnect the underfloor rear heater hoses (A) and cooler lines (C), then remove the rear hose bracket bolts (B) from the underside of the vehicle.

A : Underfloor rear heater hoses

B : Underfloor rear hose bracket bolts

C : Underfloor rear cooler lines

⇐ : Front



4. Remove the center pillar lower finisher (LH). Refer to [INT-28, "CENTER PILLAR LOWER FINISHER : Removal and Installation"](#).
5. Remove the rear ventilator duct upper and lower. Refer to [VTL-8, "REAR VENTILATOR DUCT : Removal and Installation - Rear Ventilator Duct Upper"](#) (upper) and [VTL-8, "REAR VENTILATOR DUCT : Removal and Installation - Rear Ventilator Duct Lower"](#) (lower).
6. Remove the rear floor connecting duct. Refer to [VTL-7, "REAR FLOOR DUCT : Removal and Installation - Rear Floor Connecting Duct"](#).
7. Remove the rear case opening floor cover.
8. Remove the case bracket bolts.
9. Disconnect the rear HVAC jumper harness from the rear heater and cooling unit assembly.
10. Remove the rear heater and cooling unit assembly.

INSTALLATION

Installation is in the reverse order of removal.

CAUTION:

- Recharge the A/C system. Refer to [HA-40, "HFC-134a \(R-134a\) Service Procedure"](#).
- Fill the radiator with the specified water and coolant mixture. Refer to [CO-59, "Standard and Limit"](#).
- Do not reuse O-rings.
- Apply A/C oil to new O-rings for installation.

SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

Service Data and Specification (SDS)

INFOID:000000006749357

COMPRESSOR

Make	VALEO
Model	DKS-17D
Type	Swash plate
Displacement	175.5 cm ³ (10.7 in ³) / revolution
Cylinder bore × stroke	30.5 mm (1.20 in) x 24.0 mm (0.94 in)
Direction of rotation	Clockwise (viewed from drive end)
Drive belt	Poly V

OIL

Name	NISSAN A/C System Oil Type S (DH-PS)*	
Capacity	With rear A/C	230 m ℓ (7.8 US fl oz, 8.1 Imp fl oz)
	Without rear A/C	180 m ℓ (6.1 US fl oz, 6.3 Imp fl oz)

*For further information, see "Air conditioning specification label".

REFRIGERANT

Type	HFC 134a (R-134a)*	
Capacity	With rear A/C	1.20 ± 0.05 kg (2.64 ± 0.11 lb)
	Without rear A/C	0.85 ± 0.05 kg (1.87 ± 0.11 lb)

*For further information, see "Air conditioning specification label".