

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 a new one.
- Be sure to tighten bolts and nuts securely to the specified torque.
- After installation is complete, be sure to check that each part works properly.
- Follow the steps below to clean components:
 - Water soluble dirt:
 - Dip a soft cloth into lukewarm water, wring the water out of the cloth and wipe the dirty area.
 - Then rub with a soft, dry cloth.
 - Oily dirt:
 - Dip a soft cloth into lukewarm water with mild detergent (concentration: within 2 to 3%) and wipe the dirty area.
 - Then dip a cloth into fresh water, wring the water out of the cloth and wipe the detergent off.
 - Then rub with a soft, dry cloth.
 - Do not use organic solvent such as thinner, benzene, alcohol or gasoline.
 - For genuine leather seats, use a genuine leather seat cleaner.

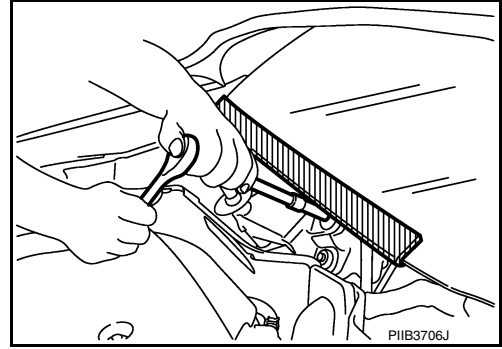
PRECAUTIONS

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Precaution for Procedure without Cowl Top Cover

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



Precautions For Refrigerant System Service

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WORKING WITH HFC-134a (R-134a)

CAUTION:

- CFC-12 (R-12) refrigerant and HFC-134a (R-134a) refrigerant are not compatible. Compressor malfunction is likely to occur if the refrigerants are mixed, refer to “CONTAMINATED REFRIGERANT” below. To determine the purity of HFC-134a (R-134a) in the vehicle and recovery tank, use Refrigerant recovery/recycling recharging equipment and Refrigerant Identifier.
- Use only specified oil for the HFC-134a (R-134a) A/C system and HFC-134a (R-134a) components. Compressor malfunction is likely to occur if oil other than that specified is used.
- The specified HFC-134a (R-134a) oil rapidly absorbs moisture from the atmosphere. The following handling precautions must be observed:
 - Cap (seal) the component immediately to minimize the entry of moisture from the atmosphere when removing refrigerant components from a vehicle.
 - Do not remove the caps (unseal) until just before connecting the components when installing refrigerant components to a vehicle. Connect all refrigerant loop components as quickly as possible to minimize the entry of moisture into system.
 - Use only the specified oil from a sealed container. Reseal containers of oil immediately. Oil becomes moisture saturated and should not be used without proper sealing.
 - Do not allow oil to come in contact with styrene foam parts. Damage may result.

GENERAL REFRIGERANT PRECAUTION

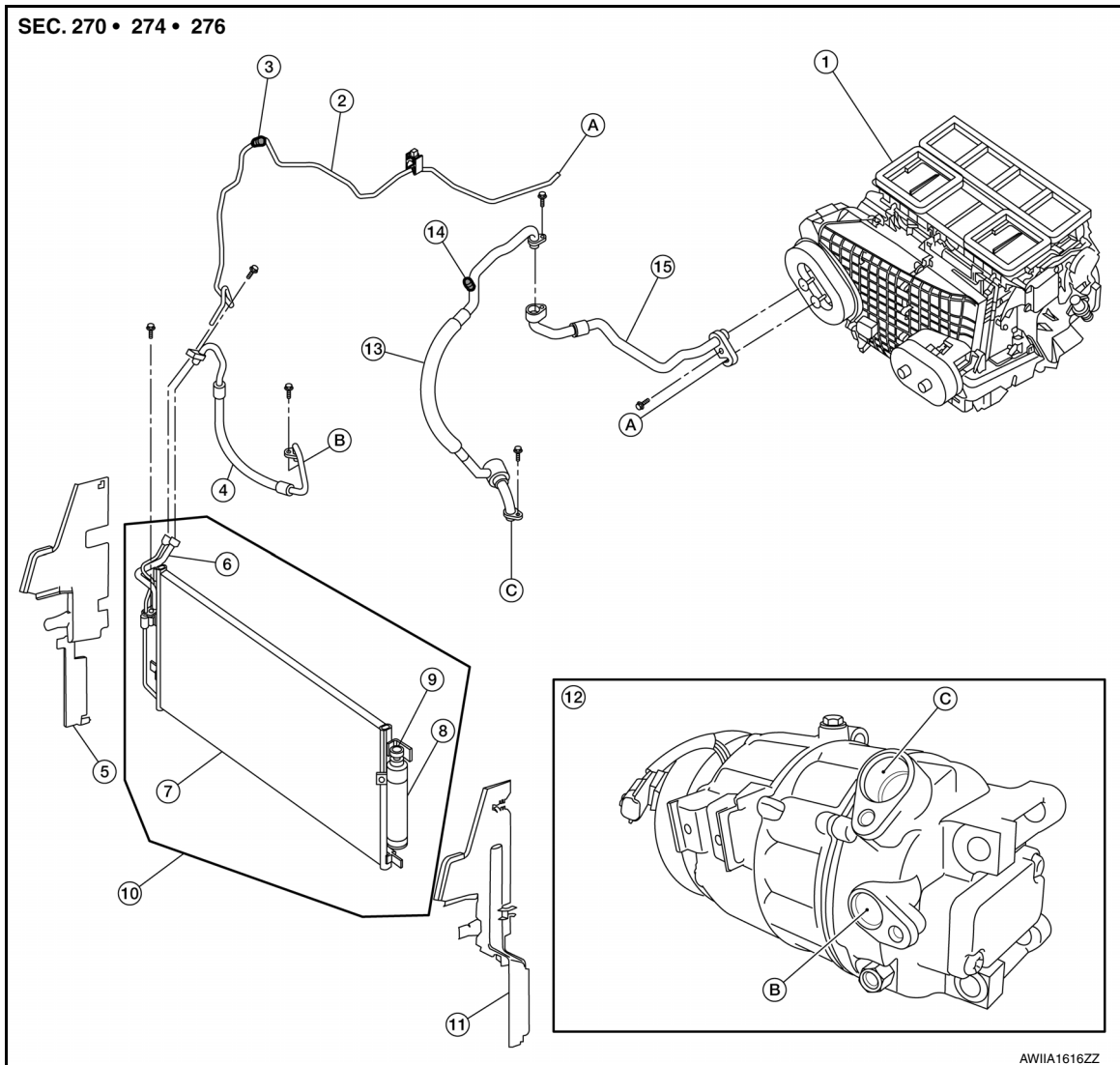
WARNING:

- Do not breathe 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 J-2210 [HFC-134a (R-134a) recycling equipment] or J-2209 [HFC-134a (R-134a) recovery equipment]. Ventilate work area before resuming service if accidental system discharge occurs. Additional health and safety information may be obtained from refrigerant and oil manufacturers.
- Do not release refrigerant into the air. Use approved recovery/recycling recharging equipment to capture the refrigerant each 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 (126°F).
- Do not heat a refrigerant container with an open flame; Place the bottom of the container in a warm pail of water if container warming is required.
- Do not intentionally drop, puncture or incinerate refrigerant containers.
- Do not refrigerant away from open flames; poisonous gas is produced if refrigerant burns.
- Refrigerant displaces oxygen; therefore be certain to work in well ventilated areas to prevent suffocation.
- Do not pressure test or leakage 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.

O-RING AND REFRIGERANT CONNECTION

PRECAUTIONS

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| 1. Heater and cooling unit assembly | 2. High-pressure pipe | 3. High-pressure A/C service valve |
| 4. High-pressure flexible hose | 5. Air deflector (RH) | 6. Junction pipe |
| 7. Condenser | 8. Liquid tank | 9. Refrigerant pressure sensor |
| 10. Condenser, liquid tank and refrigerant pressure sensor | 11. Air deflector (LH) | 12. Compressor |
| 13. Low-pressure flexible hose | 14. Low-pressure A/C service valve | 15. Low-pressure pipe |
| A. High-pressure pipe to heater and cooling unit assembly | B. High-pressure flexible hose to compressor | C. Low-pressure flexible hose to compressor |

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

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

WARNING:

Check that 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:

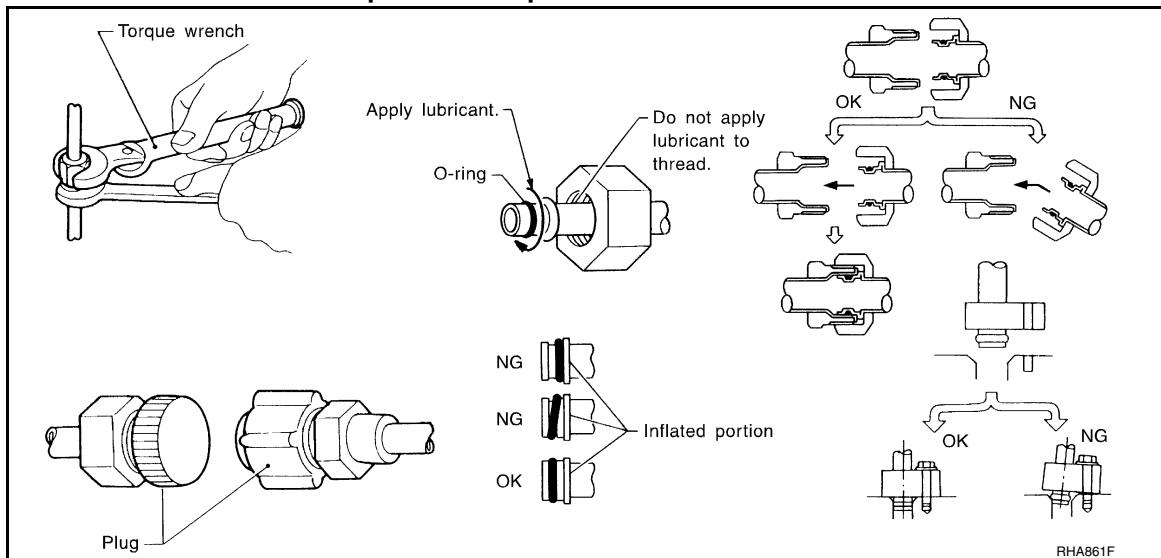
Observe the following when replacing or cleaning refrigerant cycle components.

- Store it in the same way as it is when mounted on the vehicle when the compressor is removed. Failure to do so will cause oil to enter the low-pressure chamber.
- Always use a torque wrench and a back-up wrench when connecting tubes.
- Immediately plug all openings to prevent entry of dust and moisture after disconnecting tubes.

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- Connect the pipes at the final stage of the operation when installing an air conditioner in the vehicle. 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.
- Remove moisture thoroughly from the refrigeration system before charging the refrigerant.
- Always replace used O-rings.
- Apply oil to circle of the O-rings shown in illustration when connecting tube. Be careful not to apply oil to threaded portion.
- O-ring must be closely attached to the groove portion of tube.
- Be careful not to damage O-ring and tube when replacing the O-ring.
- Connect tube until a click can be heard. Then tighten the nut or bolt by hand. Check that the O-ring is installed to tube correctly.
- Perform leakage test and make sure that there is no leakage from connections after connecting line. Disconnect that line and replace the O-ring when the refrigerant leaking point is found. Then tighten connections of seal seat to the specified torque.



CONTAMINATED REFRIGERANT

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

- Explain to the customer that environmental regulations prohibit the release of contaminated refrigerant into the atmosphere.
- Explain that recovery of the contaminated refrigerant could damage service equipment and refrigerant supply.
- Suggest the customer return the vehicle to the location of previous service where the contamination may have occurred.
- In case of repairing, recover the refrigerant using only **dedicated equipment and containers**. Do not recover contaminated refrigerant into the existing service equipment. Contact a local refrigerant product retailer for available service if the facility does not have dedicated recovery equipment. 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.
- The air conditioner warranty is void if the vehicle is within the warranty period. Please contact Nissan Customer Affairs for further assistance.

COMPRESSOR

CAUTION:

- Plug all openings to prevent moisture and foreign matter from entering.
- Store it in the same way as it is when mounted on the car when the compressor is removed.
- Follow "Maintenance of Oil Quantity in Compressor" exactly when replacing or repairing compressor. Refer to [HA-30, "Description"](#).
- Keep friction surfaces between clutch and pulley clean. Wipe it off by using a clean waste cloth moistened with thinner if the surface is contaminated with oil.

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- Turn the compressor shaft by hand more than five turns in both directions after compressor service operation. This distributes oil equally inside the compressor. Let the engine idle and operate the compressor for one hour after the compressor is installed.
- Apply voltage to the new one and check for normal operation after replacing the compressor magnet clutch.

LEAK DETECTION DYE

CAUTION:

- The A/C system contains a fluorescent leak detection dye used for locating refrigerant leakages. An ultraviolet (UV) lamp is required to illuminate the dye when inspecting for leakages.
- Always wear fluorescence enhancing UV safety goggles to protect eyes and enhance the visibility of the fluorescent dye.
- The fluorescent dye leak detector is not a replacement for an electrical leak detector (SST: J-41995). The fluorescent dye leak detector should be used in conjunction with an electrical leak detector (SST: J-41995) to pin-point refrigerant leakages.
- Read and follow all manufacturer's operating instructions and precautions prior to performing the work for the purpose of safety and customer's satisfaction.
- A compressor shaft seal should not necessarily be repaired because of dye seepage. The compressor shaft seal should only be repaired after confirming the leakage with an electrical leak detector (SST: J-41995).
- Always remove any remaining dye from the leakage area after repairs are completed to avoid a misdiagnosis during a future service.
- Do not allow dye to come into contact with painted body panels or interior components. Clean immediately with the approved dye cleaner if dye is spilled. 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 CFC-12 (R-12) A/C systems are different. Do not use HFC-134a (R-134a) leak detection dye in CFC-12 (R-12) A/C system or CFC-12 (R-12) leak detection dye in HFC-134a (R-134a) A/C system or A/C system damage may result.
- The fluorescent properties of the dye remains for three or more years unless a compressor malfunction occurs.

NOTE:

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

Service Equipment

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RECOVERY/RECYCLING RECHARGING EQUIPMENT

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

ELECTRICAL LEAK DETECTOR

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

VACUUM PUMP

PRECAUTIONS

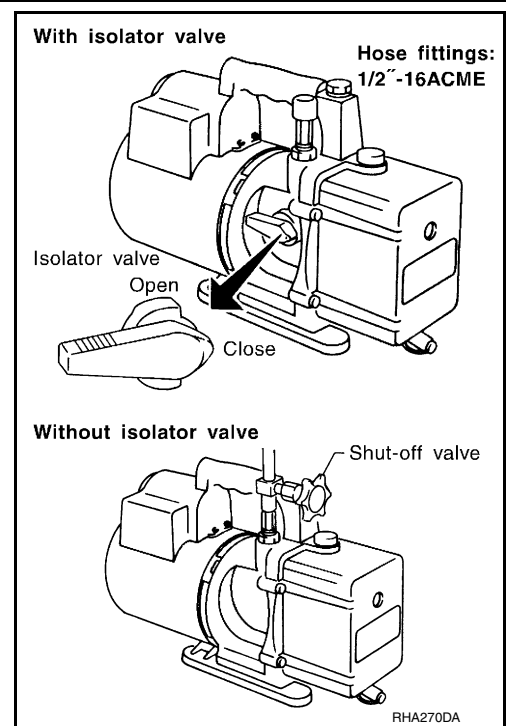
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The oil contained inside the vacuum pump is not compatible with the specified oil for HFC-134a (R-134a) A/C systems. The vent side of the vacuum pump is exposed to atmospheric pressure, so the vacuum pump oil may migrate out of the pump into the service 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 placed near the hose-to-pump connection, as per the following.

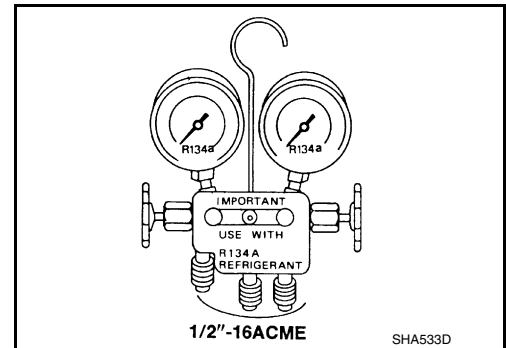
- Vacuum pumps usually have a manual isolator valve as part of the pump. Close this valve to isolate the service hose from the pump.
- Use a hose equipped with a manual shut-off valve near the pump end for pumps without an isolator. Close the valve to isolate the hose from the pump.
- Disconnect the hose from the pump if the hose has an automatic shut-off valve. As long as the hose is connected, the valve is open and lubricating oil may migrate.

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



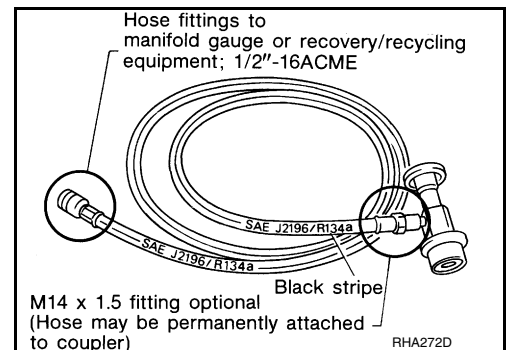
MANIFOLD GAUGE SET

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



SERVICE HOSES

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



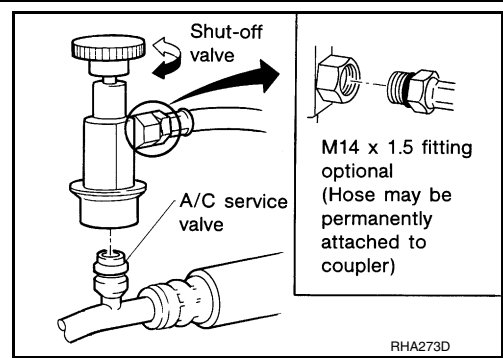
SERVICE COUPLERS

PRECAUTIONS

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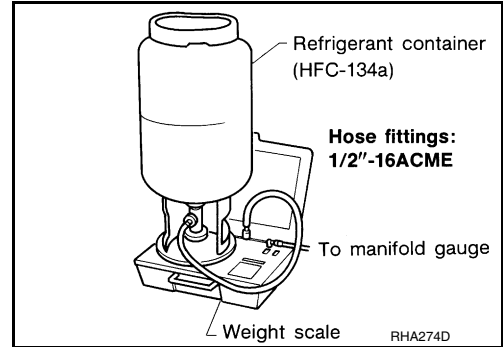
Do not attempt to connect HFC-134a (R-134a) service couplers to the CFC-12 (R-12) A/C system. The HFC-134a (R-134a) couplers do not properly connect to the CFC-12 (R-12) system. However, if an improper connection is attempted, discharging and contamination may occur.

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



REFRIGERANT WEIGHT SCALE

Verify that no refrigerant other than HFC-134a (R-134a) and specified oils have been used with the scale. The hose fitting must be 1/2"-16 ACME if the scale controls refrigerant flow electronically.



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.

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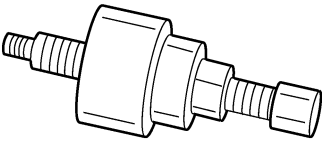
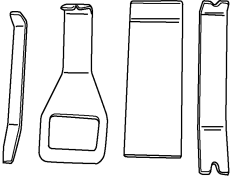
PREPARATION

PREPARATION

Special Service Tool

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

Tool number (TechMate No.) Tool name	Description
<p>— (J-41425-NIS) Aluminum tube repair kit</p>  <p style="text-align: right; font-size: small;">ALIIA0390ZZ</p>	<p>Repairing leaks in A/C tubes</p>
<p>— (J-38873-A) Drive plate installer</p>  <p style="text-align: right; font-size: small;">WJIA0367E</p>	<p>Installing pulley</p>
<p>— (J-46534) Trim Tool Set</p>  <p style="text-align: right; font-size: small;">AWJIA0483ZZ</p>	<p>Removing trim components</p>

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

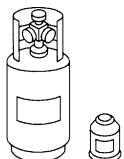

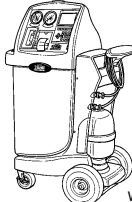
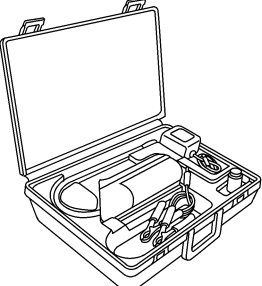
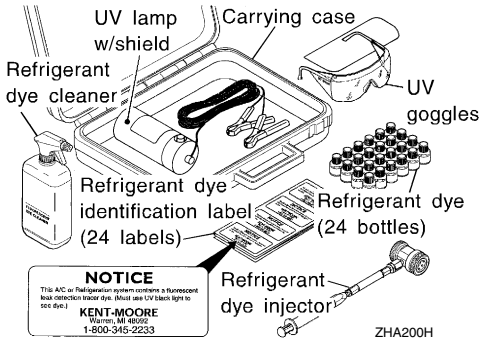
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Do not mix HFC-134a (R-134a) refrigerant and/or its specified oil with CFC-12 (R-12) refrigerant and/or its oil. Separate and non-interchangeable service equipment must be used for handling each type of refrigerant/oil. Refrigerant container fittings,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

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

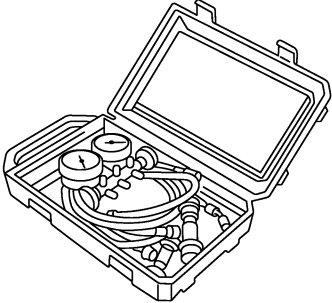
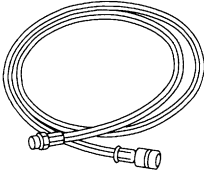
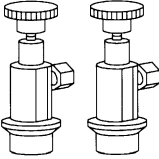
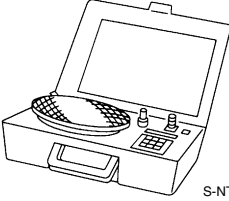
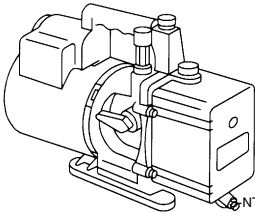
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Tool number (TechMate No.) Tool name	Description	
<p>— (—) HFC-134a (R-134a) Refrigerant</p>  <p style="text-align: center;">S-NT196</p>	<p>Container color: Light blue Container marking: HFC-134a (R-134a) Fitting size: Thread size • large container 1/2"-16 ACME</p>	A B C D
<p>— (—) NISSAN A/C System Oil Type R</p>  <p style="text-align: center;">S-NT197</p>	<p>Type: Poly alkylene glycol oil (PAG), type R Application: HFC-134a (R-134a) vane rotary compressors (NISSAN only) Lubricity: 40 mℓ (1.4 US fl oz, 1.4 Imp fl oz)</p>	E F
<p>— (J-48710) NISSAN ACR2009 RRR Unit</p>  <p style="text-align: center;">WJIA0293E</p>	<p>Refrigerant recovery, recycling and recharging</p>	G H
<p>— (J-41995) Electronic refrigerant leak detector</p>  <p style="text-align: center;">AHA281A</p>	<p>Power supply: • DC 12V (battery terminal)</p>	HA J K L
<p>— (J-43926) Refrigerant dye leak detection kit Kit includes: (J-42220) UV lamp and UV safety goggles (J-41459) Refrigerant dye injector (J-41447) Fluorescent leak detection dye (box of 24, 1/4 ounce bottles) (J-43872) Refrigerant dye cleaner</p>  <p style="text-align: center;">ZHA200H</p>	<p>Power supply: • DC 12V (battery terminal)</p>	M N O P

PREPARATION

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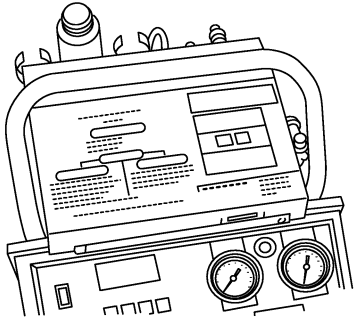

Tool number (TechMate No.) Tool name	Description
<p>— (J-39183-C) Manifold gauge set (with hoses and couplers)</p>  <p style="text-align: right; font-size: small;">R/JIA0196E</p>	<p>Identification:</p> <ul style="list-style-type: none"> • The gauge face indicates R-134a. • Fitting size-Thread size • 1/2"-16 ACME
<p>Service hoses:</p> <ul style="list-style-type: none"> • High side hose (J-39500-72B) • Low side hose (J-39500-72R) • Utility hose (J-39500-72Y)  <p style="text-align: right; font-size: small;">S-NT201</p>	<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 (J-39500-20A) • Low side coupler (J-39500-24A)  <p style="text-align: right; font-size: small;">S-NT202</p>	<p>Hose fitting to service hose:</p> <ul style="list-style-type: none"> • M14 x 1.5 fitting is optional or permanently attached.
<p>— (J-39699) Refrigerant weight scale</p>  <p style="text-align: right; font-size: small;">S-NT200</p>	<p>For measuring of refrigerant</p> <p>Fitting size-Thread size</p> <ul style="list-style-type: none"> • 1/2"-16 ACME
<p>— (J-39649) Vacuum pump (Including the isolator valve)</p>  <p style="text-align: right; font-size: small;">S-NT203</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

Commercial Service Tool

INFOID:000000009729480

PREPARATION

< PREPARATION >

(TechMate No.) Tool name	Description	A
(J-41810-NI) Refrigerant identifier equipment (R-134a)	For checking refrigerant purity and system contamination	B C D
(—) Power tool	Loosening nuts, screws and bolts	E F G
 <p style="text-align: right; margin-right: 50px;">RJIA0197E</p>	 <p style="text-align: right; margin-right: 50px;">PIIB1407E</p>	H HA J K L M N O P

REFRIGERATION SYSTEM

< SYSTEM DESCRIPTION >

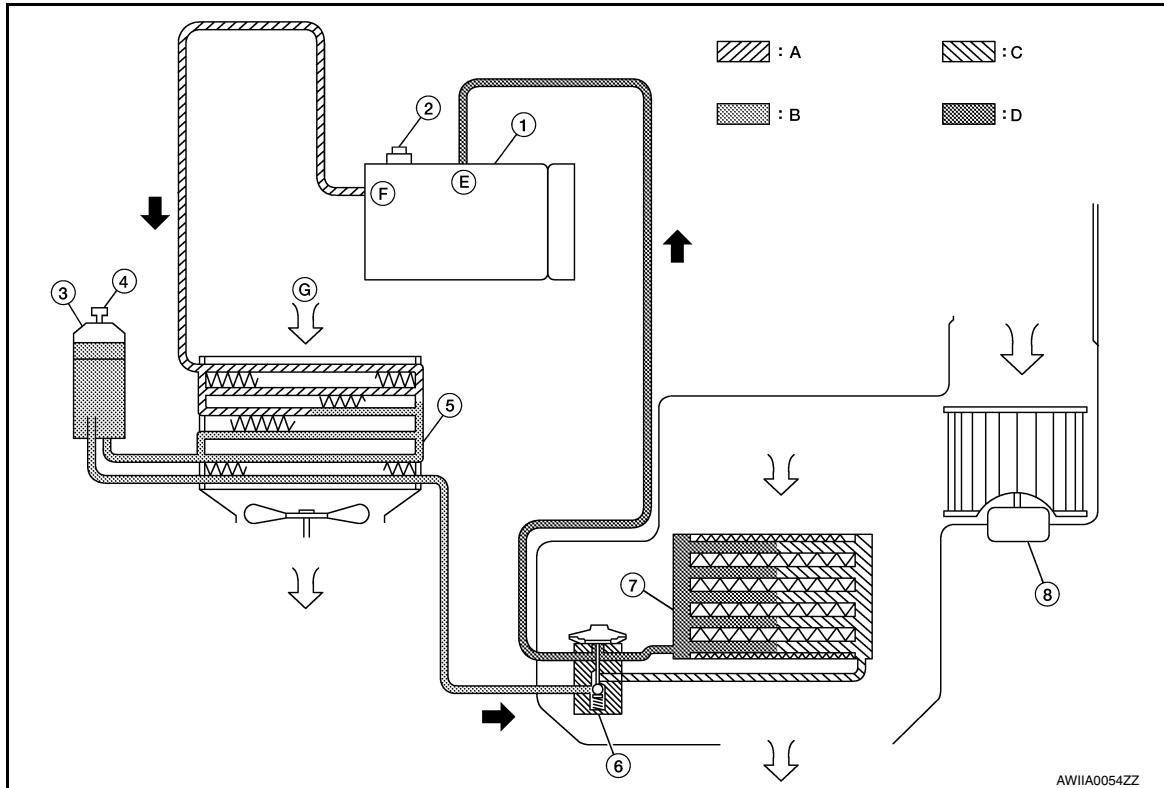
SYSTEM DESCRIPTION

REFRIGERATION SYSTEM

Refrigerant Cycle

INFOID:000000009465923

Refrigerant flow



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

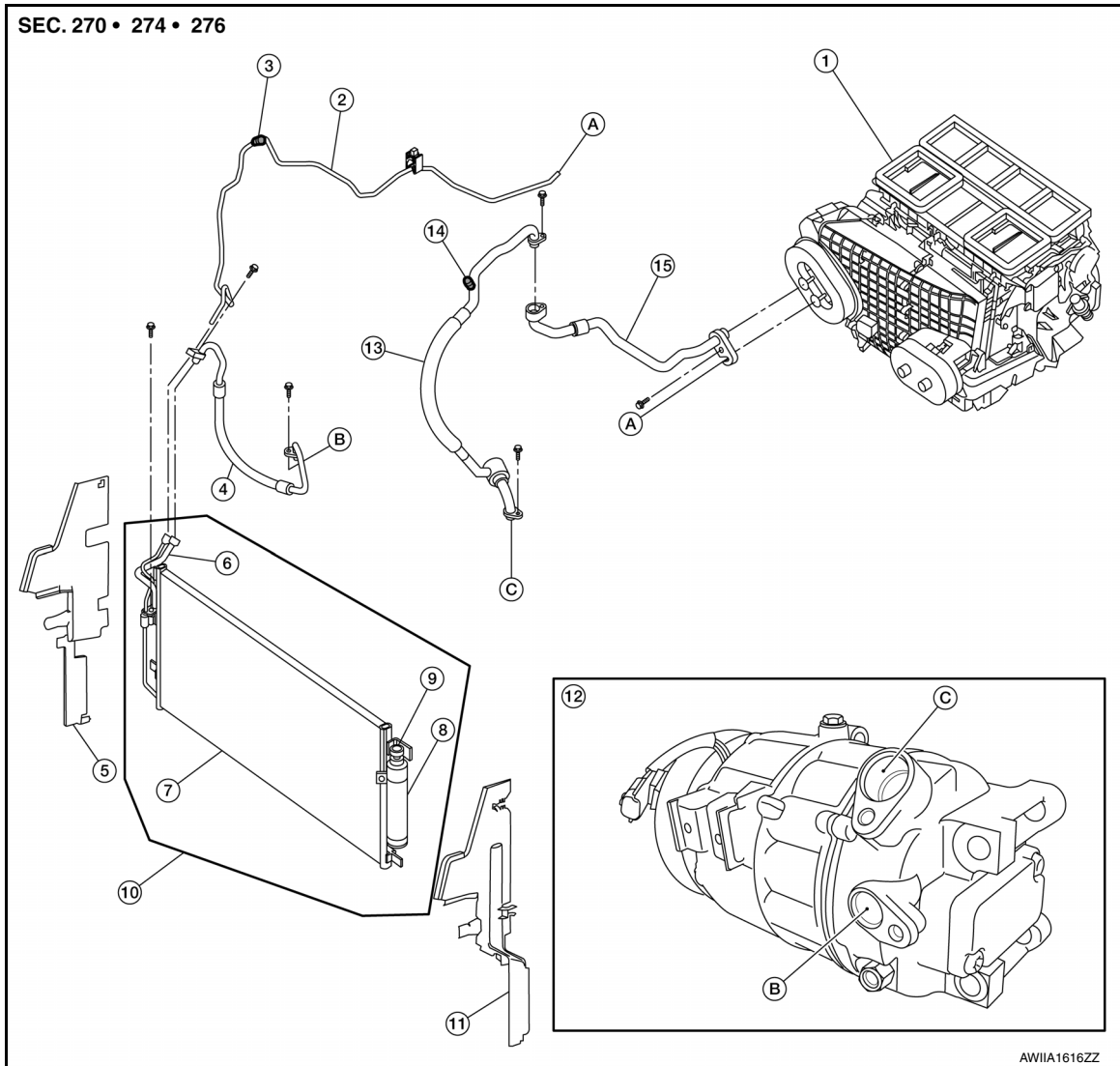
The refrigerant from the compressor flows through the condenser with liquid tank, the evaporator and returns to the compressor. The refrigerant evaporation in the evaporator is controlled by an expansion valve.

REFRIGERATION SYSTEM

< SYSTEM DESCRIPTION >

Component Part Location

INFOID:000000009465924



- | | | |
|--|--|---|
| 1. Heater and cooling unit assembly | 2. High-pressure pipe | 3. High-pressure A/C service valve |
| 4. High-pressure flexible hose | 5. Air deflector (RH) | 6. Junction pipe |
| 7. Condenser | 8. Liquid tank | 9. Refrigerant pressure sensor |
| 10. Condenser, liquid tank and refrigerant pressure sensor | 11. Air deflector (LH) | 12. Compressor |
| 13. Low-pressure flexible hose | 14. Low-pressure A/C service valve | 15. Low-pressure pipe |
| A. High-pressure pipe to heater and cooling unit assembly | B. High-pressure flexible hose to compressor | C. Low-pressure flexible hose to compressor |

Refrigerant System Protection

INFOID:000000009465925

Refrigerant pressure sensor

The refrigerant system is protected against excessively high or low pressures by the refrigerant pressure sensor, located on the condenser. If the system pressure rises above or falls below the specifications, the refrigerant pressure sensor detects the pressure inside the refrigerant line and sends the voltage signal to the ECM. The ECM then ceases to supply power to the A/C relay which disengages and stops the compressor when pressure on the high pressure side (as detected by refrigerant pressure sensor) is over approximately 2,746 kPa (28 kg/cm², 398 psi), or below approximately 120 kPa (1.22 kg/cm², 17.4 psi).

Pressure Relief Valve

REFRIGERATION SYSTEM

< SYSTEM DESCRIPTION >

The refrigerant system is also protected by a pressure relief valve, located in the rear head of the compressor. When the pressure of refrigerant in the system increases to an abnormal level [more than 3,727 kPa (38 kg/cm², 540 psi)], the release port on the pressure relief valve automatically opens and releases refrigerant into the atmosphere.

DIAGNOSIS AND REPAIR WORK FLOW

< BASIC INSPECTION >

BASIC INSPECTION

DIAGNOSIS AND REPAIR WORK FLOW WITH COLOR DISPLAY

WITH COLOR DISPLAY : How to Perform Trouble Diagnosis For Quick And Accurate Repair

INFOID:000000009465926

WORK FLOW

1. LISTEN TO CUSTOMER COMPLAINT

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

>> GO TO 2.

2. CHECK FOR SERVICE BULLETINS

Check for any service bulletins.

>> GO TO 3.

3. CHECK FOR HVAC DTCS WITH CONSULT

Using CONSULT, perform "SELF-DIAGNOSIS RESULTS" of HVAC. Refer to [HAC-65, "DTC Index"](#).

Are there any HVAC DTCS present?

YES >> Go to HVAC DTC index. Refer to [HAC-65, "DTC Index"](#).

NO >> GO TO 4.

4. CHECK FOR AUDIO DTCS WITH CONSULT

Using CONSULT, perform "SELF-DIAGNOSIS RESULTS" of MULTI AV. Refer to [AV-437, "DTC Index"](#) (without navigation) or [AV-607, "DTC Index"](#) (with navigation).

Are there any audio DTCS present?

YES >> Go to audio DTC index. Refer to [HAC-65, "DTC Index"](#).

NO >> GO TO 5.

5. PERFORM OPERATIONAL CHECK

Verify the symptom with operational check based on the information obtained from the customer. Refer to [HAC-5, "Operational Check"](#).

>> GO TO 6.

6. GO TO APPROPRIATE TROUBLE DIAGNOSIS

Go to appropriate trouble diagnosis. Refer to [HA-21, "WITH COLOR DISPLAY : Symptom Matrix Chart"](#).

NOTE:

If DTC is displayed, erase DTC after repairing or replacing malfunctioning parts.

Is the inspection result normal?

YES >> Repair or replace malfunctioning parts.

NO >> GO TO 7.

7. FINAL CHECK

Check that the A/C system operates normally.

Is the inspection result normal?

YES >> Inspection End

NO >> GO TO 3.

WITH MONOCHROME DISPLAY

WITH MONOCHROME DISPLAY : How to Perform Trouble Diagnosis For Quick And

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DIAGNOSIS AND REPAIR WORK FLOW

< BASIC INSPECTION >

Accurate Repair

INFOID:000000009465927

WORK FLOW

1. LISTEN TO CUSTOMER COMPLAINT

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

>> GO TO 2.

2. CHECK FOR SERVICE BULLETINS

Check for any service bulletins.

>> GO TO 3.

3. CHECK FOR HVAC DTCS WITH CONSULT

Using CONSULT, perform "SELF-DIAGNOSIS RESULTS" of HVAC. Refer to [HAC-171, "DTC Index"](#).

Are there any HVAC DTCS present?

YES >> Go to HVAC DTC index. Refer to [HAC-171, "DTC Index"](#).

NO >> GO TO 4.

4. PERFORM OPERATIONAL CHECK

Verify the symptom with operational check based on the information obtained from the customer. Refer to [HAC-108, "Operational Check"](#).

>> GO TO 5.

5. GO TO APPROPRIATE TROUBLE DIAGNOSIS

Go to appropriate trouble diagnosis. Refer to [HA-25, "WITH MONOCHROME DISPLAY : Symptom Matrix Chart"](#).

NOTE:

If DTC is displayed, erase DTC after repairing or replacing malfunctioning parts.

Is the inspection result normal?

YES >> Repair or replace malfunctioning parts.

NO >> GO TO 6.

6. FINAL CHECK

Check that the A/C system operates normally.

Is the inspection result normal?

YES >> Inspection End

NO >> GO TO 3.

REFRIGERATION SYSTEM SYMPTOMS

< SYMPTOM DIAGNOSIS >

SYMPTOM DIAGNOSIS

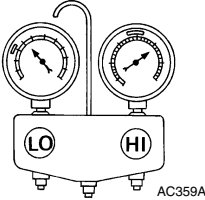
REFRIGERATION SYSTEM SYMPTOMS WITH COLOR DISPLAY

WITH COLOR DISPLAY : Trouble Diagnoses for Abnormal Pressure

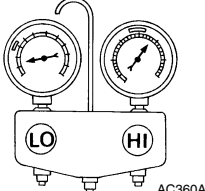
INFOID:000000009465928

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 above table (Ambient air temperature-to-operating pressure table).

Both High- and Low-pressure Sides are Too High

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
<p>A Both high- and low-pressure sides are too high.</p>  <p>AC359A</p>	Pressure is reduced soon after water is splashed on condenser.	Excessive refrigerant charge in refrigeration cycle	Reduce refrigerant until specified pressure is obtained.
	Air suction by cooling fan is insufficient.	Insufficient condenser cooling performance ↓ 1. Condenser fins are clogged. 2. Improper fan rotation of cooling fan	<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 compressor is stopped high-pressure value quickly drops by approximately 196 kPa (2 kg/cm², 28 psi). It then decreases gradually thereafter. 	Poor heat exchange in condenser (After compressor operation stops, high-pressure decreases too slowly.) ↓ Air in refrigeration cycle	Evacuate and recharge system.
	Engine tends to overheat.	Engine cooling systems malfunction.	Check and repair engine cooling system.
	<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. ↓ Improper expansion valve adjustment	Replace expansion valve.

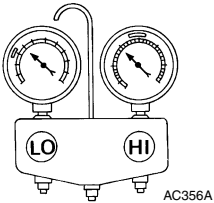
High-pressure Side is Too High and Low-pressure Side is Too Low

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

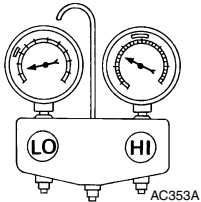
REFRIGERATION SYSTEM SYMPTOMS

< SYMPTOM DIAGNOSIS >

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

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
C High-pressure side is too low and low-pressure side is too high. 	High- and low-pressure sides become equal soon after compressor operation stops.	Compressor pressure operation is improper. ↓ Damaged inside compressor packings.	Replace compressor.
	No temperature difference between high- and low-pressure sides.	Compressor pressure operation is improper. ↓ Damaged inside compressor packings.	Replace compressor.

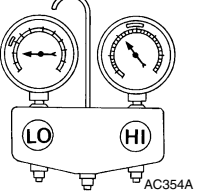
Both High- and Low-pressure Sides are Too Low

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
D Both high- and low-pressure sides are too low. 	<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. 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-26. "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-38. "Diagnosis Procedure". Repair evaporator fins. Replace evaporator. Refer to HAC-53. "Component Function Check".

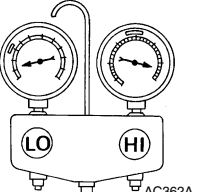
Low-pressure Side Sometimes Becomes Negative

REFRIGERATION SYSTEM SYMPTOMS

< SYMPTOM DIAGNOSIS >

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
<p>E Low-pressure side sometimes becomes negative.</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 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.

Low-pressure Side Becomes Negative

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
<p>F Low-pressure side becomes negative.</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.</p> <p>↓</p> <p>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. Check oil for contamination.

WITH COLOR DISPLAY : Symptom Matrix Chart

INFOID:000000009465929

Symptom	Reference	
A/C system A/C & AV switch is inoperative.	Go to Trouble Diagnosis Procedure for A/C System.	HAC-62. "A/C AND AV SWITCH ASSEMBLY : Diagnosis Procedure"
A/C system cannot be controlled from the A/C & AV switch assembly.	Go to Trouble Diagnosis Procedure for A/C and AV switch assembly System.	HAC-60. "A/C AUTO AMP. : Diagnosis Procedure"
Air outlet does not change.	Go to Trouble Diagnosis Procedure for Mode Door Motor. (LAN)	HAC-49. "Diagnosis Procedure"
Mode door motor does not operate normally.		
Discharge air temperature does not change.	Go to Trouble Diagnosis Procedure for Air Mix Door Motor. (LAN)	HAC-45. "Diagnosis Procedure" (driver side) or HAC-47. "Diagnosis Procedure" (passenger side)
Air mix door motor does not operate normally.		
Intake door does not change.	Go to Trouble Diagnosis Procedure for Intake Door Motor. (LAN)	HAC-52. "Diagnosis Procedure"
Intake door motor does not operate normally.		
Blower motor operation is malfunctioning.	Go to Trouble Diagnosis Procedure for Blower Motor.	HAC-53. "Diagnosis Procedure"

REFRIGERATION SYSTEM SYMPTOMS

< SYMPTOM DIAGNOSIS >

Symptom	Reference	
Magnet clutch does not engage.	Go to Trouble Diagnosis Procedure for Magnet Clutch.	HAC-57, "Diagnosis Procedure"
Insufficient cooling	Go to Trouble Diagnosis Procedure for Insufficient Cooling.	HAC-80, "Component Function Check"
No cool air comes out. (Airflow volume is normal.)		
Insufficient heating	Go to Trouble Diagnosis Procedure for Insufficient Heating.	HAC-86, "Component Function Check"
No warm air comes out. (Airflow volume is normal.)		
Noise	Go to Trouble Diagnosis Procedure for Noise.	HAC-89, "Component Function Check"
Memory function does not operate.	Go to Trouble Diagnosis Procedure for Memory Function.	HAC-91, "Component Function Check"

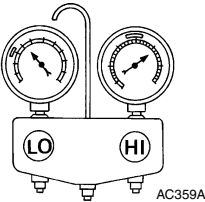
WITH MONOCHROME DISPLAY

WITH MONOCHROME DISPLAY : Trouble Diagnoses for Abnormal Pressure

INFOID:000000009465930

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 above table (Ambient air temperature-to-operating pressure table).

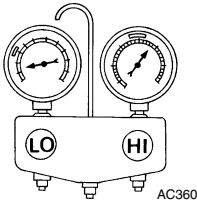
Both High- and Low-pressure Sides are Too High

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
<p>A Both high- and low-pressure sides are too high.</p>  <p style="text-align: right; font-size: small;">AC359A</p>	Pressure is reduced soon after water is splashed on condenser.	Excessive refrigerant charge in refrigeration cycle	Reduce refrigerant until specified pressure is obtained.
	Air suction by cooling fan is insufficient.	Insufficient condenser cooling performance ↓ 1. Condenser fins are clogged. 2. Improper fan rotation of cooling fan	<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. 	Poor heat exchange in condenser (After A/C compressor operation stops, high-pressure decreases too slowly.) ↓ Air in refrigeration cycle	Evacuate and recharge system.
	Engine tends to overheat.	Engine cooling systems malfunction.	Check and repair engine cooling system.
	<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. ↓ Improper expansion valve adjustment	Replace expansion valve.

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

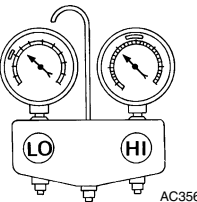
REFRIGERATION SYSTEM SYMPTOMS

< SYMPTOM DIAGNOSIS >

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 style="text-align: right; font-size: small;">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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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 style="text-align: right; font-size: small;">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.</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.</p>

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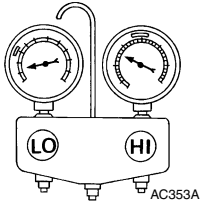
Both High- and Low-pressure Sides are Too Low

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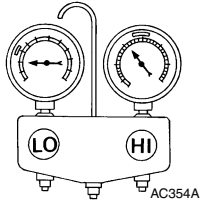
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REFRIGERATION SYSTEM SYMPTOMS

< SYMPTOM DIAGNOSIS >

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
<p>D Both high- and low-pressure sides are too low.</p> 	<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. 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-26, "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-141, "Diagnosis Procedure". Repair evaporator fins. Replace evaporator. Refer to HAC-157, "Component Function Check".

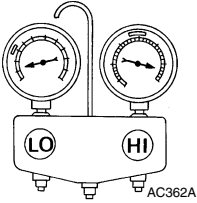
Low-pressure Side Sometimes Becomes Negative

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
<p>E Low-pressure side sometimes becomes negative.</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. 	Refrigerant does not discharge cyclically. ↓ Moisture is frozen at expansion valve outlet and inlet. ↓ Water is mixed with refrigerant.	<ul style="list-style-type: none"> Drain water from refrigerant or replace refrigerant. Replace liquid tank.

Low-pressure Side Becomes Negative

REFRIGERATION SYSTEM SYMPTOMS

< SYMPTOM DIAGNOSIS >

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
<p>F Low-pressure side becomes negative.</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. • Check oil for contamination.

WITH MONOCHROME DISPLAY : Symptom Matrix Chart

INFOID:000000009465931

Symptom	Reference	
A/C system cannot be controlled from the A/C switch assembly.	Go to Trouble Diagnosis Procedure for A/C System.	HAC-166. "A/C SWITCH ASSEMBLY : Diagnosis Procedure"
A/C display does not operate.	Go to Trouble Diagnosis Procedure for A/C display unit.	HAC-167. "A/C DISPLAY UNIT : Diagnosis Procedure"
Air outlet does not change.	Go to Trouble Diagnosis Procedure for Mode Door Motor. (LAN)	HAC-153. "Diagnosis Procedure"
Mode door motor does not operate normally.		
Discharge air temperature does not change.	Go to Trouble Diagnosis Procedure for Air Mix Door Motor. (LAN)	HAC-148. "Diagnosis Procedure" (driver side) or HAC-150. "Diagnosis Procedure" (passenger side)
Air mix door motor does not operate normally.		
Intake door does not change.	Go to Trouble Diagnosis Procedure for Intake Door Motor. (LAN)	HAC-156. "Diagnosis Procedure"
Intake door motor does not operate normally.		
Blower motor operation is malfunctioning.	Go to Trouble Diagnosis Procedure for Blower Motor.	HAC-157. "Diagnosis Procedure"
Magnet clutch does not engage.	Go to Trouble Diagnosis Procedure for Magnet Clutch.	HAC-161. "Diagnosis Procedure"
Insufficient cooling	Go to Trouble Diagnosis Procedure for Insufficient Cooling.	HAC-183. "Component Function Check"
No cool air comes out. (Airflow volume is normal.)		
Insufficient heating	Go to Trouble Diagnosis Procedure for Insufficient Heating.	HAC-189. "Component Function Check"
No warm air comes out. (Airflow volume is normal.)		
Noise	Go to Trouble Diagnosis Procedure for Noise.	HAC-192. "Component Function Check"
Memory function does not operate.	Go to Trouble Diagnosis Procedure for Memory Function.	HAC-194. "Component Function Check"

REFRIGERANT

< PERIODIC MAINTENANCE >

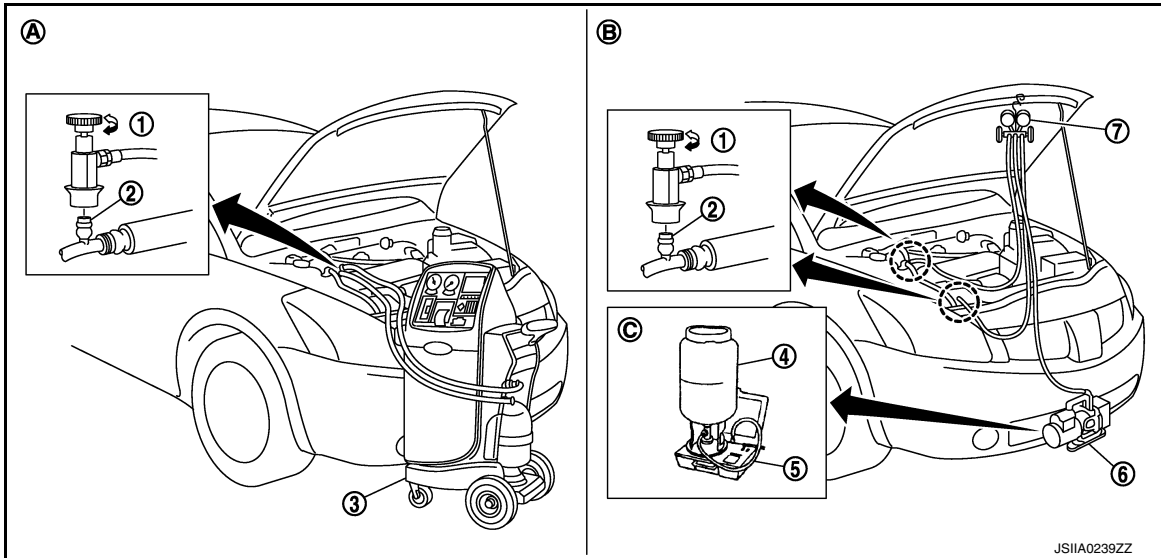
PERIODIC MAINTENANCE

REFRIGERANT

Description

INFOID:000000009465932

CONNECTION OF SERVICE TOOLS AND EQUIPMENT

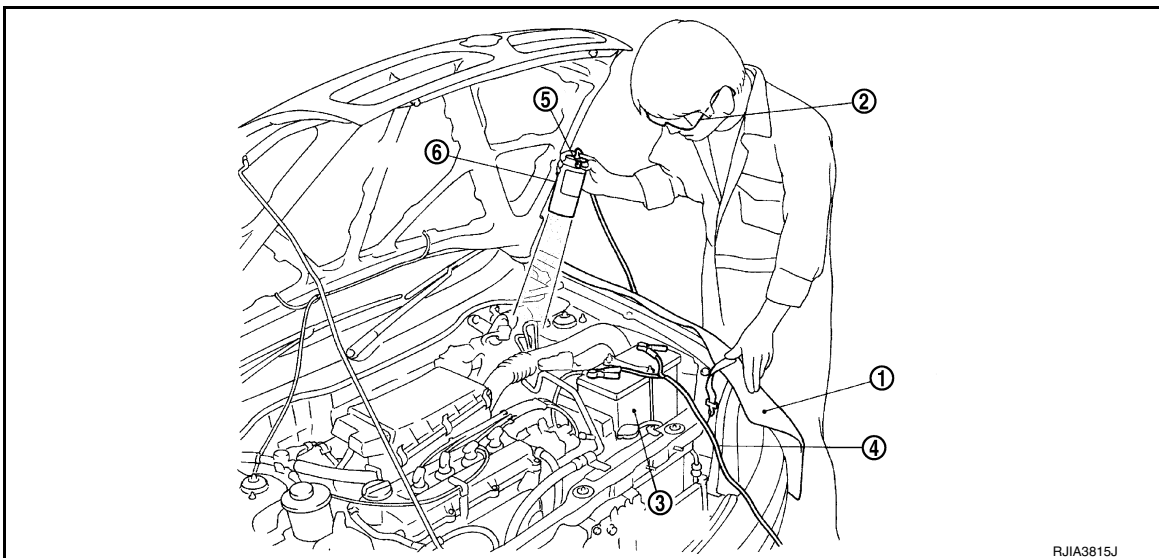


- | | | |
|-------------------------------------|---------------------------|--|
| 1. Shut-off valve | 2. A/C service valve | 3. Recovery/recycling/recharging equipment |
| 4. Refrigerant container (HFC-134a) | 5. Weight scale (J-39650) | 6. Vacuum pump (J-39649) |
| 7. Manifold gauge set (J-39183) |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

Leak Test

INFOID:000000009465933

CHECK REFRIGERANT LEAKAGE USING FLUORESCENT LEAK DETECTION DYE



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

REFRIGERANT

< PERIODIC MAINTENANCE >

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

WARNING:

Do not look directly into UV lamp light source.

NOTE:

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

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

NOTE:

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

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

WARNING:

Do not look directly into UV lamp light source.

NOTE:

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

CHECK REFRIGERANT LEAKAGE USING ELECTRICAL LEAK DETECTOR

WARNING:

Do not check refrigerant leakage while the engine is running.

CAUTION:

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

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

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

NOTE:

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

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

CAUTION:

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

NOTE:

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

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

REFRIGERANT

< PERIODIC MAINTENANCE >

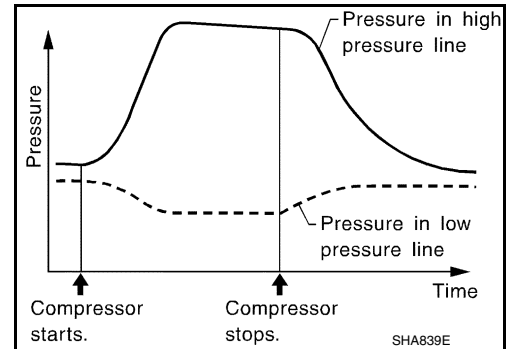
- Start the engine and set A/C control in the following conditions.
 - A/C switch ON
 - Air flow: VENT (ventilation)
 - Intake door position: Recirculation
 - Temperature setting: Full cold
 - Fan (blower) speed: Maximum speed set
- Run the engine at approximately 1,500 rpm for 2 minutes or more.
- Stop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

WARNING:

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

NOTE:

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



Recycle Refrigerant

INFOID:000000009465934

WARNING:

- Always use HFC-134a for A/C refrigerant. If CFC-12 is accidentally charged, compressor is damaged due to insufficient lubrication.
 - Always observe and follow precautions described on refrigerant container. Incorrect handling may result in an explosion of refrigerant container, frostbite or the loss of eyesight.
 - Do not breathe A/C refrigerant and oil vapor or mist. Exposure may irritate eyes, nose, or throat.
 - Do not allow HFC-134a to be exposed to an open flame or others because it generates poisonous gas when in contact with high temperature objects. Keep workshop well ventilated.
- Perform oil return operation. Refer to [HA-30, "Perform Oil Return Operation"](#). (If refrigerant or oil leakage is detected in a large amount, omit this step, and go to step 2.)

CAUTION:

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

- 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.

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

Charge Refrigerant

INFOID:000000009465935

WARNING:

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

REFRIGERANT

< PERIODIC MAINTENANCE >

1. Connect recovery/recycling/recharging equipment to the A/C service valve.
2. Operate recovery/recycling/recharging equipment, and evacuate air from A/C system for 25 minutes or more.
CAUTION:
Evacuate air for 15 minutes or more if the parts are replaced.
3. Check the airtightness of A/C system for 25 minutes or more. If pressure raises more than the specified level, charge A/C system with approximately 200g refrigerant and check that there is no refrigerant leakage. Refer to [HA-26, "Leak Test"](#).
CAUTION:
Check the airtightness for 15 minutes or more if the parts are replaced.
4. If parts other than compressor are replaced, fill compressor oil according to parts that are replaced.
5. Charge the specified amount of refrigerant to A/C system.
6. Check that A/C system operates normally.
7. Disconnect recovery/recycling/recharging equipment. (Collect the refrigerant from the high-pressure hose and low-pressure hose of recovery/recycling/recharging equipment.)
8. Install A/C service valve cap.
9. Refrigerant charge is complete.

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OIL

< PERIODIC MAINTENANCE >

OIL

Description

INFOID:000000009465936

MAINTENANCE OF OIL LEVEL

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

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

Oil Type : A/C System Oil Type S

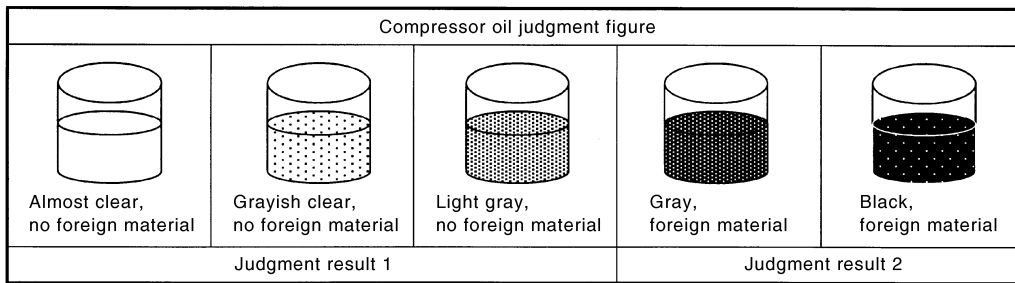
Inspection

INFOID:000000009465937

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

1. COMPRESSOR OIL JUDGMENT

1. Remove the compressor. Refer to [HA-37, "Removal and Installation for Compressor"](#).
2. Sample compressor oil and judge below according to the figure.



JSIIA0927GB

Judgement result 1>>Replace compressor only.

Judgement result 2>>Replace compressor and liquid tank.

Perform Oil Return Operation

INFOID:000000009465938

CAUTION:

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

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

Oil Adjusting Procedure for Components Replacement Except Compressor

INFOID:000000009465939

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

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

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

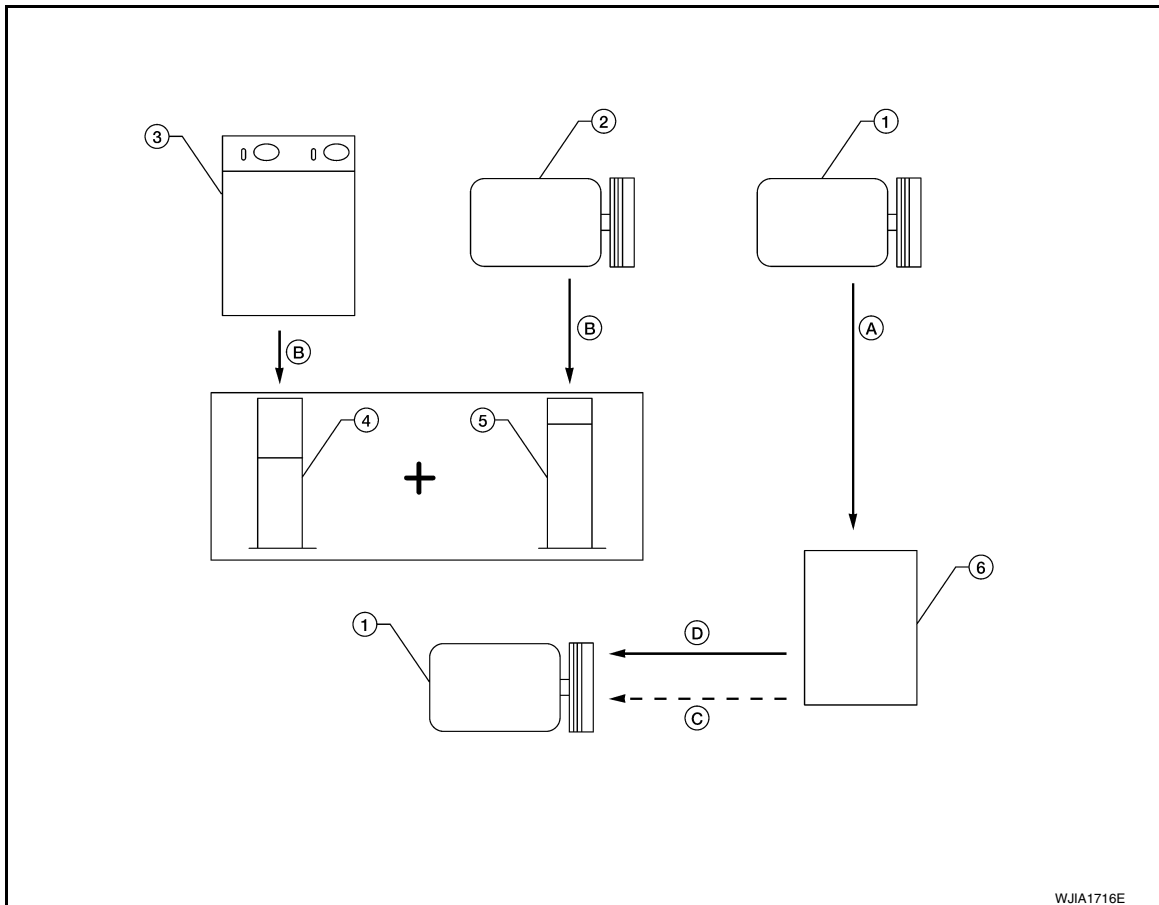
OIL

< PERIODIC MAINTENANCE >

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

Oil Adjusting Procedure for Compressor Replacement

INFOID:000000009465940



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

- Before connecting recovery/recycling equipment to vehicle, check recovery/recycling equipment gauges. No refrigerant pressure should be displayed. If NG, recover refrigerant from equipment lines.
- Connect recovery/recycling equipment to vehicle. Confirm refrigerant purity in supply tank using recovery/recycling equipment and refrigerant identifier. If NG, refer to [HAC-92. "Working with HFC-134a \(R-134a\)"](#).
- Confirm refrigerant purity in vehicle A/C system using recovery/recycling equipment and refrigerant identifier. If NG, refer to [HAC-92. "Working with HFC-134a \(R-134a\)"](#).
- Discharge refrigerant into the refrigerant recovery/recycling equipment. Measure oil discharged into the recovery/recycling equipment.
- Drain the oil from the "old" (removed) compressor into a graduated container and recover the amount of oil drained.

OIL

< PERIODIC MAINTENANCE >

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:

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

REFRIGERATION SYSTEM

< PERIODIC MAINTENANCE >

REFRIGERATION SYSTEM

Inspection

INFOID:000000009465941

1. CHECK BLOWER MOTOR OPERATION

Check blower motor operation. Refer to [HAC-53, "Component Function Check"](#).

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace the parts according to the inspection results.

2. CHECK COMPRESSOR OPERATION

Check compressor operation. Refer to [HAC-57, "Component Function Check"](#).

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace the parts according to the inspection results.

3. CHECK REFRIGERANT CYCLE PRESSURE

Connect recovery/recycling/recharging equipment to the vehicle and perform the diagnosis with the gauge pressure. Refer to [HA-19, "WITH COLOR DISPLAY : Trouble Diagnoses for Abnormal Pressure"](#) (with color display) or [HA-22, "WITH MONOCHROME DISPLAY : Trouble Diagnoses for Abnormal Pressure"](#) (with monochrome display).

Is the inspection result normal?

YES >> Perform the performance test. Refer to [HAC-84, "Performance Chart"](#).




NO >> Repair or replace the parts according to the inspection results.

Performance Chart

INFOID:000000009465942

TEST CONDITION

Testing must be performed as follows:

Vehicle location	Indoors or in the shade (in a well-ventilated place)
Doors	Closed
Door windows	Open
Hood	Open
TEMP.	Max. COLD
Mode switch	 (Ventilation) set
Intake switch	 (Recirculation) set
 (fan) speed	Max. speed set
Engine speed	Idle speed

Operate the air conditioning system for 10 minutes before taking measurements.

TEST READING

Recirculating-to-discharge Air Temperature Table

Inside air (Recirculating air) at blower assembly inlet		Discharge air temperature at center ventilator °C (°F)
Relative humidity %	Air temperature °C (°F)	
50 - 60	25 (77)	10.0 - 12.3 (50 - 54)
	30 (86)	13.2 - 15.3 (56 - 60)
	35 (95)	17.2 - 21.0 (63 - 70)

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REFRIGERATION SYSTEM

< PERIODIC MAINTENANCE >

Inside air (Recirculating air) at blower assembly inlet		Discharge air temperature at center ventilator °C (°F)
Relative humidity %	Air temperature °C (°F)	
60 - 70	25 (77)	12.3 - 14.9 (54 - 59)
	30 (86)	15.3 - 19.3 (60 - 67)
	35 (95)	21.0 - 24.4 (70 - 76)

Ambient Air Temperature-to-operating Pressure Table

Ambient air		High-pressure (Discharge side) kPa (kg/cm ² , psi)	Low-pressure (Suction side) kPa (kg/cm ² , psi)
Relative humidity %	Air temperature °C (°F)		
50 - 70	30 (86)	1,220 - 1,500 (12.44 - 15.30, 176.9 - 217.5)	240 - 295 (2.45 - 3.01, 34.8 - 42.8)
	35 (95)	1,360 - 1,690 (13.87 - 17.24, 197.2 - 245.1)	275 - 335 (2.81 - 3.42, 39.9 - 48.6)
	40 (104)	1,500 - 1,830 (12.44 - 18.67, 176.9 - 265.4)	310 - 375 (3.16 - 3.83, 45.0 - 54.4)

PERFORMANCE TEST

< PERIODIC MAINTENANCE >

PERFORMANCE TEST

Inspection

INFOID:000000009465943

INSPECTION PROCEDURE

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

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

3. Maintain test condition until A/C system becomes stable. (Approximately 10 minutes)
4. Check that test results of “recirculating-to-discharge air temperature” and “ambient air temperature-to-operating pressure” are within the specified value.
5. When test results are within the specified value, inspection is complete.
If any of test result is out of the specified value, perform diagnosis by gauge pressure. Refer to [HA-21](#).
"WITH COLOR DISPLAY : Symptom Matrix Chart".

RECIRCULATING-TO-DISCHARGE AIR TEMPERATURE TABLE

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

AMBIENT AIR TEMPERATURE-TO-OPERATING PRESSURE TABLE

PERFORMANCE TEST

< PERIODIC MAINTENANCE >

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

COMPRESSOR

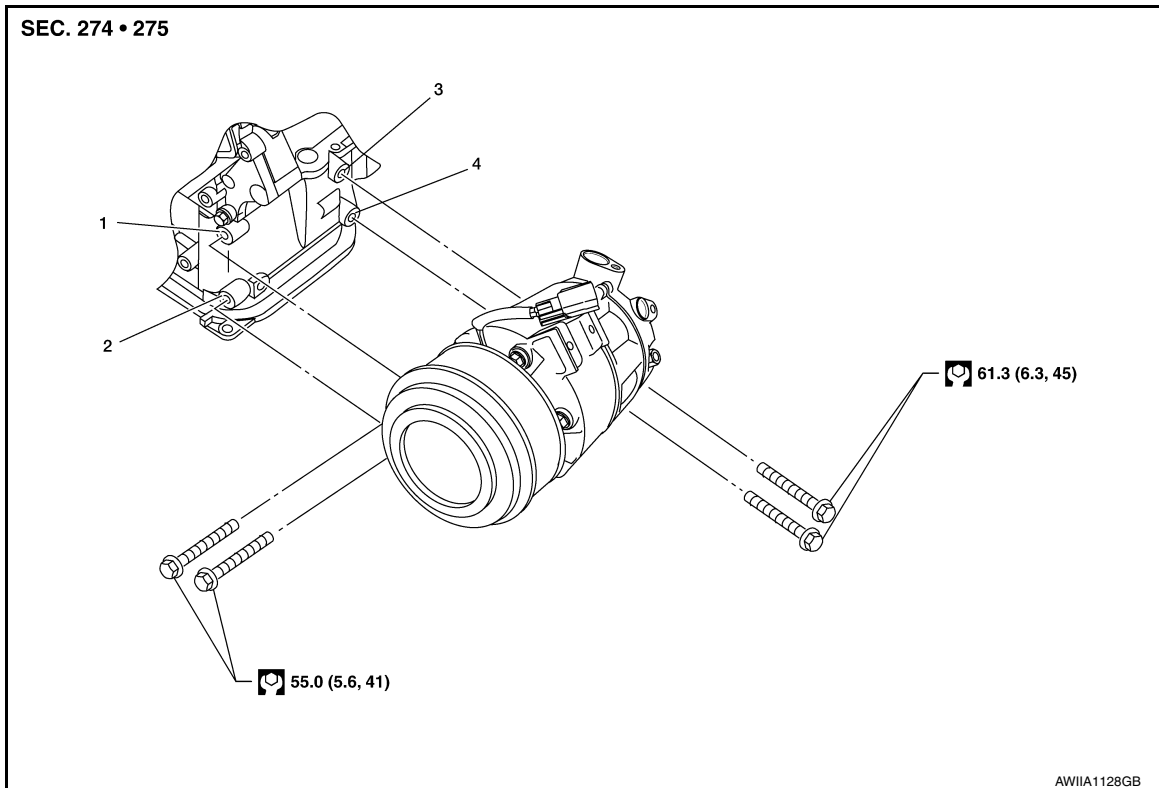
< REMOVAL AND INSTALLATION >

REMOVAL AND INSTALLATION

COMPRESSOR

Removal and Installation for Compressor

INFOID:000000009465944



REMOVAL

CAUTION:

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

1. Disconnect the battery negative and positive terminals. Refer to [PG-67, "Removal and Installation \(Battery\)"](#).
2. Discharge the refrigerant. Refer to [HA-28, "Recycle Refrigerant"](#).
3. Partially drain the engine cooling system. Refer to [CO-11, "Changing Engine Coolant"](#).
4. Remove the front RH wheel and tire using a power tool. Refer to [WT-60, "Adjustment"](#).
5. Remove the engine under cover. Refer to [EXT-15, "Exploded View"](#).
6. Remove the RH fender protector side cover and the RH fender protector. Refer to [EXT-24, "Removal and Installation"](#).
7. Remove the engine room cover.
8. Remove the air cleaner assembly. Refer to [EM-24, "Removal and Installation"](#).
9. Remove the upper radiator hose.
10. Remove the battery and battery tray. Refer to [PG-68, "Removal and Installation \(Battery Tray\)"](#).
11. Remove the engine cooling fan and shroud assembly. Refer to [CO-16, "Removal and Installation"](#).
12. Disconnect the high-pressure flexible hose and low-pressure flexible hose from the compressor.

CAUTION:

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

13. Reposition the power steering hose out of the way.
14. Disconnect the harness connector from the compressor.
15. Release the drive belt tension and reposition the drive belt off of the compressor clutch pulley. Refer to [EM-14, "Removal and Installation"](#).

COMPRESSOR

< REMOVAL AND INSTALLATION >

16. Remove the RH compressor bolts.
17. Remove the front compressor bolts using a power tool.
18. Disconnect the compressor wire harness clip from the compressor.
19. Remove the compressor.

INSTALLATION

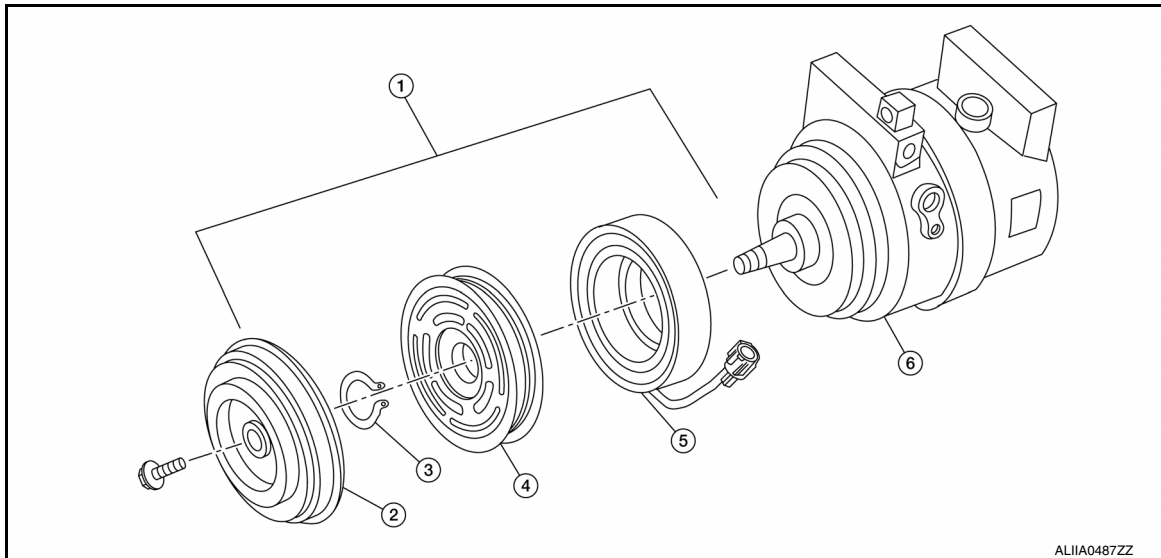
Installation is in the reverse order of removal.

CAUTION:

- For installation, tighten the compressor bolts in the order as shown.
- Do not reuse O-rings.
- Apply A/C oil to the O-rings of the low-pressure flexible hose and high-pressure flexible hose for installation.
- After charging the A/C refrigerant, check for leaks. Refer to [HA-33, "Inspection"](#).

Removal and Installation for Compressor Clutch

INFOID:000000009465945



- | | | |
|-----------------------------|----------------|---------------|
| 1. Magnetic clutch assembly | 2. Clutch disk | 3. Snap ring |
| 4. Pulley | 5. Magnet coil | 6. Compressor |

NOTE:

Illustrations shown with the compressor out of the vehicle are for clarity, it is not necessary to remove the compressor.

REMOVAL

1. Remove the front wheel and tire (RH). Refer to [WT-60, "Adjustment"](#).
2. Remove the engine under cover. Refer to [EXT-15, "Exploded View"](#).
3. Release the drive belt from the A/C pulley. Refer to [EM-14, "Removal and Installation"](#).
4. Reposition the power steering line aside, do not disconnect the power steering line.
5. Remove the center bolt by holding the clutch disc steady using a suitable tool.
6. Remove the clutch disc and shims.

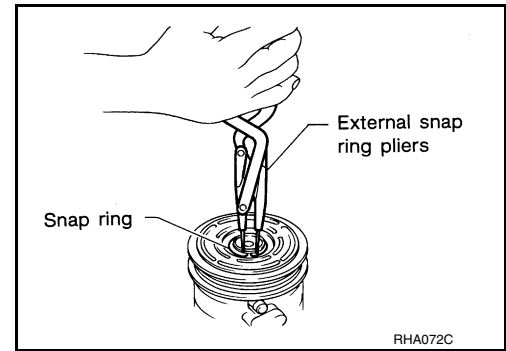
CAUTION:

Retain all the shims for installation.

COMPRESSOR

< REMOVAL AND INSTALLATION >

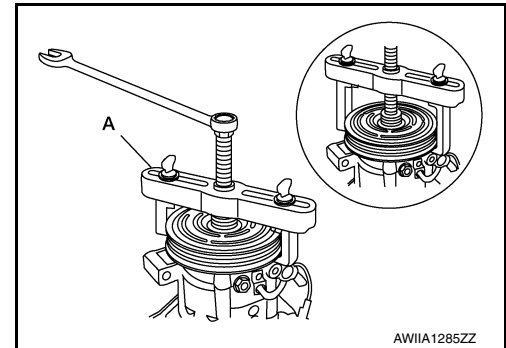
7. Remove the snap ring using a suitable tool as shown.



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

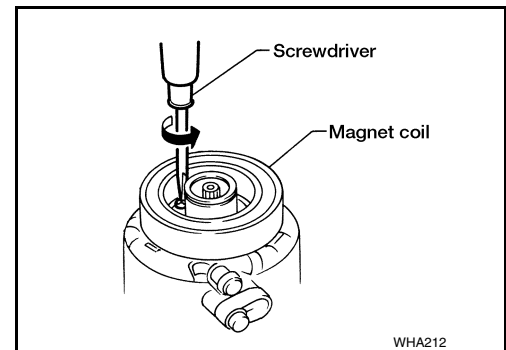
CAUTION:

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



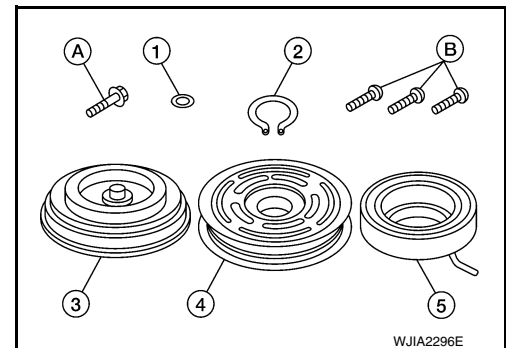
9. Disconnect the magnet coil harness.

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

COMPRESSOR

< REMOVAL AND INSTALLATION >

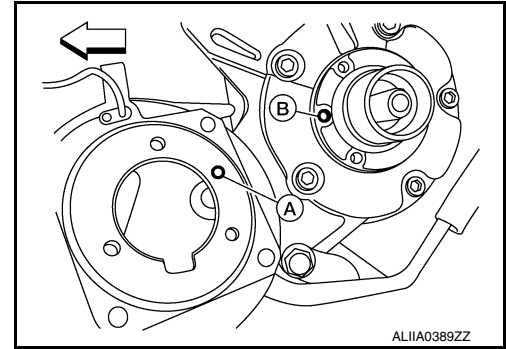
INSTALLATION

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

- ⇐: Front

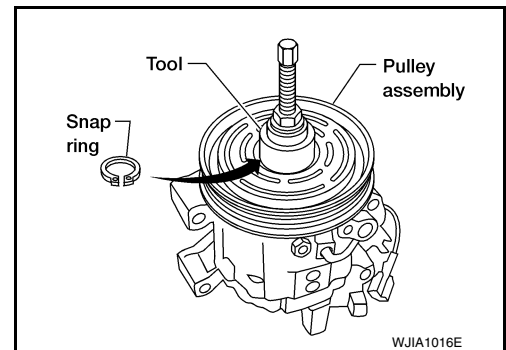
CAUTION:

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

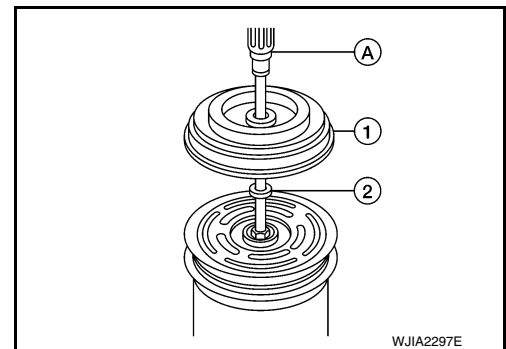


2. Connect the magnet coil harness.
3. Install the pulley assembly using Tool and a wrench as shown, then install the snap ring using a suitable tool.

Tool number : — (J-38873-A)



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



5. Install the center bolt using suitable tool.

Center bolt : 12 N·m (1.2 kg-m, 9 ft-lb)

- After tightening the center bolt to specification, check that the pulley rotates smoothly.

6. Reposition the power steering line back into position, do not disconnect the power steering line.
7. Install the drive belt back onto the A/C pulley. Refer to [EM-14. "Removal and Installation"](#).
8. Install the engine under cover. Refer to [EXT-15. "Exploded View"](#).
9. Install the front wheel and tire (RH). Refer to [WT-60. "Adjustment"](#).

INSPECTION AFTER INSTALLATION

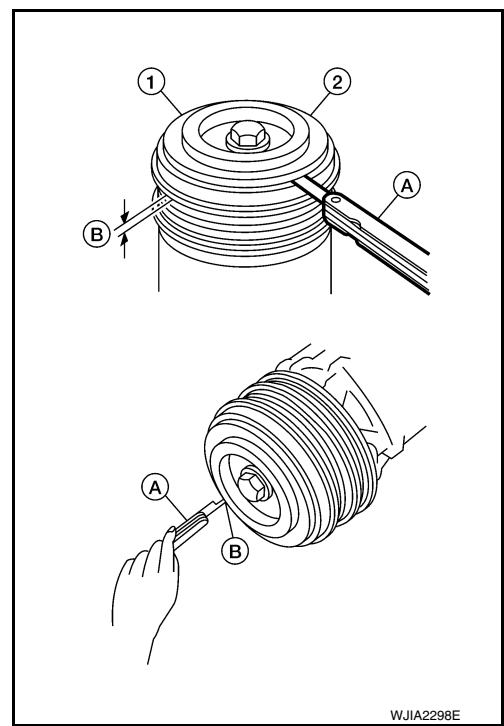
COMPRESSOR

< 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.

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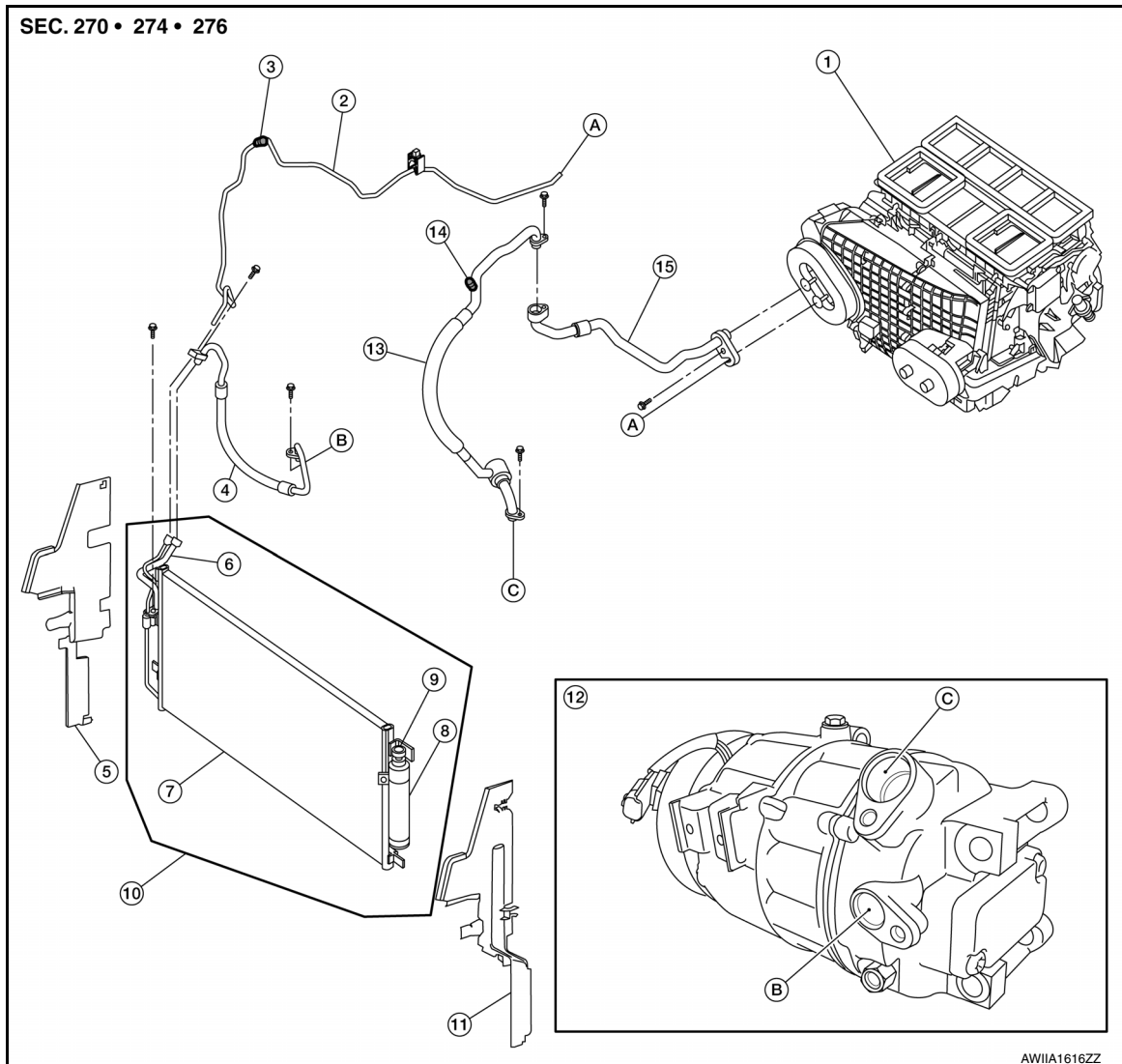
COOLER PIPE AND HOSE

< REMOVAL AND INSTALLATION >

COOLER PIPE AND HOSE

Exploded View

INFOID:000000009465946



- | | | |
|--|--|---|
| 1. Heater and cooling unit assembly | 2. High-pressure pipe | 3. High-pressure A/C service valve |
| 4. High-pressure flexible hose | 5. Air deflector (RH) | 6. Junction pipe |
| 7. Condenser | 8. Liquid tank | 9. Refrigerant pressure sensor |
| 10. Condenser, liquid tank and refrigerant pressure sensor | 11. Air deflector (LH) | 12. Compressor |
| 13. Low-pressure flexible hose | 14. Low-pressure A/C service valve | 15. Low-pressure pipe |
| A. High-pressure pipe to heater and cooling unit assembly | B. High-pressure flexible hose to compressor | C. Low-pressure flexible hose to compressor |

LOW-PRESSURE FLEXIBLE HOSE

LOW-PRESSURE FLEXIBLE HOSE : Removal and Installation

INFOID:000000009465947

REMOVAL

CAUTION:

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

1. Discharge the refrigerant. Refer to [HA-28. "Recycle Refrigerant"](#).

COOLER PIPE AND HOSE

< REMOVAL AND INSTALLATION >

2. Partially drain the engine cooling system. Refer to [CO-11, "Changing Engine Coolant"](#).
3. Disconnect the battery negative and positive terminals.
4. Remove the engine room cover.
5. Remove the air cleaner assembly and air ducts. Refer to [EM-24, "Removal and Installation"](#).
6. Remove the upper radiator hose.
7. Remove the battery and battery tray. Refer to [PG-68, "Removal and Installation \(Battery Tray\)"](#).
8. Remove the engine cooling fan and shroud assembly. Refer to [CO-17, "Removal and Installation"](#).
9. Disconnect the low-pressure flexible hose from the compressor and the low-pressure pipe.

CAUTION:

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

10. Remove the low-pressure flexible hose.

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 recharging the refrigerant, check for leaks. Refer to [HA-26, "Leak Test"](#).

LOW-PRESSURE PIPE

LOW-PRESSURE PIPE : Removal and Installation

INFOID:000000009465948

REMOVAL

1. Discharge the refrigerant. Refer to [HA-28, "Recycle Refrigerant"](#).
2. Remove the hoodledge covers (LH/RH).
3. Remove the strut tower bar. Refer to [FSU-13, "Exploded View"](#).
4. Remove the upper cowl. Refer to [EXT-21, "Removal and Installation"](#).
5. Remove the lower RH cowl.
6. Reposition the power steering reservoir out of the way without disconnecting the hose.
7. Disconnect the power steering hose clamp to reposition the power steering hose out of the way without disconnecting the hose.
8. Disconnect the low-pressure pipe from the expansion valve and the low-pressure hose.

CAUTION:

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

9. Remove the low-pressure pipe.

INSTALLATION

Installation is in the reverse order of removal.

CAUTION:

- Do not reuse O-rings.
- Apply A/C oil to the new O-rings for installation.
- After recharging the refrigerant, check for leaks. Refer to [HA-26, "Leak Test"](#).

HIGH-PRESSURE FLEXIBLE HOSE

HIGH-PRESSURE FLEXIBLE HOSE : Removal and Installation

INFOID:000000009465949

REMOVAL

CAUTION:

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

1. Discharge the refrigerant. Refer to [HA-28, "Recycle Refrigerant"](#).
2. Partially drain the engine cooling system. Refer to [CO-11, "Changing Engine Coolant"](#).
3. Disconnect the battery negative and positive terminals.
4. Remove the hoodledge covers (LH/RH).

COOLER PIPE AND HOSE

< REMOVAL AND INSTALLATION >

5. Remove the air cleaner assembly and air ducts. Refer to [EM-24, "Removal and Installation"](#).
6. Remove the upper radiator hose.
7. Remove the battery and battery tray. Refer to [PG-68, "Removal and Installation \(Battery Tray\)"](#).
8. Remove the engine cooling fan and shroud assembly. Refer to [CO-16, "Removal and Installation"](#).
9. Disconnect the high-pressure flexible hose from the compressor and the high-pressure pipe and junction pipe.

CAUTION:

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

10. Remove the high-pressure flexible hose.

INSTALLATION

Installation is in the reverse order of removal.

CAUTION:

- Do not reuse O-rings.
- Apply A/C oil to the new O-rings for installation.
- After charging the refrigerant, check for leaks. Refer to [HA-26, "Leak Test"](#).

HIGH-PRESSURE PIPE

HIGH-PRESSURE PIPE : Removal and Installation

INFOID:000000009465950

REMOVAL

1. Discharge the refrigerant. Refer to [HA-28, "Recycle Refrigerant"](#).
2. Remove the hoodedge covers (LH/RH).
3. Remove the strut tower bar. Refer to [FSU-13, "Exploded View"](#).
4. Remove the upper cowl. Refer to [EXT-21, "Removal and Installation"](#).
5. Remove the lower RH cowl.
6. Reposition the engine coolant reservoir out of the way without disconnecting the hose.
7. Reposition the power steering reservoir out of the way without disconnecting the hose.
8. Disconnect the power steering hose clamp to reposition the power steering hose out of the way without disconnecting the hose.
9. Remove the torque rod. Refer to [EM-103, "Removal and Installation"](#).
10. Disconnect the harness bracket from the engine cover.
11. Disconnect the high-pressure pipe from the expansion valve and the high-pressure flexible hose and junction pipe.

CAUTION:

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

12. Remove the high-pressure pipe.

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 the refrigerant, check for leaks. Refer to [HA-26, "Leak Test"](#).

CONDENSER

< REMOVAL AND INSTALLATION >

CONDENSER

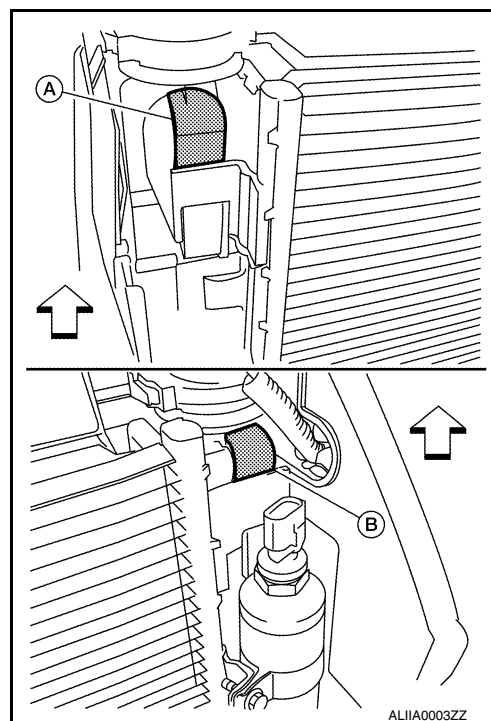
CONDENSER

CONDENSER : Removal and Installation

INFOID:000000009465951

REMOVAL

1. Discharge the refrigerant. Refer to [HA-28. "Recycle Refrigerant"](#).
2. Remove the RH hoodledge cover.
3. Remove the front bumper fascia. Refer to [EXT-16. "Removal and Installation"](#).
4. Disconnect the high-pressure pipe from the condenser pipe assembly.
CAUTION:
Cap or wrap the joint of the pipe with suitable material such as vinyl tape to avoid the entry of air.
5. Disconnect the high-pressure flexible hose from the condenser pipe assembly.
6. Disconnect the harness connector from the refrigerant pressure sensor.
7. Depress the top RH clip (A) and the top LH clip (B) to release the top condenser brackets as shown.
8. Slide the condenser up to release the condenser from the clips.



9. Remove the condenser and liquid tank assembly.
CAUTION:
 - Do not damage the condenser fins

INSTALLATION

Installation is in the reverse order of removal.

CAUTION:

- Do not damage the condenser fins.
- 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-26. "Leak Test"](#).

CONDENSER PIPE ASSEMBLY

CONDENSER PIPE ASSEMBLY : Removal and Installation

INFOID:000000009465952

The condenser pipe assembly is serviced with the condenser and liquid tank assembly. Refer to [HA-45. "CONDENSER : Removal and Installation"](#).

REFRIGERANT PRESSURE SENSOR

CONDENSER

< REMOVAL AND INSTALLATION >

REFRIGERANT PRESSURE SENSOR : Removal and Installation

INFOID:000000009465953

REMOVAL

1. Discharge the refrigerant. Refer to [HA-28. "Recycle Refrigerant"](#).
2. Remove the core support upper cover.
3. Disconnect the harness connector from the refrigerant pressure sensor.
4. Remove the refrigerant pressure sensor.

CAUTION:

Cap or wrap the opening of the refrigerant pressure sensor with suitable material such as vinyl tape to avoid the entry of air.

INSTALLATION

Installation is in the reverse order of removal.

CAUTION:

- Do not reuse O-ring.
- Apply A/C oil to the O-ring of the refrigerant pressure sensor for installation.
- After charging refrigerant, check for leaks. Refer to [HA-26. "Leak Test"](#).

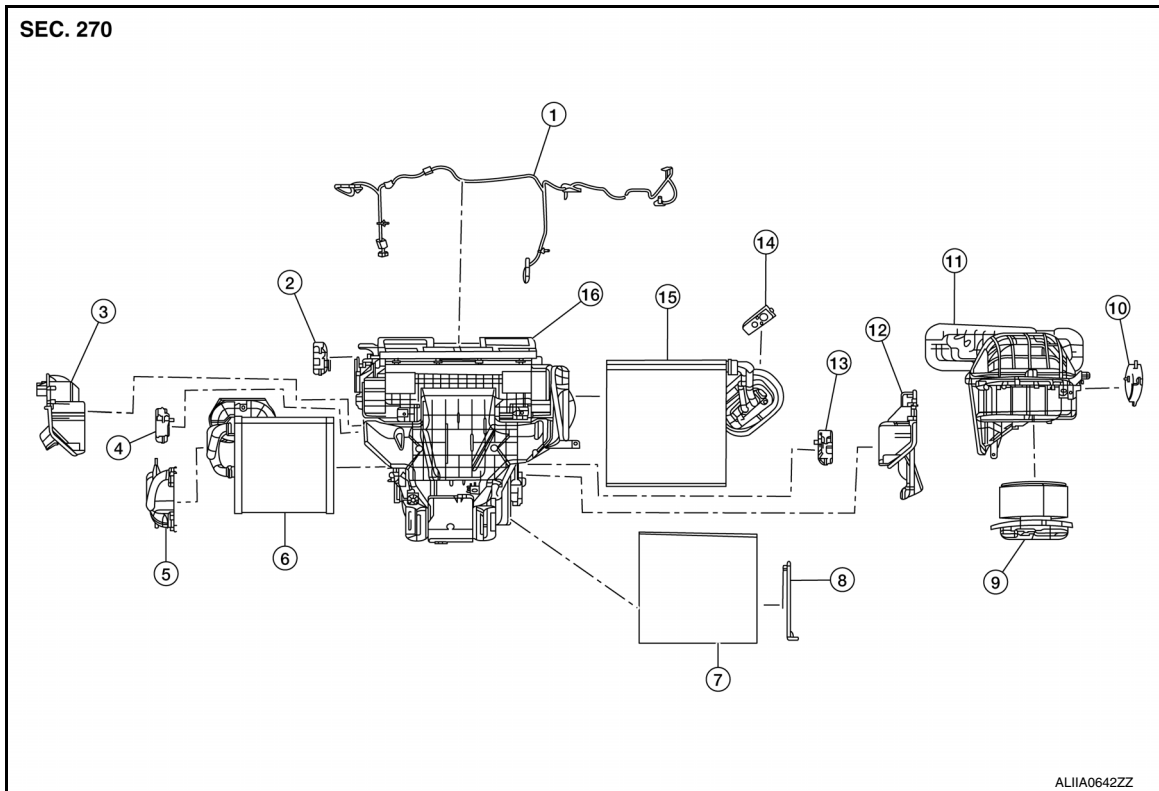
HEATER & COOLING UNIT ASSEMBLY

< REMOVAL AND INSTALLATION >

HEATER & COOLING UNIT ASSEMBLY

Exploded View

INFOID:000000009465954



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

NOTE:

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

HEATER & COOLING UNIT ASSEMBLY

HEATER & COOLING UNIT ASSEMBLY : Removal and Installation

INFOID:000000009465955

REMOVAL

CAUTION:

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

1. Discharge the refrigerant. Refer to [HA-28. "Recycle Refrigerant"](#).
2. Drain the engine coolant. Refer to [CO-11. "Changing Engine Coolant"](#).
3. Disconnect the battery negative and positive terminals.
4. Remove the front wiper drive assembly. Refer to [WW-78. "FRONT WIPER ARMS : Removal and Installation"](#).
5. Remove the strut tower bar. Refer to [FSU-13. "Exploded View"](#).
6. Disconnect the heater hoses from the heater core pipes.

HEATER & COOLING UNIT ASSEMBLY

< REMOVAL AND INSTALLATION >

7. Disconnect the high-pressure pipe and low-pressure pipe from the expansion valve. Refer to [HA-42, "Exploded View"](#).
CAUTION:
Cap or wrap the pipe joint with a suitable material such as vinyl tape to avoid the entry of air.
8. Remove the instrument panel assembly. Refer to [IP-11, "Removal and Installation"](#).
9. Remove the steering column assembly. Refer to [ST-23, "Removal and Installation"](#).
10. Disconnect the drain hose.
11. Remove the interior fuse block (J/B). Refer to [PG-62, "Terminal Arrangement"](#).
12. Remove the LH, RH and center connector ducts. Refer to [VTL-11, "REAR FLOOR DUCTS : Removal and Installation"](#).
13. Remove the steering member center stay.
14. Remove the heating and cooling unit assembly attached to the steering member as one assembly from the vehicle.
15. Remove the blower unit from the heating and cooling unit and steering member assembly.
16. Remove the heating and cooling unit from the steering member.

INSTALLATION

Installation is in the reverse order of removal.

HEATER CORE

HEATER CORE : Removal and Installation

INFOID:000000009465956

REMOVAL

1. Remove the heating and cooling unit assembly. Refer to [HA-47, "HEATER & COOLING UNIT ASSEMBLY : Removal and Installation"](#).
2. Remove the heater core pipes cover. Refer to [HA-47, "Exploded View"](#).
3. Remove the heater core.

INSTALLATION

Installation is in the reverse order of removal.

CAUTION:

Make sure that the aspirator hose is securely attached to the aspirator on the upper floor connecting duct LH.

EVAPORATOR

EVAPORATOR : Removal and Installation

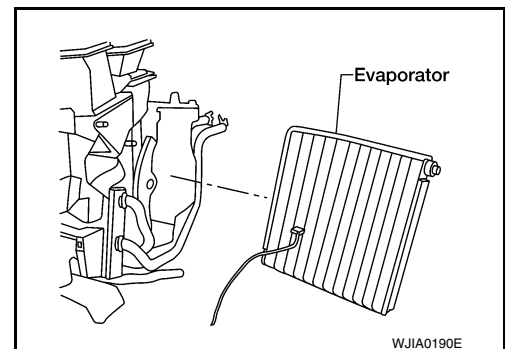
INFOID:000000009465957

REMOVAL

1. Remove the heating and cooling unit assembly. Refer to [HA-28, "Recycle Refrigerant"](#).
2. Remove the upper floor connecting duct RH. Refer to [HA-47, "Exploded View"](#).
3. Remove the evaporator.
 - Remove the intake sensor.

CAUTION:

- **Mark the mounting position of the intake sensor.**



4. Remove the expansion valve from the evaporator.

INSTALLATION

Installation is in the reverse order of removal.

CAUTION:

HEATER & COOLING UNIT ASSEMBLY

< REMOVAL AND INSTALLATION >

- 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-26, "Leak Test"](#).

EXPANSION VALVE

EXPANSION VALVE : Removal and Installation for Expansion Valve

INFOID:000000009465958

REMOVAL

1. Discharge the refrigerant. Refer to [HA-28, "Recycle Refrigerant"](#).
2. Remove the hoodledge covers (LH/RH).
3. Remove the strut tower bar. Refer to [FSU-13, "Exploded View"](#).
4. Remove the cowl top grille. Refer to [EXT-21, "Removal and Installation"](#).
5. Remove the lower cowl top extension RH.
6. Disconnect the high-pressure pipe and low-pressure pipe from the expansion valve.

CAUTION:

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

7. Remove the expansion valve.

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-26, "Leak Test"](#).

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SERVICE DATA AND SPECIFICATIONS (SDS)

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SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

Compressor

INFOID:000000009465959

Model	VALEO
Type	DKS-17D
Displacement	175 cm ³ (10.68 in ³) / revolution
Cylinder bore × stroke	30.5 mm (1.201 in) x 24 mm (0.94 in)
Direction of rotation	Clockwise (viewed from drive end)
Drive belt	Poly V 7-grooves

Oil

INFOID:000000009465960

Name	NISSAN A/C System Oil Type S or equivalent	
Capacity	Total in system	150 m ℓ (5.03 US fl oz, 5.03 Imp fl oz)
	Compressor (service part) charging amount	Refer to HA-31, "Oil Adjusting Procedure for Compressor Replacement" .

Refrigerant

INFOID:000000009465961

Type	HFC-134a (R-134a)
Capacity	0.55 ± 0.025 kg (1.21 ± 0.055 lb)