

SECTION **HA**

HEATER & AIR CONDITIONING SYSTEM

A
B
C

CONTENTS

PRECAUTION	PERIODIC MAINTENANCE	F
PRECAUTIONS	REFRIGERANT	G
Precaution for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER"	Description	H
Precaution for Work	Leak Test	HA
Precaution for Procedure without Cowl Top Cover.....	Recycle Refrigerant	J
Precautions For Refrigerant System Service	Charge Refrigerant	K
Service Equipment	OIL	L
PREPARATION	Description	M
PREPARATION	Inspection	N
Special Service Tool	Perform Oil Return Operation	O
HFC-134a (R-134a) Service Tool and Equipment.....	Oil Adjusting Procedure for Components Replacement Except Compressor	P
Commercial Service Tool	Oil Adjusting Procedure for Compressor Replacement	
Sealant or/and Lubricant	PERFORMANCE TEST	
SYSTEM DESCRIPTION	Inspection	
REFRIGERATION SYSTEM	REMOVAL AND INSTALLATION	
Component Part Location	COMPRESSOR	
Refrigerant Cycle	Exploded View	
Refrigerant System Protection	COMPRESSOR	
BASIC INSPECTION	COMPRESSOR : Removal and Installation	
DIAGNOSIS AND REPAIR WORKFLOW	MAGNET CLUTCH	
Workflow	MAGNET CLUTCH : Removal and Installation	
SYMPTOM DIAGNOSIS	COOLER PIPE AND HOSE	
HEATER AND AIR CONDITIONING SYSTEM SYMPTOMS	Exploded View	
Symptom Table	LOW-PRESSURE FLEXIBLE HOSE	
REFRIGERATION SYSTEM SYMPTOMS	LOW-PRESSURE FLEXIBLE HOSE : Removal and Installation	
Trouble Diagnosis For Unusual Pressure	HIGH-PRESSURE FLEXIBLE HOSE	
Symptom Table	HIGH-PRESSURE FLEXIBLE HOSE : Removal and Installation	
NOISE	HIGH-PRESSURE PIPE	
Symptom Table		

HIGH-PRESSURE PIPE : Removal and Installation	37	HEATING AND COOLING UNIT ASSEMBLY : Removal and Installation	43
CONDENSER	39	HEATER CORE	44
Exploded View	39	HEATER CORE : Removal and Installation	44
CONDENSER	39	EVAPORATOR	44
CONDENSER : Removal and Installation	39	EVAPORATOR : Removal and Installation	45
REFRIGERANT PRESSURE SENSOR	40	EXPANSION VALVE	45
REFRIGERANT PRESSURE SENSOR : Removal and Installation	40	EXPANSION VALVE : Removal and Installation ...	45
HEATING AND COOLING UNIT ASSEMBLY...	42	SERVICE DATA AND SPECIFICATIONS (SDS)	46
Exploded View	42	SERVICE DATA AND SPECIFICATIONS (SDS)	46
HEATING AND COOLING UNIT ASSEMBLY	43	Service Data and Specification (SDS)	46

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 Air Bag Diagnosis Sensor Unit or other Air Bag 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.

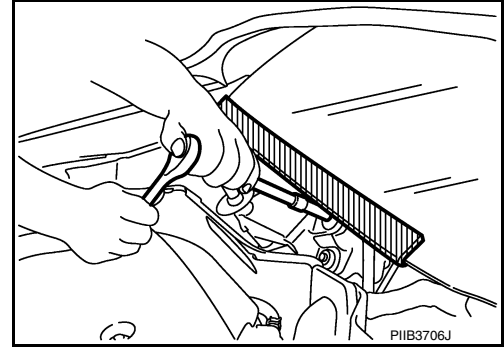
PRECAUTIONS

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Precaution for Procedure without Cowl Top Cover

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



Precautions For Refrigerant System Service

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

CAUTION:

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

CONTAMINATED REFRIGERANT

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

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

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.**

PRECAUTIONS

< PRECAUTION >

- Always wear eye and hand protection (goggles and gloves) when working with any refrigerant or air conditioning system. A
- 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. B
- Do not intentionally drop, puncture or incinerate refrigerant containers. B
- 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. C
- Do not pressure test or leakage test HFC-134a (R-134a) service equipment and/or vehicle air conditioning systems with compressed air during repair. Some mixtures of air and HFC-134a (R-134a) have been shown to be combustible at elevated pressures. These mixtures, if ignited, may cause injury or property damage. Additional health and safety information may be obtained from refrigerant manufacturers. D

REFRIGERANT CONNECTION

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

- 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. F

CAUTION:

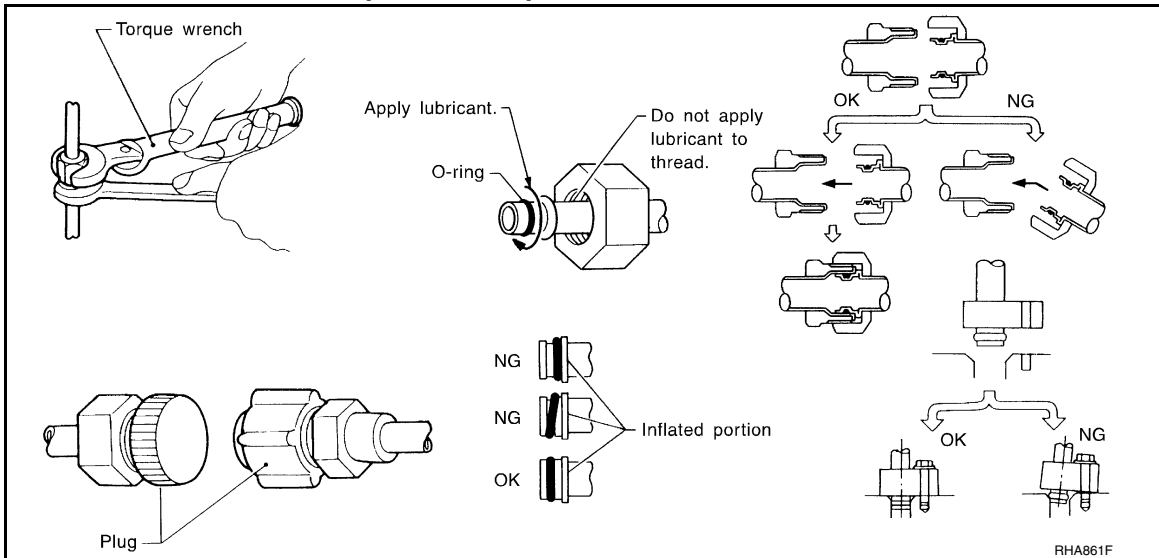
Observe the following when replacing or cleaning refrigerant cycle components. G

- 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. H
- Always use a torque wrench and a back-up wrench when connecting tubes.
- Plug immediately 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. HA
- 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. J
- Remove moisture thoroughly from the refrigeration system before charging the refrigerant.
- Always replace used O-rings.
- Apply oil to circle of the O-rings shown in illustration when connecting tube. Be careful not to apply oil to threaded portion. K
- 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. L

PRECAUTIONS

< PRECAUTION >

- Perform leakage test and make sure that there is no leakage from connections after connecting line. Disconnect that line and replace the O-ring when the refrigerant leaking point is found. Then tighten connections of seal seat to the specified torque.



COMPRESSOR

CAUTION:

- Plug all openings to prevent moisture and foreign matter from entering.
- Store it in the same way as it is when mounted on the car when the compressor is removed.
- Follow "Maintenance of Oil Quantity in Compressor" exactly when replacing or repairing compressor. Refer to [HA-25, "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 leakages. An ultraviolet (UV) lamp is required to illuminate the dye when inspecting for leakages.
- Always wear fluorescence enhancing UV safety goggles to protect eyes and enhance the visibility of the fluorescent dye.
- The fluorescent dye leak detector is not a replacement for an electrical leak detector (SST: J-41995). The fluorescent dye leak detector should be used in conjunction with an electrical leak detector (SST: J-41995) to pin-point refrigerant leakages.
- Read and follow all manufacturer's operating instructions and precautions prior to performing the work for the purpose of safety and customer's satisfaction.
- A compressor shaft seal should not necessarily be repaired because of dye seepage. The compressor shaft seal should only be repaired after confirming the leakage with an electrical leak detector (SST: J-41995).
- Always remove any remaining dye from the leakage area after repairs are completed to avoid a misdiagnosis during a future service.
- Do not allow dye to come into contact with painted body panels or interior components. Clean immediately with the approved dye cleaner if dye is spilled. Fluorescent dye left on a surface for an extended period of time cannot be removed.
- Do not spray the fluorescent dye cleaning agent on hot surfaces (engine exhaust manifold, etc.).
- Do not use more than one refrigerant dye bottle [1/4 ounce (7.4 cc)] per A/C system.
- Leak detection dyes for HFC-134a (R-134a) and CFC-12 (R-12) A/C systems are different. Do not use HFC-134a (R-134a) leak detection dye in CFC-12 (R-12) A/C system or CFC-12 (R-12) leak detection dye in HFC-134a (R-134a) A/C system, or A/C system damage may result.
- The fluorescent properties of the dye remains for three or more years unless a compressor malfunction occurs.

PRECAUTIONS

< PRECAUTION >

NOTE:

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

Service Equipment

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RECOVERY/RECYCLING RECHARGING EQUIPMENT

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

ELECTRICAL LEAK DETECTOR

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

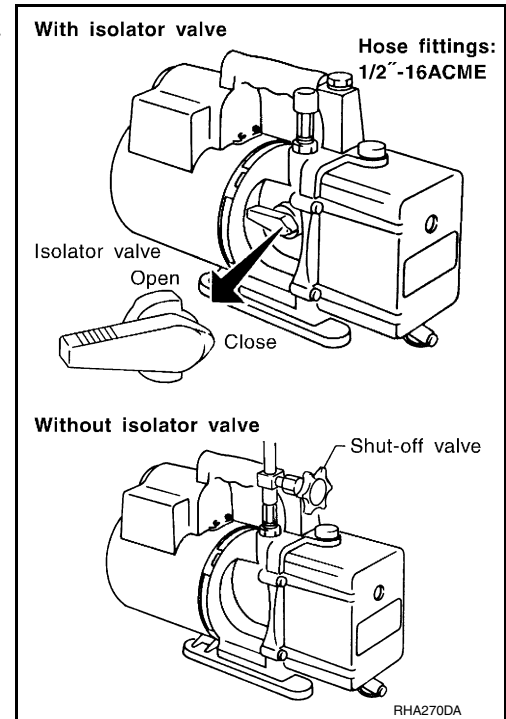
VACUUM PUMP

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

To prevent this migration, use a manual valve placed near the hose-to-pump connection, as per the following.

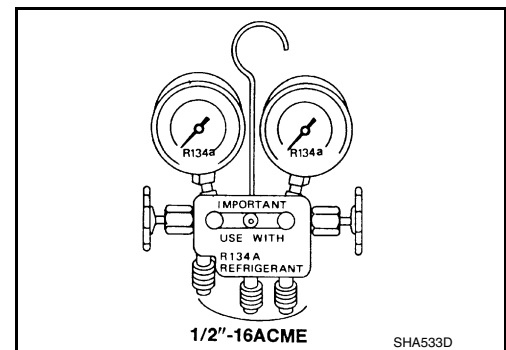
- Vacuum pumps usually have a manual isolator valve as part of the pump. Close this valve to isolate the service hose from the pump.
- Use a hose equipped with a manual shut-off valve near the pump end for pumps without an isolator. Close the valve to isolate the hose from the pump.
- Disconnect the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

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



MANIFOLD GAUGE SET

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

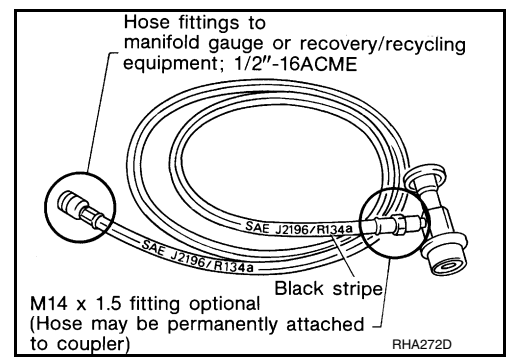


SERVICE HOSES

PRECAUTIONS

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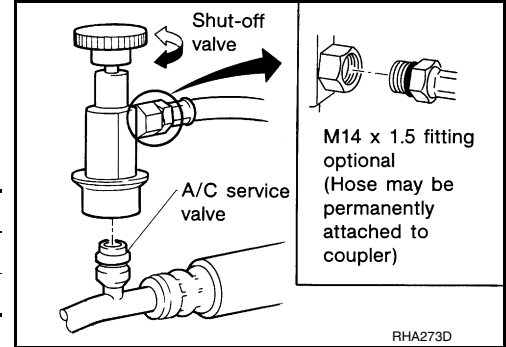
Be certain that the service hoses display the markings described (colored hose with black stripe). All hoses must equip positive shut-off devices (either manual or automatic) near the end of the hoses opposite to the manifold gauge.



SERVICE COUPLERS

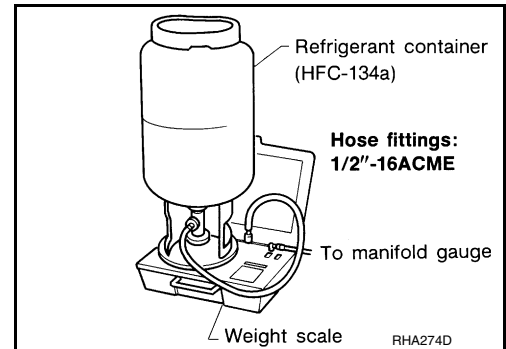
Do not attempt to connect HFC-134a (R-134a) service couplers to the CFC-12 (R-12) A/C system. The HFC-134a (R-134a) couplers do not properly connect to the CFC-12 (R-12) system. However, if an improper connection is attempted, discharging and contamination may occur.

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

INFOID:000000012786594

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

Tool number (TechMate No.) Tool name	Description
— (J-41425-NIS) AL Tubing Repair Kit	Repairing leaks in A/C tubes
— (J-44614) Clutch disc holding tool	Clutch disc holding tool
— (J-38873-A) Drive plate installer	Installing pulley / magnet clutch
— (J-46534) Trim Tool Set	Removing trim components

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

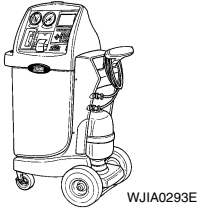
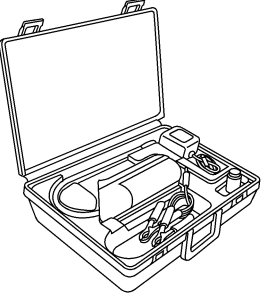
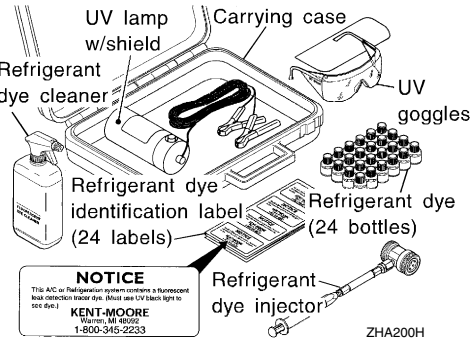
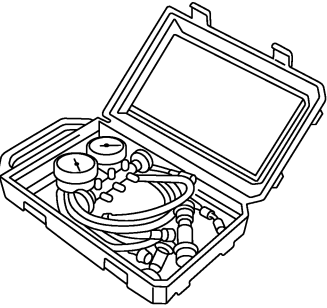
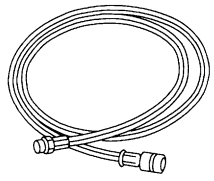
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Do not mix HFC-134a (R-134a) refrigerant and/or its specified oil with CFC-12 (R-12) refrigerant and/or its oil. Separate and non-interchangeable service equipment must be used for handling each type of refrigerant/oil. Refrigerant container fittings, 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.

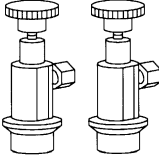
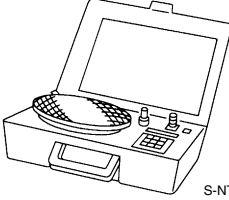
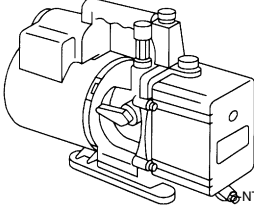
PREPARATION

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Tool number (TechMate No.) Tool name	Description
<p>— (J-48710) NISSAN ACR2009 RRR Unit</p>	<p>Refrigerant recovery, recycling and re-charging</p>  <p style="text-align: center;">WJIA0293E</p>
<p>— (J-41995) Electronic refrigerant leak detector</p>	<p>Power supply: • DC 12V (battery terminal)</p>  <p style="text-align: center;">AHA281A</p>
<p>— (J-43926) A/C 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: • DC 12V (battery terminal)</p>  <p style="text-align: center;">ZHA200H</p>
<p>— (J-39183-C) Manifold gauge set (with hoses and couplers)</p>	<p>Identification: • The gauge face indicates R-134a. Fitting size-Thread size • 1/2"-16 ACME</p>  <p style="text-align: center;">RJIA0196E</p>
<p>Service hoses: • High side hose (J-39500-72B) • Low side hose (J-39500-72R) • Utility hose (J-39500-72Y)</p>	<p>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</p>  <p style="text-align: center;">S-NT201</p>

PREPARATION

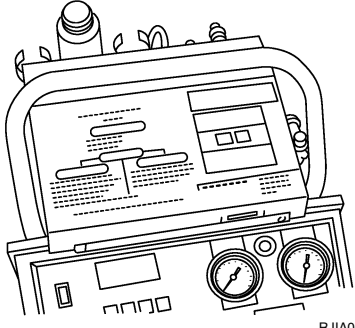

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Tool number (TechMate No.) Tool name	Description	A
Service couplers <ul style="list-style-type: none"> • High side coupler (J-39500-20A) • Low side coupler (J-39500-24A)  <p style="text-align: center;">S-NT202</p>	Hose fitting to service hose: <ul style="list-style-type: none"> • M14 x 1.5 fitting is optional or permanently attached. 	B
— (J-39699) Refrigerant weight scale  <p style="text-align: center;">S-NT200</p>	For measuring of refrigerant Fitting size-Thread size <ul style="list-style-type: none"> • 1/2"-16 ACME 	D
— (J-39649) Vacuum pump (Including the isolator valve)  <p style="text-align: center;">S-NT203</p>	Capacity: <ul style="list-style-type: none"> • Air displacement: 4 CFM • Micron rating: 20 microns • Oil capacity: 482 g (17 oz) Fitting size-Thread size <ul style="list-style-type: none"> • 1/2"-16 ACME 	G

Commercial Service Tool

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HA

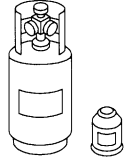

(TechMate No.) Tool name	Description	J
(J-41810-NI) Refrigerant identifier equipment (R-134a)  <p style="text-align: center;">RJIA0197E</p>	For checking refrigerant purity and system contamination	K
(—) Power tool  <p style="text-align: center;">PIIB1407E</p>	Loosening nuts, screws and bolts	N

Sealant or/and Lubricant

INFOID:000000012786597

PREPARATION

< PREPARATION >

Tool number (TechMate No.) Tool name	Description
<p>— (—) HFC-134a (R-134a) Refrigerant</p> <div style="text-align: center;">  <p>S-NT196</p> </div>	<p>Container color: Light blue Container marking: HFC-134a (R-134a) Fitting size: Thread size • large container 1/2"-16 ACME</p>
<p>— (—) NISSAN A/C System Oil Type</p> <div style="text-align: center;">  <p>S-NT197</p> </div>	<p>Type: Poly alkylene glycol oil (PAG), type S (DH-PS) Application: HFC-134a (R-134a) swash plate compressors (NISSAN only).</p>

REFRIGERATION SYSTEM

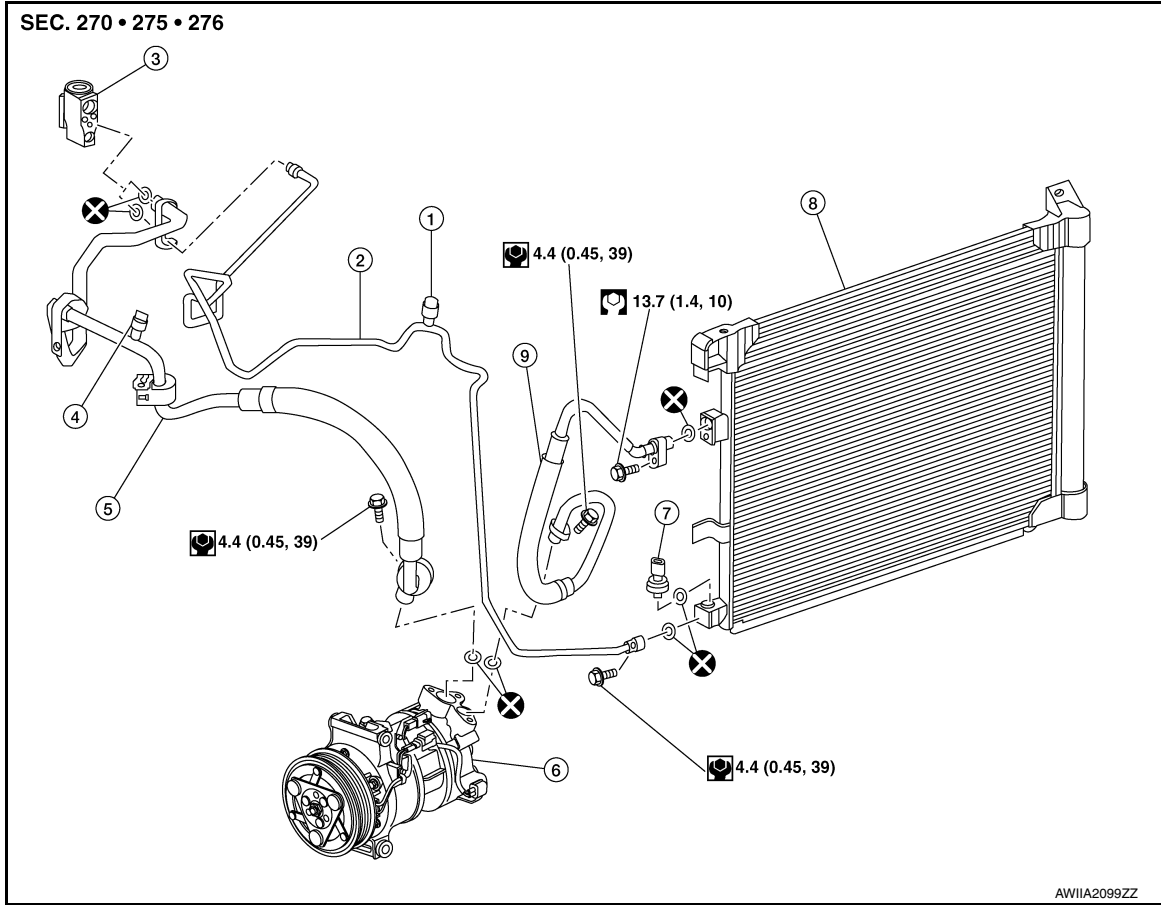
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SYSTEM DESCRIPTION

REFRIGERATION SYSTEM

Component Part Location

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- | | | |
|--------------------------------|---------------------------------------|--------------------------------|
| 1. High-pressure service port | 2. High-pressure pipe | 3. Expansion valve |
| 4. Low-pressure service port | 5. Low-pressure flexible hose | 6. Compressor |
| 7. Refrigerant pressure sensor | 8. Condenser and liquid tank assembly | 9. High-pressure flexible hose |

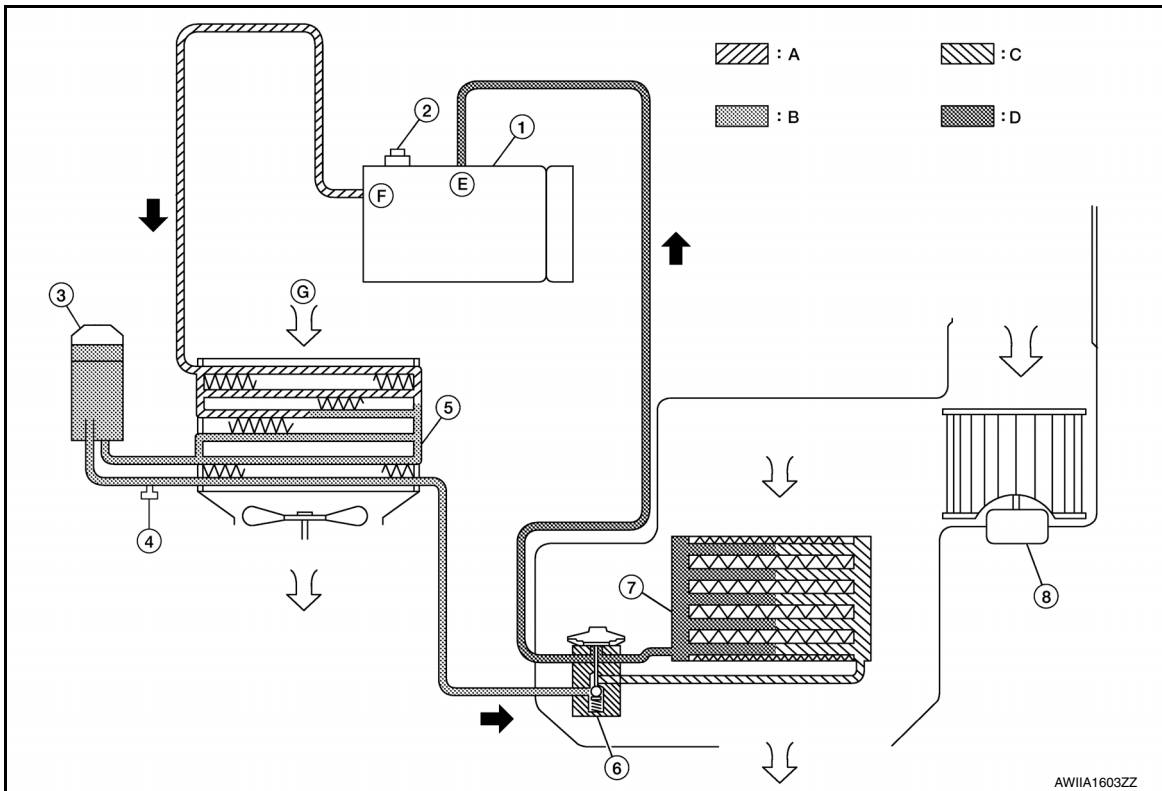
Refrigerant Cycle

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Refrigerant flow

REFRIGERATION SYSTEM

< SYSTEM DESCRIPTION >



- | | | |
|--------------------------------|--------------------------|----------------------|
| 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 and liquid tank, the evaporator and returns to the compressor. The refrigerant evaporation in the evaporator is controlled by an expansion valve.

Freeze Protection

To prevent the evaporator from freezing up, the evaporator air temperature is monitored by the intake sensor 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:000000012786600

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 pressure on the high pressure side (as detected by refrigerant pressure sensor) is over approximately 2,746 kPa (28 kg/cm², 398 psi), or below approximately 120 kPa (1.22 kg/cm², 17.4 psi).

Pressure Relief Valve

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

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

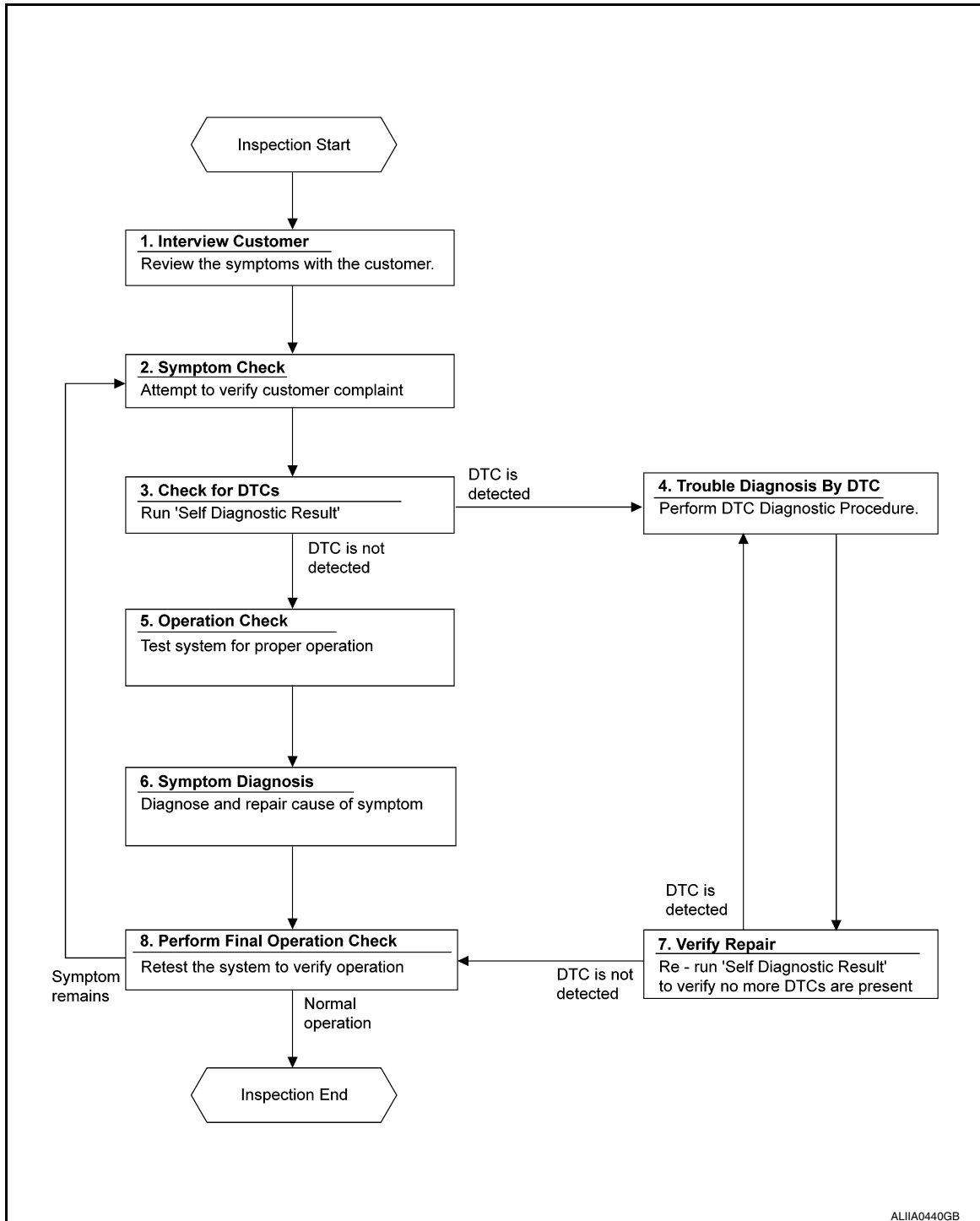
BASIC INSPECTION

DIAGNOSIS AND REPAIR WORKFLOW

Workflow

INFOID:0000000012786601

OVERALL SEQUENCE



DETAILED FLOW

1. INTERVIEW CUSTOMER

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

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

>> GO TO 2.

2. SYMPTOM CHECK

Verify symptoms.

>> GO TO 3.

3. CHECK FOR DTCS

Ⓜ With CONSULT

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

Is any DTC detected?

YES >> GO TO 4.

NO >> GO TO 5.

4. PERFORM DTC DIAGNOSTIC PROCEDURE

Perform the diagnostic procedure for the detected DTC. Refer to [HAC-38. "DTC Inspection Priority Chart"](#).

>> GO TO 7.

5. OPERATION CHECK

Perform the operation check. Refer to [HAC-53. "Work Procedure"](#) (automatic A/C) or [HAC-158. "Work Procedure"](#) (manual A/C).

>> GO TO 6.

6. SYMPTOM DIAGNOSIS

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

>> GO TO 8.

7. VERIFY REPAIR.

Ⓜ With CONSULT

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

Is any DTC detected?

YES >> GO TO 4.

NO >> GO TO 8.

8. PERFORM FINAL OPERATION CHECK

Perform the operation check. Refer to [HAC-53. "Work Procedure"](#) (automatic A/C) or [HAC-158. "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:0000000012786602

SYMPTOM TABLE

Symptom	Reference Page
A/C system does not come on.	Go to Trouble Diagnosis Procedure for A/C System. HAC-102 (automatic A/C) HAC-187 (manual A/C)
A/C system cannot be controlled.	Go to Self-diagnosis Function. HAC-51 (automatic A/C) HAC-157 (manual A/C)
Air outlet does not change.	Go to Trouble Diagnosis Procedure for Mode Door Motor. HAC-77 (automatic A/C) HAC-162 (manual A/C)
Mode door motor is malfunctioning.	
Discharge air temperature does not change.	Go to Trouble Diagnosis Procedure for Air Mix Door Motor. HAC-72 (automatic A/C driver side) HAC-74 (automatic A/C passenger side) HAC-164 (manual A/C)
Air mix door motor is malfunctioning.	
Intake door does not change.	Go to Trouble Diagnosis Procedure for Intake Door Motor. HAC-79 (automatic A/C) HAC-166 (manual A/C)
Intake door motor is malfunctioning.	
Blower motor operation is malfunctioning.	Go to Trouble Diagnosis Procedure for Blower Motor. HAC-90 (automatic A/C) HAC-175 (manual A/C)
Magnet clutch does not engage.	Go to Trouble Diagnosis Procedure for Magnet Clutch. HAC-94 (automatic A/C) HAC-179 (manual A/C)
Insufficient cooling.	Go to Trouble Diagnosis Procedure for Insufficient Cooling. HAC-99 (automatic A/C) HAC-183 (manual A/C)
Insufficient heating.	Go to Trouble Diagnosis Procedure for Insufficient Heating. HAC-101 (automatic A/C) HAC-185 (manual A/C)
Noise.	Go to Trouble Diagnosis Procedure for Noise. HA-20
A/C switch LED does not illuminate.	Go to Trouble Diagnosis Procedure for A/C System. HAC-84 (automatic A/C) HAC-161 (manual A/C)
Mode button LED(s) does not illuminate.	Go to Trouble Diagnosis Procedure for A/C System. HAC-84 (automatic A/C) HAC-161 (manual A/C)
Both high- and low-pressure sides are too high.	Go to Trouble Diagnosis Procedure for Abnormal Pressure. HA-18
High-pressure side is too high and low-pressure side is too low.	Go to Trouble Diagnosis Procedure for Abnormal Pressure. HA-18
High-pressure side is too low and low-pressure side is too high.	Go to Trouble Diagnosis Procedure for Abnormal Pressure. HA-18
Both high- and low-pressure sides are too low.	Go to Trouble Diagnosis Procedure for Abnormal Pressure. HA-18
Low-pressure side sometimes becomes negative.	Go to Trouble Diagnosis Procedure for Abnormal Pressure. HA-18
Low-pressure side becomes negative.	Go to Trouble Diagnosis Procedure for Abnormal Pressure. HA-18

REFRIGERATION SYSTEM SYMPTOMS

< SYMPTOM DIAGNOSIS >

REFRIGERATION SYSTEM SYMPTOMS

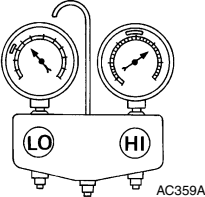
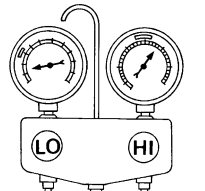
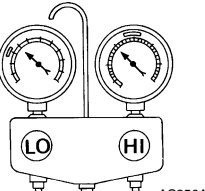
Trouble Diagnosis For Unusual Pressure

INFOID:000000012786603

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.

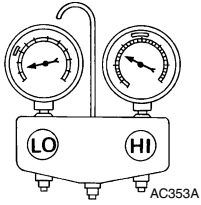
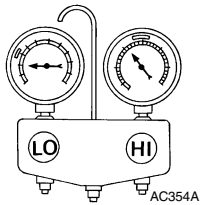
Symptom Table

INFOID:000000012786604

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>Collect all refrigerant, evacuate refrigerant cycle again, and then refill it with the specified amount of refrigerant.</p>
	<p>Air flow to condenser is insufficient.</p>	<p>Insufficient condenser cooling performance.</p> <ul style="list-style-type: none"> Poor fan rotation of radiator and condenser. Improper installation of air guide. Clogged or dirty condenser fins. 	<ul style="list-style-type: none"> Repair or replace malfunctioning parts. Clean and repair condenser fins.
	<p>When compressor is stopped, a high-pressure reading quickly drops by approximately 196 kPa (2 kg/cm², 28 psi). It then gradually decreases.</p>	<p>Air mixed in refrigerant cycle.</p>	<p>Collect all refrigerant, evacuate refrigerant cycle again, and then refill it with the specified amount of refrigerant.</p>
	<ul style="list-style-type: none"> Low-pressure pipe is cooler than the outlet of evaporator. Low-pressure pipe is frosted. 	<p>Expansion valve opened too much (excessive flow of refrigerant).</p>	<p>Replace expansion valve.</p>
<p>High-pressure side is excessively high and low-pressure side is too low.</p> 	<p>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"> The readings of both sides become equal soon after compressor operation stops. There is no temperature difference between high- and low-pressure sides. 	<p>Malfunction in compressor system (insufficient compressor pressure operation).</p> <ul style="list-style-type: none"> Damage or breakage of valve. Malfunctioning gaskets. 	<p>Replace compressor.</p>

REFRIGERATION SYSTEM SYMPTOMS

< SYMPTOM DIAGNOSIS >

Gauge indication	Refrigerant cycle	Probable cause	Corrective action	
<p>Both high and low pressure sides are too low.</p> 	<ul style="list-style-type: none"> The area around evaporator outlet does not become cold. The area around evaporator inlet becomes frosted. 	<ul style="list-style-type: none"> Clogged expansion valve. Breakage of temperature sensor. Clogging by foreign material. 	Eliminate foreign material from expansion valve or replace it.	A
	<ul style="list-style-type: none"> There is a temperature difference between the areas around outlet and inlet pipes of liquid tank. Liquid tank becomes frosted. 	Malfunction in inner liquid tank (clogged strainer).	Replace liquid tank.	B
	Evaporator becomes frosted.	Clogged or crushed low-pressure pipe.	Repair or replace malfunctioning parts.	C
		Malfunction in intake air temperature sensor.	Check intake sensor system. Refer to HAC-67, "Component Inspection" (automatic A/C) or HAC-172, "Component Inspection" (manual A/C).	D
<p>Low-pressure side sometimes becomes negative.</p> 	<ul style="list-style-type: none"> There is a small temperature difference between the high and low pressure pipes for refrigerant cycle. 	<ul style="list-style-type: none"> Shortage of refrigerant. Leakage of refrigerant. 	<ul style="list-style-type: none"> Check for leakage. Collect all refrigerant, evacuate refrigerant cycle again, and then refill it with the specified amount of refrigerant. 	E
	<ul style="list-style-type: none"> Sometimes the area around evaporator outlet does not become cold. Sometimes the area around evaporator inlet is frosted. 	<ul style="list-style-type: none"> Icing caused by the mixing of water in cooler cycle. Deteriorated dryer in liquid tank. 	<ul style="list-style-type: none"> Collect all refrigerant. Evacuate refrigerant cycle completely, and then refill it with the specified amount of refrigerant. At this time, always replace liquid tank. 	F
Hunting in high-pressure side.	There is no temperature difference between high- and low-pressure sides.	Malfunctioning variable valve in compressor.	<ul style="list-style-type: none"> Replace compressor. Check ECV system. 	G

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NOISE

< SYMPTOM DIAGNOSIS >

NOISE

Symptom Table

INFOID:000000012786605

Symptom	Noise source	Probable cause	Corrective action
Unusual noise from compressor when A/C is ON.	Inside of compressor	Wear, breakage or clogging of foreign material in inner parts.	Check compressor oil. Refer to HA-25, "Inspection" .
	Magnet clutch	Contact of clutch disc with pulley.	Check clearance between clutch disc and pulley.
	Compressor body	Loosened compressor mounting bolts.	Check bolts for tightness. Refer to HA-30, "Exploded View" .
Unusual noise from cooler piping.	Cooler piping (pipe and flexible hose)	Improper installation of clip and bracket.	Check the installation condition of the cooler piping. Refer to HA-35, "Exploded View" .
Unusual noise from expansion valve when A/C is ON.	Expansion valve	Shortage of refrigerant.	<ul style="list-style-type: none"> • Check for leakage. • Collect all refrigerant, evacuate refrigerant cycle again, and then refill it with the specified amount of refrigerant.
		Wear, breakage or clogging of foreign material in inner parts.	Eliminate foreign material from expansion valve or replace it.
Unusual noise from belt.	—	Loosened belt	Check belt tension. Refer to EM-16, "Inspection" .
		Internal compressor parts get locked	Replace compressor. Refer to HA-31, "COMPRESSOR : Removal and Installation" .

REFRIGERANT

< PERIODIC MAINTENANCE >

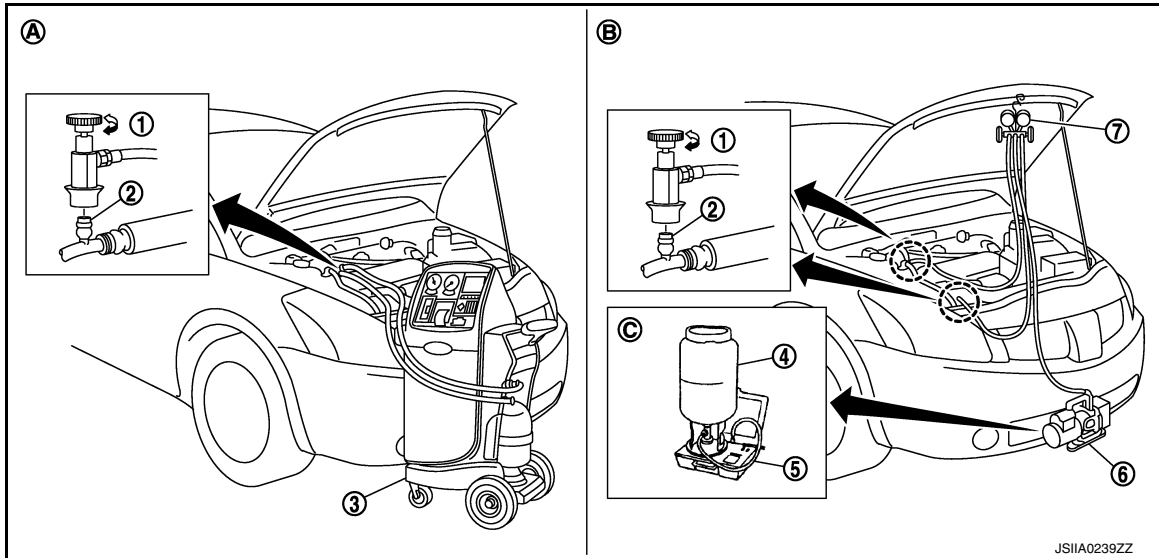
PERIODIC MAINTENANCE

REFRIGERANT

Description

INFOID:000000012786606

CONNECTION OF SERVICE TOOLS AND EQUIPMENT

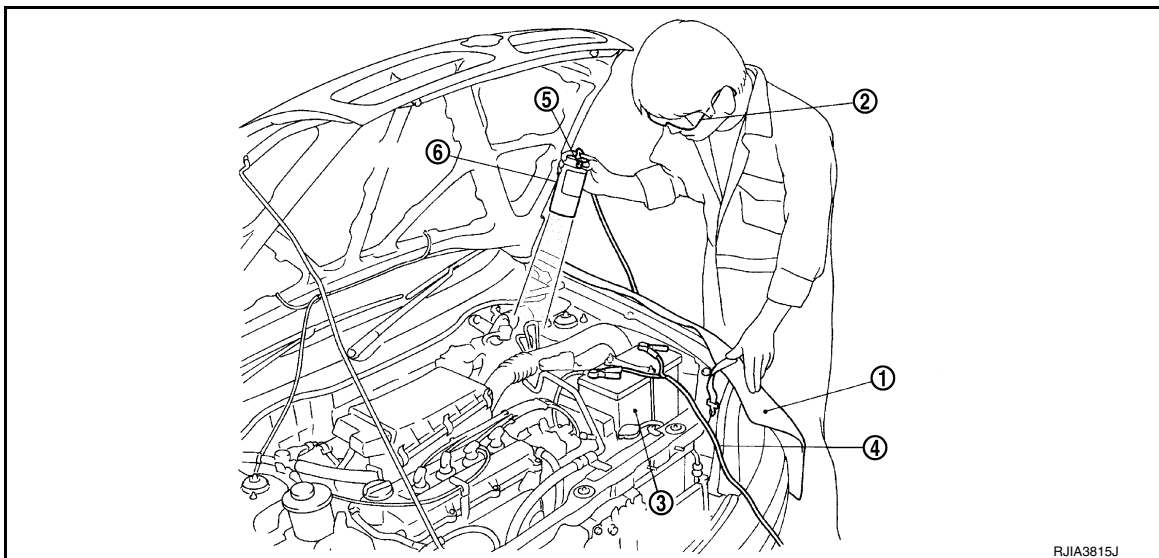


- | | | |
|-------------------------------------|---------------------------|--|
| 1. Shut-off valve | 2. A/C service valve | 3. Recovery/recycling/recharging equipment |
| 4. Refrigerant container (HFC-134a) | 5. Weight scale (J-39650) | 6. Vacuum pump (J-39649) |
| 7. Manifold gauge set (J-39183) |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

Leak Test

INFOID:000000012786607

CHECK REFRIGERANT LEAKAGE USING FLUORESCENT LEAK DETECTION DYE



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

REFRIGERANT

< PERIODIC MAINTENANCE >

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

WARNING:

Do not look directly into UV lamp light source.

NOTE:

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

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

NOTE:

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

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

WARNING:

Do not look directly into UV lamp light source.

NOTE:

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

CHECK REFRIGERANT LEAKAGE USING ELECTRICAL LEAK DETECTOR

WARNING:

Do not check refrigerant leakage while the engine is running.

CAUTION:

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

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

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

NOTE:

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

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

CAUTION:

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

NOTE:

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

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

REFRIGERANT

< PERIODIC MAINTENANCE >

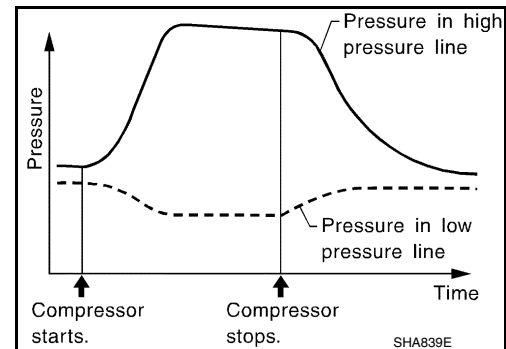
- Start the engine and set A/C control in the following conditions.
 - A/C switch ON
 - Air flow: VENT (ventilation)
 - Intake door position: Recirculation
 - Temperature setting: Full cold
 - Fan (blower) speed: Maximum speed set
- Run the engine at approximately 1,500 rpm for 2 minutes or more.
- Stop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

WARNING:

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

NOTE:

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



Recycle Refrigerant

INFOID:0000000012786608

WARNING:

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

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

CAUTION:

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

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

NOTE:

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

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

Charge Refrigerant

INFOID:0000000012786609

WARNING:

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

REFRIGERANT

< PERIODIC MAINTENANCE >

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

OIL

< PERIODIC MAINTENANCE >

OIL

Description

INFOID:000000012786610

MAINTENANCE OF OIL LEVEL

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

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

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

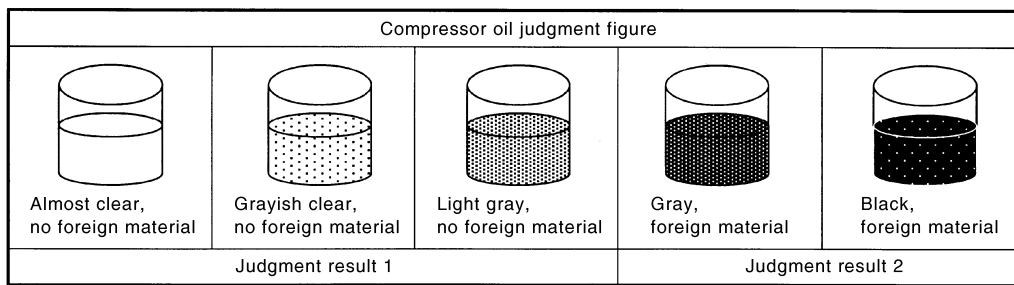
Inspection

INFOID:000000012786611

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

1. COMPRESSOR OIL JUDGMENT

1. Remove the compressor. Refer to [HA-31, "COMPRESSOR : Removal and Installation"](#).
2. Sample compressor oil and judge below according to the figure.



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Judgement result 1>>Replace compressor only.

Judgement result 2>>Replace compressor and liquid tank.

Perform Oil Return Operation

INFOID:000000012786612

CAUTION:

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

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

Oil Adjusting Procedure for Components Replacement Except Compressor

INFOID:000000012786613

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

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

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

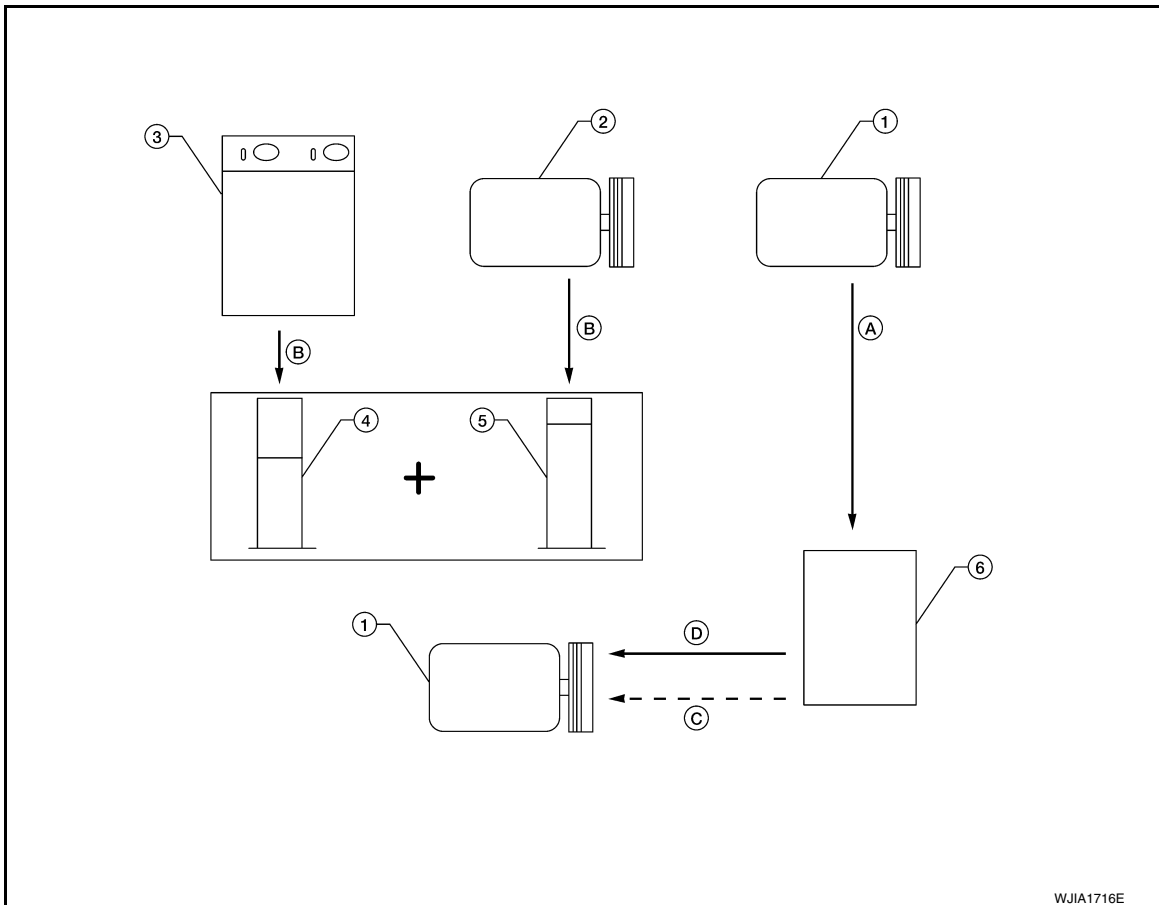
OIL

< PERIODIC MAINTENANCE >

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

Oil Adjusting Procedure for Compressor Replacement

INFOID:0000000012786614



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- | | | |
|---|-----------------------------------|--|
| 1. New compressor | 2. Old compressor | 3. Recovery/recycling equipment |
| 4. Measuring cup X | 5. Measuring cup Y | 6. New oil |
| A. Drain oil from the new compressor into clean container | B. Record amount of oil recovered | C. Add an additional 5 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-4, "Precautions For Refrigerant System Service"](#).
- Confirm refrigerant purity in vehicle A/C system using recovery/recycling equipment and refrigerant identifier. If NG, refer to [HA-4, "Precautions For Refrigerant System Service"](#).
- 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 m ℓ (0.2 US fl oz, 0.2 Imp fl oz) of oil at this time. C

CAUTION:

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

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PERFORMANCE TEST

< PERIODIC MAINTENANCE >

PERFORMANCE TEST

Inspection

INFOID:000000012786615

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-18, "Symptom Table"](#).

RECIRCULATING-TO-DISCHARGE AIR TEMPERATURE TABLE

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

AMBIENT AIR TEMPERATURE-TO-OPERATING PRESSURE TABLE

PERFORMANCE TEST

< PERIODIC MAINTENANCE >

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

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COMPRESSOR

< REMOVAL AND INSTALLATION >

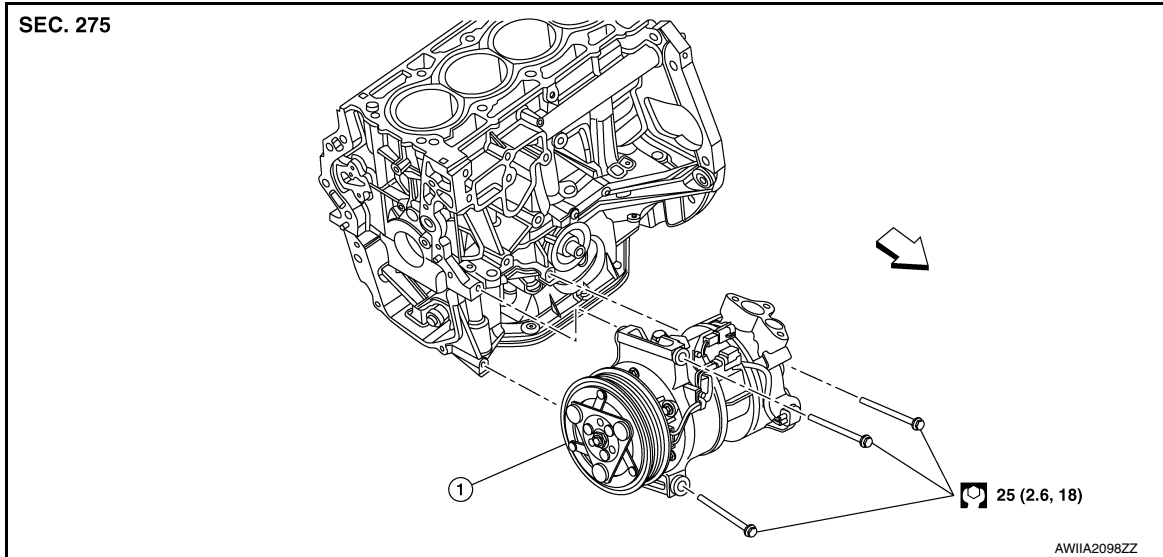
REMOVAL AND INSTALLATION

COMPRESSOR

Exploded View

INFOID:000000012786616

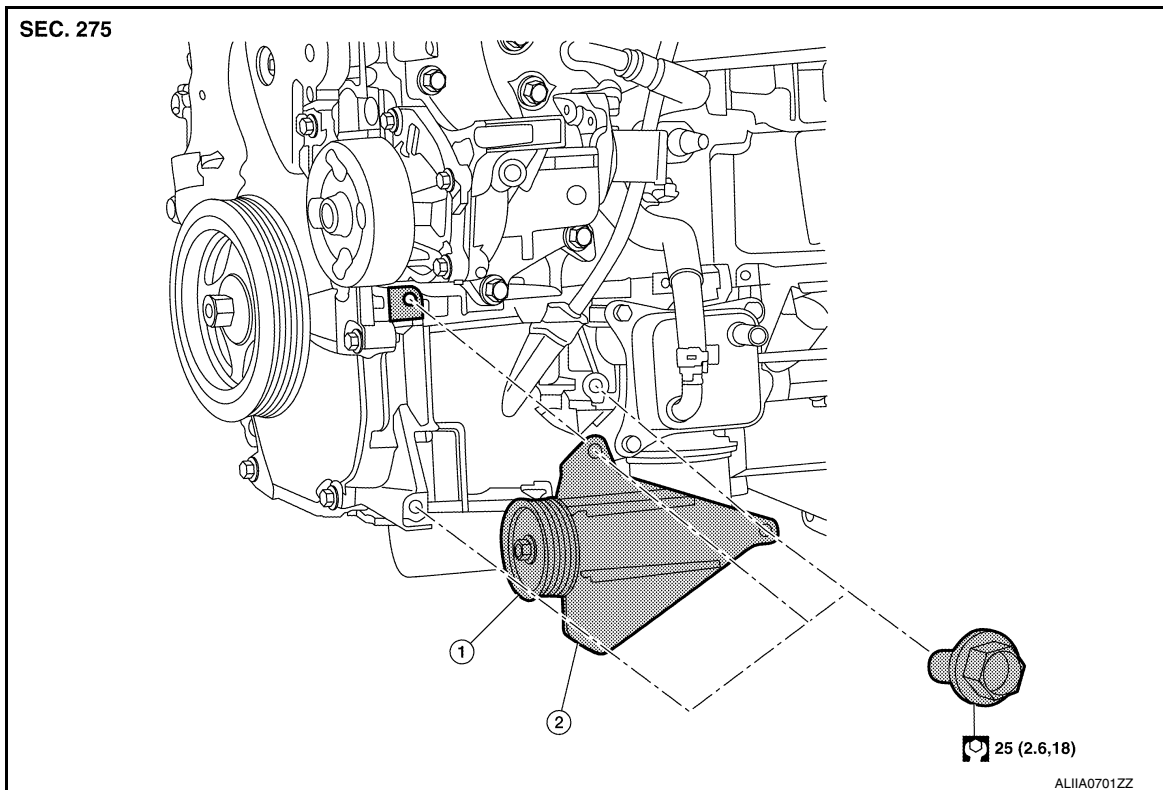
WITH AIR CONDITIONING



1. Compressor

← Front

WITHOUT AIR CONDITIONING



1. A/C idler pulley

2. A/C idler pulley bracket

COMPRESSOR

COMPRESSOR

< REMOVAL AND INSTALLATION >

COMPRESSOR : Removal and Installation

INFOID:000000012786617

REMOVAL

1. Discharge the refrigerant. Refer to [HA-23, "Recycle Refrigerant"](#).
2. Remove the front under cover. Refer to [EXT-31, "ENGINE UNDER COVER : Removal and Installation"](#).
3. Partially remove the front fender protector (RH). Refer to [EXT-28, "FENDER PROTECTOR : Removal and Installation - Front Fender Protector"](#).
4. Remove the drive belt from the compressor. Refer to [EM-15, "Removal and Installation"](#).

NOTE:

Complete removal of the drive belt is not necessary.

5. Remove the bolt that retains the high-pressure flexible hose to the compressor, then disconnect the high-pressure flexible hose 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.

6. Remove the bolt that retains the low-pressure flexible hose to the compressor, then disconnect the low-pressure flexible hose from the compressor.
7. Disconnect the harness connector from the compressor.
8. Remove the compressor bolts and the compressor.

INSTALLATION

Installation is in the reverse order of removal.

CAUTION:

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

MAGNET CLUTCH

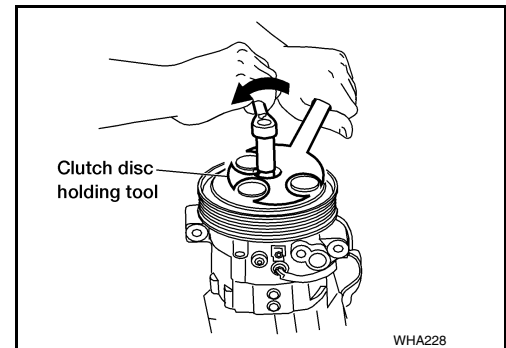
MAGNET CLUTCH : Removal and Installation

INFOID:000000012786618

REMOVAL

1. Remove the compressor. Refer to [HA-31, "COMPRESSOR : Removal and Installation"](#).
2. Remove the center bolt by holding the clutch disc steady using the clutch disc holding tool.

Tool number : (J-44614)



3. Remove the clutch disc and shim(s).

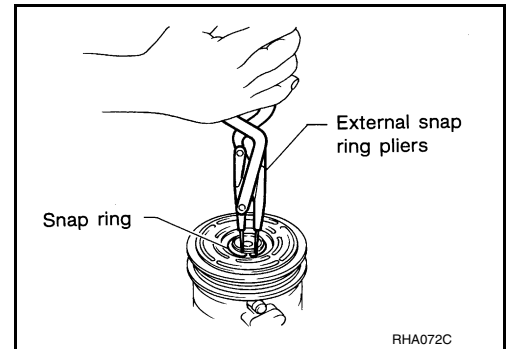
CAUTION:

Retain shim(s) for installation.

COMPRESSOR

< REMOVAL AND INSTALLATION >

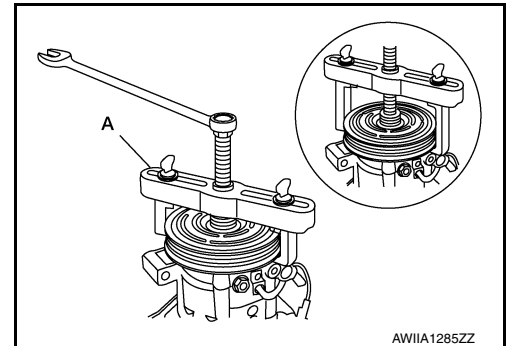
4. Remove the snap ring using external snap ring pliers.



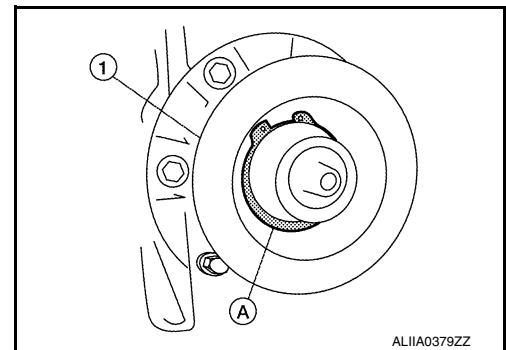
5. Remove the pulley assembly using suitable tool (A).

CAUTION:

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



6. Remove the magnet coil snap ring (A) using a suitable tool. Then remove the magnet coil (1) from compressor shaft.



INSPECTION AFTER REMOVAL

Clutch Disc

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

Pulley

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

Magnet Coil

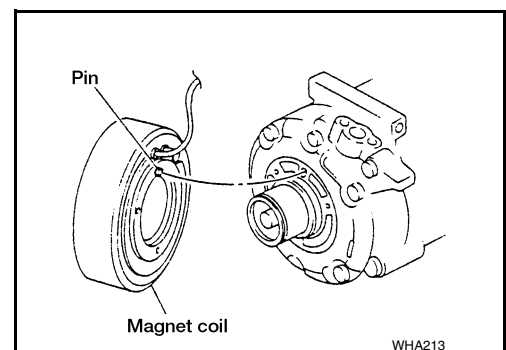
Check the magnet coil for a loose connection or cracked insulation.

INSTALLATION

1. Install the magnet coil.

CAUTION:

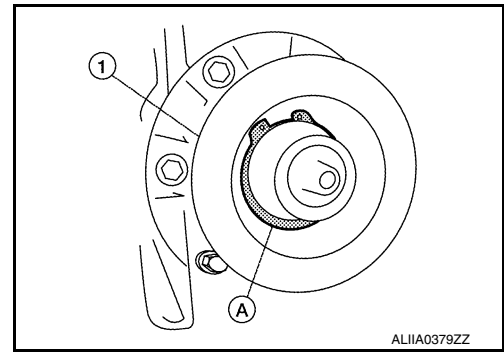
Be sure to align the magnet coil pin with the hole in the compressor front head.



COMPRESSOR

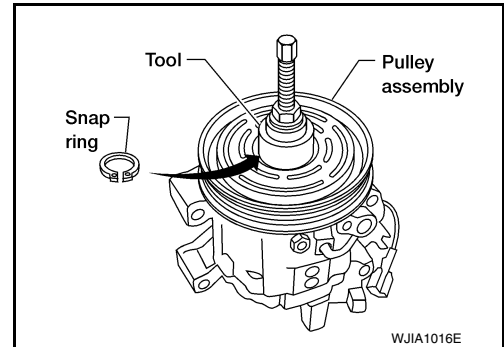
< REMOVAL AND INSTALLATION >

2. Install the magnet coil (1) on the compressor shaft with the snap ring (A) using suitable tool.

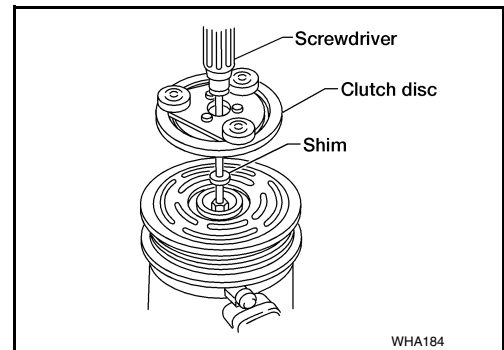


3. Install the pulley assembly using the drive plate installer and a wrench, then install the snap ring using snap ring pliers.

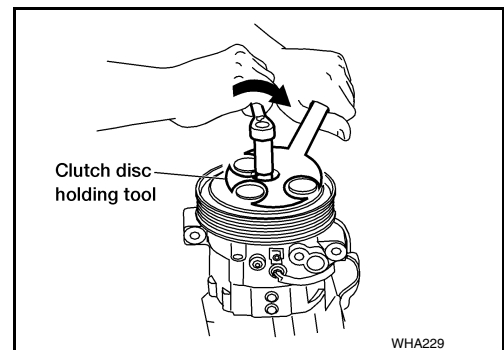
Tool number : — (J-38873-A)



4. Install the clutch disc on the drive shaft, together with the original shim(s). Press the clutch disc down using the drive plate installer.



5. Install the center bolt using the clutch disc holding tool.
 - After installation, check that the pulley rotates smoothly.



6. Install the compressor. Refer to [HA-31, "COMPRESSOR : Removal and Installation"](#).

INSPECTION OF CLUTCH DISC TO PULLEY CLEARANCE

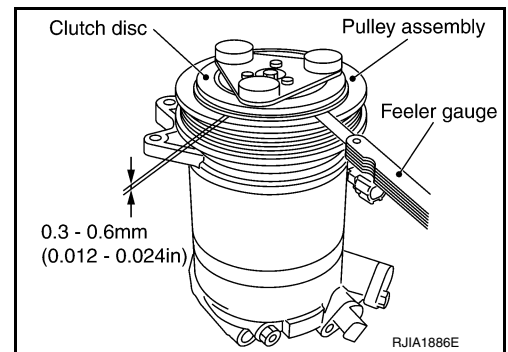
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COMPRESSOR

< REMOVAL AND INSTALLATION >

1. Check the clearance around the entire periphery of the clutch disc.

Clutch disc to pulley clearance : 0.3 - 0.6 mm (0.01 - 0.02 in)



2. If specified clearance is not obtained, replace compressor clutch.

BREAK-IN OPERATION

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

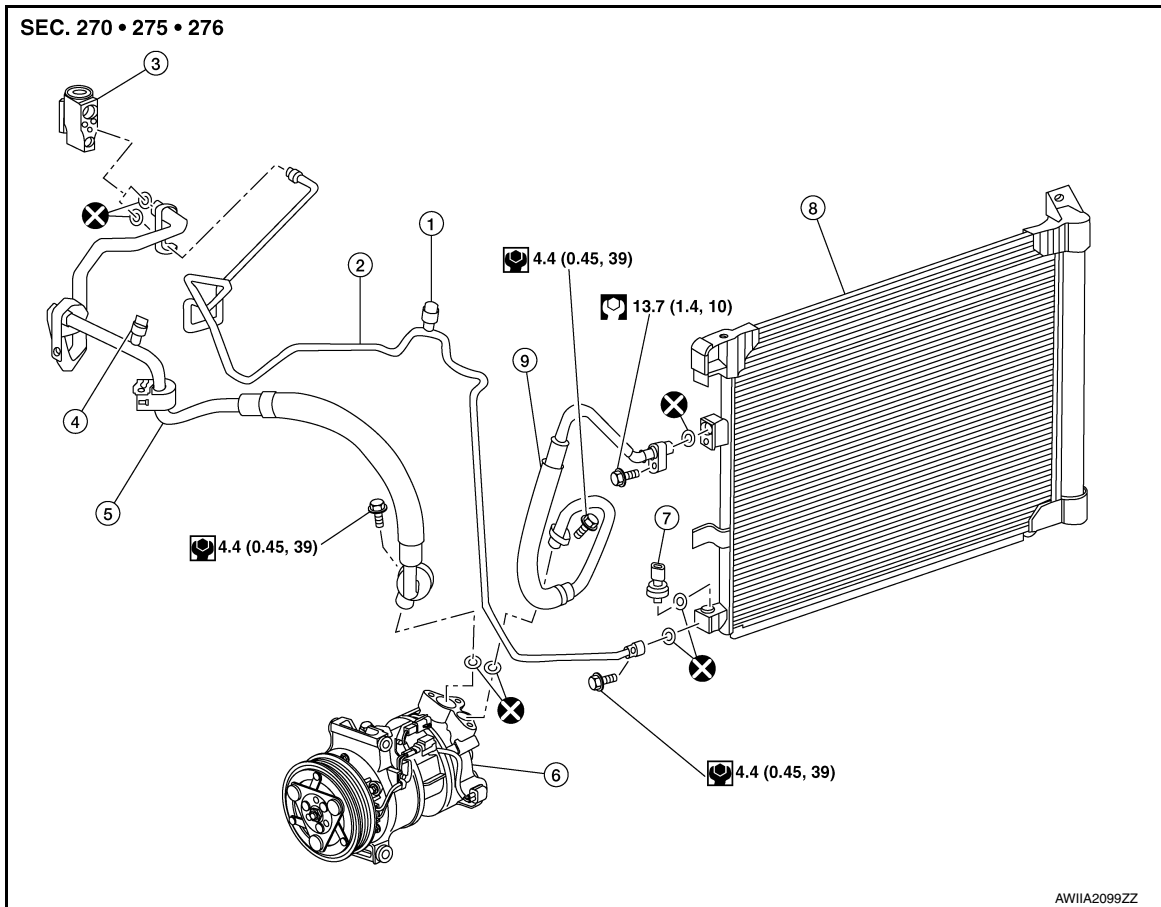
COOLER PIPE AND HOSE

< REMOVAL AND INSTALLATION >

COOLER PIPE AND HOSE

Exploded View

INFOID:000000012786619



- | | | |
|--------------------------------|---------------------------------------|--------------------------------|
| 1. High-pressure service port | 2. High-pressure pipe | 3. Expansion valve |
| 4. Low-pressure service port | 5. Low-pressure flexible hose | 6. Compressor |
| 7. Refrigerant pressure sensor | 8. Condenser and liquid tank assembly | 9. High-pressure flexible hose |

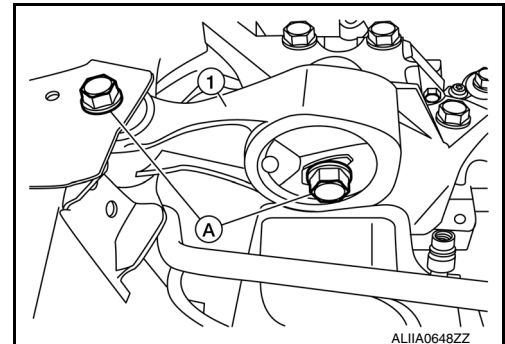
LOW-PRESSURE FLEXIBLE HOSE

LOW-PRESSURE FLEXIBLE HOSE : Removal and Installation

INFOID:000000012786620

REMOVAL

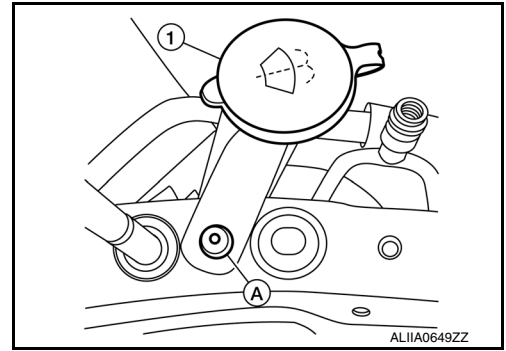
1. Discharge the refrigerant. Refer to [HA-23. "Recycle Refrigerant"](#).
2. Remove the upper torque rod bolts (A) and the upper torque rod (1).



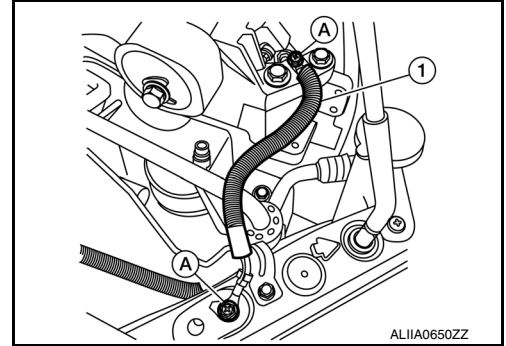
COOLER PIPE AND HOSE

< REMOVAL AND INSTALLATION >

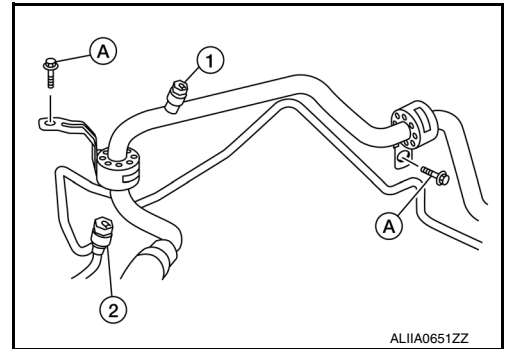
3. Remove the washer tank inlet bolt (A), then pull the washer tank inlet (1) up and out of the washer tank.



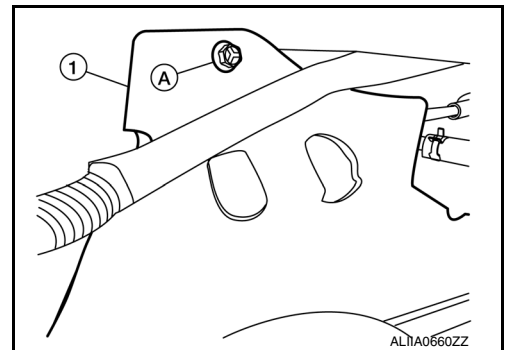
4. Remove the engine ground bolts (A) and the engine ground (1).



5. Remove the A/C pipe bracket bolts (A).
(1): Low-pressure service port
(2): High-pressure service port



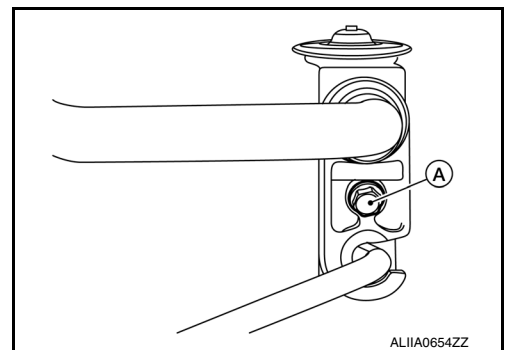
6. Remove the push nut (A) from the expansion valve insulator (1) and reposition.



7. Remove the bolt (A) that retains the high-pressure pipe and low-pressure flexible hose to the expansion valve, then disconnect the low-pressure flexible hose from the expansion valve and high-pressure pipe.

CAUTION:

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



COOLER PIPE AND HOSE

< REMOVAL AND INSTALLATION >

8. Remove the front under cover. Refer to [EXT-31, "ENGINE UNDER COVER : Removal and Installation"](#).
9. Remove the bolt that retains the high-pressure flexible hose to the compressor, then disconnect the high-pressure flexible hose from the compressor.
10. Remove the bolt that retains the low-pressure flexible hose to the compressor, then disconnect the low-pressure flexible hose from the compressor.
11. Remove the low-pressure flexible hose.

INSTALLATION

Installation is in the reverse order of removal.

CAUTION:

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

HIGH-PRESSURE FLEXIBLE HOSE

HIGH-PRESSURE FLEXIBLE HOSE : Removal and Installation

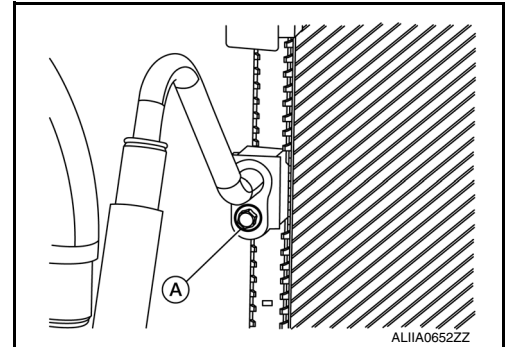
INFOID:000000012786621

REMOVAL

1. Discharge the refrigerant. Refer to [HA-23, "Recycle Refrigerant"](#).
2. Remove the core support upper cover. Refer to [HA-39, "Exploded View"](#).
3. Remove the bolt (A) that retains the high-pressure flexible hose to the condenser, then disconnect the high-pressure flexible hose from the condenser and liquid tank assembly.

CAUTION:

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



4. Remove the bolt that retains the high-pressure flexible hose to the compressor, then disconnect the high-pressure flexible hose from the compressor.
5. 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"](#).

HIGH-PRESSURE PIPE

HIGH-PRESSURE PIPE : Removal and Installation

INFOID:000000012786622

REMOVAL

1. Discharge the refrigerant. Refer to [HA-23, "Recycle Refrigerant"](#).
2. Remove the core support upper. Refer to [HA-39, "Exploded View"](#).
3. Remove the low-pressure flexible hose. Refer to [HA-35, "LOW-PRESSURE FLEXIBLE HOSE : Removal and Installation"](#).

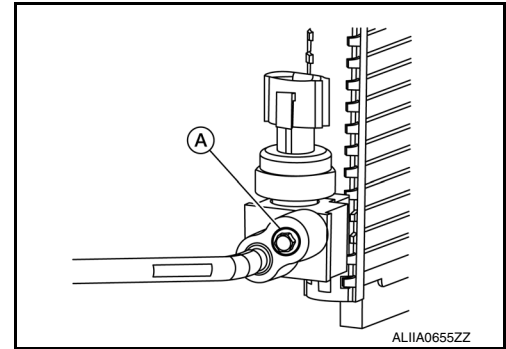
COOLER PIPE AND HOSE

< REMOVAL AND INSTALLATION >

4. Remove the bolt (A) that retains the high-pressure pipe to the condenser, then disconnect the high-pressure pipe from the condenser and liquid tank assembly.

CAUTION:

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



5. Remove the high-pressure pipe.

INSTALLATION

Installation is in the reverse order of removal.

CAUTION:

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

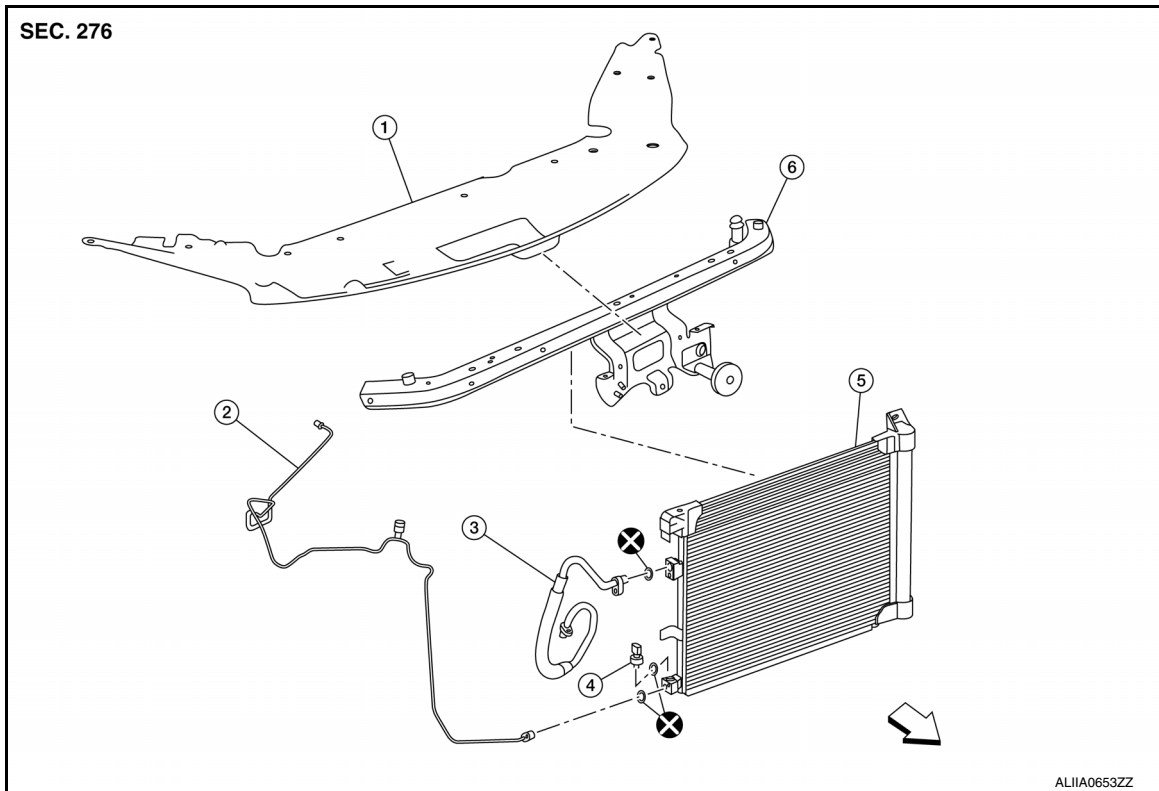
CONDENSER

< REMOVAL AND INSTALLATION >

CONDENSER

Exploded View

INFOID:000000012786623



- | | | |
|--------------------------------|---------------------------------------|--------------------------------|
| 1. Core support upper cover | 2. High-pressure pipe | 3. High-pressure flexible hose |
| 4. Refrigerant pressure sensor | 5. Condenser and liquid tank assembly | 6. Core support upper |

⇐ Front

CONDENSER

CONDENSER : Removal and Installation

INFOID:000000012786624

REMOVAL

1. Discharge the refrigerant. Refer to [HA-23, "Recycle Refrigerant"](#).
2. Reposition the hood lock assembly. Refer to [DLK-149, "HOOD LOCK CONTROL : Exploded View"](#).
NOTE:
Disconnection of the hood release cable is not necessary.
3. Remove the core support upper. Refer to [HA-39, "Exploded View"](#).
4. Remove the front grille. Refer to [EXT-23, "Removal and Installation"](#).
5. Disconnect the harness connector from the refrigerant pressure sensor.

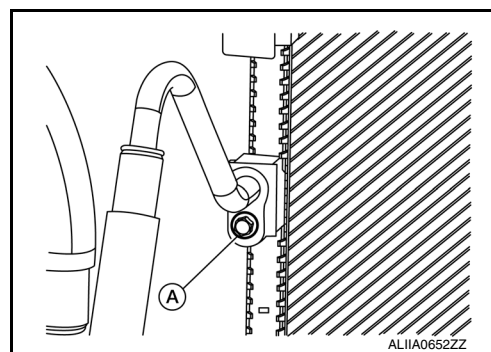
CONDENSER

< REMOVAL AND INSTALLATION >

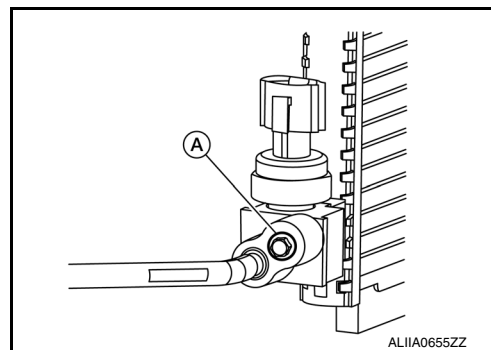
6. Remove the bolt (A) that retains the high-pressure flexible hose to the condenser, then disconnect the high-pressure flexible hose from the condenser and liquid tank assembly.

CAUTION:

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



7. Remove the bolt (A) that retains the high-pressure pipe to the condenser, then disconnect the high-pressure pipe from the condenser and liquid tank assembly.



8. Remove the condenser and liquid tank assembly.

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:000000012786625

REMOVAL

1. Discharge the refrigerant. Refer to [HA-23, "Recycle Refrigerant"](#).
2. Reposition the hood lock assembly. Refer to [DLK-149, "HOOD LOCK CONTROL : Exploded View"](#).

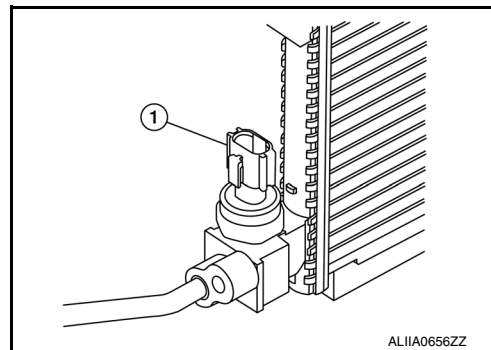
NOTE:

Disconnection of the hood release cable is not necessary.

3. Remove the core support upper. Refer to [HA-39, "Exploded View"](#).
4. Disconnect the harness connector from the refrigerant pressure sensor.
5. 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:

CONDENSER

< REMOVAL AND INSTALLATION >

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

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HEATING AND COOLING UNIT ASSEMBLY

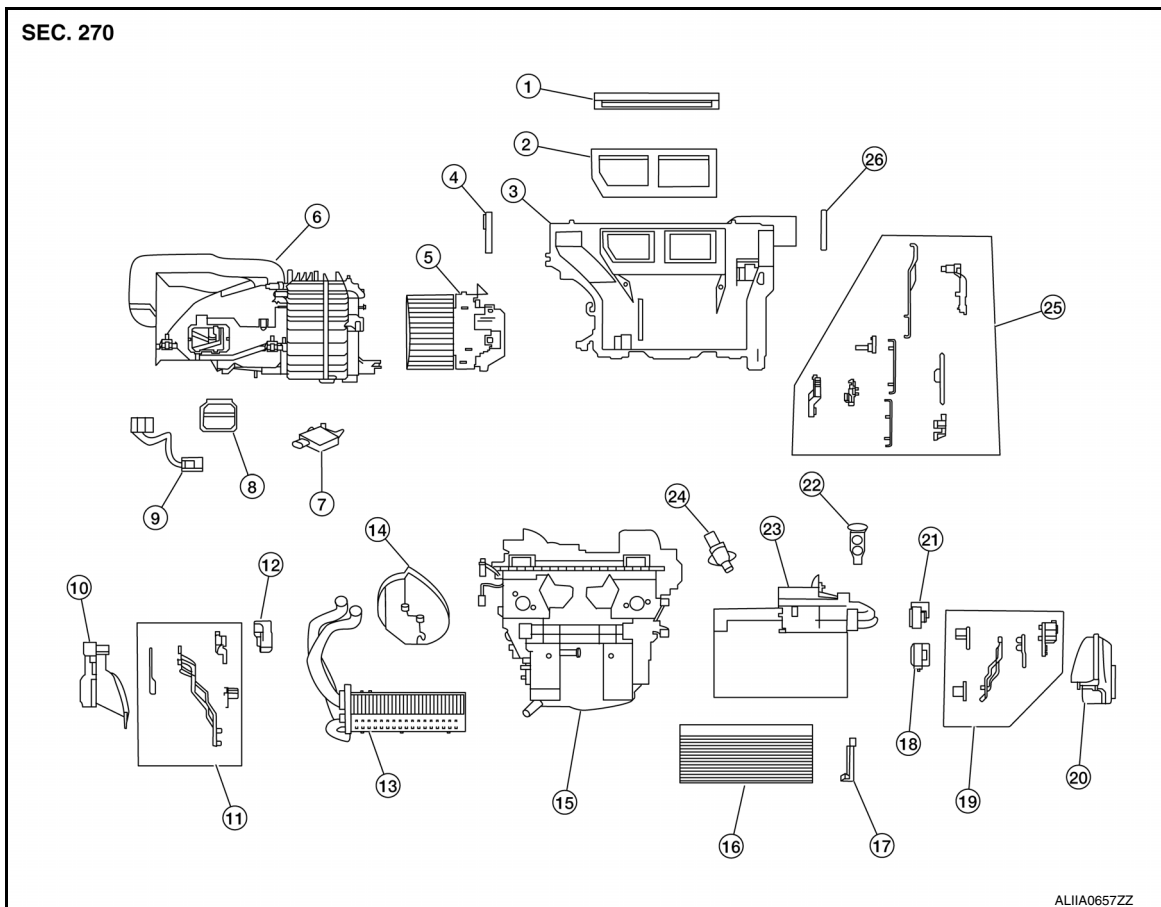
< REMOVAL AND INSTALLATION >

HEATING AND COOLING UNIT ASSEMBLY

Exploded View

INFOID:000000012786626

WITH AIR CONDITIONING

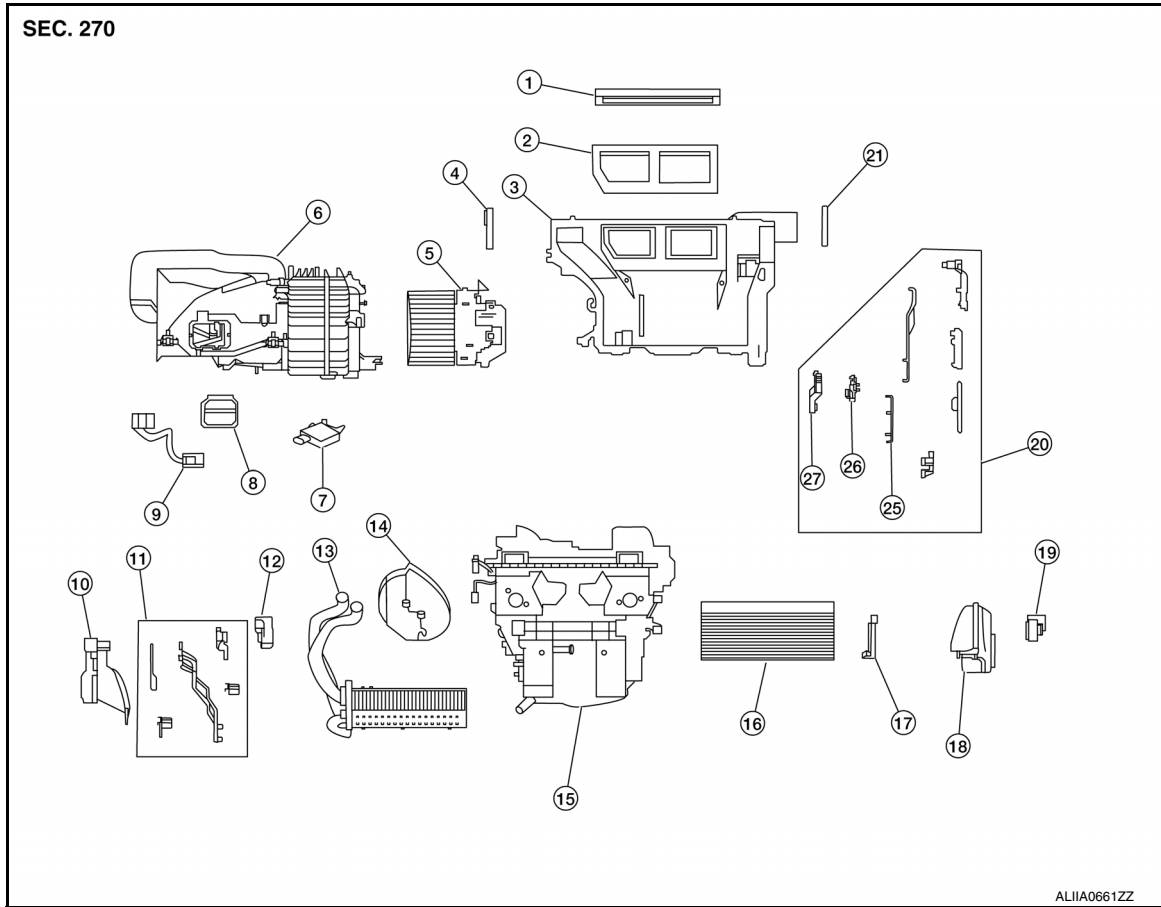


- | | | |
|--------------------------------|--------------------------------|--|
| 1. Defroster seal | 2. Center ventilator seal | 3. Upper distribution module |
| 4. Side ventilator seal (LH) | 5. Blower motor | 6. Blower unit |
| 7. Intake door motor | 8. Power transistor | 9. Power transistor wiring harness |
| 10. Front floor duct (LH) | 11. Vent and defroster linkage | 12. Mode door motor |
| 13. Heater core | 14. Heater core pipes grommet | 15. Heating and cooling unit |
| 16. In-cabin microfilter | 17. In-cabin microfilter cover | 18. Air mix door motor (LH) (Automatic A/C only) |
| 19. Vent and defroster linkage | 20. Front floor duct (RH) | 21. Air mix door motor (RH) |
| 22. Expansion valve | 23. Evaporator | 24. Aspirator (Automatic A/C only) |
| 25. Vent and defroster linkage | 26. Side ventilator seal (RH) | |

HEATING AND COOLING UNIT ASSEMBLY

< REMOVAL AND INSTALLATION >

WITHOUT AIR CONDITIONING



- | | | |
|------------------------------|--------------------------------|------------------------------------|
| 1. Defroster seal | 2. Center ventilator seal | 3. Upper distribution module |
| 4. Side ventilator seal (LH) | 5. Blower motor | 6. Blower unit |
| 7. Intake door motor | 8. Power transistor | 9. Power transistor wiring harness |
| 10. Front floor duct (LH) | 11. Vent and defroster linkage | 12. Mode door motor |
| 13. Heater core | 14. Heater core pipes grommet | 15. Heating and cooling unit |
| 16. In-cabin microfilter | 17. In-cabin microfilter cover | 18. Front floor duct (RH) |
| 19. Air mix door motor | 20. Vent and defroster linkage | 21. Side ventilator seal (RH) |

HEATING AND COOLING UNIT ASSEMBLY

HEATING AND COOLING UNIT ASSEMBLY : Removal and Installation

INFOID:0000000012786627

NOTE:

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

REMOVAL

1. Discharge the refrigerant. Refer to [HA-23. "Recycle Refrigerant"](#).
2. Drain the cooling system. Refer to [CO-13. "Changing Engine Coolant"](#).
3. Remove the instrument panel assembly. Refer to [IP-14. "Removal and Installation"](#).
4. Remove the steering column. Refer to [ST-13. "Removal and Installation"](#).
5. Remove the center console. Refer to [IP-17. "Removal and Installation"](#).
6. Remove the wiper drive assembly. Refer to [WW-64. "Removal and Installation"](#).

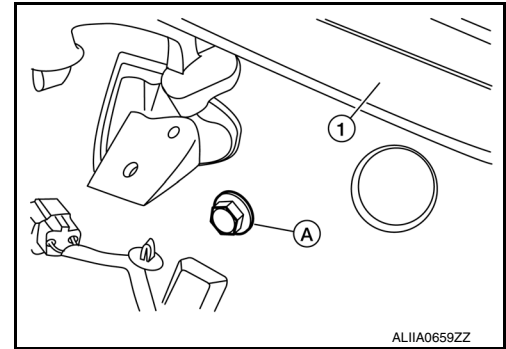
HEATING AND COOLING UNIT ASSEMBLY

< REMOVAL AND INSTALLATION >

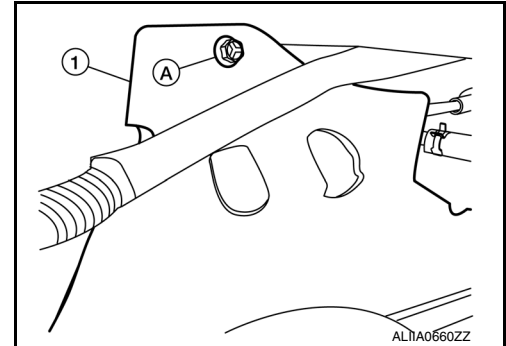
7. Remove the steering member bolt (A).
(1): Windshield glass

NOTE:

The steering member bolt (A) can be found near the drivers side cowl area in the engine compartment.



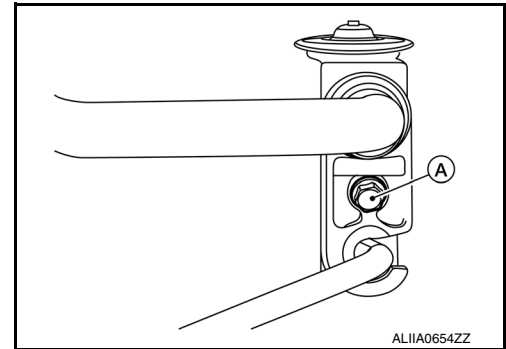
8. Remove the push nut (A) from the expansion valve insulator (1) and reposition.



9. Remove the bolt (A) that retains the low-pressure flexible hose and high-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.



10. Disconnect the low-pressure pipe and high-pressure pipe from the expansion valve.
11. Disconnect the heater hoses from the heater core pipes.
12. Remove the remaining steering member bolts.
13. Disconnect the harness connectors from the heating and cooling unit assembly and steering member.
14. Remove the heating and cooling unit assembly and steering member as an assembly from the vehicle.
15. Separate the heating and cooling unit assembly from the steering member.

INSTALLATION

Installation is in the reverse order of removal.

CAUTION:

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

HEATER CORE

HEATER CORE : Removal and Installation

INFOID:000000012786628

REMOVAL

The heater core is not serviced separately and must be replaced with the heating and cooling unit assembly. Refer to [HA-43, "HEATING AND COOLING UNIT ASSEMBLY : Removal and Installation"](#).

EVAPORATOR

HEATING AND COOLING UNIT ASSEMBLY

< REMOVAL AND INSTALLATION >

EVAPORATOR : Removal and Installation

INFOID:000000012786629

REMOVAL

The evaporator is not serviced separately and must be replaced with the heating and cooling unit assembly. Refer to [HA-45, "EVAPORATOR : Removal and Installation"](#).

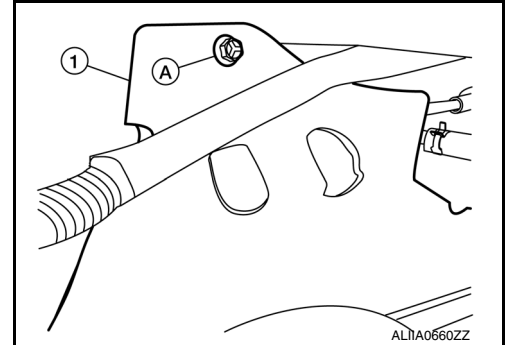
EXPANSION VALVE

EXPANSION VALVE : Removal and Installation

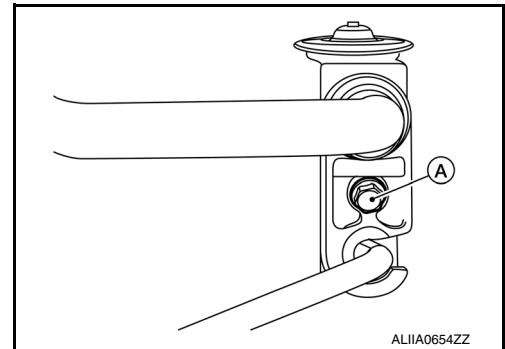
INFOID:000000012786630

REMOVAL

1. Discharge the refrigerant. Refer to [HA-23, "Recycle Refrigerant"](#).
2. Remove the push nut (A) from the expansion valve insulator (1) and reposition.



3. Remove the bolt (A) that retains the low-pressure flexible hose and high-pressure pipe to the expansion valve.



4. Disconnect the low-pressure pipe and 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:

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

SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE DATA AND SPECIFICATIONS (SDS)

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COMPRESSOR

Model	SANDEN
Type	PXC14 (swashplate)
Displacement	137.2 cm ³ (8.37 in ³) / revolution
Direction of rotation	Clockwise
Drive belt	Poly V 6-grooves

OIL

Name	Genuine NISSAN A/C System Oil Type S or equivalent	
Capacity	Total in system	90 mℓ (3.0 US fl oz, 3.2 Imp fl oz)
	Compressor (service part) charging amount	Refer to HA-26, "Oil Adjusting Procedure for Compressor Replacement" .

REFRIGERANT

Type	HFC-134a (R-134a)
Capacity	0.45 ± 0.05 kg (0.992 ± 0.110 lb)