

## SECTION **HA** HEATER & AIR CONDITIONING SYSTEM

### CONTENTS

<b>PRECAUTION</b> .....	3	<b>NOISE</b> .....	20
<b>PRECAUTIONS</b> .....	3	Symptom Table .....	20
Precaution for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER" .....	3	<b>PERIODIC MAINTENANCE</b> .....	21
Precaution for Work .....	3	<b>REFRIGERANT</b> .....	21
Precaution for Working with HFC-134a (R-134a).....	3	Description .....	21
Contaminated Refrigerant .....	4	Leak Test .....	21
Precaution for Leak Detection Dye .....	4	Recycle Refrigerant .....	23
Precaution for Refrigerant Connection .....	4	Charge Refrigerant .....	23
Precaution for Service Equipment .....	7	<b>OIL</b> .....	25
<b>PREPARATION</b> .....	9	Description .....	25
<b>PREPARATION</b> .....	9	Inspection .....	25
Special Service Tool .....	9	Perform Oil Return Operation .....	25
HFC-134a (R-134a) Service Tool and Equipment.....	9	Oil Adjusting Procedure for Components Replacement Except Compressor .....	25
Commercial Service Tool .....	11	Oil Adjusting Procedure for Compressor Replacement .....	26
Sealant and/or Oil .....	12	<b>PERFORMANCE TEST</b> .....	28
<b>SYSTEM DESCRIPTION</b> .....	13	Inspection .....	28
<b>REFRIGERATION SYSTEM</b> .....	13	<b>REMOVAL AND INSTALLATION</b> .....	30
Refrigerant Cycle .....	13	<b>COMPRESSOR</b> .....	30
Refrigerant System Protection .....	13	<b>COMPRESSOR</b> .....	30
Component Part Location .....	14	COMPRESSOR : Exploded View .....	30
<b>BASIC INSPECTION</b> .....	15	COMPRESSOR : Removal and Installation .....	30
<b>DIAGNOSIS AND REPAIR WORKFLOW</b> .....	15	<b>MAGNET CLUTCH</b> .....	31
Workflow .....	15	MAGNET CLUTCH : Removal and Installation .....	31
<b>SYMPTOM DIAGNOSIS</b> .....	17	<b>COOLER PIPE AND HOSE</b> .....	33
<b>HEATER AND AIR CONDITIONING SYSTEM SYMPTOMS</b> .....	17	Exploded View .....	33
Symptom Table .....	17	<b>LOW-PRESSURE FLEXIBLE HOSE</b> .....	33
<b>REFRIGERATION SYSTEM SYMPTOMS</b> .....	18	LOW-PRESSURE FLEXIBLE HOSE : Removal and Installation .....	33
Trouble Diagnosis For Unusual Pressure .....	18	<b>HIGH-PRESSURE FLEXIBLE HOSE</b> .....	34
Symptom Table .....	18		

HIGH-PRESSURE FLEXIBLE HOSE : Removal and Installation .....	34	<b>HEATING AND COOLING UNIT ASSEMBLY...</b>	<b>39</b>
		Exploded View .....	39
<b>LOW-PRESSURE PIPE .....</b>	<b>34</b>	<b>HEATING AND COOLING UNIT ASSEMBLY .....</b>	<b>39</b>
LOW-PRESSURE PIPE : Removal and Installation .....	34	HEATING AND COOLING UNIT ASSEMBLY : Removal and Installation .....	40
<b>HIGH-PRESSURE PIPE .....</b>	<b>35</b>	<b>HEATER CORE .....</b>	<b>40</b>
HIGH-PRESSURE PIPE : Removal and Installation .....	35	HEATER CORE : Removal and Installation .....	41
<b>CONDENSER .....</b>	<b>37</b>	<b>EVAPORATOR .....</b>	<b>41</b>
Exploded View .....	37	EVAPORATOR : Removal and Installation .....	41
<b>CONDENSER .....</b>	<b>37</b>	<b>EXPANSION VALVE .....</b>	<b>41</b>
CONDENSER : Removal and Installation .....	37	EXPANSION VALVE : Removal and Installation for Expansion Valve .....	41
<b>LIQUID TANK .....</b>	<b>37</b>	<b>SERVICE DATA AND SPECIFICATIONS (SDS) .....</b>	<b>42</b>
LIQUID TANK : Removal and Installation .....	37		
<b>REFRIGERANT PRESSURE SENSOR .....</b>	<b>38</b>	<b>SERVICE DATA AND SPECIFICATIONS (SDS) .....</b>	<b>42</b>
REFRIGERANT PRESSURE SENSOR : Removal and Installation .....	38	Service Data and Specification (SDS) .....	42

# PRECAUTIONS

< PRECAUTION >

## PRECAUTION

### PRECAUTIONS

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

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

##### **WARNING:**

- To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, it is recommended that all maintenance and repair be performed by an authorized NISSAN/INFINITI dealer.
- Improper repair, 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 or batteries, and wait at least three 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.

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

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##### **WARNING:**

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

## PRECAUTIONS

### < PRECAUTION >

- Use only specified oil for the HFC-134a (R-134a) A/C system and HFC-134a (R-134a) components. If oil other than that specified is used, compressor failure is likely to occur.
- The specified HFC-134a (R-134a) oil rapidly absorbs moisture from the atmosphere. The following handling precautions must be observed:
  - When removing refrigerant components from a vehicle, immediately cap (seal) the component to minimize the entry of moisture from the atmosphere.
  - When installing refrigerant components to a vehicle, do not remove the caps (unseal) until just before connecting the components. Connect all refrigerant loop components as quickly as possible to minimize the entry of moisture into system.
  - Only use the specified oil from a sealed container. Immediately reseal containers of oil. Without proper sealing, oil will become moisture saturated and should not be used.
  - Avoid breathing A/C refrigerant and oil vapor or mist. Exposure may irritate eyes, nose and throat. Remove HFC-134a (R-134a) from the A/C system using certified service equipment meeting requirements of SAE J2210 [HFC-134a (R-134a) recycling equipment], or J2209 [HFC-134a (R-134a) recycling equipment]. If accidental system discharge occurs, ventilate work area before resuming service. Additional health and safety information may be obtained from refrigerant and oil manufacturers.
- Do not allow A/C oil to come in contact with styrofoam parts. Damage may result.

### Contaminated Refrigerant

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

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

### Precaution for Leak Detection Dye

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- The A/C system contains a fluorescent leak detection dye used for locating refrigerant leaks. An ultraviolet (UV) lamp is required to illuminate the dye when inspecting for leaks.
- Always wear fluorescence enhancing UV safety goggles to protect your eyes and enhance the visibility of the fluorescent dye.
- A compressor shaft seal should not be repaired because of dye seepage. The compressor shaft seal should only be repaired after confirming the leak with an electronic refrigerant leak detector (J-41995).
- Always remove any dye from the leak area after repairs are complete to avoid a misdiagnosis during a future service.
- Do not allow dye to come into contact with painted body panels or interior components. If dye is spilled, clean immediately with the approved dye cleaner. Fluorescent dye left on a surface for an extended period of time **cannot be removed.**
- Do not spray the fluorescent dye cleaning agent on hot surfaces (engine exhaust manifold, etc.).
- Do not use more than one refrigerant dye bottle (1/4 ounce / 7.4 cc) per A/C system.
- Leak detection dyes for HFC-134a (R-134a) and HC-12 (R-12) A/C systems are different. Do not use HFC-134a (R-134a) leak detection dye in R-12 A/C systems or HC-12 (R-12) leak detection dye in HFC-134a (R-134a) A/C systems or A/C system damage may result.
- The fluorescent properties of the dye will remain for over three (3) years unless a compressor failure occurs.

### Precaution for Refrigerant Connection

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

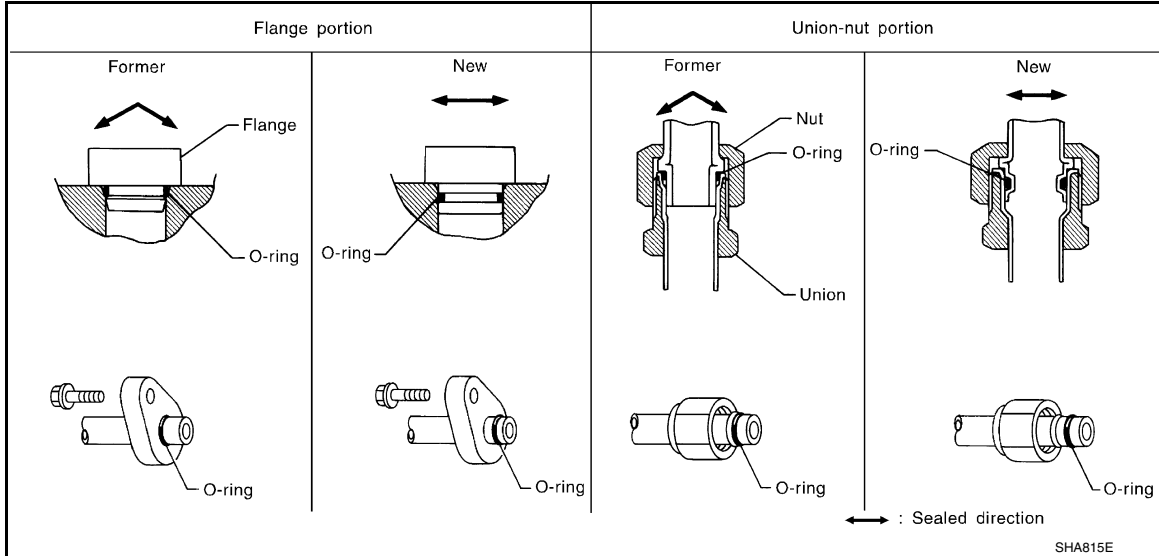
- Expansion valve to cooling unit
- Evaporator pipes to evaporator (inside cooling unit)
- Refrigerant pressure sensor

# PRECAUTIONS

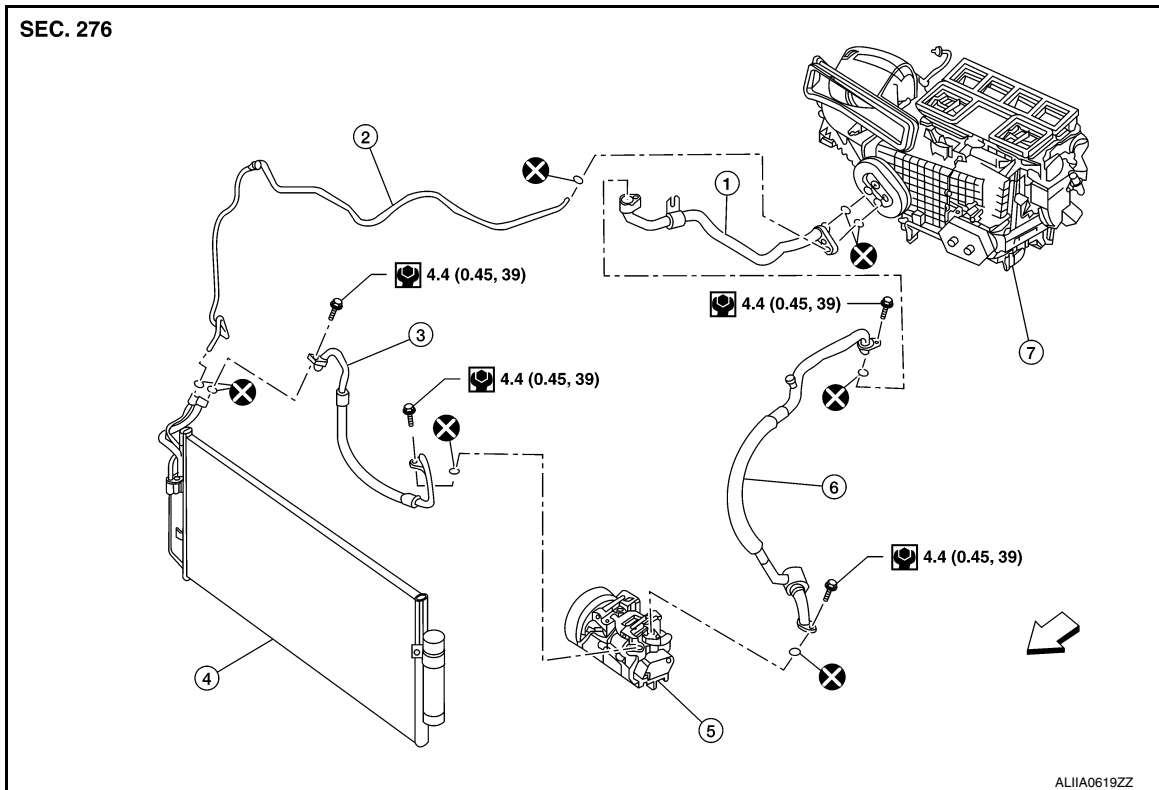
## < PRECAUTION >

### FEATURES OF NEW TYPE REFRIGERANT CONNECTION

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



### O-RING AND REFRIGERANT CONNECTION



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

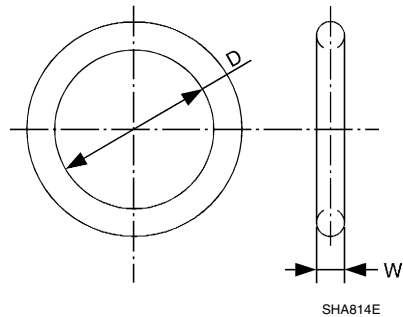
## CAUTION:

# PRECAUTIONS

## < PRECAUTION >

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

O-Ring Specifications\*



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

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

### **WARNING:**

Make sure all refrigerant is discharged into the recycling equipment and the pressure in the system is less than atmospheric pressure. Then gradually loosen the discharge side hose fitting and remove it.

### **CAUTION:**

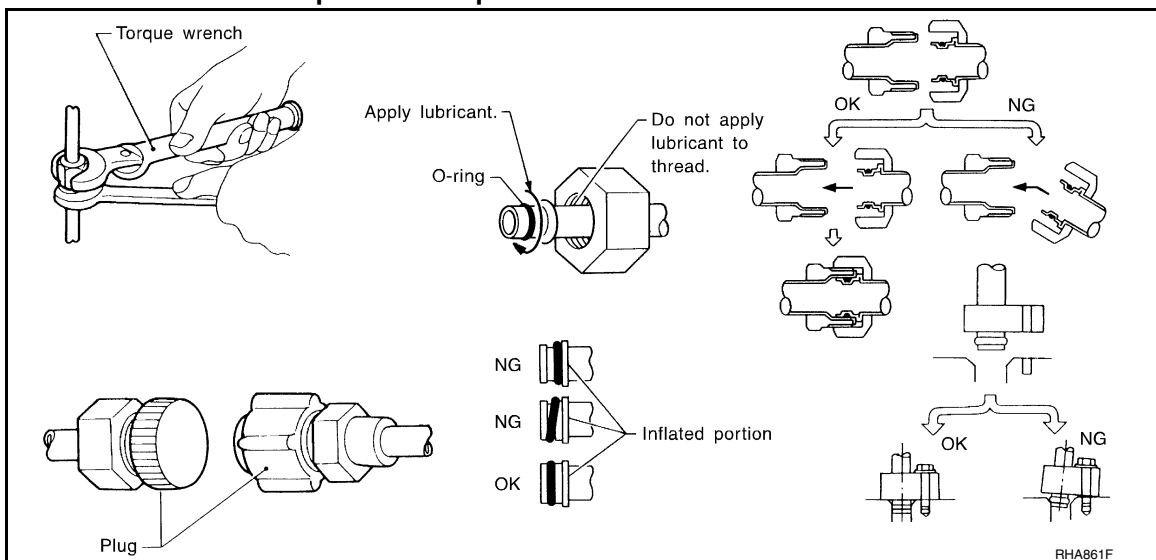
When replacing or cleaning refrigerant cycle components, observe the following.

- When the compressor is removed, store it in the same position as it is when mounted on the car. Failure to do so will cause oil to enter the low pressure chamber.
- When connecting tubes, always use a torque wrench and a back-up wrench.
- After disconnecting tubes, immediately plug all openings to prevent entry of dirt and moisture.
- When installing an air conditioner in the vehicle, connect the pipes as the final stage of the operation. Do not remove the seal caps of pipes and other components until just before required for connection.
- Allow components stored in cool areas to warm to working area temperature before removing seal caps. This prevents condensation from forming inside A/C components.
- Thoroughly remove moisture from the refrigeration system before charging the refrigerant.
- Do not reuse the O-rings.
- Apply A/C compressor oil to the new O-rings for installation.  
Oil name: NISSAN A/C System Oil Type S or equivalent
- O-ring must be closely attached to dented portion of tube.
- When replacing the O-ring, do not damage O-ring and tube.
- Connect tube until you hear it click, then tighten the nut or bolt by hand until snug. Make sure that the O-ring is installed to tube correctly.

## PRECAUTIONS

### < PRECAUTION >

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



### Precaution for Service Equipment

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### RECOVERY/RECYCLING EQUIPMENT

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

### ELECTRONIC LEAK DETECTOR

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

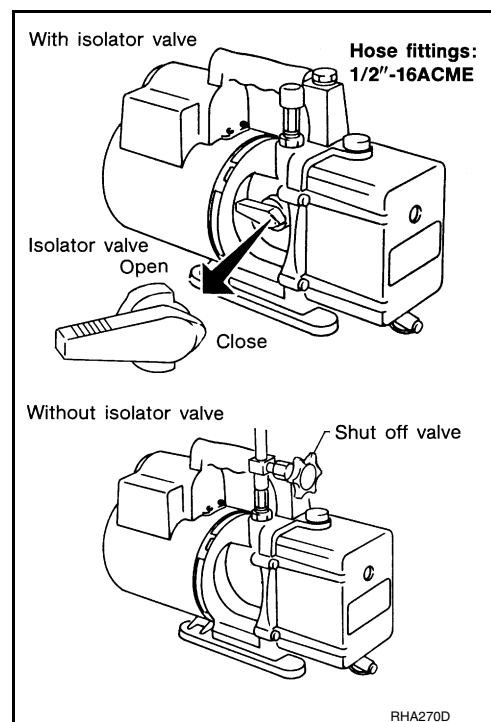
### VACUUM PUMP

The oil contained inside the vacuum pump is not compatible with the specified oil for HFC-134a (R-134a) A/C systems. The vent side of the vacuum pump is exposed to atmospheric pressure so the vacuum pump oil may migrate out of the pump into the service hose. This is possible when the pump is switched off after evacuation (vacuuming) and hose is connected to it.

To prevent this migration, use a manual valve situated near the hose-to-pump connection, as follows.

- Usually vacuum pumps have a manual isolator valve as part of the pump. Close this valve to isolate the service hose from the pump.
- For pumps without an isolator, use a hose equipped with a manual shut-off valve near the pump end. Close the valve to isolate the hose from the pump.
- If the hose has an automatic shut off valve, disconnect the hose from the pump: as long as the hose is connected, the valve is open and oil may migrate.

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

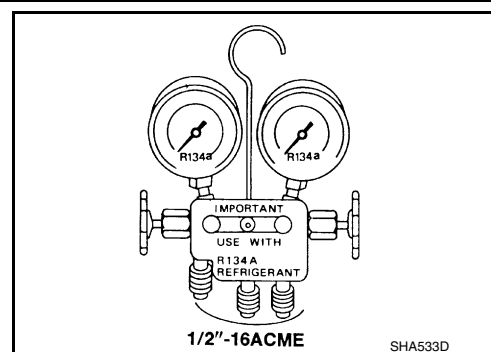


### MANIFOLD GAUGE SET

# PRECAUTIONS

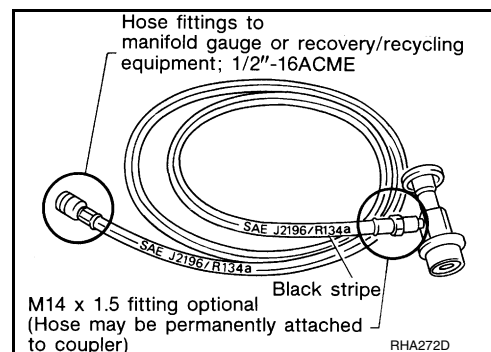
## < PRECAUTION >

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



## SERVICE HOSES

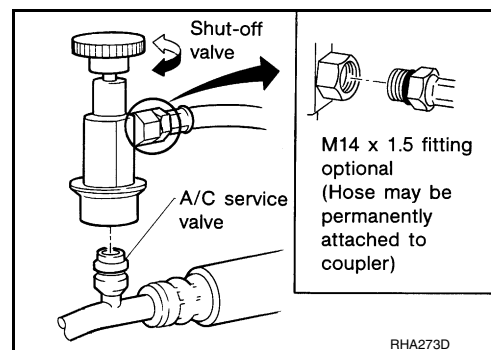
Be certain that the service hoses display the markings described (colored hose with black stripe). All hoses must include positive shut-off devices (either manual or automatic) near the end of the hoses opposite the manifold gauge.



## SERVICE COUPLERS

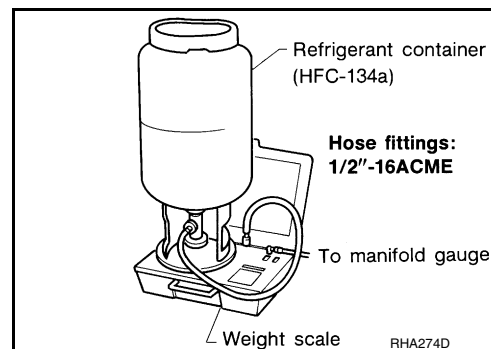
Do not attempt to connect HFC-134a (R-134a) service couplers to a CFC-12 (R-12) A/C system. The HFC-134a (R-134a) couplers will not properly connect to the CFC-12 (R-12) system. However, if an improper connection is attempted, discharging and contamination may occur.

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



## REFRIGERANT WEIGHT SCALE

Verify that no refrigerant other than HFC134a (R-134a) and specified oils have been used with the scale. If the scale controls refrigerant flow electronically, the hose fitting must be 1/2"-16 ACME.



## CHARGING CYLINDER

Using a charging cylinder is not recommended. Refrigerant may be vented into air from cylinder's top valve when filling the cylinder with refrigerant. Also, the accuracy of the cylinder is generally less than that of an electronic scale or of quality recycle/recharge equipment.

# PREPARATION

< PREPARATION >

## PREPARATION

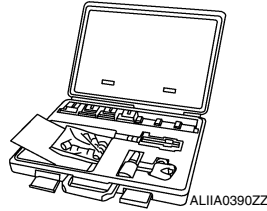
### PREPARATION

#### Special Service Tool

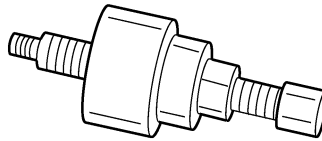
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The actual shape of the tools may differ from those illustrated here.

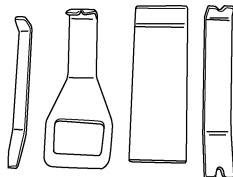
Tool number (TechMate No.) Tool name	Description
— (J-41425-NIS) Aluminum tube repair kit	Repairing leaks in A/C tubes
— (J-38873-A) Drive plate installer	Installing pulley
— (J-46534) Trim Tool Set	Removing trim components



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


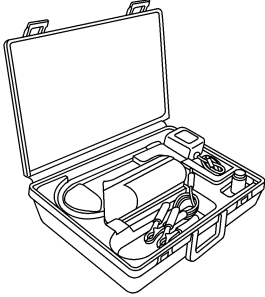
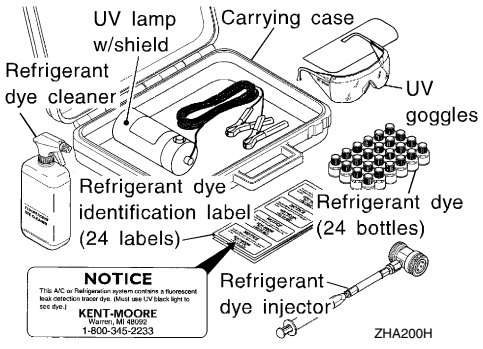
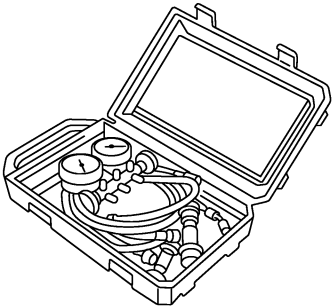
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Do not mix HFC-134a (R-134a) refrigerant and/or its specified oil with CFC-12 (R-12) refrigerant and/or its oil. Separate and non-interchangeable service equipment must be used for handling each type of refrigerant/oil. Refrigerant container fittings,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

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

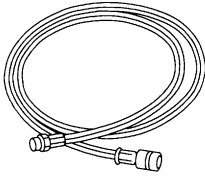
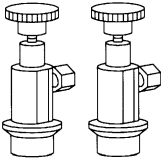
# PREPARATION

## < PREPARATION >

Tool number (TechMate No.) Tool name	Description
<p>—</p> <p>(J-48710) NISSAN ACR2009 RRR Unit</p>	<p>Refrigerant recovery, recycling and re-charging</p>  <p>WJIA0293E</p>
<p>—</p> <p>(J-41995) Electronic refrigerant leak detector</p>	<p>Power supply:</p> <ul style="list-style-type: none"> <li>• DC 12V (battery terminal)</li> </ul>  <p>AHA281A</p>
<p>—</p> <p>(J-43926) Refrigerant dye leak detection kit Kit includes: (J-42220) UV lamp and UV safety goggles (J-41459) Refrigerant dye injector (J-41447) Fluorescent leak detection dye (box of 24, 1/4 ounce bottles) (J-43872) Refrigerant dye cleaner</p>	<p>Power supply:</p> <ul style="list-style-type: none"> <li>• DC 12V (battery terminal)</li> </ul>  <p>NOTICE This A/C or Refrigerant system contains a fluorocarbon leak detection tracer dye. (Must use UV black light to see dye.) <b>KENT-MOORE</b> Warren, MI 48090 1-800-345-2233</p> <p>ZHA200H</p>
<p>—</p> <p>(J-39183-C) Manifold gauge set (with hoses and couplers)</p>	<p>Identification:</p> <ul style="list-style-type: none"> <li>• The gauge face indicates R-134a.</li> <li>• Fitting size-Thread size</li> <li>• 1/2"-16 ACME</li> </ul>  <p>RJIA0196E</p>

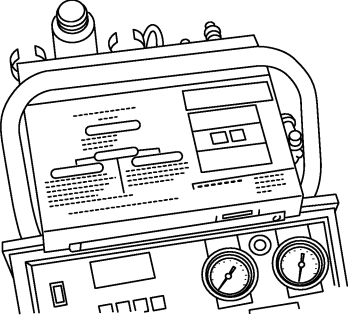

# PREPARATION

## < PREPARATION >

Tool number (TechMate No.) Tool name	Description	A
Service hoses: <ul style="list-style-type: none"> <li>• High side hose (J-39500-72B)</li> <li>• Low side hose (J-39500-72R)</li> <li>• Utility hose (J-39500-72Y)</li> </ul>  S-NT201	Hose color: <ul style="list-style-type: none"> <li>• Low side hose: Blue with black stripe</li> <li>• High side hose: Red with black stripe</li> <li>• Utility hose: Yellow with black stripe or green with black stripe</li> </ul> Hose fitting to gauge: <ul style="list-style-type: none"> <li>• 1/2"-16 ACME</li> </ul>	B C
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>  S-NT202	Hose fitting to service hose: <ul style="list-style-type: none"> <li>• M14 x 1.5 fitting is optional or permanently attached.</li> </ul>	D E F

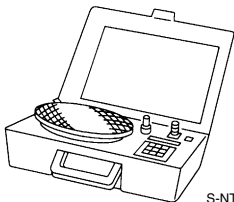
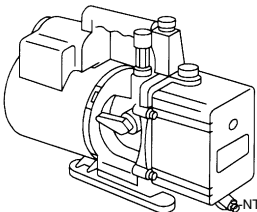
## Commercial Service Tool

INFOID:0000000012600725

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

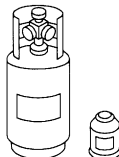
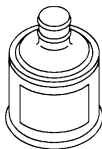
# PREPARATION

## < PREPARATION >

(TechMate No.) Tool name	Description
(J-39699) Refrigerant weight scale  S-NT200	For measuring of refrigerant Fitting size-Thread size • 1/2"-16 ACME
(J-39649) Vacuum pump (Including the isolator valve)  S-NT203	Capacity: • Air displacement: 4 CFM • Micron rating: 20 microns • Oil capacity: 482 g (17 oz) Fitting size-Thread size • 1/2"-16 ACME

## Sealant and/or Oil

INFOID:0000000012600726

Tool number (TechMate No.) Tool name	Description
— ( — ) HFC-134a (R-134a) Refrigerant  S-NT196	Container color: Light blue Container marking: HFC-134a (R-134a) Fitting size: Thread size • large container 1/2"-16 ACME
— ( — ) NISSAN A/C System Oil Type S  JMIIA1759ZZ	Type: Poly alkylene glycol oil (PAG), type S (DH-PS) Application: HFC-134a (R-134a) swash plate compressors Capacity: 40 mℓ (1.4 US fl oz, 1.4 Imp fl oz)

# REFRIGERATION SYSTEM

< SYSTEM DESCRIPTION >

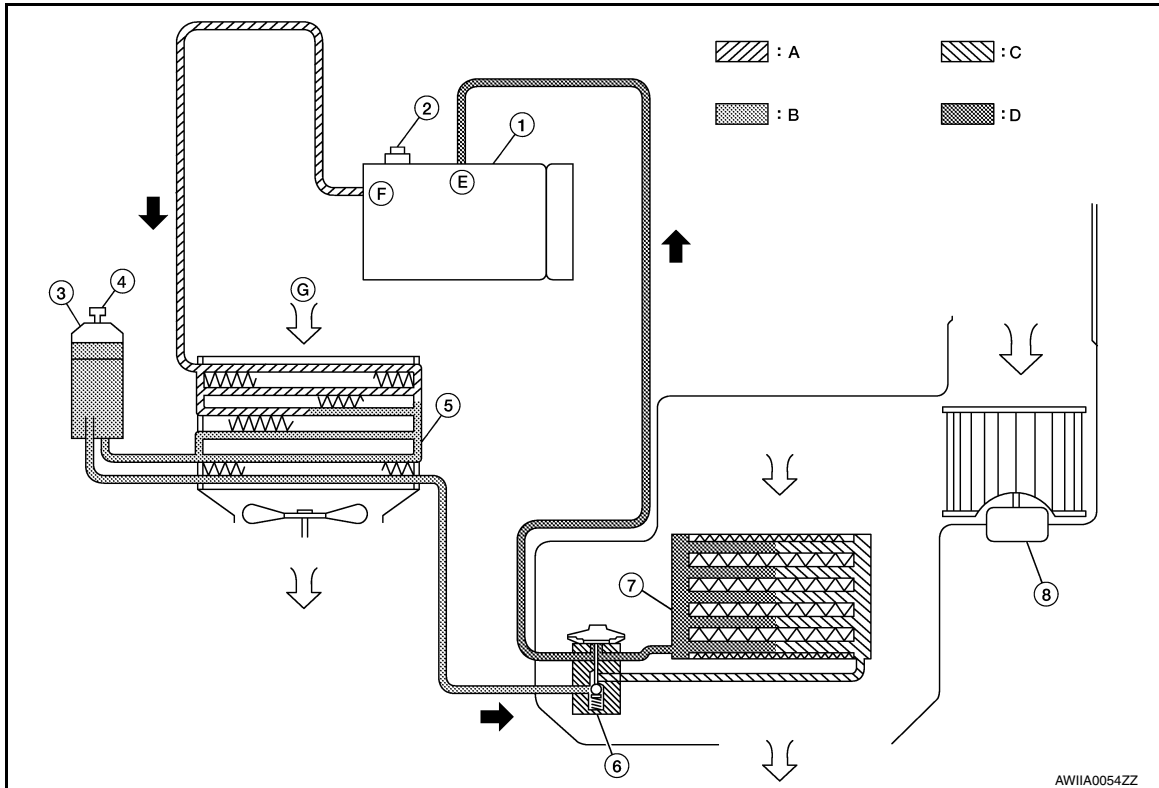
## SYSTEM DESCRIPTION

### REFRIGERATION SYSTEM

#### Refrigerant Cycle

INFOID:0000000012600727

#### Refrigerant flow



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

#### Refrigerant Flow

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

#### Freeze Protection

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

#### Refrigerant System Protection

INFOID:0000000012600728

#### Refrigerant pressure sensor

The refrigerant system is protected against excessively high or low pressures by the refrigerant pressure sensor, located on the liquid tank. 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 the high-pressure side detected by refrigerant pressure sensor meet the following conditions.

- 3,120 KPa (31.82 kg/cm<sup>2</sup>, 452.4 psi) or more (When the engine speed is less than 1,500 rpm).
- 2,740 KPa (27.95 kg/cm<sup>2</sup>, 397.3 psi) or more (When the engine speed is 1,500 rpm or more).

# REFRIGERATION SYSTEM

## < SYSTEM DESCRIPTION >

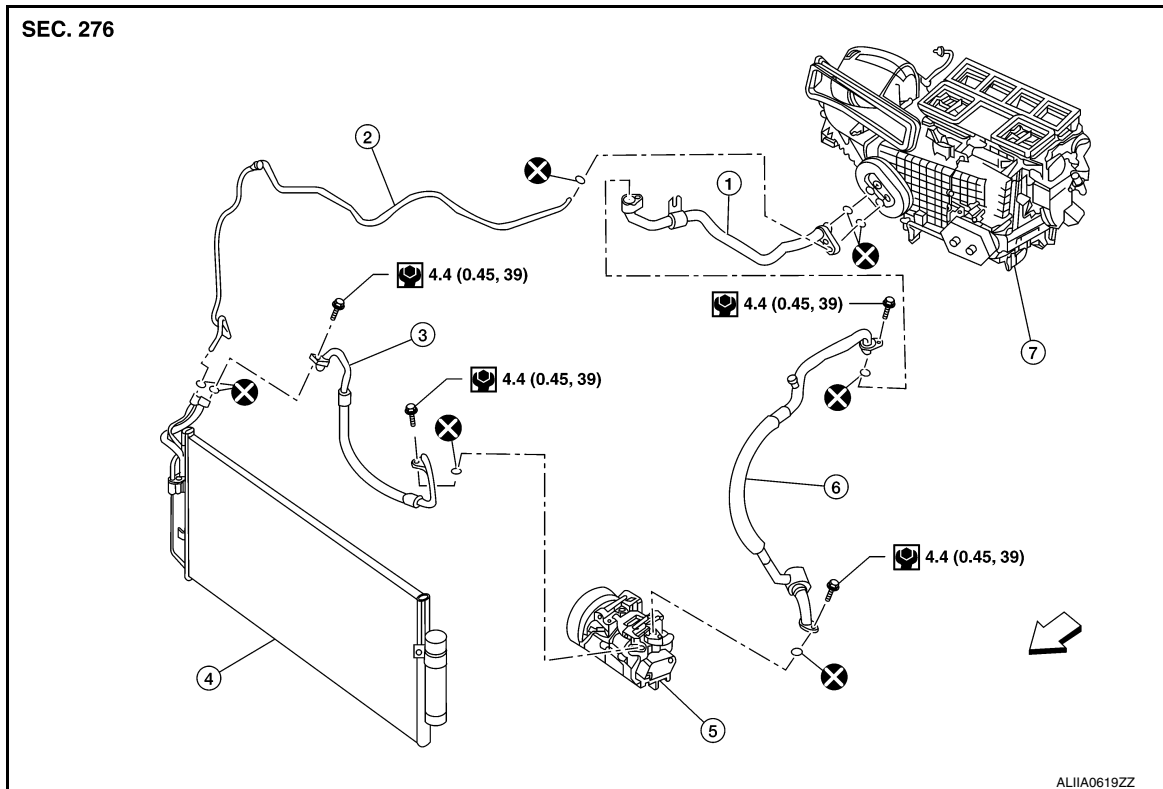
- 140 KPa (1.43 kg/cm<sup>2</sup>, 20.3 psi) or less.

### Pressure Relief Valve

The refrigerant system is also protected by a pressure relief valve, located in the rear head of the compressor. When the pressure of refrigerant in the system increases to an abnormal level [more than 2,990 kPa (30.50 kg/cm<sup>2</sup>, 433.6 psi)], the release port on the pressure relief valve automatically opens and releases refrigerant into the atmosphere.

### Component Part Location

INFOID:0000000012600729



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

# DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

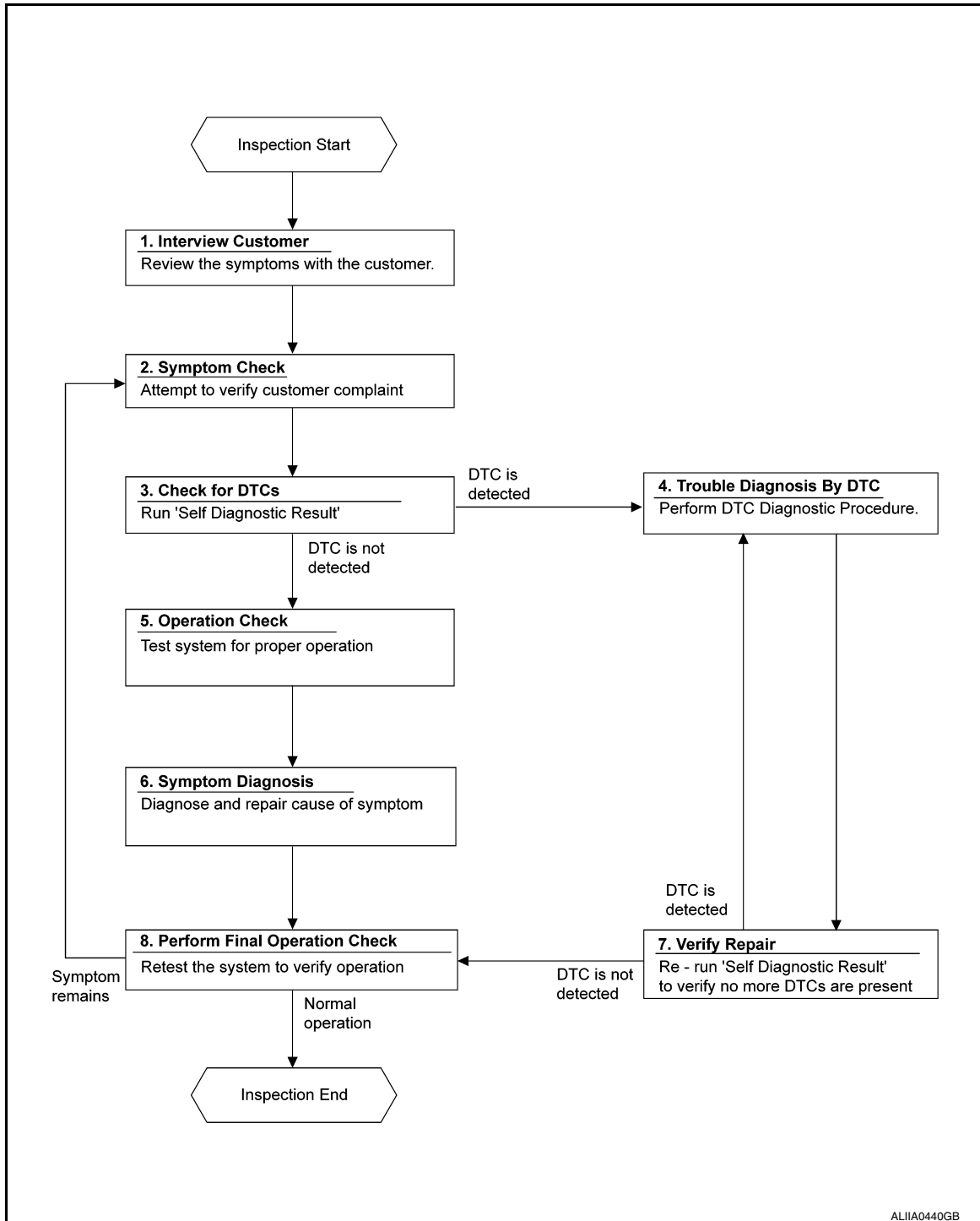
## BASIC INSPECTION

### DIAGNOSIS AND REPAIR WORKFLOW

Workflow

INFOID:0000000012600730

#### OVERALL SEQUENCE



#### DETAILED FLOW

##### 1. INTERVIEW CUSTOMER

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

# DIAGNOSIS AND REPAIR WORKFLOW

## < BASIC INSPECTION >

---

>> GO TO 2.

### 2. SYMPTOM CHECK

---

Verify symptoms.

>> GO TO 3.

### 3. CHECK FOR DTCS

---

 With CONSULT

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

Is any DTC detected?

YES >> GO TO 4.

NO >> GO TO 5.

### 4. PERFORM DTC DIAGNOSTIC PROCEDURE

---

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

>> GO TO 7.

### 5. OPERATION CHECK

---

Perform the operation check. Refer to [HAC-47, "Work Procedure"](#) (automatic A/C) or [HAC-139, "Work Procedure"](#) (manual A/C).

>> GO TO 6.

### 6. SYMPTOM DIAGNOSIS

---

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

>> GO TO 8.

### 7. VERIFY REPAIR.

---

 With CONSULT

1. Turn ignition switch ON.
2. Select "Self Diagnostic Result" of "HVAC".
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-47, "Work Procedure"](#) (automatic A/C) or [HAC-139, "Work Procedure"](#) (manual A/C).

Does it operate normally?

YES >> Inspection End.

NO >> GO TO 2.

# HEATER AND AIR CONDITIONING SYSTEM SYMPTOMS

< SYMPTOM DIAGNOSIS >

## SYMPTOM DIAGNOSIS

### HEATER AND AIR CONDITIONING SYSTEM SYMPTOMS

#### Symptom Table

INFOID:0000000012600731

#### SYMPTOM TABLE

Symptom	Reference Page	
A/C system does not come on.	Go to Trouble Diagnosis Procedure for A/C System.	<a href="#">HAC-158</a> (manual A/C) <a href="#">HAC-98</a> (automatic A/C)
A/C system cannot be controlled.	Go to Self-diagnosis Function.	<a href="#">HAC-138</a> (manual A/C) <a href="#">HAC-45</a> (automatic A/C)
Air outlet does not change.	Go to Trouble Diagnosis Procedure for Mode Door Motor.	<a href="#">HAC-141</a> (manual A/C) <a href="#">HAC-72</a> (automatic A/C)
Mode door motor is malfunctioning.		
Discharge air temperature does not change.	Go to Trouble Diagnosis Procedure for Air Mix Door Motor.	<a href="#">HAC-143</a> (manual A/C) <a href="#">HAC-68</a> (automatic A/C driver side) <a href="#">HAC-70</a> (automatic A/C passenger side)
Air mix door motor is malfunctioning.		
Intake door does not change.	Go to Trouble Diagnosis Procedure for Intake Door Motor.	<a href="#">HAC-145</a> (manual A/C) <a href="#">HAC-74</a> (automatic A/C)
Intake door motor is malfunctioning.		
Blower motor operation is malfunctioning.	Go to Trouble Diagnosis Procedure for Blower Motor.	<a href="#">HAC-147</a> (manual A/C) <a href="#">HAC-83</a> (automatic A/C)
Magnet clutch does not engage.	Go to Trouble Diagnosis Procedure for Magnet Clutch.	<a href="#">HAC-150</a> (manual A/C) <a href="#">HAC-86</a> (automatic A/C)
Insufficient cooling.	Go to Trouble Diagnosis Procedure for Insufficient Cooling.	<a href="#">HAC-154</a> (manual A/C) <a href="#">HAC-95</a> (automatic A/C)
Insufficient heating.	Go to Trouble Diagnosis Procedure for Insufficient Heating.	<a href="#">HAC-156</a> (manual A/C) <a href="#">HAC-97</a> (automatic A/C)
Noise.	Go to Trouble Diagnosis Procedure for Noise.	<a href="#">HA-20</a>
A/C switch LED does not illuminate.	Go to Trouble Diagnosis Procedure for A/C System.	<a href="#">HAC-151</a> (manual A/C) <a href="#">HAC-82</a> (automatic A/C)
Mode button LED(s) does not illuminate.	Go to Trouble Diagnosis Procedure for A/C System.	<a href="#">HAC-151</a> (manual A/C) <a href="#">HAC-82</a> (automatic A/C)
Both high- and low-pressure sides are too high.	Go to Trouble Diagnosis Procedure for Abnormal Pressure.	<a href="#">HA-18</a>
High-pressure side is too high and low-pressure side is too low.	Go to Trouble Diagnosis Procedure for Abnormal Pressure.	<a href="#">HA-18</a>
High-pressure side is too low and low-pressure side is too high.	Go to Trouble Diagnosis Procedure for Abnormal Pressure.	<a href="#">HA-18</a>
Both high- and low-pressure side sometimes becomes negative.	Go to Trouble Diagnosis Procedure for Abnormal Pressure.	<a href="#">HA-18</a>
Low-pressure side sometimes becomes negative.	Go to Trouble Diagnosis Procedure for Abnormal Pressure.	<a href="#">HA-18</a>
Low-pressure side becomes negative.	Go to Trouble Diagnosis Procedure for Abnormal Pressure.	<a href="#">HA-18</a>

# REFRIGERATION SYSTEM SYMPTOMS

< SYMPTOM DIAGNOSIS >

## REFRIGERATION SYSTEM SYMPTOMS

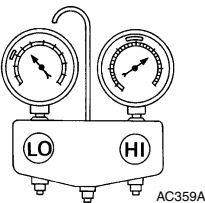
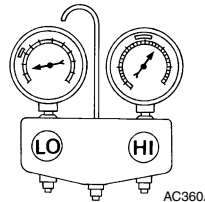
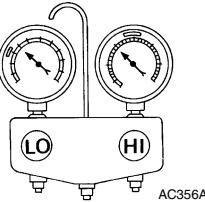
### Trouble Diagnosis For Unusual Pressure

INFOID:0000000012600732

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

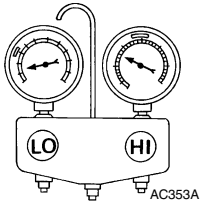
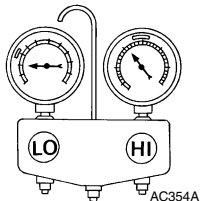
### Symptom Table

INFOID:0000000012600733

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

# REFRIGERATION SYSTEM SYMPTOMS

## < SYMPTOM DIAGNOSIS >

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
<p>Both high and low pressure sides are too low.</p>  <p>AC353A</p>	<ul style="list-style-type: none"> <li>The area around evaporator outlet does not become cold.</li> <li>The area around evaporator inlet becomes frosted.</li> </ul>	<p>Clogged expansion valve.</p> <ul style="list-style-type: none"> <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 in inner liquid tank (clogged strainer).</p>	<p>Replace liquid tank.</p>
	<p>Evaporator becomes frosted.</p>	<p>Clogged or crushed low-pressure pipe.</p>	<p>Repair or replace malfunctioning parts.</p>
		<p>Malfunction in intake air temperature sensor.</p>	<p>Check intake sensor system. Refer to <a href="#">HAC-63, "Component Inspection"</a>.</p>
	<p>There is a small temperature difference between the high and low pressure pipes for refrigerant cycle.</p>	<ul style="list-style-type: none"> <li>Shortage of refrigerant.</li> <li>Leaks of refrigerant.</li> </ul>	<ul style="list-style-type: none"> <li>Check for leaks.</li> <li>Collect all refrigerant, evacuate refrigerant cycle again, and then refill it with the specified amount of refrigerant.</li> </ul>
<p>Low-pressure side sometimes becomes negative.</p>  <p>AC354A</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 the mixing of water in cooler cycle.</li> <li>Deteriorated dryer in liquid tank.</li> </ul>	<ul style="list-style-type: none"> <li>Collect all refrigerant.</li> <li>Evacuate refrigerant cycle completely, and then refill it with the specified amount of refrigerant. At this time, always replace liquid tank.</li> </ul>
<p>Hunting in high-pressure side.</p>	<p>There is no temperature difference between high- and low-pressure sides.</p>	<p>Malfunctioning variable valve in compressor.</p>	<ul style="list-style-type: none"> <li>Replace compressor.</li> <li>Check ECV system.</li> </ul>

# NOISE

< SYMPTOM DIAGNOSIS >

## NOISE

### Symptom Table

INFOID:0000000012600734

Symptom	Noise source	Probable cause	Corrective action
Unusual noise from compressor when A/C is ON.	Inside of compressor	Wear, breakage or clogging of foreign material in inner parts.	Check compressor oil. Refer to <a href="#">HA-25, "Inspection"</a> .
	Magnet clutch	Contact of clutch disc with pulley.	Check clearance between clutch disc and pulley.
	Compressor body	Loosened compressor mounting bolts.	Check bolts for tightness. Refer to <a href="#">HA-30, "COMPRESSOR : Exploded View"</a> .
Unusual noise from cooler piping.	Cooler piping (pipe and flexible hose)	Improper installation of clip and bracket.	Check the installation condition of the cooler piping. Refer to <a href="#">HA-33, "Exploded View"</a> .
Unusual noise from expansion valve when A/C is ON.	Expansion valve	Shortage of refrigerant.	<ul style="list-style-type: none"> <li>Check for leaks.</li> <li>Collect all refrigerant, evacuate refrigerant cycle again, and then refill it with the specified amount of refrigerant.</li> </ul>
		Wear, breakage or clogging of foreign material in inner parts.	Eliminate foreign material from expansion valve or replace it.
Unusual noise from belt.	—	Loosened belt	Check belt tension. Refer to <a href="#">MA-14, "DRIVE BELTS : Checking Drive Belts"</a> (QR25DE) or <a href="#">MA-23, "DRIVE BELTS : Checking Drive Belts"</a> (VQ35DE).
		Internal compressor parts get locked	Replace compressor. Refer to <a href="#">HA-30, "COMPRESSOR : Removal and Installation"</a> .

# REFRIGERANT

< PERIODIC MAINTENANCE >

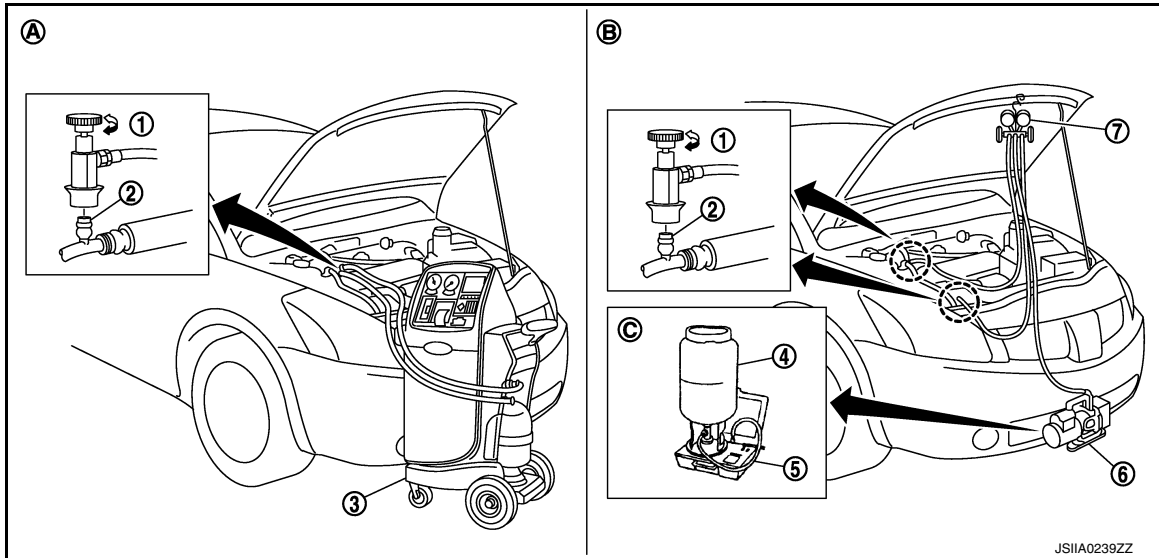
## PERIODIC MAINTENANCE

### REFRIGERANT

#### Description

INFOID:0000000012600735

#### CONNECTION OF SERVICE TOOLS AND EQUIPMENT

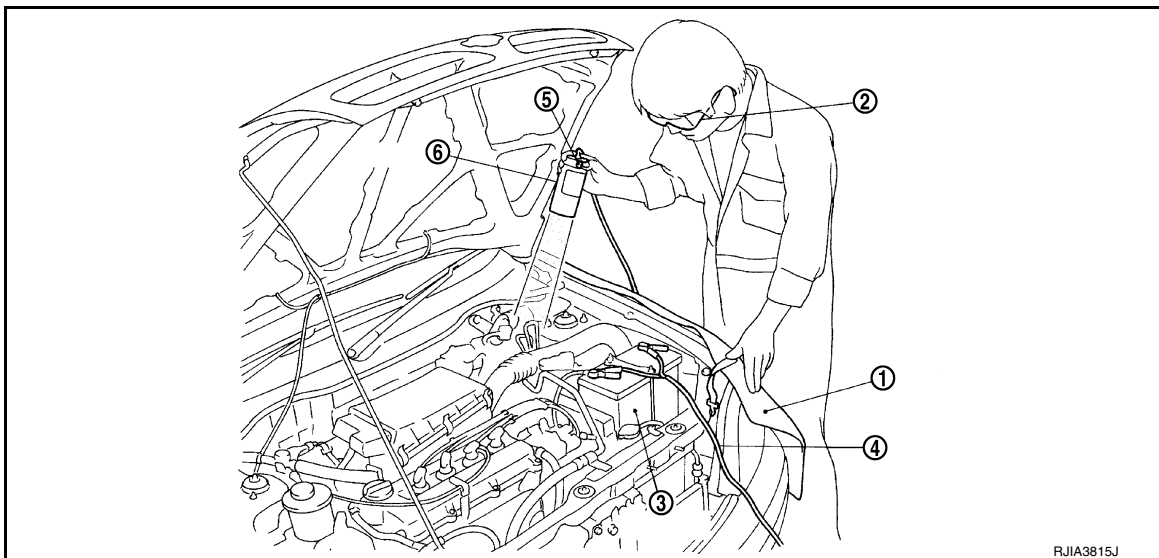


- |                                     |                           |  |
|-------------------------------------|---------------------------|--|
| 1. Shut-off valve                   | 2. A/C service valve      | 3. Recovery/recycling/recharging equipment |
| 4. Refrigerant container (HFC-134a) | 5. Weight 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:0000000012600736

#### 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 (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 leaks. (Where refrigerant leaks occur, 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 are no leaks.
- Use a mirror in area that is difficult to see to check refrigerant leaks.
- Refrigerant leaks 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 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 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 LEAKS USING ELECTRICAL LEAK DETECTOR

### **WARNING:**

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

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/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 fill 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 area where refrigerant leak check is performed and check refrigerant leaks 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 leaks.**
- **When a leak is detected, clean leak area using compressed air and check again.**
- **When checking leaks 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 for leaks starting from high-pressure side and continue to low-pressure side.
- When checking for leaks 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 leaks are detected. (Leak is detected but leak area is unknown.)
6. Start the engine and set A/C control in the following conditions.

# REFRIGERANT

## < PERIODIC MAINTENANCE >

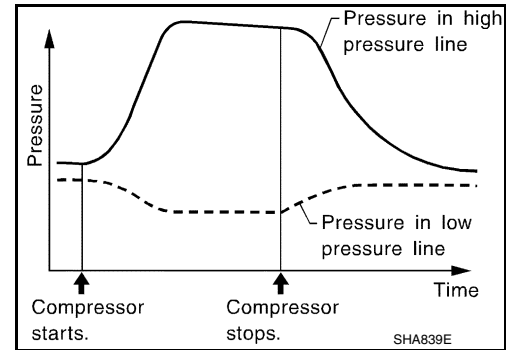
- A/C switch ON
  - Air flow: VENT (ventilation)
  - Intake door position: Recirculation
  - Temperature setting: Full cold
  - Fan (blower) speed: Maximum speed set
7. Run the engine at approximately 1,500 rpm for 2 minutes or more.
  8. Stop the engine. Check again for refrigerant leaks. Go to step 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 after this, pressure on the high-pressure side falls gradually.
- The higher the pressure is, the easier it is to find the refrigerant leaks.



## Recycle Refrigerant

INFOID:0000000012600737

### **WARNING:**

- Always use HFC-134a for A/C refrigerant. If CFC-12 is accidentally charged, compressor is damaged due to insufficient lubrication.
  - Always observe and follow precautions described on refrigerant container. Incorrect handling may result in an explosion of refrigerant container, frostbite or the loss of eyesight.
  - Do not breathe A/C refrigerant and oil vapor or mist. Exposure may irritate eyes, nose, or throat.
  - Do not allow HFC-134a to be exposed to an open flame or others because it generates poisonous gas when in contact with high temperature objects. Keep workshop well ventilated.
1. Perform oil return operation. Refer to [HA-25, "Perform Oil Return Operation"](#). (If refrigerant or oil leak 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 leak is detected.**

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

### **NOTE:**

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

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

## Charge Refrigerant

INFOID:0000000012600738

### **WARNING:**

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

## 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 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 are no refrigerant leaks. Refer to [HA-21, "Leak Test"](#).

**CAUTION:**

**Check the airtightness for 15 minutes or more if the parts are replaced.**

4. If parts other than compressor are replaced, fill compressor oil according to parts that are replaced.
5. Charge the specified amount of refrigerant to A/C system.
6. Check that A/C system operates normally.
7. Disconnect recovery/recycling/recharging equipment. (Collect the refrigerant from the high-pressure hose and low-pressure hose of recovery/recycling/recharging equipment.)
8. Install A/C service valve cap.
9. Refrigerant charge is complete.

# OIL

## < PERIODIC MAINTENANCE >

### OIL

#### Description

INFOID:0000000012600739

#### 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 leak 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 (DH-PS)**

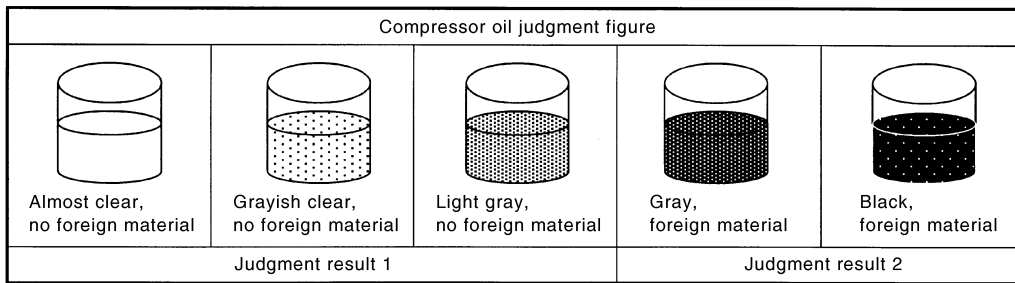
#### Inspection

INFOID:0000000012600740

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

#### 1.COMPRESSOR OIL JUDGMENT

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



Judgement result 1>>Replace compressor only.

Judgement result 2>>Replace compressor and liquid tank.

#### Perform Oil Return Operation

INFOID:0000000012600742

#### CAUTION:

**If a large amount of refrigerant or oil leak 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:0000000012600742

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)

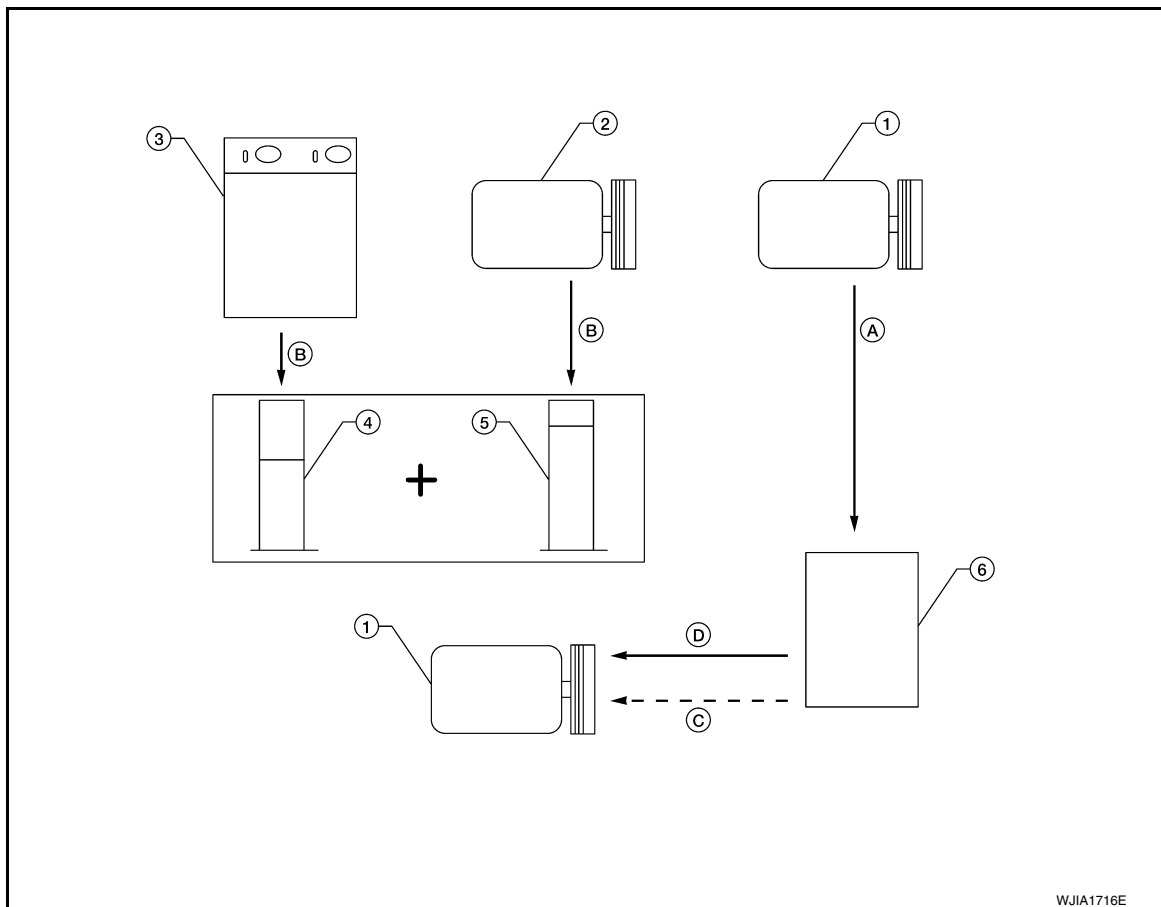
# OIL

## < 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 leak is detected	Large amount leak	30 (1.0, 1.1)
	Small amount leak	—
Oil amount that is recycled together with refrigerant during recycle operation		α

## Oil Adjusting Procedure for Compressor Replacement

INFOID:0000000012600743



WJIA1716E

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

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

# OIL

## < PERIODIC MAINTENANCE >

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

### **CAUTION:**

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

E

F

G

H

HA

J

K

L

M

N

O

P

# PERFORMANCE TEST

< PERIODIC MAINTENANCE >

## PERFORMANCE TEST

### Inspection

INFOID:0000000012600744

### INSPECTION PROCEDURE

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

Test condition

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

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

### RECIRCULATING-TO-DISCHARGE AIR TEMPERATURE TABLE

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

### AMBIENT AIR TEMPERATURE-TO-OPERATING PRESSURE TABLE

# PERFORMANCE TEST

< PERIODIC MAINTENANCE >

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

# COMPRESSOR

< REMOVAL AND INSTALLATION >

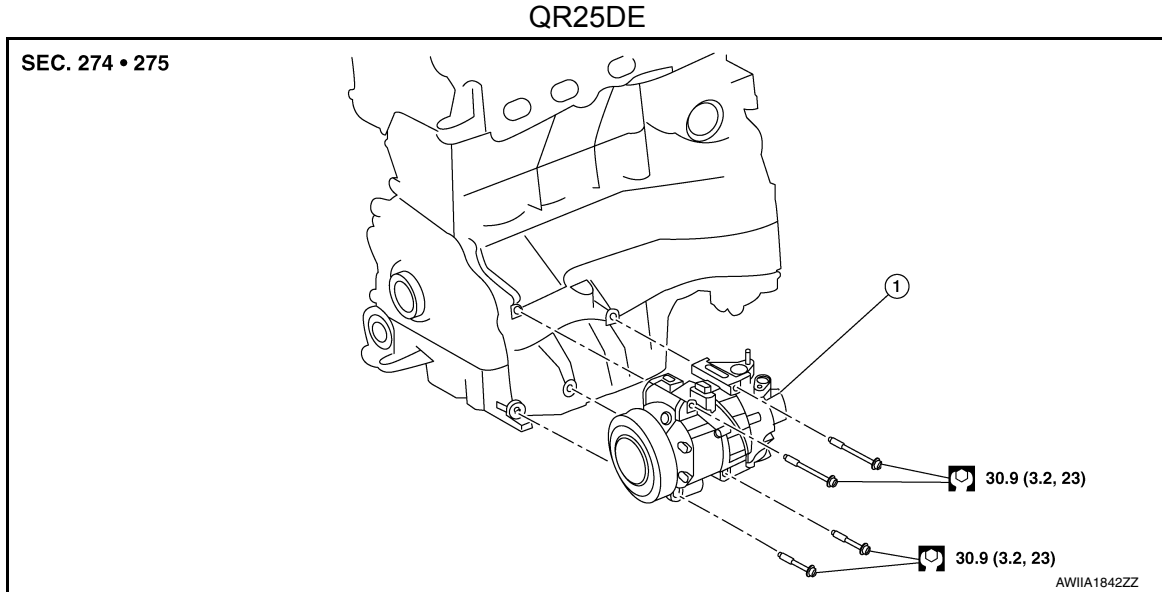
## REMOVAL AND INSTALLATION

COMPRESSOR

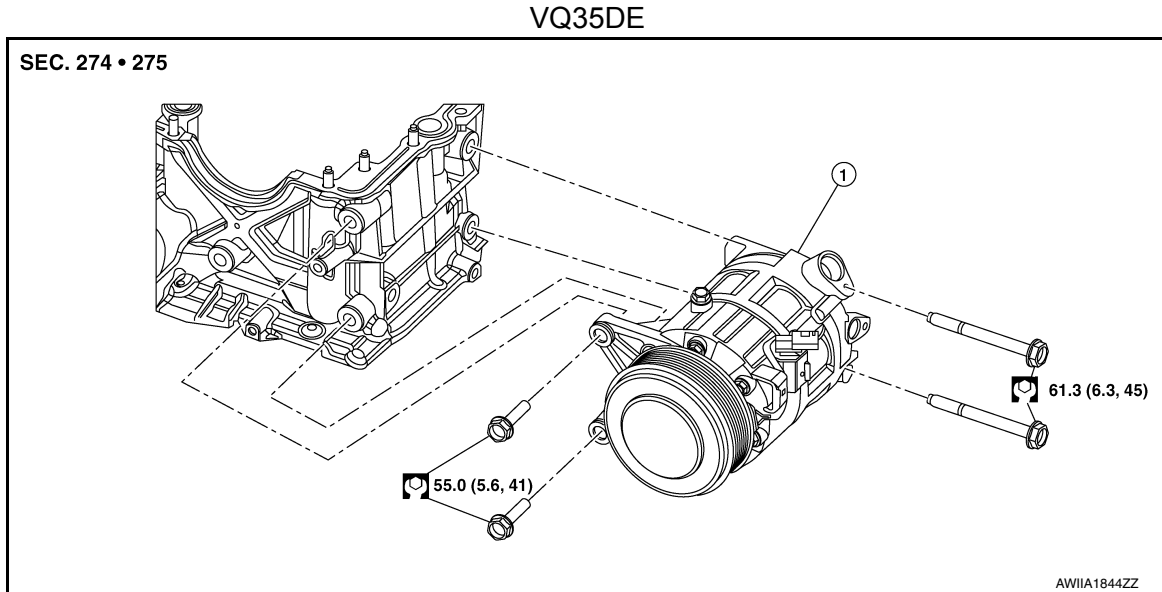
COMPRESSOR

COMPRESSOR : Exploded View

INFOID:0000000012600745



1. Compressor



1. Compressor

## COMPRESSOR : Removal and Installation

INFOID:0000000012600746

### REMOVAL

1. Discharge the refrigerant. Refer to [HA-23, "Recycle Refrigerant"](#).
2. Remove the front under cover. Refer to [EXT-38, "FRONT UNDER COVER : Removal and Installation"](#).
3. Partially remove the fender protector (RH). Refer to [EXT-36, "FENDER PROTECTOR : Removal and Installation"](#).

# COMPRESSOR

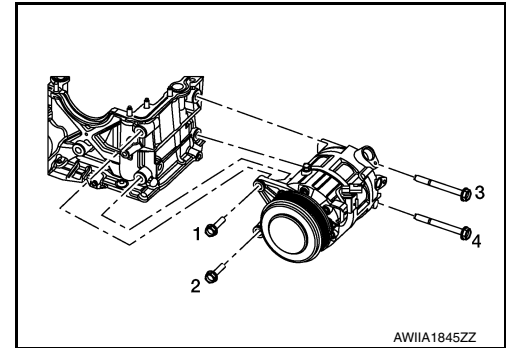
## < REMOVAL AND INSTALLATION >

4. Remove the drive belt. Refer to [EM-19, "Removal and Installation"](#) (QR25DE), or [EM-136, "Removal and Installation"](#) (VQ35DE).
5. Reposition the power steering line. Refer to [ST-41, "Exploded View"](#).
6. Disconnect the A/C pipes from the compressor.

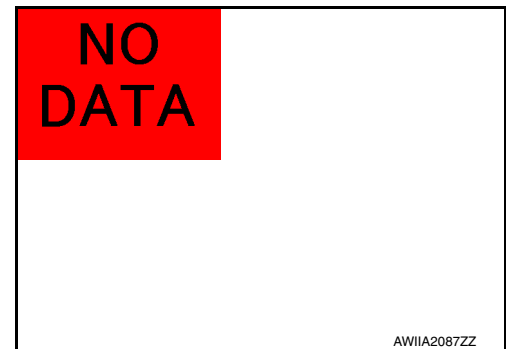
### CAUTION:

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

7. Disconnect the harness connector from the compressor.
8. Remove the compressor bolts in the reverse order and the compressor.
  - For VQ35DE



- For QR25DE



## INSTALLATION

Installation is in the reverse order of removal.

### CAUTION:

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

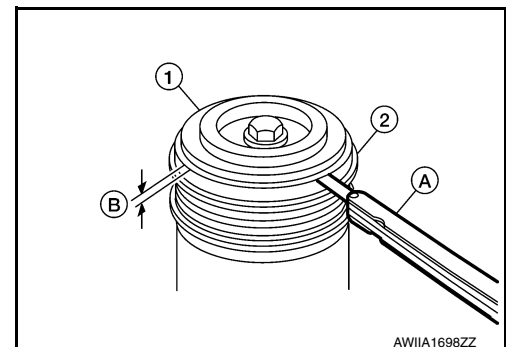
## INSPECTION AFTER INSTALLATION

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

**Clutch disc-to-pulley  
clearance (B)**

**: Refer to [HA-42, "Service Data and Specification \(SDS\)"](#).**

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



## MAGNET CLUTCH

### MAGNET CLUTCH : Removal and Installation

#### REMOVAL

INFOID:0000000012600747

## COMPRESSOR

### < REMOVAL AND INSTALLATION >

---

The Magnet clutch is not available separately and must be replaced with the compressor unit as an assembly.  
Refer to [HA-30, "COMPRESSOR : Exploded View"](#).

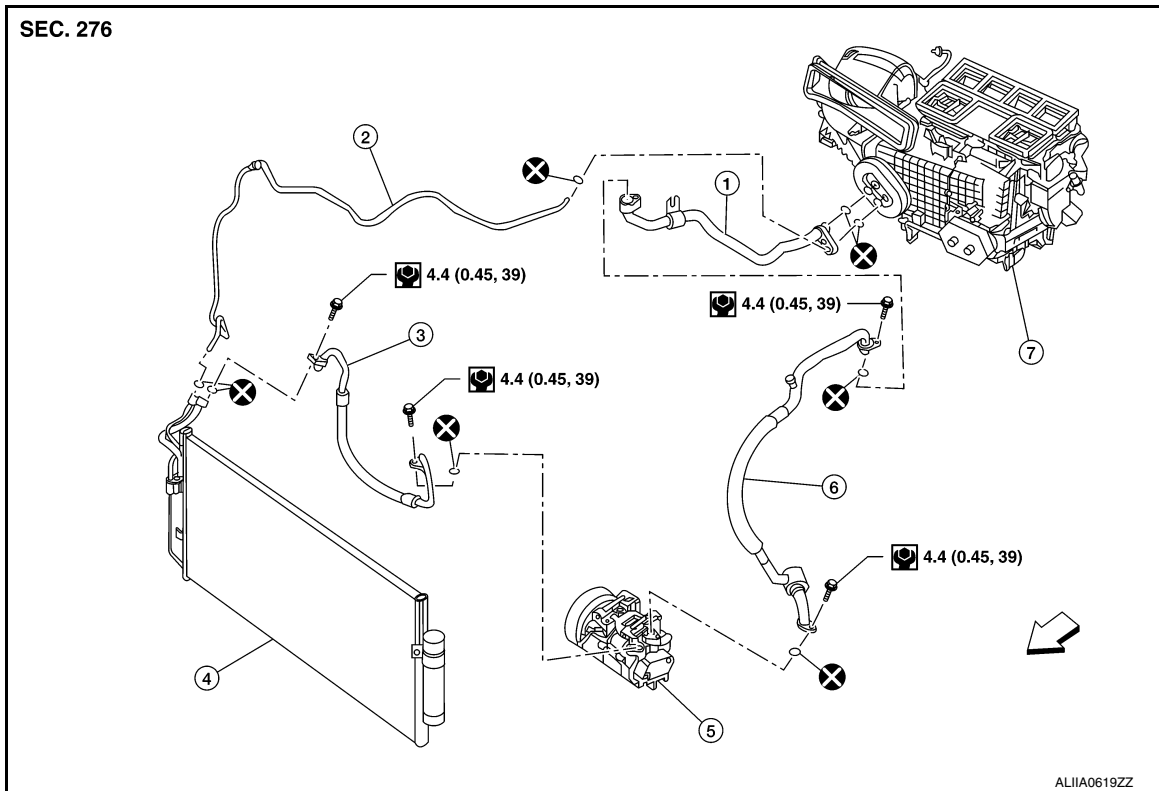
# COOLER PIPE AND HOSE

< REMOVAL AND INSTALLATION >

## COOLER PIPE AND HOSE

Exploded View

INFOID:0000000012600748



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

## LOW-PRESSURE FLEXIBLE HOSE

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

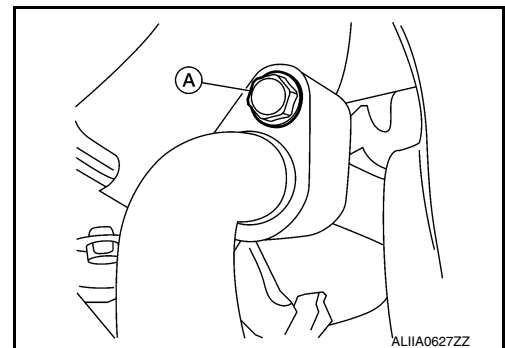
INFOID:0000000012600749

#### REMOVAL

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

#### CAUTION:

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



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

#### INSTALLATION

# COOLER PIPE AND HOSE

## < REMOVAL AND INSTALLATION >

Installation is in the reverse order of removal.

### CAUTION:

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

## HIGH-PRESSURE FLEXIBLE HOSE

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

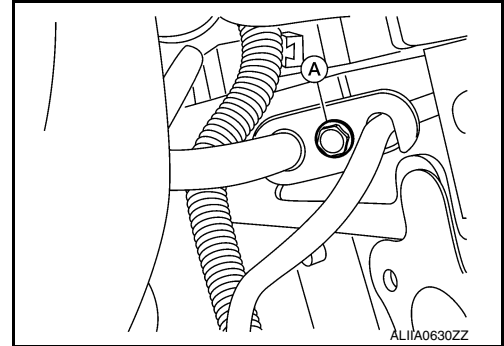
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#### REMOVAL

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

#### CAUTION:

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



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

#### INSTALLATION

Installation is in the reverse order of removal.

#### CAUTION:

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

## LOW-PRESSURE PIPE

### LOW-PRESSURE PIPE : Removal and Installation

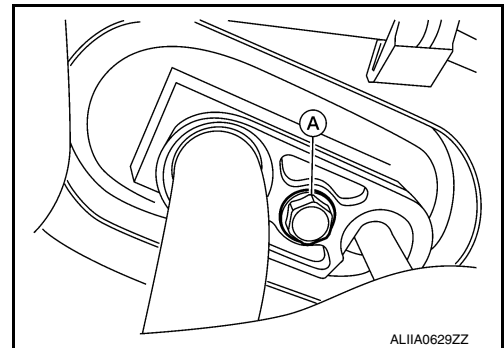
INFOID:0000000012600751

#### REMOVAL

1. Discharge the refrigerant. Refer to [HA-23, "Recycle Refrigerant"](#).
2. Drain the power steering fluid. Refer to [ST-31, "Draining and Refilling"](#).
3. Remove the bolt (A) that retains the low-pressure pipe to the expansion valve.

#### CAUTION:

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

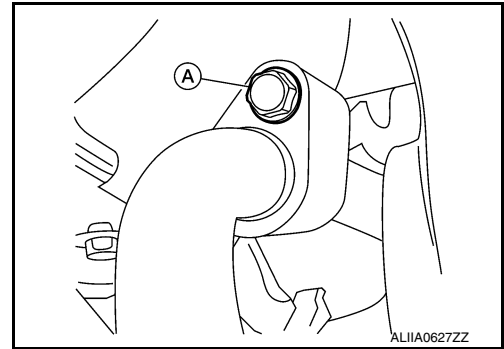


4. Remove the strut tower bar (VQ35DE only). Refer to [FSU-18, "Exploded View"](#).
5. Remove the high pressure piping upper and low pressure piping upper from the power steering pump assembly. Refer to [ST-41, "Exploded View"](#).

## COOLER PIPE AND HOSE

### < REMOVAL AND INSTALLATION >

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



7. Remove the low-pressure pipe.

### INSTALLATION

Installation is in the reverse order of removal.

#### **CAUTION:**

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

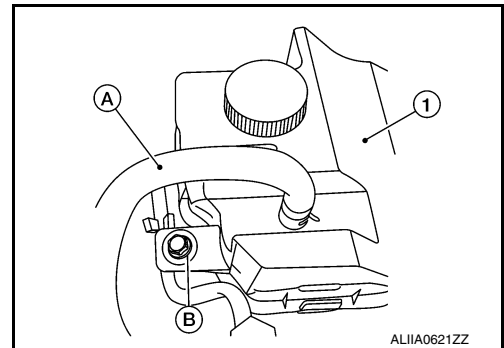
### HIGH-PRESSURE PIPE

#### HIGH-PRESSURE PIPE : Removal and Installation

INFOID:0000000012600752

### REMOVAL

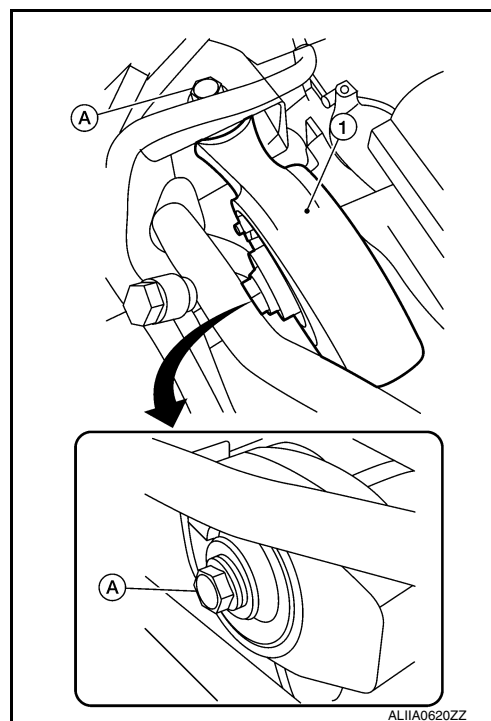
1. Discharge the refrigerant. Refer to [HA-23, "Recycle Refrigerant"](#).
2. Remove the power steering pump assembly. Refer to [ST-39, "Removal and Installation"](#).
3. Remove the strut tower bar. Refer to [FSU-18, "Exploded View"](#).
4. Remove the coolant overflow reservoir tube (A).
5. Remove the coolant overflow reservoir bolt (B).
6. Remove the coolant overflow reservoir (1).



## COOLER PIPE AND HOSE

### < REMOVAL AND INSTALLATION >

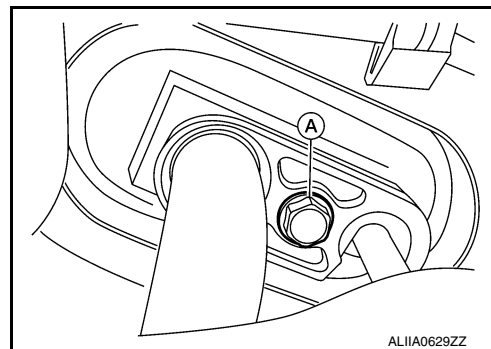
7. Remove the upper torque rod bolts (A).
8. Remove the upper torque rod (1).



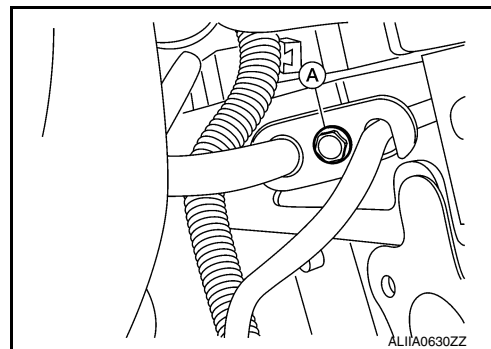
9. Remove the bolt (A) that retains the high-pressure pipe to the expansion valve.

**CAUTION:**

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



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



### INSTALLATION

Installation is in the reverse order of removal.

**CAUTION:**

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

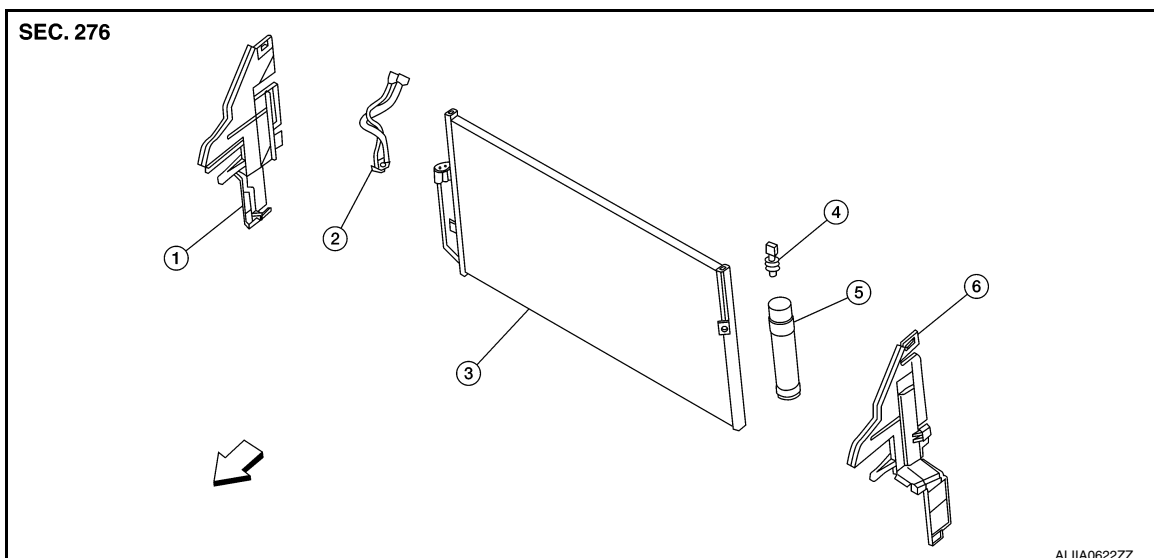
# CONDENSER

< REMOVAL AND INSTALLATION >

## CONDENSER

### Exploded View

INFOID:0000000012600753



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

↩ Front

## CONDENSER

### CONDENSER : Removal and Installation

INFOID:0000000012600754

#### REMOVAL

1. Discharge the refrigerant. Refer to [HA-23. "Recycle Refrigerant"](#).
2. Remove the front bumper fascia. Refer to [EXT-25. "Removal and Installation"](#).
3. Remove the front air duct. Refer to [EM-29. "Removal and Installation"](#) (QR25DE) or [EM-146. "Removal and Installation"](#) (VQ35DE).
4. Disconnect the refrigerant lines from the condenser.
5. Remove the condenser.

#### INSTALLATION

Installation is in the reverse order of removal.

#### CAUTION:

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

## LIQUID TANK

### LIQUID TANK : Removal and Installation

INFOID:0000000012600755

#### REMOVAL

#### CAUTION:

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

1. Discharge the refrigerant. Refer to [HA-23. "Recycle Refrigerant"](#).
2. Remove the front fascia. Refer to [EXT-25. "Removal and Installation"](#).
3. Clean liquid tank and its surrounding area, and remove dirt and rust from liquid tank.

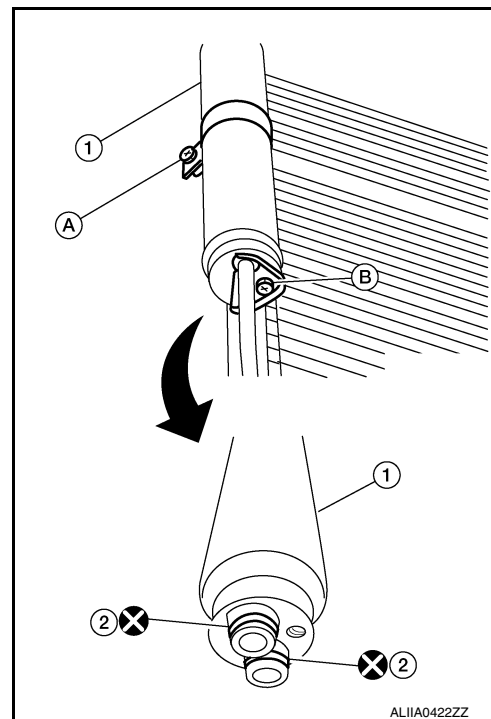
#### CAUTION:

**Be sure to clean carefully.**

## CONDENSER

### < REMOVAL AND INSTALLATION >

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



7. Remove the refrigerant pressure sensor from the liquid tank (if necessary).

### INSTALLATION

Installation is in the reverse order of removal.

#### CAUTION:

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

### REFRIGERANT PRESSURE SENSOR

### REFRIGERANT PRESSURE SENSOR : Removal and Installation

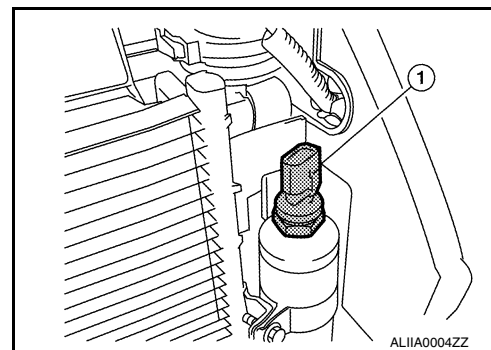
INFOID:000000012600756

### REMOVAL

1. Discharge the refrigerant. Refer to [HA-23, "Recycle Refrigerant"](#).
2. Remove the front fascia. Refer to [EXT-25, "Removal and Installation"](#).
3. Remove the refrigerant pressure sensor (1) from the liquid tank on the condenser.

#### CAUTION:

Do not damage the condenser fins.



### INSTALLATION

Installation is in the reverse order of removal.

#### CAUTION:

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

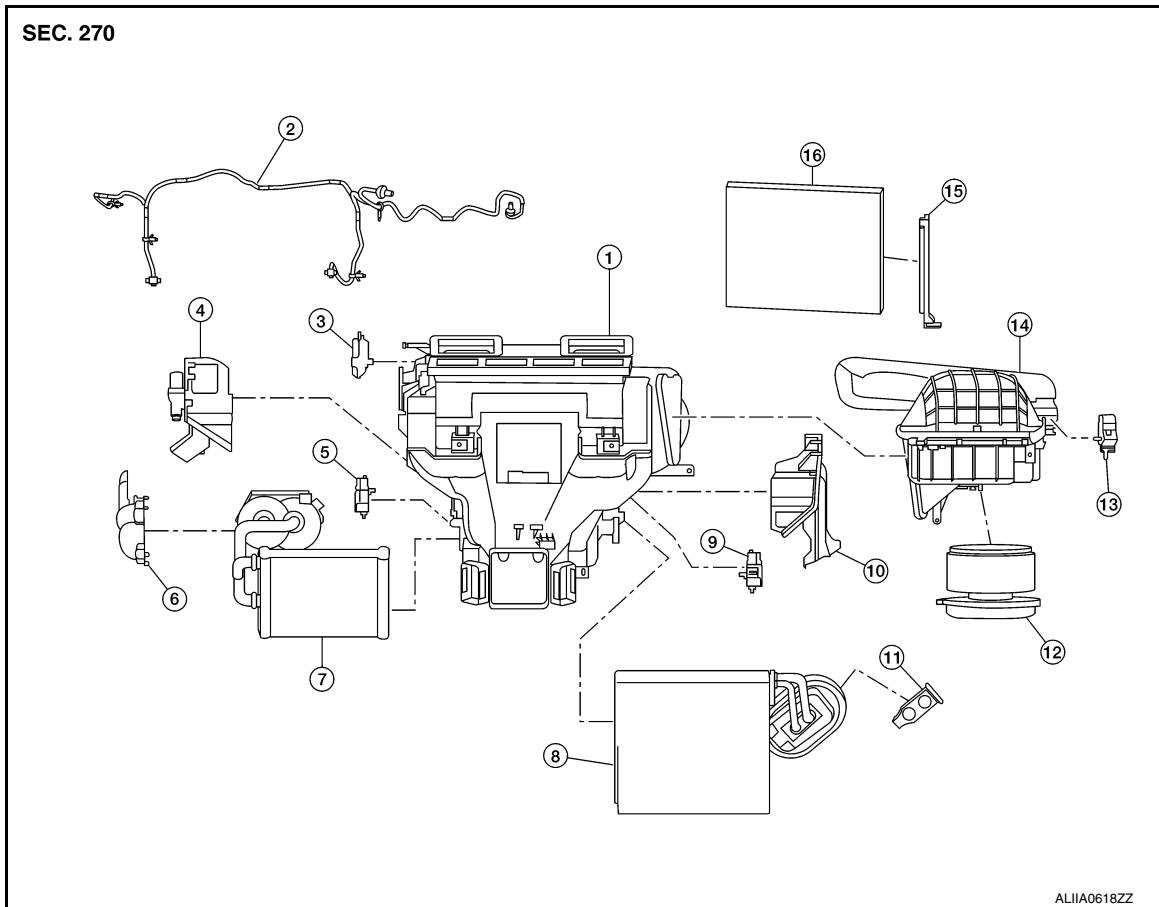
# HEATING AND COOLING UNIT ASSEMBLY

< REMOVAL AND INSTALLATION >

## HEATING AND COOLING UNIT ASSEMBLY

Exploded View

INFOID:000000012600757



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

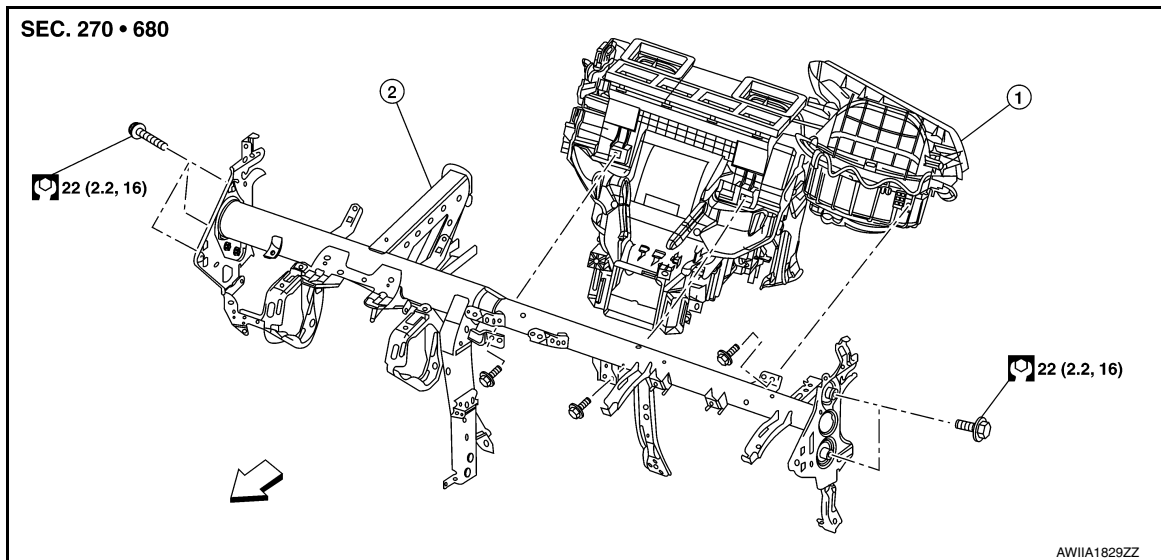
## HEATING AND COOLING UNIT ASSEMBLY

# HEATING AND COOLING UNIT ASSEMBLY

< REMOVAL AND INSTALLATION >

## HEATING AND COOLING UNIT ASSEMBLY : Removal and Installation

INFOID:000000012600758



1. Heating and cooling unit assembly

2. Steering member

⇐ Front

### REMOVAL

1. Discharge the refrigerant. Refer to [HA-23, "Recycle Refrigerant"](#).
2. Drain the cooling system. Refer to [CO-11, "Changing Engine Coolant"](#).
3. Remove the instrument panel assembly. Refer to [IP-15, "Removal and Installation"](#).
4. Remove the steering column. Refer to [ST-34, "Removal and Installation"](#).
5. Remove the strut tower brace. Refer to [FSU-18, "Exploded View"](#).
6. Disconnect the low-pressure pipe from the expansion valve.

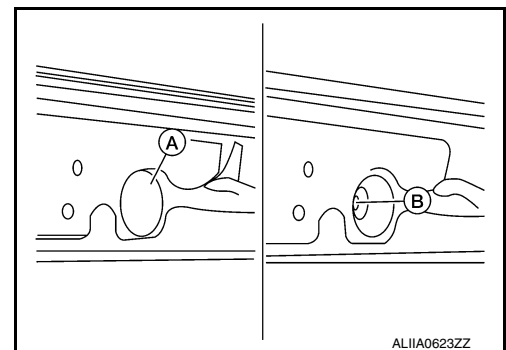
#### CAUTION:

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

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

#### NOTE:

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



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

### INSTALLATION

Installation is in the reverse order of removal.

#### CAUTION:

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

### HEATER CORE

# HEATING AND COOLING UNIT ASSEMBLY

## < REMOVAL AND INSTALLATION >

### HEATER CORE : Removal and Installation

INFOID:0000000012600759

#### REMOVAL

1. Remove the heating and cooling unit assembly. Refer to [HA-40, "HEATING AND COOLING UNIT ASSEMBLY : Removal and Installation"](#).
2. Remove the heater core pipes cover. Refer to [HA-39, "Exploded View"](#).
3. Disconnect the harness connector from the blower motor.
4. Remove the heater core.

#### INSTALLATION

Installation is in the reverse order of removal.

### EVAPORATOR

### EVAPORATOR : Removal and Installation

INFOID:0000000012600760

#### REMOVAL

1. Remove the heater core. Refer to [HA-41, "HEATER CORE : Removal and Installation"](#).
2. Remove the upper floor connecting duct (RH). Refer to [VTL-6, "Exploded View"](#).
3. Remove the air mix door motor (driver). Refer to [HAC-108, "AIR MIX DOOR MOTOR : Removal and Installation - Air Mix Door Motor \(RH\)"](#).
4. Remove the air mix door motor (passenger) (if equipped). Refer to [HAC-108, "AIR MIX DOOR MOTOR : Removal and Installation - Air Mix Door Motor \(LH\)"](#).
5. Disconnect the harness connector from the intake sensor.
6. Remove the evaporator and expansion valve assembly.

#### INSTALLATION

Installation is in the reverse order of removal.

#### NOTE:

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

### EXPANSION VALVE

### EXPANSION VALVE : Removal and Installation for Expansion Valve

INFOID:0000000012600761

#### REMOVAL

1. Discharge the refrigerant. Refer to [HA-23, "Recycle Refrigerant"](#).
2. Remove the strut tower brace. Refer to [FSU-18, "Exploded View"](#).
3. Disconnect the low-pressure pipe from the expansion valve.
4. Disconnect the high-pressure pipe from the expansion valve.
5. Remove the expansion valve bolts.
6. Remove the expansion valve.

#### INSTALLATION

Installation is in the reverse order of removal.

#### CAUTION:

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

## SERVICE DATA AND SPECIFICATIONS (SDS)

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INFOID:0000000012600762

#### COMPRESSOR

Make		VALEO
Model	Automatic A/C	DCS-14EC
	Manual A/C	DCS-14IC
Type		Variable displacement swash plate
Displacement		140 cm <sup>3</sup> (8.54 in <sup>3</sup> ) / revolution
Direction of rotation		Clockwise (viewed from drive end)
Drive belt	QR25DE	Poly V 6-grooves
	VQ35DE	Poly V 7-grooves
Disc to pulley clearance	Standard	0.3 – 0.7 mm (0.012 – 0.028 in)

#### OIL

Name		NISSAN A/C System Oil Type S (DH-PS) or equivalent
Capacity	Total in system	128 mℓ (4.3 US fl oz, 4.5 Imp fl oz)
	Compressor (service part) charging amount	Refer to <a href="#">HA-26, "Oil Adjusting Procedure for Compressor Replacement"</a> .

#### REFRIGERANT

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