

SECTION **HA**

**HEATER & AIR CONDITIONING SYSTEM**

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# PRECAUTIONS

< PRECAUTION >

## PRECAUTION

### PRECAUTIONS

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

INFOID:000000012431985

The Supplemental Restraint System such as "AIR BAG" and "SEAT BELT PRE-TENSIONER", used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. Information necessary to service the system safely is included in the SR and SB section of this Service Manual.

#### **WARNING:**

- To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.
- Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SR section.
- Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.

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

#### **WARNING:**

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

#### Precaution for Work

INFOID:000000012918336

- 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.

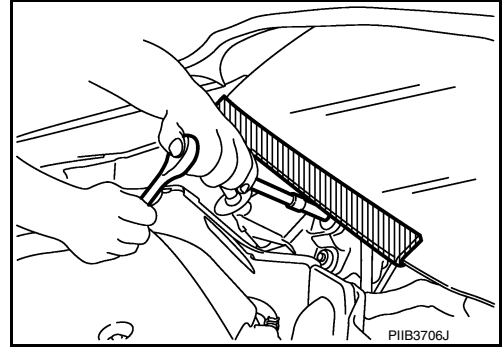
# PRECAUTIONS

## < PRECAUTION >

### 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 leak test HFC-134a (R-134a) service equipment and/or vehicle air conditioning systems with compressed air during repair. Some mixtures of air and HFC-134a (R-134a) have been shown to be combustible at elevated pressures. These mixtures, if ignited, may cause injury or property damage. Additional health and safety information may be obtained from refrigerant manufacturers.

#### REFRIGERANT CONNECTION

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

# PRECAUTIONS

## < PRECAUTION >

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

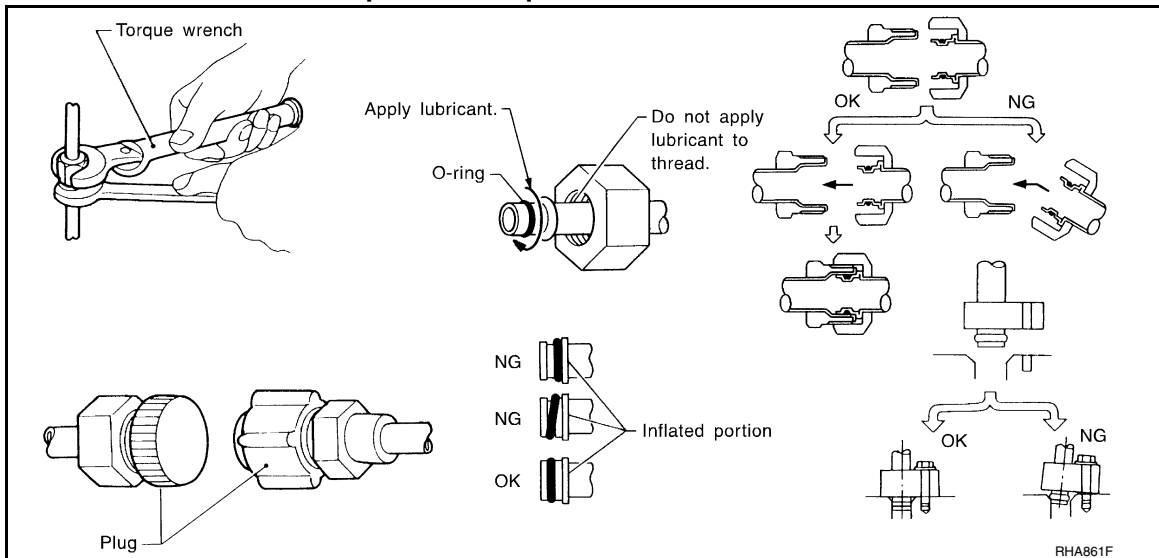
### WARNING:

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.
- 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.
- Do not reuse 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 leak test and make sure that there are no leaks 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.

# PRECAUTIONS

## < PRECAUTION >

- The air conditioner warranty is void if the vehicle is within the warranty period. Please contact Nissan Customer Affairs for further assistance.

### COMPRESSOR

#### CAUTION:

- Cap or 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 Level" exactly when replacing or repairing compressor. Refer to [HA-22, "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.
- 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 leaks. An ultraviolet (UV) lamp is required to illuminate the dye when inspecting for leaks.
- 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 leaks.
- 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 leak with an electrical leak detector (SST: J-41995).
- Always remove any remaining dye from the leak area after repairs are completed to avoid a misdiagnosis during a future service.
- 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

INFOID:000000012431988

### 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.

### ELECTRONIC LEAK DETECTOR

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

### VACUUM PUMP

# PRECAUTIONS

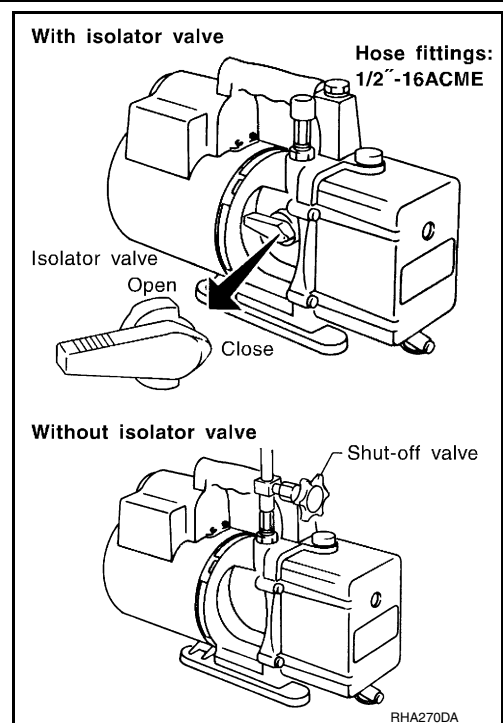
## < PRECAUTION >

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. 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.

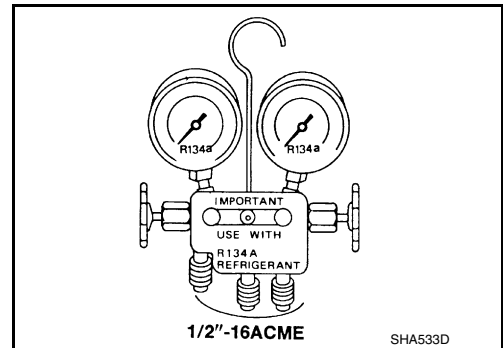
- Vacuum pumps usually have a manual isolator valve as part of the pump. Close this valve to isolate the service hose from the pump.
- Use a hose equipped with a manual shut-off valve near the pump end for pumps without an isolator. Close the valve to isolate the hose from the pump.
- Disconnect the 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.



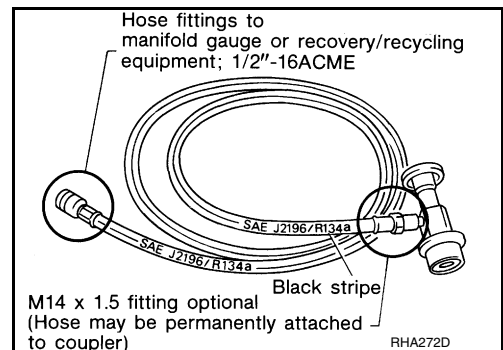
## MANIFOLD GAUGE SET

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 be equipped with positive shut-off devices (either manual or automatic) near the end of the hoses opposite to the manifold gauge.



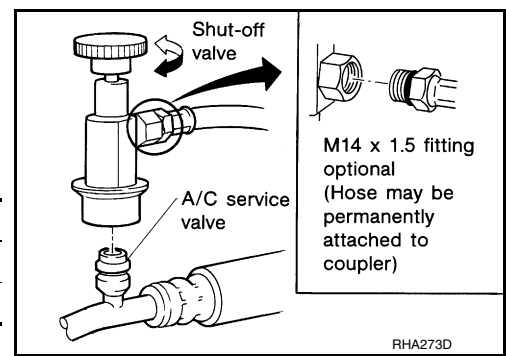
## SERVICE COUPLERS

# PRECAUTIONS

## < PRECAUTION >

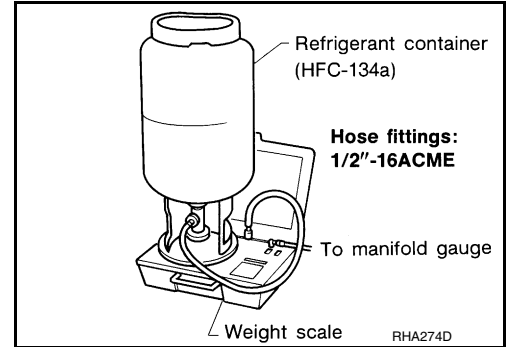
Do not attempt to connect HFC-134a (R-134a) service couplers to the CFC-12 (R-12) A/C system. The HFC-134a (R-134a) couplers do not properly connect to the CFC-12 (R-12) system. However, if an improper connection is attempted, discharging and contamination may occur.

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.



# PREPARATION

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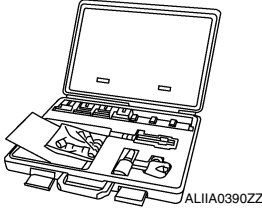
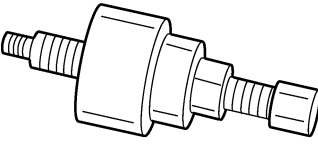
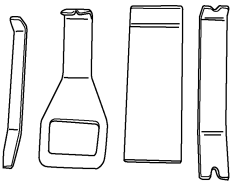
## PREPARATION

### PREPARATION

#### Special Service Tool

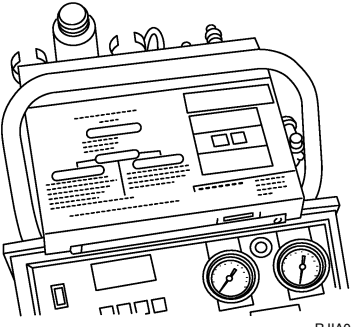

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The actual shape of the tools may differ from those illustrated here.

(TechMate No.) Tool name	Description
(J-41425-NIS) AL Tubing Repair Kit   ALIIA0390ZZ	Repairing leaks in A/C tubes
(J-38873-A) Drive plate installer   WJIA0367E	Installing pulley
(J-46534) Trim Tool Set   AWJIA0483ZZ	Removing trim components

#### Commercial Service Tool

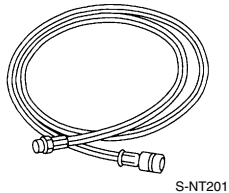
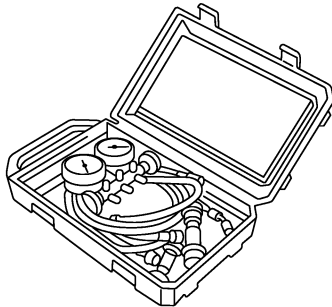
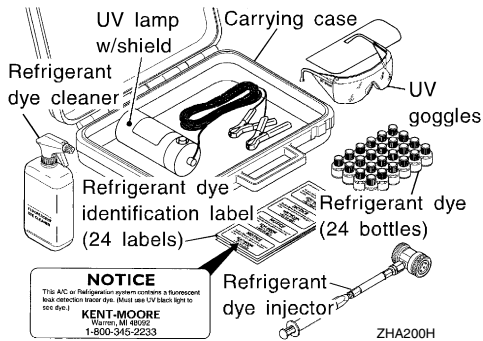
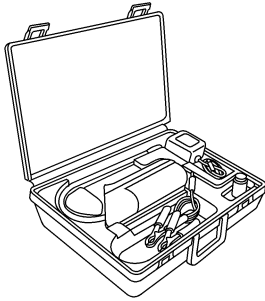
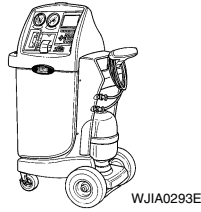
INFOID:000000012431990

(TechMate No.) Tool name	Description
(J-41810-NI) Refrigerant identifier equipment (R-134a)   RJIA0197E	For checking refrigerant purity and system contamination
( — ) Power tool   PIIB1407E	Loosening nuts, screws and bolts

# PREPARATION

## < PREPARATION >

(TechMate No.) Tool name	Description
(J-48710) NISSAN ACR2009 RRR Unit	Refrigerant recovery, recycling and re-charging
(J-41995) Electronic refrigerant leak detector	Power supply: • DC 12V (battery terminal)
(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	Power supply: • DC 12V (battery terminal)
(J-39183-C) Manifold gauge set (with hoses and couplers)	Identification: • The gauge face indicates R-134a. Fitting size-Thread size • 1/2"-16 ACME
Service hoses: • High side hose (J-39500-72B) • Low side hose (J-39500-72R) • Utility hose (J-39500-72Y)	Hose color: • Low side hose: Blue with black stripe • High side hose: Red with black stripe • Utility hose: Yellow with black stripe or green with black stripe Hose fitting to gauge: • 1/2"-16 ACME



# PREPARATION

## < PREPARATION >

(TechMate No.) Tool name	Description	
Service couplers <ul style="list-style-type: none"> <li>• High side coupler (J-39500-20A)</li> <li>• Low side coupler (J-39500-24A)</li> </ul>	Hose fitting to service hose: <ul style="list-style-type: none"> <li>• M14 x 1.5 fitting is optional or permanently attached.</li> </ul>	A B C
(J-39699) Refrigerant weight scale	For measuring of refrigerant Fitting size-Thread size <ul style="list-style-type: none"> <li>• 1/2"-16 ACME</li> </ul>	D E F
(J-39649) Vacuum pump (Including the isolator valve)	Capacity: <ul style="list-style-type: none"> <li>• Air displacement: 4 CFM</li> <li>• Micron rating: 20 microns</li> <li>• Oil capacity: 482 g (17 oz)</li> </ul> Fitting size-Thread size <ul style="list-style-type: none"> <li>• 1/2"-16 ACME</li> </ul>	G H

## Sealant and/or Oil

INFOID:000000012431991

Tool name	Description	
HFC-134a (R-134a) Refrigerant	Container color: Light blue Container marking: HFC-134a (R-134a) Fitting size: Thread size <ul style="list-style-type: none"> <li>• large container 1/2"-16 ACME</li> </ul>	J K L
NISSAN A/C System Oil Type DH-PR	Type: Poly alkylene glycol (PAG), type DH-PR Application: HFC-134a (R-134a) Vane-rotary compressors Capacity: 110 - 130 mℓ (3.7 - 4.4 US fl oz, 3.9 - 4.6 Imp fl oz)	M N O P

# COMPONENT PARTS

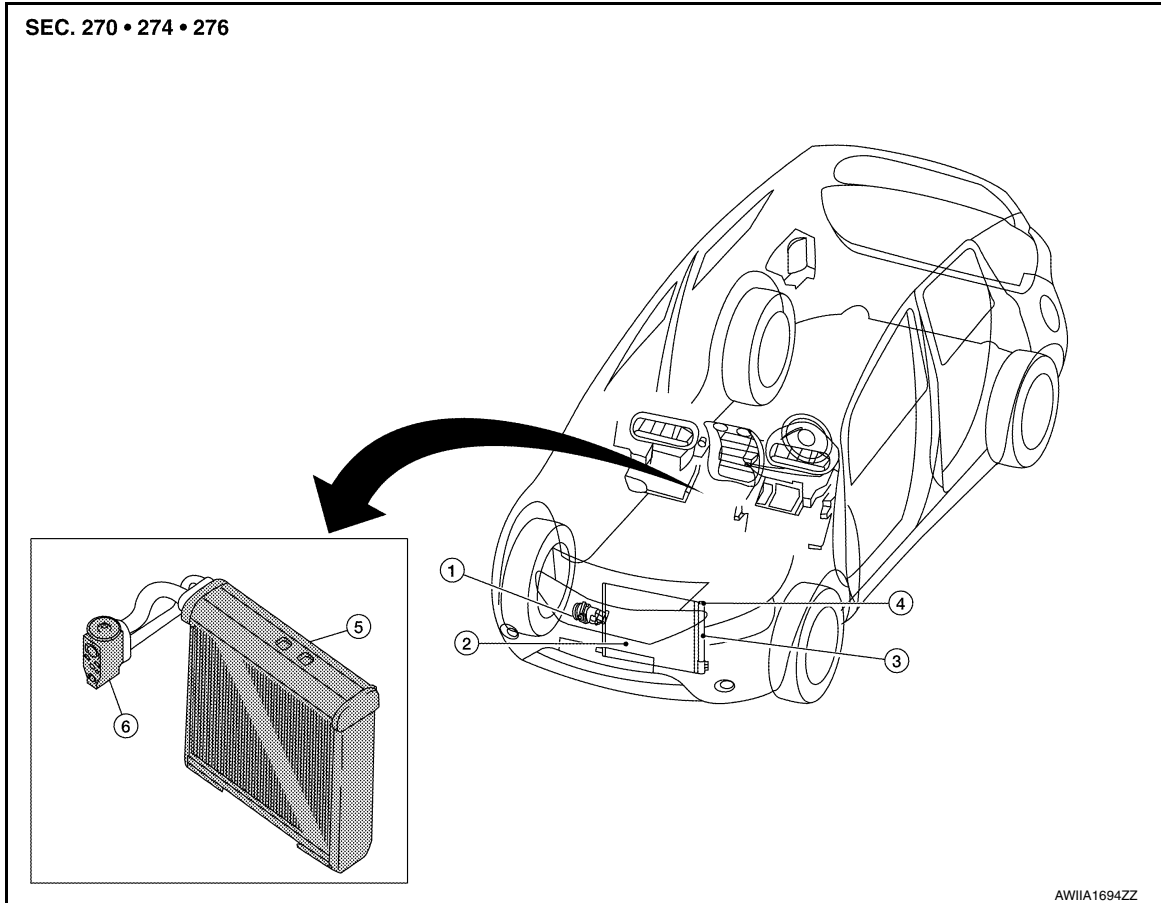
< SYSTEM DESCRIPTION >

## SYSTEM DESCRIPTION

### COMPONENT PARTS

#### Component Parts Location

INFOID:000000012431992



	Component	Function
1.	Compressor	Intakes, compresses, discharges and circulates refrigerant.
2.	Condenser	Cools the high-temperature high-pressure refrigerant discharged from the compressor to change it into a liquid.
3.	Liquid tank	Filters and stores a reserve of liquid refrigerant.
4.	Pressure sensor	Senses refrigerant pressure for proper A/C cycle operation.
5.	Evaporator	Evaporates refrigerant which removes heat from the air lowering its temperature.
6.	Expansion valve	Transforms high-pressure liquid refrigerant to low-pressure liquid refrigerant.

# DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

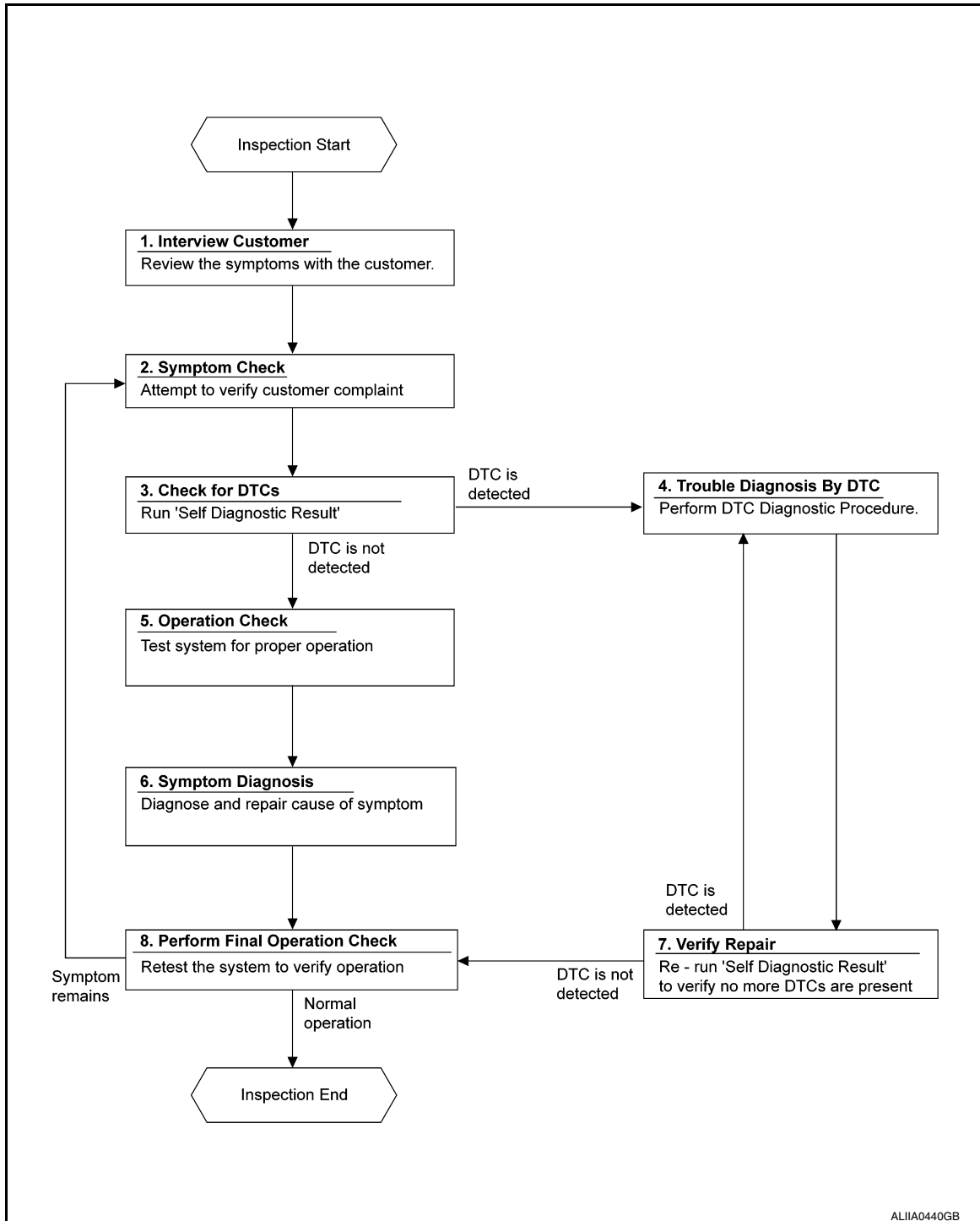
## BASIC INSPECTION

### DIAGNOSIS AND REPAIR WORKFLOW

Workflow

INFOID:0000000012431993

#### OVERALL SEQUENCE



#### DETAILED FLOW

##### 1. INTERVIEW CUSTOMER

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

# DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

---

>> GO TO 2.

## 2. SYMPTOM CHECK

---

Verify symptoms.

>> GO TO 3.

## 3. CHECK FOR DTCS

---

④ With CONSULT

1. Turn ignition switch ON.
2. Select "Self Diagnostic Result" of "BCM".
3. Check DTC.

Is any DTC detected?

YES >> GO TO 4.

NO >> GO TO 5.

## 4. PERFORM DTC DIAGNOSTIC PROCEDURE

---

Perform the diagnostic procedure for the detected DTC. Refer to [BCS-49, "DTC Inspection Priority Chart"](#) (with Intelligent Key system) or [BCS-115, "DTC Inspection Priority Chart"](#) (without Intelligent Key system).

>> GO TO 7.

## 5. OPERATION CHECK

---

Perform the operation check. Refer to [HAC-30, "Work Procedure"](#).

>> GO TO 6.

## 6. SYMPTOM DIAGNOSIS

---

Check the symptom diagnosis table. Refer to [HA-15, "Symptom Table"](#).

>> GO TO 8.

## 7. VERIFY REPAIR.

---

④ With CONSULT

1. Turn ignition switch ON.
2. Select "Self Diagnostic Result" of "BCM".
3. Check DTC.

Is any DTC detected?

YES >> GO TO 4.

NO >> GO TO 8.

## 8. PERFORM FINAL OPERATION CHECK

---

Perform the operation check. Refer to [HAC-30, "Work Procedure"](#).

Does it operate normally?

YES >> Inspection End.

NO >> GO TO 2.

# REFRIGERATION SYSTEM SYMPTOMS

< SYMPTOM DIAGNOSIS >

## SYMPTOM DIAGNOSIS

### REFRIGERATION SYSTEM SYMPTOMS

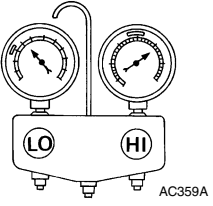
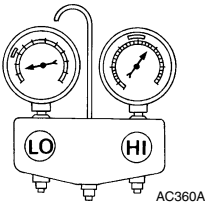
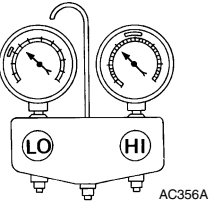
#### Trouble Diagnosis For Unusual Pressure

INFOID:000000012431994

Diagnose using a manifold gauge set whenever refrigerant pressures are unusual. The marker above the gauge scale in the following table indicates the standard (usual) pressure range. Refer to [HA-24, "Inspection"](#).

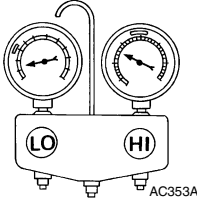
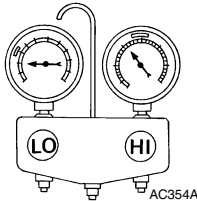
#### Symptom Table

INFOID:000000012431995

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
<p>Both high and low-pressure sides are too high.</p> 	<p>The pressure returns to normal soon after sprinkling water on condenser.</p>	<p>Overfilled refrigerant.</p>	<p>Recover refrigerant, evacuate system, and recharge with the specified amount of refrigerant. Refer to <a href="#">HA-20, "Recycle Refrigerant"</a>.</p>
	<p>Air flow to condenser is insufficient.</p>	<p>Insufficient condenser cooling performance.</p> <ul style="list-style-type: none"> <li>Poor cooling fan rotation.</li> <li>Missing and/or improper installation of air guides.</li> <li>Clogged or dirty condenser fins.</li> </ul>	<ul style="list-style-type: none"> <li>Repair or replace malfunctioning parts.</li> <li>Clean and/or repair condenser fins.</li> </ul>
	<p>When compressor stops, high-pressure gauge quickly drops by approximately 196 kPa (2 kg/cm<sup>2</sup>, 28 psi), then gradually decreases.</p>	<p>Air mixed with refrigerant.</p>	<p>Recover refrigerant, evacuate system, and recharge with the specified amount of refrigerant. Refer to <a href="#">HA-20, "Recycle Refrigerant"</a>.</p>
	<ul style="list-style-type: none"> <li>Low-pressure pipe is cooler than the outlet of evaporator.</li> <li>Low-pressure pipe is frosted.</li> </ul>	<p>Expansion valve opened too much (excessive flow of refrigerant).</p>	<p>Replace expansion valve. Refer to <a href="#">HA-36, "EXPANSION VALVE: Removal and Installation"</a>.</p>
<p>High-pressure side is excessively high and low-pressure side is too low.</p> 	<p>High-pressure pipe and upper side of condenser become hot, however, liquid tank does not become so hot.</p>	<p>Clogged or crushed high-pressure pipe located between compressor and condenser.</p>	<p>Repair or replace the malfunctioning parts.</p>
<p>High-pressure side is too low and low-pressure side is too high.</p> 	<ul style="list-style-type: none"> <li>The readings of both sides become equal soon after compressor stops.</li> <li>There is no temperature difference between high and low-pressure sides.</li> </ul>	<p>Malfunctioning compressor (insufficient compressor pressure operation).</p> <ul style="list-style-type: none"> <li>Damaged or broken of internal components.</li> <li>Malfunctioning gaskets.</li> </ul>	<p>Replace compressor. Refer to <a href="#">HA-26, "Removal and Installation"</a>.</p>

# REFRIGERATION SYSTEM SYMPTOMS

## < SYMPTOM DIAGNOSIS >

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
<p>Both high and low-pressure sides are too low.</p> 	<ul style="list-style-type: none"> <li>The area around evaporator outlet does not become cold.</li> <li>The area around evaporator inlet becomes frosted.</li> </ul>	<ul style="list-style-type: none"> <li>Clogged expansion valve.</li> <li>Breakage of temperature sensor.</li> <li>Clogging by foreign material.</li> </ul>	<p>Eliminate foreign material from expansion valve, or replace it.</p>
	<ul style="list-style-type: none"> <li>There is a temperature difference between the areas around outlet and inlet pipes of liquid tank.</li> <li>Liquid tank becomes frosted.</li> </ul>	<p>Malfunction inside liquid tank (clogged strainer).</p>	<p>Replace condenser (includes liquid tank). Refer to <a href="#">HA-31, "CONDENSER : Removal and Installation"</a>.</p>
	<p>Evaporator becomes frosted.</p>	<ul style="list-style-type: none"> <li>Clogged or crushed low-pressure pipe.</li> <li>Malfunctioning thermo amp.</li> </ul>	<p>Repair or replace malfunctioning parts.</p> <p>Check thermo amp. system. Refer to <a href="#">HAC-32, "Diagnosis Procedure"</a>.</p>
	<p>There is a small temperature difference between the high and low pressure pipes.</p>	<ul style="list-style-type: none"> <li>Low refrigerant charge.</li> <li>Leak or leaks in A/C system.</li> </ul>	<ul style="list-style-type: none"> <li>Check for leaks. Refer to <a href="#">HA-18, "Leak Test"</a>.</li> <li>Recover refrigerant, evacuate system, and recharge with the specified amount of refrigerant. Refer to <a href="#">HA-20, "Recycle Refrigerant"</a>.</li> </ul>
<p>Low-pressure side sometimes becomes negative.</p> 	<ul style="list-style-type: none"> <li>Sometimes the area around evaporator outlet does not become cold.</li> <li>Sometimes the area around evaporator inlet is frosted.</li> </ul>	<ul style="list-style-type: none"> <li>Icing caused by moisture mixed with refrigerant.</li> <li>Deteriorated dryer material in liquid tank.</li> </ul>	<p>Recover refrigerant then replace condenser (includes liquid tank). Refer to <a href="#">HA-31, "CONDENSER : Removal and Installation"</a>. Evacuate system and recharge with the specified amount of refrigerant. Refer to <a href="#">HA-20, "Charge Refrigerant"</a>.</p>



# NOISE

< SYMPTOM DIAGNOSIS >

## NOISE

### Symptom Table

INFOID:000000012431996

Symptom	Noise source	Probable cause	Corrective action
Unusual noise from compressor when A/C is ON.	Inside of compressor	Worn, broken, or clogged internal components.	Check compressor oil. Refer to <a href="#">HA-22, "Inspection"</a> .
	Magnet clutch	Contact of clutch disc with pulley.	Check clearance between clutch disc and pulley. Refer to <a href="#">HA-27, "Inspection"</a> .
	Compressor body	Loose compressor mounting bolts.	Check torque of mounting bolts. Refer to <a href="#">HA-26, "Exploded View"</a> .
Unusual noise from cooler piping.	Cooler piping (pipe and flexible hose)	Loose or improper installation of clip and bracket.	Check installation of cooler piping. Refer to <a href="#">HA-28, "Exploded View"</a> .
Unusual noise from expansion valve when A/C is ON.	Expansion valve	Low refrigerant charge.	<ul style="list-style-type: none"> <li>Check for leaks. Refer to <a href="#">HA-18, "Leak Test"</a>.</li> <li>Recover refrigerant, evacuate system, and recharge with the specified amount of refrigerant.</li> </ul>
		Worn, broken, or clogged internal components.	Eliminate foreign material from expansion valve, or replace it.
Unusual noise from belt.	—	Loose belt	Check belt tension. Refer to <a href="#">EM-17, "Adjustment"</a> .
		Damaged or broken components inside compressor.	Replace compressor. Refer to <a href="#">HA-26, "Removal and Installation"</a> .

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# REFRIGERANT

< PERIODIC MAINTENANCE >

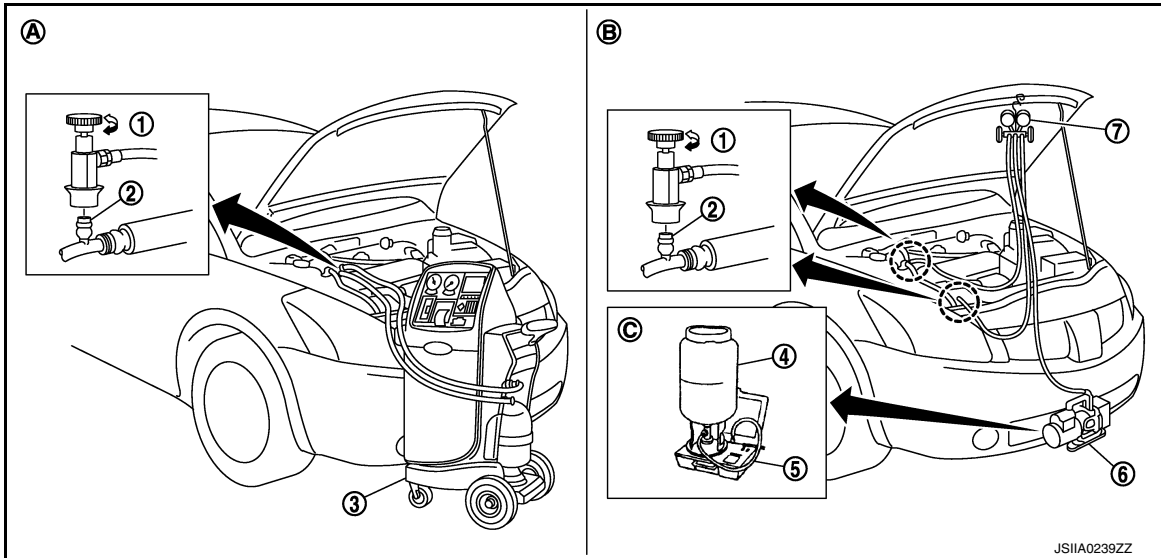
## PERIODIC MAINTENANCE

### REFRIGERANT

#### Description

INFOID:000000012431997

#### CONNECTION OF SERVICE TOOLS AND EQUIPMENT

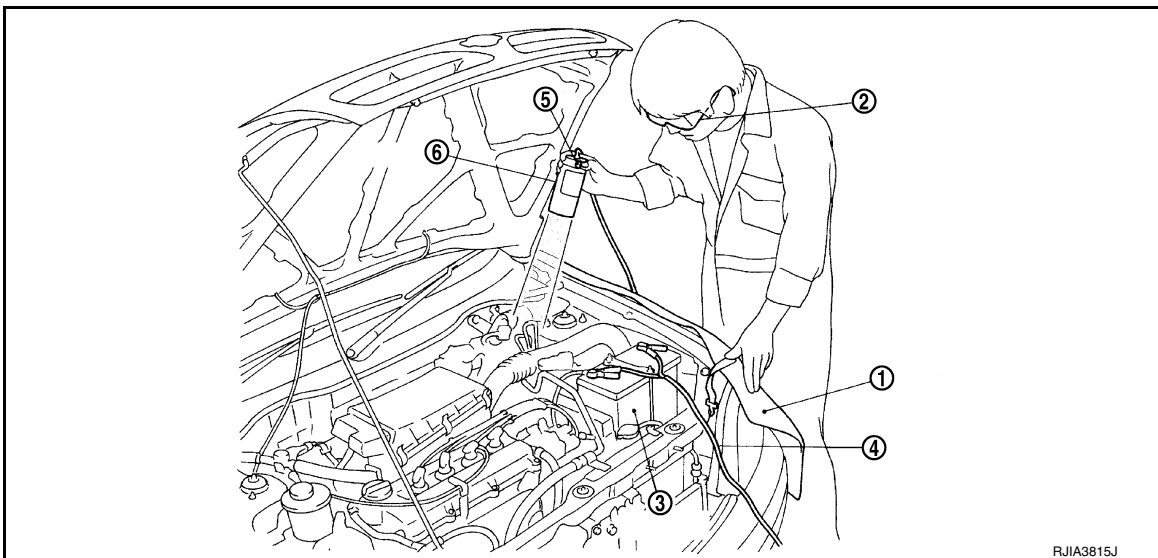


- |                                     |                       |  |
|-------------------------------------|-----------------------|--|
| 1. Shut-off valve                   | 2. A/C service valve  | 3. Recovery/recycling/recharging equipment |
| 4. Refrigerant container (HFC-134a) | 5. Weight scale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

#### Leak Test

INFOID:000000012431998

#### CHECK REFRIGERANT LEAKS USING FLUORESCENT LEAK DETECTION DYE



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

# REFRIGERANT

## < PERIODIC MAINTENANCE >

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

**WARNING:**

**Do not look directly into UV lamp light source.**

**NOTE:**

- For continuous operating time of UV lamp, follow the manufacturer's operating instructions.
- Illuminate pipe joints from different angles using UV lamp to check for leaks.
- Use a mirror in areas that are difficult to see to check for leaks.
- Refrigerant leaks from the evaporator can be detected by soaking a cotton swab or similar material with drain hose water and illuminating it using the UV lamp.
- Dust, dirt, and packing material adhesives used for condenser, evaporator, and other components may fluoresce. Be careful not to misidentify leaks.

5. Repair or replace parts where refrigerant leaks occur and wipe off fluorescent leak detection dye.

**NOTE:**

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

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's operating instructions.
- Dust, dirt, and packing material adhesives used for condenser, evaporator, and other components may fluoresce. Be careful not to misidentify leaks.

## CHECK REFRIGERANT LEAKS USING ELECTRONIC LEAK DETECTOR

**WARNING:**

**Do not check for refrigerant leaks 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 other contaminants around the vehicle.**
- **Always check refrigerant leaks in a low air flow environment so that refrigerant may not disperse.**

1. Stop the engine.
2. Connect recovery/recycling/recharging equipment or manifold gauge set to the A/C service valves.
3. Check that A/C refrigerant pressure is 345 kPa (3.52 kg/cm<sup>2</sup>, 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 recharge refrigerant to the specified level.

**NOTE:**

Leaks may not be detected if A/C refrigerant pressure is 345 kPa (3.52 kg/cm<sup>2</sup>, 50 psi) or less when temperature is less than 16°C (61°F).

4. Clean the area where the refrigerant leak check is performed and check for refrigerant leaks along all surfaces of pipe connections and A/C system components using electronic leak detector probe.

**CAUTION:**

- **Continue checking once leaks are found. Always continue and complete checking along all pipe connections and A/C system components for additional leaks.**
- **When leaks are detected, clean leak area using compressed air and re-check.**
- **When checking the evaporator for leaks, always clean inside of drain hose so that the probe surface may not be exposed to water or dirt.**

**NOTE:**

- Always check for leaks starting from the high-pressure side and continue to the low-pressure side.
- When checking the evaporator for leaks, operate blower motor for 15 minutes or more at the maximum speed while the engine is stopped. Insert electronic 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 leaks occur.
6. Start the engine and set A/C control in the following conditions.
  - A/C switch: ON

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# REFRIGERANT

## < PERIODIC MAINTENANCE >

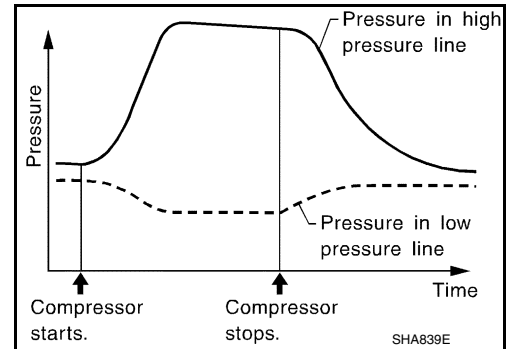
- Air flow: VENT (ventilation)
  - Intake door position: Recirculation
  - Temperature setting: Full cold
  - Blower speed: Maximum
7. Run the engine at approximately 1,500 rpm for two minutes or more.
  8. Stop the engine. Check for refrigerant leaks. Go to step 4.

### **WARNING:**

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

### **NOTE:**

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



## Recycle Refrigerant

INFOID:000000012431999

### **WARNING:**

- Always use HFC-134a for A/C refrigerant. If CFC-12 is accidentally charged, compressor damage may result 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. Poisonous gas is produced if refrigerant burns. Keep workshop well ventilated.

1. Perform oil return operation. Refer to [HA-22, "Perform Oil Return Operation"](#). (If refrigerant or oil leaks are 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 has leaked.**

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

### **NOTE:**

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

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

## Charge Refrigerant

INFOID:000000012432000

### **WARNING:**

- Always use HFC-134a for A/C refrigerant. If CFC-12 is accidentally charged, compressor damage may result 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. Poisonous gas is produced if refrigerant burns. Keep workshop well ventilated.

1. Connect recovery/recycling/recharging equipment to the A/C service valves.

# REFRIGERANT

## < PERIODIC MAINTENANCE >

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 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 of refrigerant and check that there are no refrigerant leaks. Refer to [HA-18. "Leak Test"](#).  
**CAUTION:**  
**Check the airtightness for 15 minutes or more if parts are replaced.**
4. If parts other than the compressor are replaced, fill compressor oil according to parts that are replaced. Refer to [HA-22. "Oil Adjusting Procedure for Components Replacement Except Compressor"](#).
5. Charge the specified amount of refrigerant into A/C system.
6. Check that the A/C system operates normally.
7. Collect the refrigerant from the high-pressure hose and low-pressure hose of recovery/recycling/recharging equipment. Disconnect recovery/recycling/recharging equipment.
8. Install A/C service valve caps.
9. Refrigerant charge is complete.

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# OIL

< PERIODIC MAINTENANCE >

## OIL

### Description

INFOID:000000012432001

#### MAINTENANCE OF OIL LEVEL

The compressor oil circulates in the system together with the refrigerant. It is necessary to add oil to the compressor when replacing A/C system components or when a large amount of refrigerant leaks from the system. It is important to always maintain oil level within the specified level. Otherwise, the following conditions may occur.

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

**Name**                      **A/C System Oil Type: DH-PR**

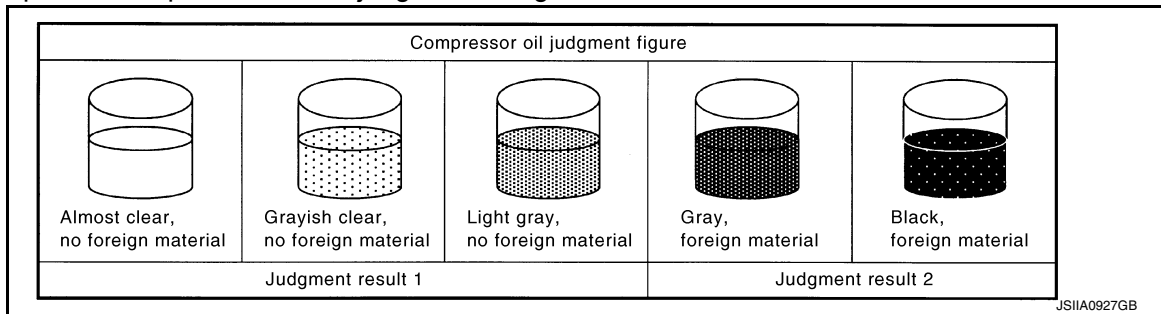
### Inspection

INFOID:000000012432002

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

#### 1. COMPRESSOR OIL JUDGMENT

1. Remove the compressor. Refer to [HA-26. "Removal and Installation"](#).
2. Sample the compressor oil and judge on the figure.



Judgement result 1>>Replace compressor only.

Judgement result 2>>Replace compressor and condenser (includes liquid tank).

### Perform Oil Return Operation

INFOID:000000012432003

#### CAUTION:

**If a large amount of refrigerant or oil leaks from the system, do not perform oil return operation.**

1. Start the engine and set the front air control to the following conditions.
  - Engine speed: Idling to 1,200 rpm
  - A/C switch: ON
  - Blower speed: Maximum
  - 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:000000012432004

Add the amount of oil that is calculated according to the following conditions.

Example: Oil amount to be added when replacing evaporator [m ℓ (Imp fl oz.)] = 35 (1.2) + α

Conditions	Oil amount to be added to A/C system m ℓ (Imp fl oz.)
Replace evaporator	35 (1.2)
Replace condenser (includes liquid tank)	20 (0.7)

# OIL

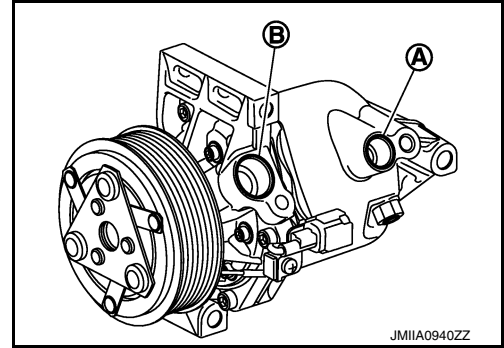
## < PERIODIC MAINTENANCE >

Conditions		Oil amount to be added to A/C system m ℓ (Imp fl oz.)
Refrigerant leak is detected	Large amount leakage	30 (1.1)
	Small amount leakage	—
Oil amount that is recycled together with refrigerant during recycle operation		$\alpha$

### Oil Adjusting Procedure for Compressor Replacement

INFOID:000000012432005

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



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

**Amount to be drained (A) [m ℓ (Imp fl oz.)] = F – (D + S + R +  $\alpha$ )**

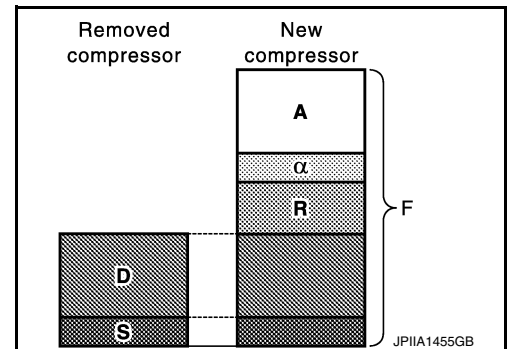
**F:** Oil amount that a new compressor contains [120 (4.2)]

**D:** Oil amount that is drained from removed compressor

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

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

**$\alpha$ :** Oil amount that is recycled together with refrigerant during recycle operation



**CAUTION:**

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

Conditions	Oil amount to be added to A/C system m ℓ (Imp fl oz.)
Replace evaporator	35 (1.2)
Replace condenser (includes liquid tank)	20 (0.7)

Example: Oil amount to be drained from a new compressor when replacing compressor [m ℓ (Imp fl oz.)]  
[D = 60 (2.1),  $\alpha$  = 5 (0.2)]

$$120 (4.2) - [60 (2.1) + 20 (0.7) + 5 (0.2)] = 35 (1.1)$$

- Install compressor and check the operation.

# PERFORMANCE TEST

< PERIODIC MAINTENANCE >

## PERFORMANCE TEST

### Inspection

INFOID:000000012432006

### INSPECTION PROCEDURE

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

Test condition		
Surrounding condition		In a well-ventilated place away from direct sunlight.
Vehicle condition	Doors	Closed
	Door glass	Closed
	Hood	Open
	Engine speed	Idle speed
A/C condition (front/rear)	Temperature control	Full cold
	A/C switch	ON
	Air outlet	VENT (ventilation)
	Intake door position	Recirculation
	Blower speed	Maximum

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 test result is out of the specified value, perform diagnosis by manifold gauge set. Refer to [HA-15, "Symptom Table"](#).

### RECIRCULATING-TO-DISCHARGE AIR TEMPERATURE TABLE

#### FRONT

Inside air (Recirculating air) at blower assembly inlet		Discharge air temperature from center ventilator °C (°F)
Relative humidity %	Air temperature °C (°F)	
50 – 60	20 (68)	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 <sup>2</sup> , psi)	Low-pressure (Suction side) kPa (kg/cm <sup>2</sup> , psi)
Relative humidity %	Air temperature °C (°F)		
50 – 70	25 (77)	900 - 1,112 (9.2 - 11.3, 130.5 - 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 - 3.1, 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)

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# COMPRESSOR

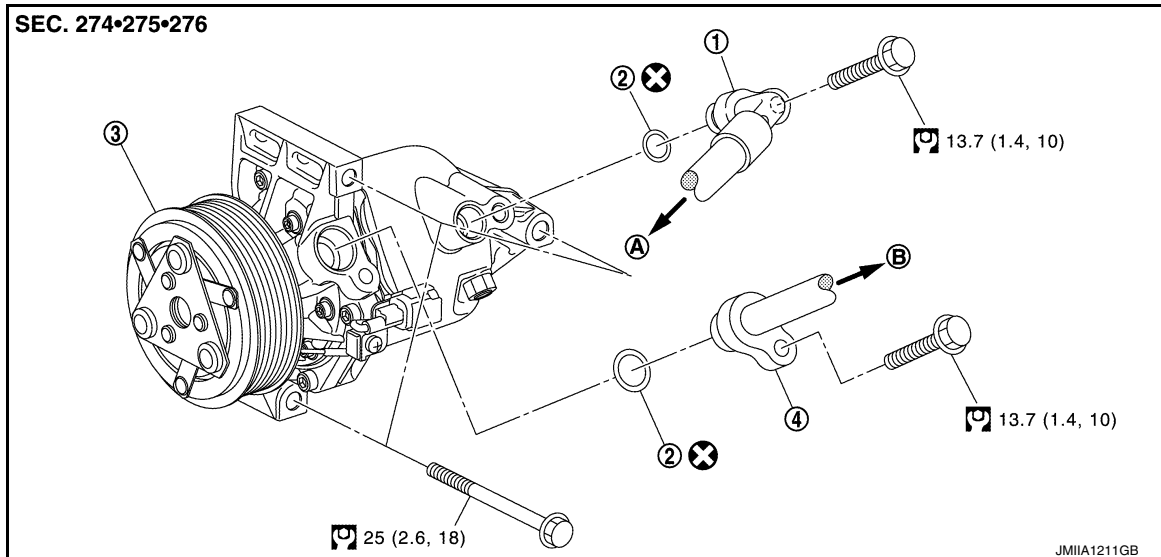
< REMOVAL AND INSTALLATION >

## REMOVAL AND INSTALLATION

### COMPRESSOR

Exploded View

INFOID:000000012432007



- |                                |                 |                  |
|--------------------------------|-----------------|------------------|
| 1. High-pressure flexible hose | 2. O-ring       | 3. Compressor    |
| 4. Low-pressure flexible hose  | A. To condenser | B. To evaporator |

### Removal and Installation

INFOID:000000012432008

#### CAUTION:

Perform oil return operation before each refrigeration system disassembly. However, if a large amount of refrigerant or oil is detected, do not perform oil return operation. Refer to [HA-22, "Perform Oil Return Operation"](#).

#### REMOVAL

1. Discharge the refrigerant. Refer to [HA-20, "Recycle Refrigerant"](#).
2. Remove front grille. Refer to [EXT-32, "Removal and Installation"](#).
3. Remove fender protector (RH). Refer to [EXT-38, "Removal and Installation"](#).
4. Remove low-pressure flexible hose and high-pressure flexible hose from compressor.

#### CAUTION:

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

5. Remove drive belt. Refer to [EM-16, "Removal and Installation"](#).
6. Disconnect magnet clutch harness connector.
7. Remove bolts and compressor.

#### INSTALLATION

Installation is in the reverse order of removal.

#### CAUTION:

- Do not reuse O-rings.
- Apply compressor oil to the new O-rings of the low-pressure flexible hose and high-pressure flexible hose for installation.
- Perform oil adjusting procedure before installing new compressor. Refer to [HA-23, "Oil Adjusting Procedure for Compressor Replacement"](#).
- After charging the A/C refrigerant, check for leaks. Refer to [HA-18, "Leak Test"](#).
- Check drive belt tension after installing compressor. Refer to [EM-17, "Adjustment"](#).

# COMPRESSOR

## < REMOVAL AND INSTALLATION >

### Inspection

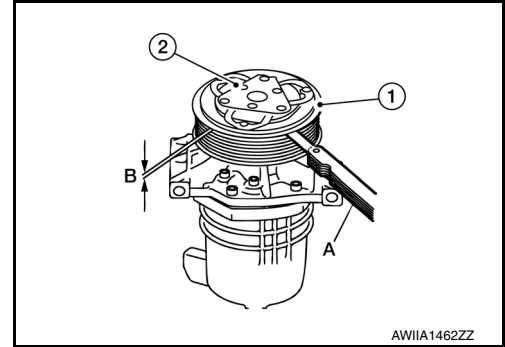
INFOID:000000012432009

#### CHECK DISC TO PULLEY CLEARANCE

Check the clearance (B) between pulley assembly (1) and clutch disc (2) along the entire periphery with a feeler gauge (A).

**Clearance** : Refer to [HA-37, "Compressor"](#).

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



A  
B  
C  
D  
E  
F  
G  
H  
HA  
J  
K  
L  
M  
N  
O  
P

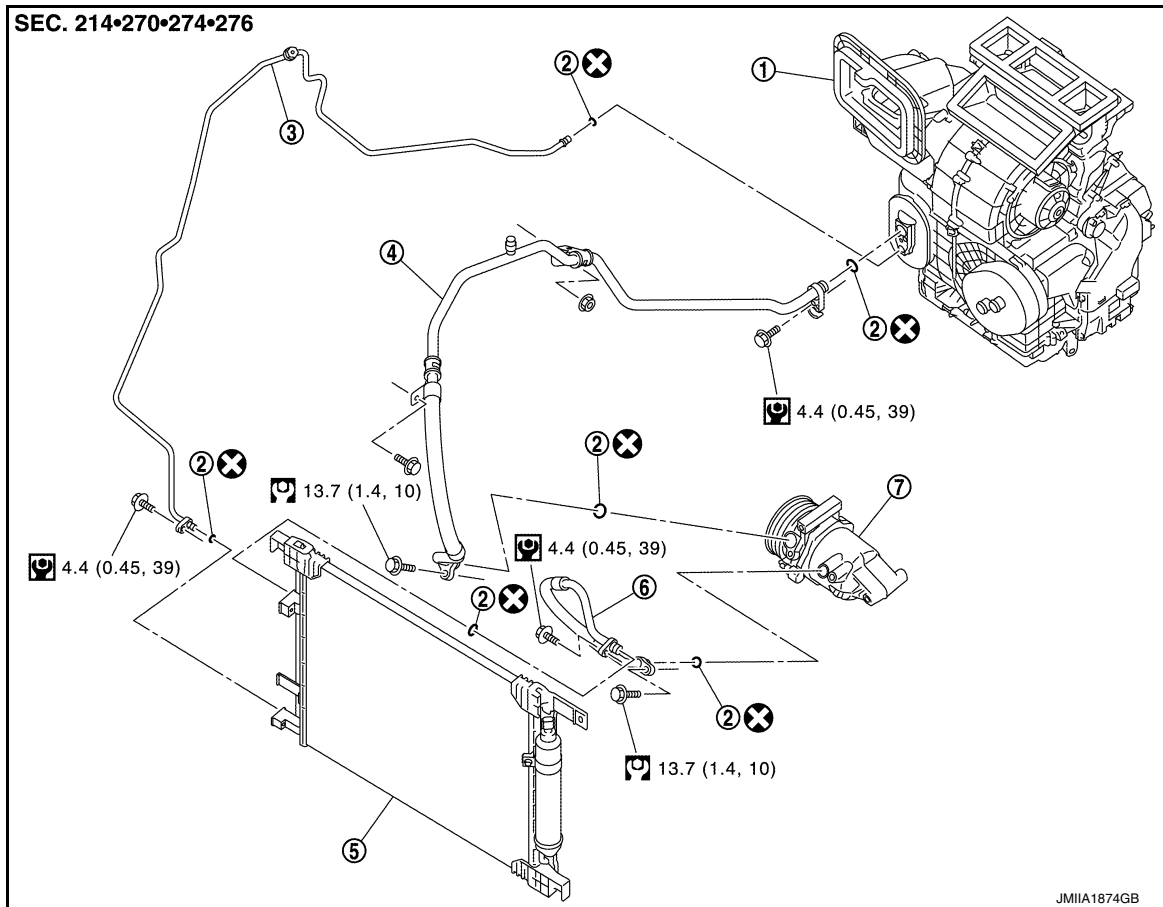
# COOLER PIPE AND HOSE

< REMOVAL AND INSTALLATION >

## COOLER PIPE AND HOSE

Exploded View

INFOID:000000012432010



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

## LOW-PRESSURE FLEXIBLE HOSE

### LOW-PRESSURE FLEXIBLE HOSE : Removal and Installation

INFOID:000000012432011

#### CAUTION:

Perform oil return operation before each refrigeration system disassembly. However, if a large amount of refrigerant or oil is detected, do not perform oil return operation. Refer to [HA-22, "Perform Oil Return Operation"](#).

#### REMOVAL

1. Discharge the refrigerant. Refer to [HA-20, "Recycle Refrigerant"](#).
2. Disconnect vacuum hose from intake manifold. Refer to [BR-33, "Exploded View"](#).
3. Remove ground wire from engine to radiator core support upper.
4. Remove front grille. Refer to [EXT-32, "Removal and Installation"](#).
5. Remove low-pressure flexible hose nut and bolt, then position lower dash insulator as necessary.
6. Remove bolt and low-pressure flexible hose from expansion valve.

#### CAUTION:

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

7. Remove bolt and low-pressure flexible hose from compressor.

# COOLER PIPE AND HOSE

## < REMOVAL AND INSTALLATION >

### CAUTION:

Cap or wrap the joint of the A/C hose and compressor 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-rings.
- Apply compressor oil to new O-rings of low-pressure flexible hose for installation.
- After charging refrigerant, check for leaks. Refer to [HA-18, "Leak Test"](#).

## HIGH-PRESSURE FLEXIBLE HOSE

### HIGH-PRESSURE FLEXIBLE HOSE : Removal and Installation

INFOID:000000012432012

### CAUTION:

Perform oil return operation before each refrigeration system disassembly. However, if a large amount of refrigerant or oil is detected, do not perform oil return operation. Refer to [HA-22, "Perform Oil Return Operation"](#).

### REMOVAL

1. Discharge the refrigerant. Refer to [HA-20, "Recycle Refrigerant"](#).
2. Remove front grille. Refer to [EXT-32, "Removal and Installation"](#).
3. Remove bolt and high-pressure flexible hose from condenser.

### CAUTION:

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

4. Remove bolt and high-pressure flexible hose from compressor.

### CAUTION:

Cap or wrap the joint of the A/C hose and compressor 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-rings.
- Apply compressor oil to new O-rings of the high-pressure flexible hose for installation.
- After charging refrigerant, check for leaks. Refer to [HA-18, "Leak Test"](#).

## HIGH-PRESSURE PIPE

### HIGH-PRESSURE PIPE : Removal and Installation

INFOID:000000012432013

### REMOVAL

1. Discharge the refrigerant. Refer to [HA-20, "Recycle Refrigerant"](#).
2. Remove radiator core support upper. Refer to [DLK-144, "RADIATOR CORE SUPPORT UPPER : Removal and Installation"](#).
3. Remove low-pressure flexible hose. Refer to [HA-28, "LOW-PRESSURE FLEXIBLE HOSE : Removal and Installation"](#).
4. Remove high-pressure flexible hose. Refer to [HA-29, "HIGH-PRESSURE FLEXIBLE HOSE : Removal and Installation"](#).
5. Disconnect high-pressure pipe from expansion valve.

### CAUTION:

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

6. Remove bolt and high-pressure pipe from condenser.

### CAUTION:

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

7. Release clips and remove high-pressure pipe from vehicle.

## COOLER PIPE AND HOSE

< REMOVAL AND INSTALLATION >

---

### INSTALLATION

Installation is in the reverse order of removal.

**CAUTION:**

- Do not reuse O-rings.
- Apply compressor oil to new O-rings of the high-pressure pipe for installation.
- After charging refrigerant, check for leaks. Refer to [HA-18, "Leak Test"](#).

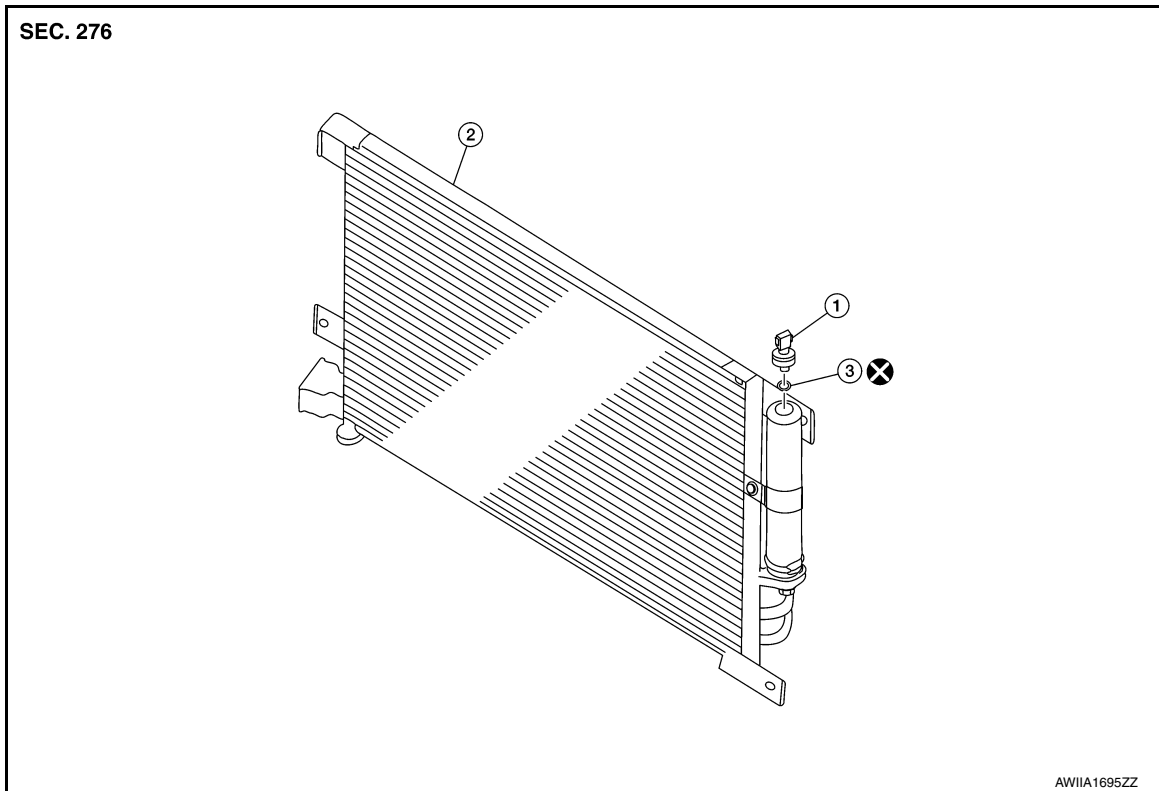
# CONDENSER

< REMOVAL AND INSTALLATION >

## CONDENSER

### Exploded View

INFOID:000000012432014



1. Refrigerant pressure sensor      2. Condenser with liquid tank      3. O-ring

## CONDENSER

### CONDENSER : Removal and Installation

INFOID:000000012432015

#### CAUTION:

Perform oil return operation before each refrigeration system disassembly. However, if a large amount of refrigerant or oil is detected, do not perform oil return operation. Refer to [HA-22, "Perform Oil Return Operation"](#).

#### REMOVAL

1. Discharge the refrigerant. Refer to [HA-20, "Recycle Refrigerant"](#).
2. Remove front grille. Refer to [EXT-32, "Removal and Installation"](#).
3. Remove air guides. Refer to [DLK-144, "Exploded View"](#).
4. Remove radiator core support upper. Refer to [DLK-144, "RADIATOR CORE SUPPORT UPPER : Removal and Installation"](#).
5. Remove bolt and high-pressure flexible hose from condenser.  
**CAUTION:**  
Cap or wrap the joint of the A/C hose and condenser with suitable material such as vinyl tape to avoid the entry of air.
6. Remove bolt and high-pressure pipe from condenser.  
**CAUTION:**  
Cap or wrap the joint of the A/C piping and condenser with suitable material such as vinyl tape to avoid the entry of air.
7. Disconnect the harness connector from the refrigerant pressure sensor and remove condenser.  
**CAUTION:**  
Be careful not to damage core surface of condenser.

# CONDENSER

## < REMOVAL AND INSTALLATION >

### INSTALLATION

Installation is in the reverse order of removal.

#### CAUTION:

- Do not reuse O-rings.
- Apply compressor oil to new O-rings of the high-pressure flexible hose and high-pressure pipe for installation.
- Perform oil adjusting procedure before installing new condenser. Refer to [HA-22, "Oil Adjusting Procedure for Components Replacement Except Compressor"](#).
- After charging refrigerant, check for leaks. Refer to [HA-18, "Leak Test"](#).

### LIQUID TANK

#### LIQUID TANK : Removal and Installation of Liquid Tank

INFOID:000000012432016

The liquid tank is only serviced as part of the condenser. Refer to [HA-31, "CONDENSER : Removal and Installation"](#).

### REFRIGERANT PRESSURE SENSOR

#### REFRIGERANT PRESSURE SENSOR : Removal and Installation

INFOID:000000012432017

#### CAUTION:

Perform oil return operation before each refrigeration system disassembly. However, if a large amount of refrigerant or oil is detected, do not perform oil return operation. Refer to [HA-22, "Perform Oil Return Operation"](#).

### REMOVAL

1. Discharge the refrigerant. Refer to [HA-20, "Recycle Refrigerant"](#).
2. Remove front grille. Refer to [EXT-32, "Removal and Installation"](#).
3. Remove upper air guide and air guide (LH). Refer to [DLK-144, "Exploded View"](#).
4. Clean refrigerant pressure sensor and surrounding area.

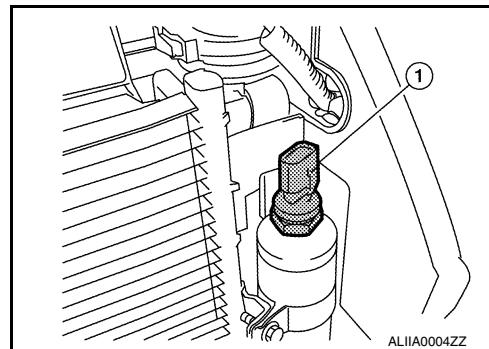
#### CAUTION:

**Make sure to clean carefully.**

5. Disconnect the harness connector from the refrigerant pressure sensor.
6. Support liquid tank, then remove refrigerant pressure sensor (1).

#### CAUTION:

- Be careful not to damage liquid tank.
- Be careful not to damage core surface of condenser.
- Cap or wrap the joint of the condenser and liquid tank 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-rings.
- Apply compressor oil to new O-ring of the refrigerant pressure sensor for installation.
- After charging refrigerant, check for leaks. Refer to [HA-18, "Leak Test"](#).



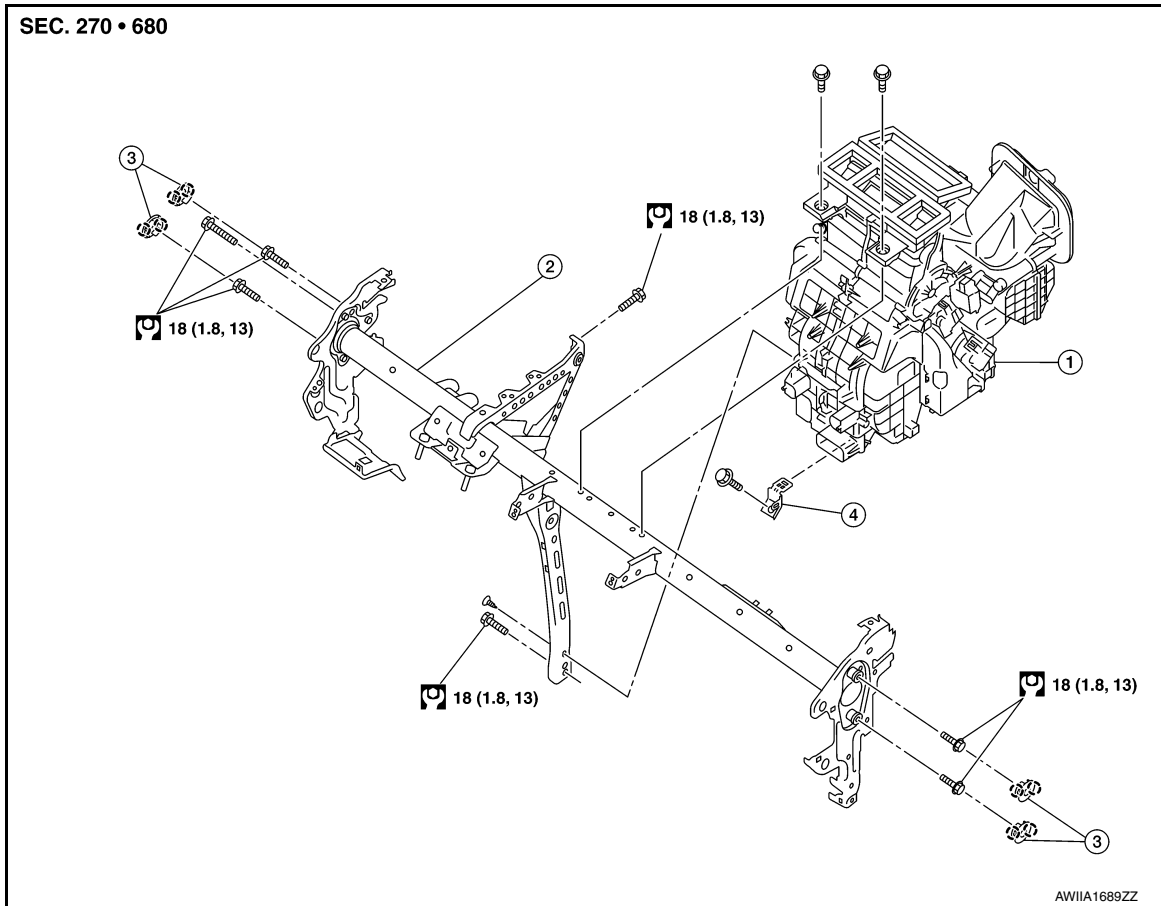
# HEATING AND COOLING UNIT ASSEMBLY

< REMOVAL AND INSTALLATION >

## HEATING AND COOLING UNIT ASSEMBLY

Exploded View

INFOID:000000012432018

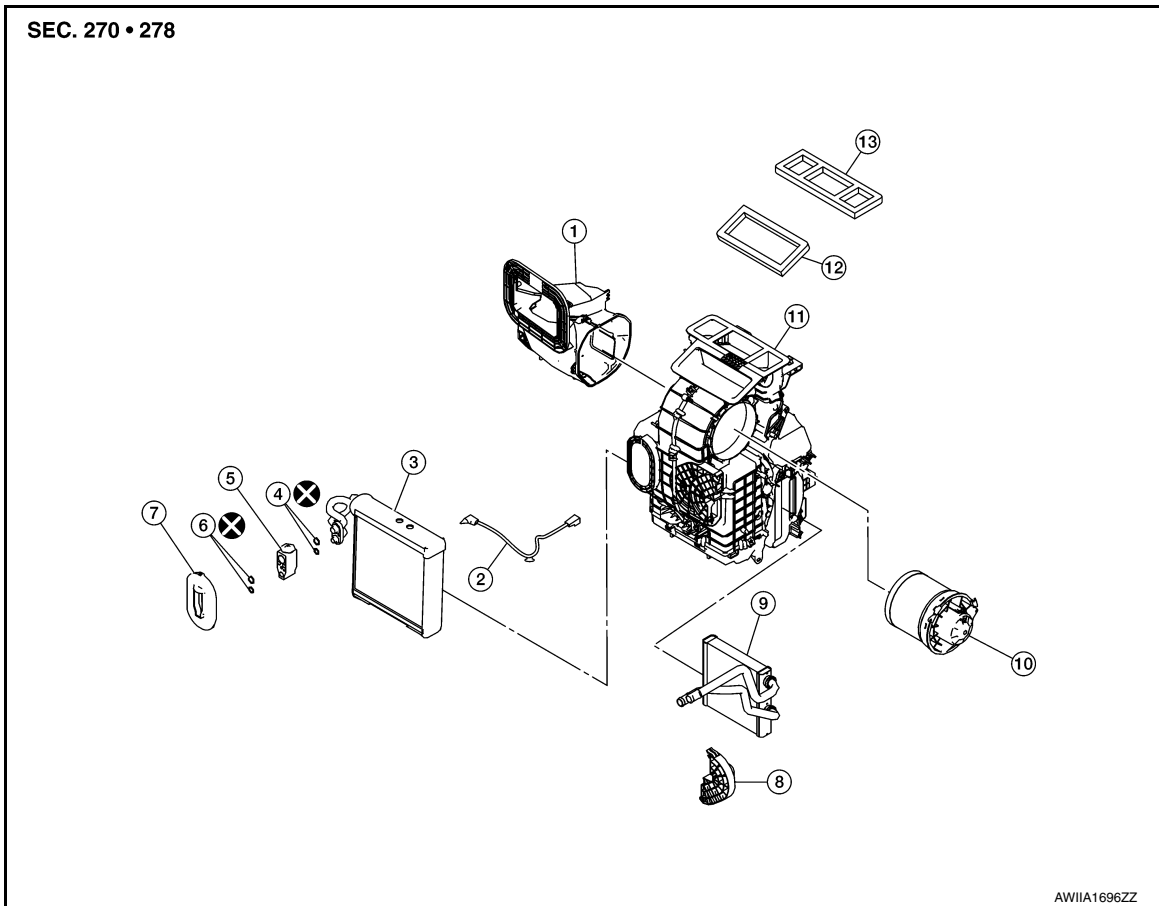


- 1. Heating and cooling unit assembly
  - 2. Steering member
  - 3. Cap
  - 4. Bracket
- Pawl

A  
B  
C  
D  
E  
F  
G  
H  
HA  
J  
K  
L  
M  
N  
O  
P

# HEATING AND COOLING UNIT ASSEMBLY

< REMOVAL AND INSTALLATION >



- |                        |                                       |                |
|------------------------|---------------------------------------|----------------|
| 1. Intake case         | 2. Thermo control amp.                | 3. Evaporator  |
| 4. O-ring              | 5. Expansion valve                    | 6. O-ring      |
| 7. Grommet             | 8. Heater pipe flange                 | 9. Heater core |
| 10. Front blower motor | 11. Heating and cooling unit assembly | 12. Seal       |
| 13. Seal               |                                       |                |

## HEATING AND COOLING UNIT ASSEMBLY

### HEATING AND COOLING UNIT ASSEMBLY : Removal and Installation

INFOID:000000012432019

#### CAUTION:

Perform oil return operation before each refrigeration system disassembly. However, if a large amount of refrigerant or oil is detected, do not perform oil return operation. Refer to [HA-22, "Perform Oil Return Operation"](#).

#### REMOVAL

1. Discharge the refrigerant (if equipped). Refer to [HA-20, "Recycle Refrigerant"](#).
2. Drain engine coolant. Refer to [CO-8, "Draining Engine Coolant"](#).
3. Disconnect low-pressure flexible hose from expansion valve (if equipped). Refer to [HA-28, "LOW-PRESSURE FLEXIBLE HOSE : Removal and Installation"](#).

#### CAUTION:

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

4. Disconnect high-pressure pipe from expansion valve (if equipped). Refer to [HA-29, "HIGH-PRESSURE PIPE : Removal and Installation"](#).

#### CAUTION:

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

# HEATING AND COOLING UNIT ASSEMBLY

## < REMOVAL AND INSTALLATION >

5. Disconnect heater hoses from heater core.
6. Remove instrument panel assembly. Refer to [IP-15, "Removal and Installation"](#).
7. Disconnect evaporator drain hose from heating and cooling unit assembly.
8. Disconnect harness connectors, grounds, retainers, etc., and remove bolts required to remove steering member.
9. Remove steering member and heating and cooling unit assembly.
10. Remove heating and cooling unit assembly from steering member. Refer to [HA-33, "Exploded View"](#).

## INSTALLATION

Installation is in the reverse order of removal.

### CAUTION:

- Do not reuse O-rings.
- Apply compressor oil to new O-rings of the low-pressure flexible hose and high-pressure pipe for installation.
- After charging refrigerant, check for leaks. Refer to [HA-18, "Leak Test"](#).

### NOTE:

When refilling engine coolant, refer to [CO-9, "Refilling"](#).

## HEATER CORE

### HEATER CORE : Removal and Installation

INFOID:000000012432020

## REMOVAL

1. Remove the heating and cooling unit assembly. Refer to [HA-34, "HEATING AND COOLING UNIT ASSEMBLY : Removal and Installation"](#).
2. Remove foot duct (LH). Refer to [VTL-7, "FOOT DUCT : Removal and Installation"](#).
3. Remove heater packing.
4. Remove heater pipe flange.
5. Remove heater core.

## INSTALLATION

Installation is in the reverse order of removal.

### NOTE:

When refilling engine coolant, refer to [CO-9, "Refilling"](#).

## EVAPORATOR

### EVAPORATOR : Removal and Installation

INFOID:000000012432021

## REMOVAL

1. Remove heating and cooling unit assembly. Refer to [HA-34, "HEATING AND COOLING UNIT ASSEMBLY : Removal and Installation"](#).
2. Remove foot duct (RH). Refer to [VTL-7, "FOOT DUCT : Removal and Installation"](#).
3. Remove intake case. Refer to [HA-33, "Exploded View"](#).
4. Remove expansion valve. Refer to [HA-36, "EXPANSION VALVE : Removal and Installation"](#).
5. Remove evaporator cover and evaporator assembly.

## INSTALLATION

Installation is in the reverse order of removal.

### CAUTION:

- Do not reuse O-rings.
- Apply compressor oil to new O-rings for installation.
- Perform oil adjusting procedure after installing new evaporator. Refer to [HA-22, "Oil Adjusting Procedure for Components Replacement Except Compressor"](#).
- After charging refrigerant, check for leaks. Refer to [HA-18, "Leak Test"](#).

## EXPANSION VALVE

# HEATING AND COOLING UNIT ASSEMBLY

< REMOVAL AND INSTALLATION >

## EXPANSION VALVE : Removal and Installation

INFOID:000000012432022

### REMOVAL

1. Discharge the refrigerant. Refer to [HA-20. "Recycle Refrigerant"](#).
2. Disconnect low-pressure flexible hose from expansion valve. Refer to [HA-28. "LOW-PRESSURE FLEXIBLE HOSE : Removal and Installation"](#).
3. Disconnect high-pressure pipe from expansion valve. Refer to [HA-29. "HIGH-PRESSURE PIPE : Removal and Installation"](#).
4. Remove bolts and expansion valve.

**CAUTION:**

Cap or wrap the joint of the evaporator and expansion valve 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-rings.
- Apply compressor oil to new O-rings of the low-pressure flexible hose and high-pressure pipe for installation.
- After charging refrigerant, check for leaks. Refer to [HA-18. "Leak Test"](#).

## SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE DATA AND SPECIFICATIONS (SDS)

# SERVICE DATA AND SPECIFICATIONS (SDS)

## SERVICE DATA AND SPECIFICATIONS (SDS)

### Compressor

INFOID:0000000012432023

Model		CALSONIC KANSEI CR08b
Type		Vane rotary
Displacement	Maximum	83 cm <sup>3</sup> (5.1cu in)/rev
Direction of rotation		Clockwise (viewed from clutch)
Drive belt		Poly V
Disc to pulley clearance	Standard	0.25 – 0.55 mm (0.010 – 0.022 in)

### Oil

INFOID:0000000012432024

Name		A/C System Oil Type DH-PR
Capacity	Total in system	110 - 130 m ℓ (3.7 - 4.4 US fl oz, 3.9 - 4.6 Imp fl oz)
	Replacement compressor charging amount	Refer to <a href="#">HA-23, "Oil Adjusting Procedure for Compressor Replacement"</a> .

### Refrigerant

INFOID:0000000012432025

Type		HFC-134a (R-134a)
Capacity		0.4 kg (0.9 lb)