SECTION HA
HEATER & AIR CONDITIONING SYSTEM

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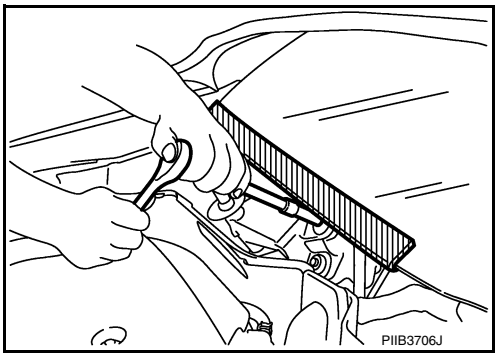
PRECAUTION

PRECAUTIONS

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.

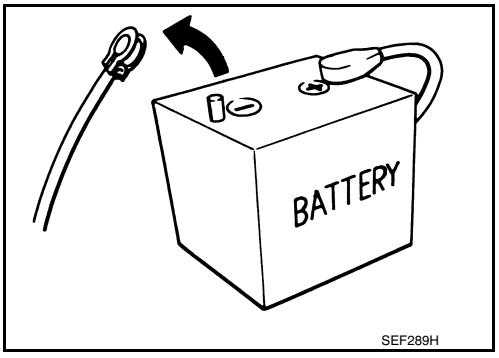


Precautions for Removing Battery Terminal

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When disconnecting the battery terminal, pay attention to the following.

- Always use a 12V battery as power source.
- Never disconnect battery terminal while engine is running.
- When removing the 12V battery terminal, turn OFF the ignition switch and wait at least 30 seconds.
- For vehicles with the engine listed below, remove the battery terminal after a lapse of the specified time:



BR08DE	: 4 minutes	YD25DDTi	: 2 minutes
D4D engine	: 20 minutes	YS23DDT	: 4 minutes
HRA2DDT	: 12 minutes	YS23DDTT	: 4 minutes
K9K engine	: 4 minutes	ZD30DDTi	: 60 seconds
M9R engine	: 4 minutes	ZD30DDTT	: 60 seconds
R9M engine	: 4 minutes		
V9X engine	: 4 minutes		

NOTE:
ECU may be active for several tens of seconds after the ignition switch is turned OFF. If the battery terminal is removed before ECU stops, then a DTC detection error or ECU data corruption may occur.

- After high-load driving, if the vehicle is equipped with the V9X engine, turn the ignition switch OFF and wait for at least 15 minutes to remove the battery terminal.

NOTE:
- Turbocharger cooling pump may operate in a few minutes after the ignition switch is turned OFF.
- Example of high-load driving
  - Driving for 30 minutes or more at 140 km/h (86 MPH) or more.
  - Driving for 30 minutes or more on a steep slope.

- For vehicles with the 2-batteries, be sure to connect the main battery and the sub battery before turning ON the ignition switch.

NOTE:
If the ignition switch is turned ON with any one of the terminals of main battery and sub battery disconnected, then DTC may be detected.

- After installing the 12V battery, always check "Self Diagnosis Result" of all ECUs and erase DTC.

NOTE:
The removal of 12V battery may cause a DTC detection error.

Precautions For Refrigerant System Service

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GENERAL REFRIGERANT PRECAUTION

WARNING:

- **Never breathe A/C refrigerant and lubricant 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 lubricant manufacturers.**
- **Never release refrigerant into the air. Use approved recovery/recycling recharging equipment to capture the refrigerant each time an air conditioning system is discharged.**
- **Wear always eye and hand protection (goggles and gloves) when working with any refrigerant or air conditioning system.**
- **Never store or heat refrigerant containers above 52°C (126°F).**
- **Never 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.**
- **Never intentionally drop, puncture, or incinerate refrigerant containers.**
- **Keep 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.**
- **Never 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.**

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 lubricant for the HFC-134a (R-134a) A/C system and HFC-134a (R-134a) components. Compressor malfunction is likely to occur if lubricant other than that specified is used.**
- **The specified HFC-134a (R-134a) lubricant rapidly absorbs moisture from the atmosphere. The following handling precautions must be observed:**
- **Cap (seal) immediately the component to minimize the entry of moisture from the atmosphere when removing refrigerant components from a vehicle.**
- **Never 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 lubricant from a sealed container. Reseal immediately containers of lubricant. Lubricant becomes moisture saturated and should not be used without proper sealing.**
- **Never allow lubricant 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. Never 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.

REFRIGERANT CONNECTION

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

- Expansion valve to evaporator

- Refrigerant pressure sensor to high-pressure pipe

WARNING:

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

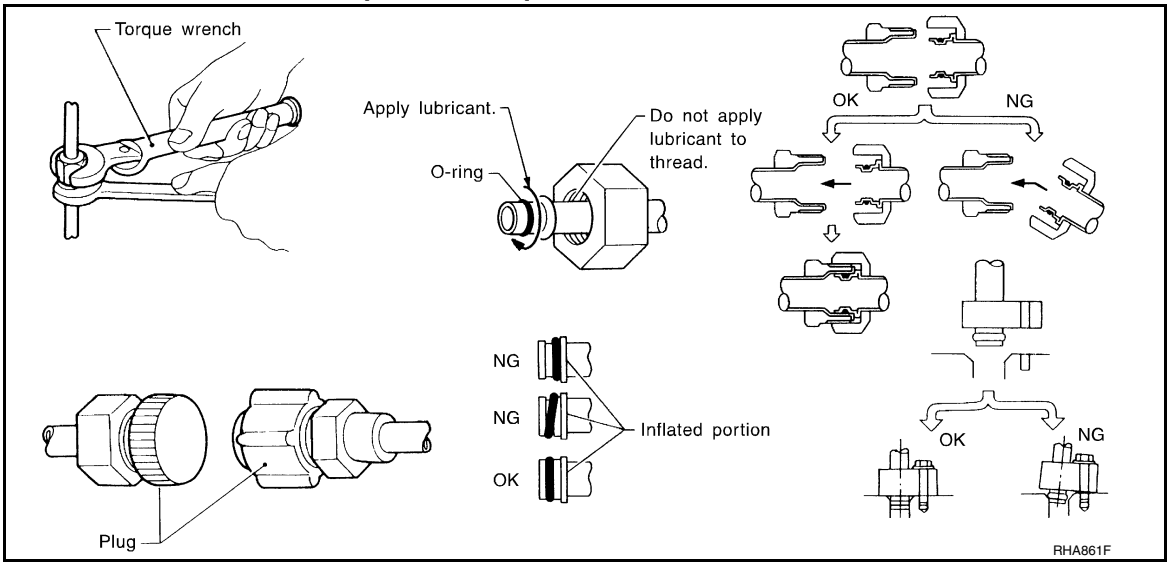
CAUTION:

Observe the following when replacing or cleaning refrigerant cycle components.

- **Store it in the same way at it is when mounted on the car when the compressor is removed. Failure to do so will cause lubricant to enter the low-pressure chamber.**
- **Use always 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. Never remove the seal caps of pipes and other components until just before required for connection.**
- **Allow components stored in cool areas to warm to working area temperature before removing seal caps. This prevents condensation from forming inside A/C components.**
- **Remove thoroughly moisture from the refrigeration system before charging the refrigerant.**
- **Replace always used O-rings.**
- **Apply lubricant to circle of the O-rings shown in illustration when connecting tube. Be careful not to apply lubricant to threaded portion.**

Name : ND-OIL 8

- **O-ring must be closely attached to the groove portion of tube.**
- **Be careful not to damage O-ring and tube when replacing the O-ring.**
- **Connect tube until a click can be heard. Then tighten the nut or bolt by hand. Check that the O-ring is installed to tube correctly.**
- **Perform leakage test and make sure that there is no leakage from connections after connecting line. Disconnect that line and replace the O-ring when the refrigerant leaking point is found. Then tighten connections of seal seat to the specified torque.**



COMPRESSOR

CAUTION:

- **Plug all openings to prevent moisture and foreign matter from entering.**
- **Store it in the same way at it is when mounted on the car when the compressor is removed.**
- **Follow “Maintenance of Lubricant Quantity in Compressor” exactly when replacing or repairing compressor. Refer to HA-18, "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 lubricant.**
- **Turn the compressor shaft by hand more than five turns in both directions after compressor service operation. This distributes equally lubricant 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.**
- **Wear always 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 manufacture'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).**
- **Remove always any remaining dye from the leakage area after repairs are completed to avoid a misdiagnosis during a future service.**
- **Never 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.**
- **Never spray the fluorescent dye cleaning agent on hot surfaces (engine exhaust manifold, etc.).**
- **Never 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. Never 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.**

Service Equipment

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RECOVERY/RECYCLING RECHARGING EQUIPMENT

Be certain to follow the manufacturer's instructions for machine operation and machine maintenance. Never introduce any refrigerant other than that specified into the machine.

ELECTRICAL LEAK DETECTOR

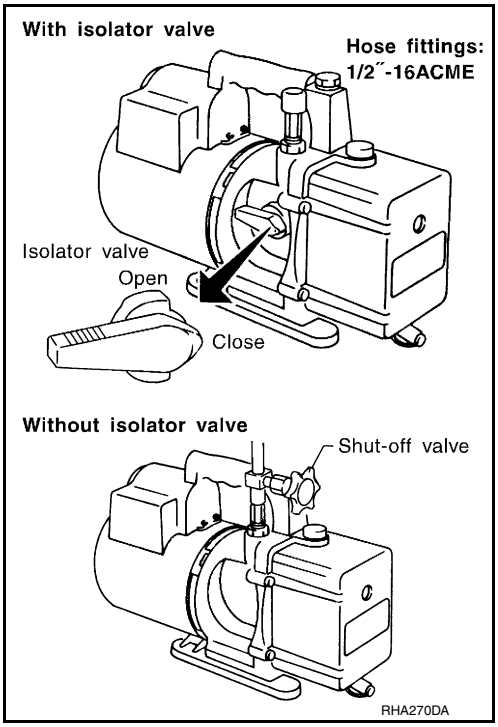
Be certain to follow the manufacturer's instructions for tester operation and tester maintenance.

VACUUM PUMP

The lubricant contained inside the vacuum pump is not compatible with the specified lubricant for HFC-134a (R-134a) A/C systems. The vent side of the vacuum pump is exposed to atmospheric pressure. So the vacuum pump lubricant 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.

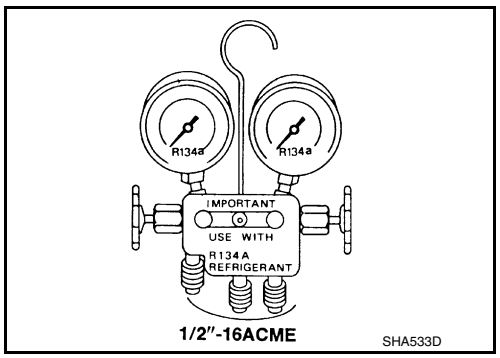
- Vacuum pumps usually have a manual isolator valve as part of the pump. Close this valve to isolate the service hose from the pump.
- Use a hose equipped with a manual shut-off valve near the pump end for pumps without an isolator. Close the valve to isolate the hose from the pump.
- Disconnect the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



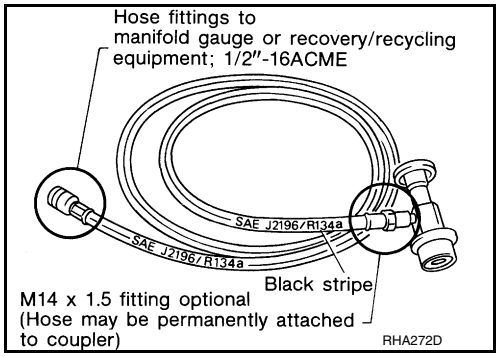
MANIFOLD GAUGE SET

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 lubricants.



SERVICE HOSES

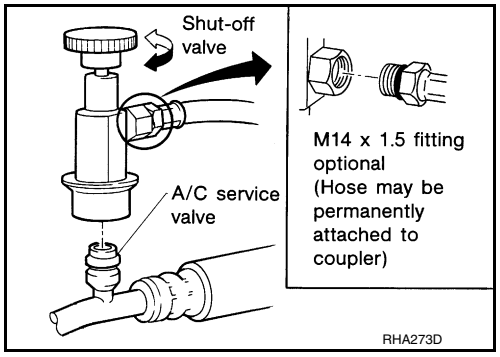
Be certain that the service hoses display the markings described (colored hose with black stripe). All hoses must equip positive shut-off devices (either manual or automatic) near the end of the hoses opposite to the manifold gauge.



SERVICE COUPLERS

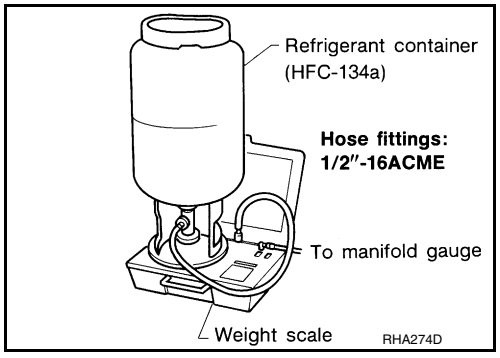
Never attempt to connect HFC-134a (R-134a) service couplers to the CFC-12 (R-12) A/C system. The HFC-134a (R-134a) couplers do not properly connect to the CFC-12 (R-12) system. However, if an improper connection is attempted, discharging and contamination may occur.

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 lubricants 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

PREPARATION

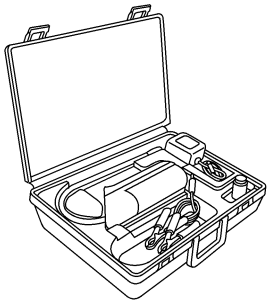
Special Service Tool

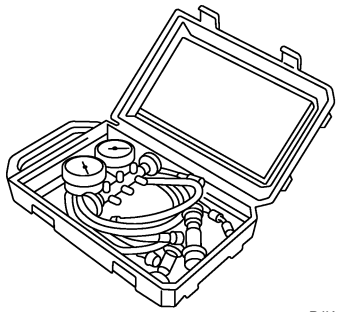
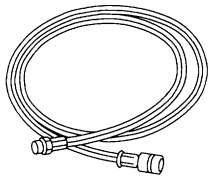
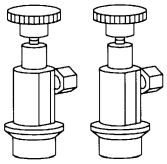
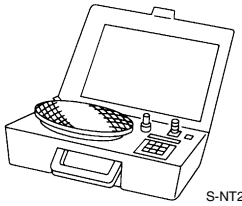
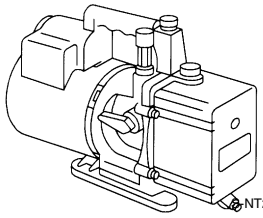
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The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

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

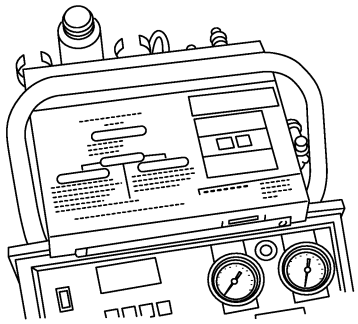
- Never mix HFC-134a (R-134a) refrigerant and/or its specified lubricant with CFC-12 (R-12) refrigerant and/or its lubricant.
- Separate and non-interchangeable service equipment must be used for handling each type of refrigerant/lubricant.
- Refrigerant container fittings, service hose fittings and service equipment fittings (equipment which handles refrigerant and/or lubricant) are different between CFC-12 (R-12) and HFC-134a (R-134a). This is to avoid mixed use of the refrigerants/lubricant.
- Never use adapters that convert one size fitting to another: refrigerant/lubricant contamination occurs and compressor malfunction may result.

Tool number (Kent-Moore No.) Tool name		Description
(ACR2005-NI) ACR5 A/C Service Center	 WJIA0293E	Function: Refrigerant recovery, recycling and recharging
(J-41995) Electrical leak detector	 AHA281A	Power supply: DC 12 V (Battery terminal)
(J-43872) Refrigerant dye cleaner	 SHA441F	For cleaning dye spills

Tool number (Kent-Moore No.) Tool name		Description
(J-39183) Manifold gauge set (with hoses and couplers)	 RJIA0196E	Identification: • The gauge face indicates HFC-134a (R-134a). Fitting size: Thread size • 1/2″-16 ACME
Service hoses • High-pressure side hose (J-39501-72) • Low-pressure side hose (J-39502-72) • Utility hose (J-39476-72)	 S-NT201	Hose color: • Low-pressure side hose: Blue with black stripe • High-pressure 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
Service couplers • High-pressure side coupler (J-39500-20) • Low-pressure side coupler (J-39500-24)	 S-NT202	Hose fitting to service hose: M14 x 1.5 fitting is optional or permanently attached.
(J-39650) 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)	 NT203	Capacity: • Air displacement: 4 CFM • Micron rating: 20 microns • Oil capacity: 482 g (17 oz) Fitting size: Thread size • 1/2″-16 ACME

Commercial Service Tool

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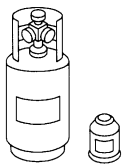
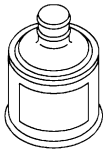
Tool name		Description
Refrigerant identifier equipment	 RJIA0197E	Checking for refrigerant purity and system contamination

Sealant or/and Lubricant

INFOID:0000000013550782

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

- Never mix HFC-134a (R-134a) refrigerant and/or its specified lubricant with CFC-12 (R-12) refrigerant and/or its lubricant.
- Separate and non-interchangeable service equipment must be used for handling each type of refrigerant/lubricant.
- Refrigerant container fittings, service hose fittings and service equipment fittings (equipment which handles refrigerant and/or lubricant) are different between CFC-12 (R-12) and HFC-134a (R-134a). This is to avoid mixed use of the refrigerants/lubricant.
- Never use adapters that convert one size fitting to another: refrigerant/lubricant contamination occurs and compressor malfunction may result.

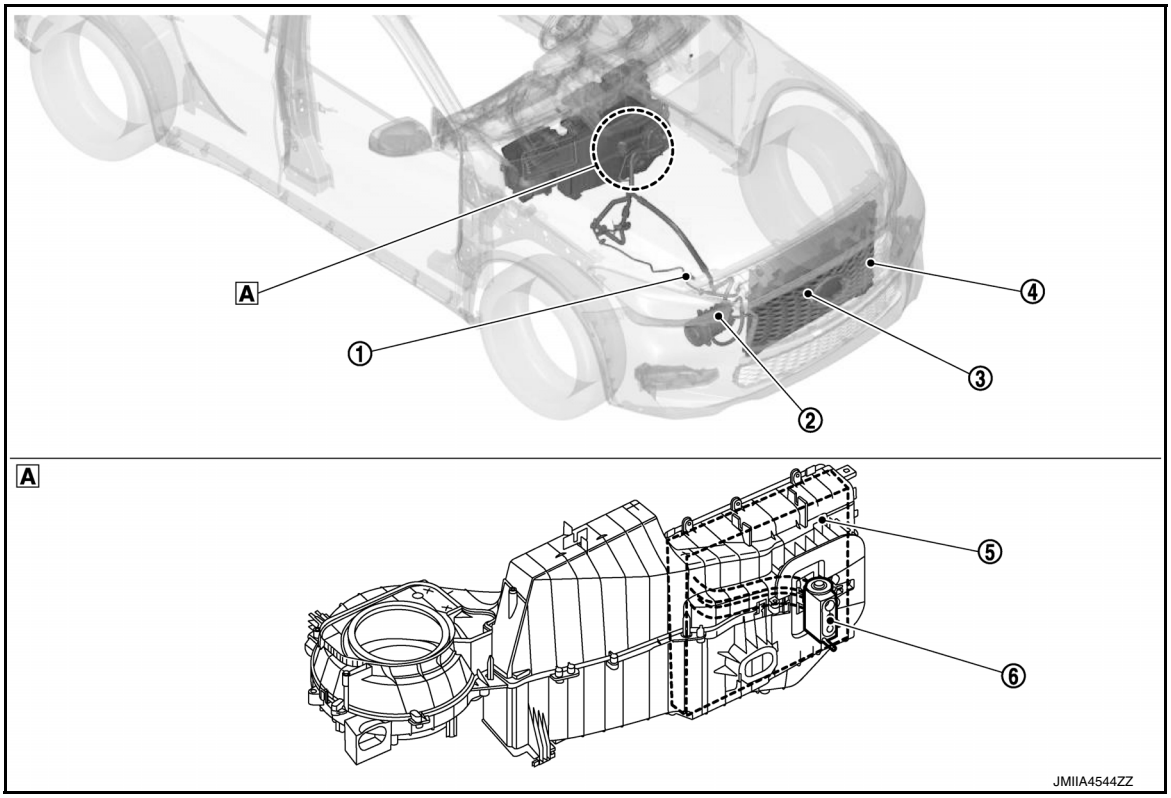
Tool name		Description
HFC-134a (R-134a) refrigerant	 S-NT196	Container color: Light blue Container marking: HFC-134a (R-134a) Fitting size: Thread size • Large container 1/2″-16 ACME
ND-OIL 8	 JMIIA1759ZZ	Type: Polyalkylene glycol oil (PAG), ND-OIL 8 Application: HFC-134a (R-134a) swash plate compressors Capacity: 40 m ℓ (1.4 US fl oz, 1.4 Imp fl oz)

SYSTEM DESCRIPTION

COMPONENT PARTS

Component Parts Location

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A In the evaporator case

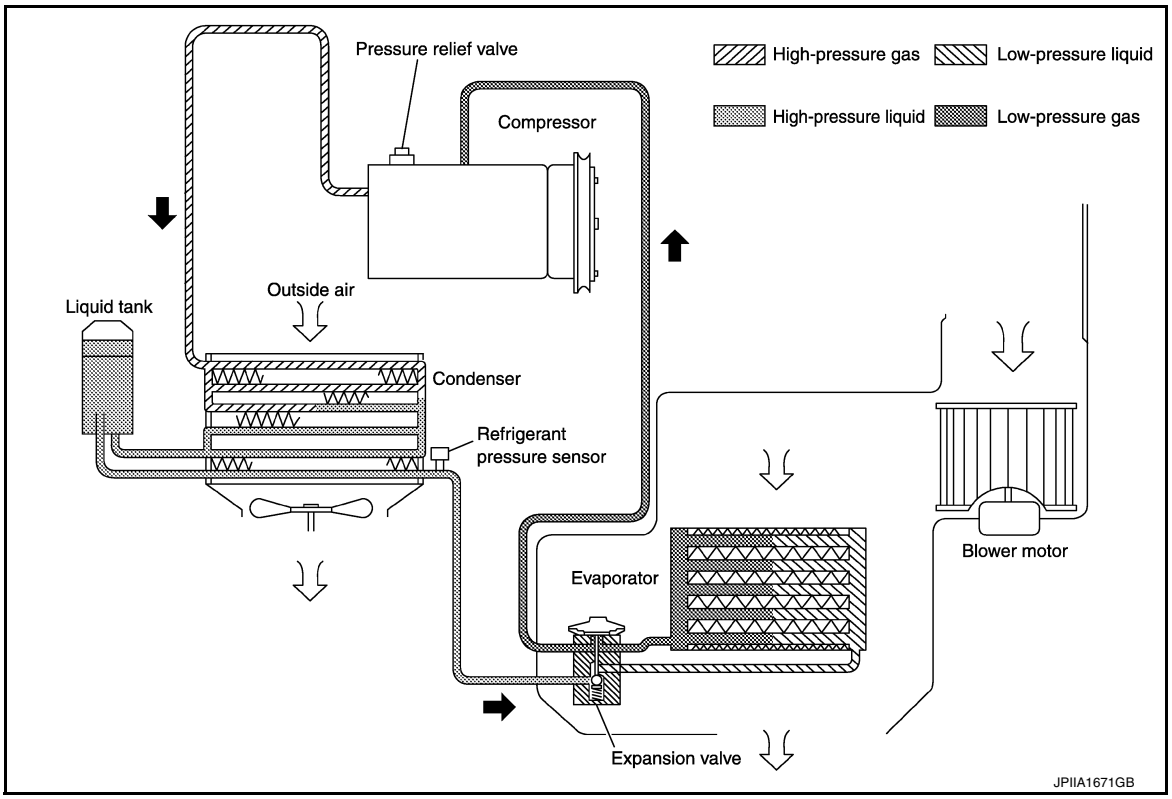
No.	Location	Function
①	Refrigerant pressure sensor	Refer to HAC-12, "Refrigerant Pressure Sensor".
②	Compressor	Intakes, compresses, and discharges refrigerant, to circulate refrigerant inside the refrigerant cycle.
③	Condenser	Cools refrigerant discharged from compressor, and transforms it to liquid refrigerant.
④	Desiccant cartridge (liquid tank)	Eliminates foreign matter in refrigerant, and stores temporarily liquid refrigerant.
⑤	Evaporator	The mist form liquid refrigerant transforms to gas by evaporation by the air conveyed from blower motor. The air is cooled by the heat by evaporation.
⑥	Expansion valve	Transforms high-pressure liquid refrigerant to mist form low-pressure liquid refrigerant by drawing function.

SYSTEM

System Description

INFOID:0000000013550784

SYSTEM DIAGRAM



REFRIGERANT CYCLE

Refrigerant Flow

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

Freeze Protection

When evaporator fin temperature is low, compressor stops so that freeze of evaporator can be prevented. Refer to HAC-18, "Compressor Control".

REFRIGERANT SYSTEM PROTECTION

Refrigerant Pressure Sensor

- The refrigerant system is protected against excessively high- or low-pressures by the refrigerant pressure sensor, installed to the high-pressure pipe. The refrigerant pressure sensor detects the pressure inside the refrigerant line and sends the voltage signal to the ECM if the system pressure rises above, or falls below the specifications.
- A/C auto amp. turns the stops the compressor when the high-pressure side detected by refrigerant pressure sensor is following conditions;

- Approximately 2,800 kPa (28.6 kg/cm^2, 406 psi) or more
- Approximately 170 kPa (1.7 kg/cm^2, 25 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. The release port on the pressure relief valve automatically opens and releases refrigerant into the atmosphere when the pressure of refrigerant in the system increases to an unusual level [more than 3,500 kPa (35.7 kg/cm^2, 508 psi)].

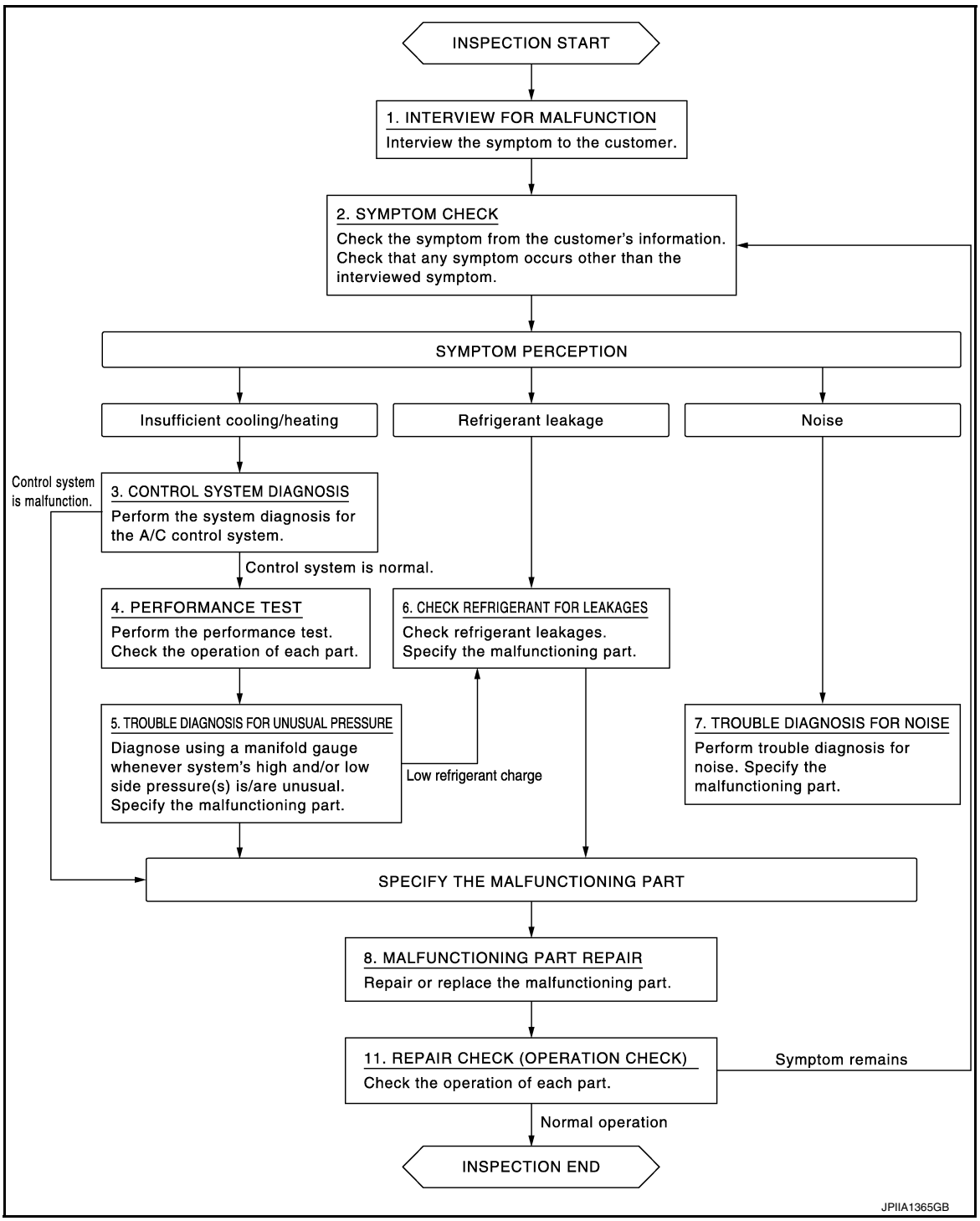
BASIC INSPECTION

DIAGNOSIS AND REPAIR WORKFLOW

Work Flow

INFOID:0000000013550785

OVERALL SEQUENCE



DETAILED FLOW

1.INTERVIEW FOR MALFUNCTION

Interview the symptom to the customer.

>> GO TO 2.

2.SYMPTOM CHECK

Check the symptom from the customer's information. Check that any symptom occurs other than the interviewed symptom.

Insufficient cooling/heating>>GO TO 3.
Refrigerant leakage>>GO TO 6.
Noise >> GO TO 7.

3.CONTROL SYSTEM DIAGNOSIS

Perform the system diagnosis for the A/C control system. Refer to HAC-48, "Description".

Is A/C control system normal?

YES >> GO TO 4.
NO >> GO TO 8.

4.PERFORMANCE TEST

Perform the performance test. Check the operation of each part. Refer to HA-20, "Inspection".

>> GO TO 5.

5.TROUBLE DIAGNOSIS FOR UNUSUAL PRESSURE

Diagnose using a manifold gauge whenever system's high and/or low side pressure(s) is/are unusual. Specify the malfunctioning part. Refer to HA-22, "Symptom Table".

Low refrigerant charge>>GO TO 6.
Except above>>GO TO 8.

6.CHECK REFRIGERANT FOR LEAKAGES

Check refrigerant for leakages. Specify the malfunctioning part. Refer to HA-15, "Leak Test".

>> GO TO 8.

7.TROUBLE DIAGNOSIS FOR NOISE

Perform trouble diagnosis for noise. Specify the malfunctioning part. Refer to HA-24, "Symptom Table".

>> GO TO 8.

8.MALFUNCTION PART REPAIR

Repair or replace the malfunctioning part.

>> GO TO 9.

9.REPAIR CHECK (OPERATION CHECK)

Check the operation of each part.

Does it operate normally?

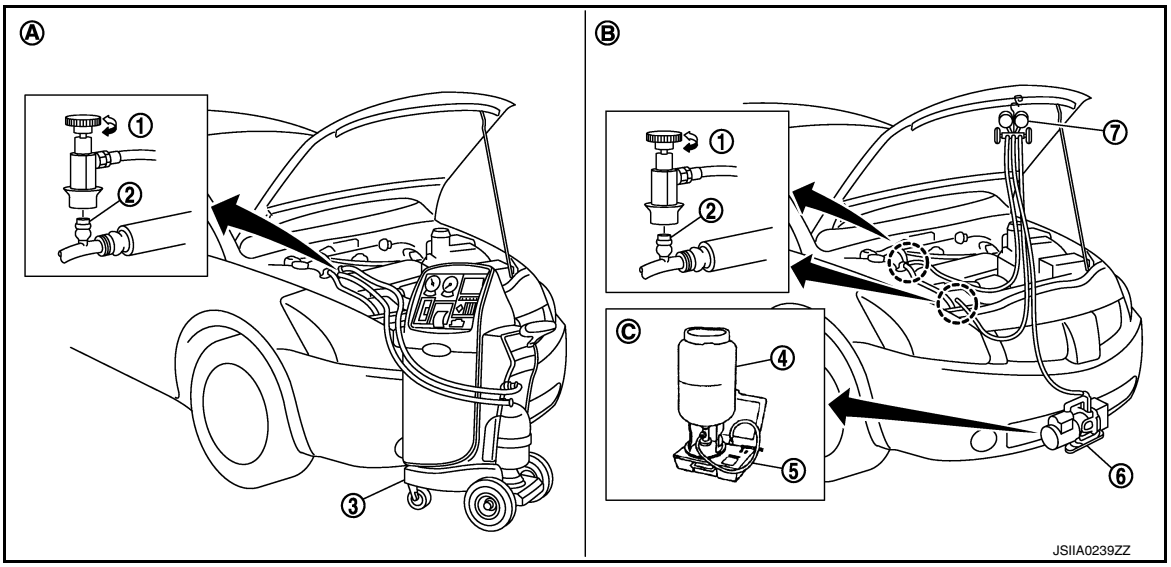
YES >> INSPECTION END
NO >> GO TO 2.

REFRIGERANT

Description

INFOID:0000000013550786

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)		
Ⓐ Preferred (best) method	Ⓑ Alternative method	Ⓒ For charging

Leak Test

INFOID:0000000013550787

CHECK REFRIGERANT LEAKAGE USING ELECTRICAL LEAK DETECTOR

WARNING:

Never check refrigerant leakage while the engine is running.

CAUTION:

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

- **Never 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) to A/C service valve.
3. Check that A/C refrigerant pressure is 345 kPa (3.52 kg/cm^2, 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/cm^2, 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.

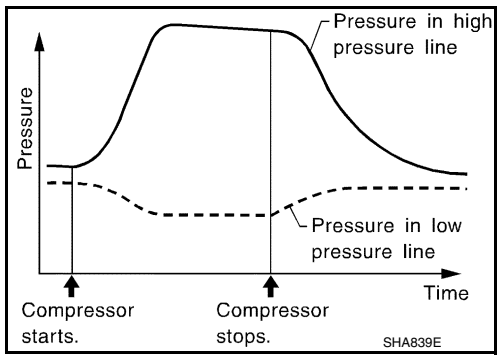
   CAUTION:

   - **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. GO TO 6.)
6. Start the engine and set A/C control in the following conditions.
   - A/C switch ON
   - Air flow: VENT (ventilation)
   - Intake door position: Recirculation
   - Temperature setting: Full cold
   - Fan (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 leakage. GO TO 4.

WARNING:
Be careful not to get burned when the engine is hot.
NOTE:
- Start refrigerant leakage check immediately after the engine is stopped.
- When refrigerant circulation is stopped, pressure on the low-pressure side rises gradually, and after this, pressure on the high-pressure side falls gradually.
- The higher the pressure is, the easier it is to find the refrigerant leakage.



Recycle Refrigerant

INFOID:0000000013550788

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.**
- **Never breathe A/C refrigerant and lubricant vapor or mist. Exposure may irritate eyes, nose, or throat.**
- **Never allow HFC-134a to be exposed to an open flame or others because it generates poisonous gas when in contact with high temperature objects. Keep workshop well ventilated.**

1. Perform lubricant return operation. Refer to HA-18, "Perform Lubricant Return Operation". (If refrigerant or lubricant leakage is detected in a large amount, omit this step, and then GO TO 2.)
   CAUTION:
   Never perform lubricant return operation if a large amount of refrigerant or lubricant leakage is detected.
2. Check gauge pressure readings of recovery/recycling/recharging equipment. When remaining pressure exists, recycle refrigerant from high-pressure hose and low-pressure hose.
   NOTE:
   Follow manufacturer instructions for the handling or maintenance of the equipment. Never fill the equipment with non-specified refrigerant.
3. Remove A/C service valve cap from the vehicle.
4. Connect recovery/recycling/recharging equipment to A/C service valve.
5. Operate recovery/recycling/recharging equipment, and recycle refrigerant from the vehicle.
6. Evacuate air for 10 minutes or more to remove any remaining refrigerant integrated to compressor lubricant, etc.

7. Refrigerant recycle operation is complete.

Charge Refrigerant

INFOID:0000000013550789

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.**
- **Never breathe A/C refrigerant and lubricant vapor or mist. Exposure my irritate eyes, nose, or throat.**
- **Never 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.
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 200 g refrigerant and check that there is no refrigerant leakage. Refer to HA-15, "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 lubricant according to parts that are replaced.
5. Charge the specified amount of refrigerant to A/C system.
6. Check that A/C system operates normally.
7. Disconnect recovery/recycling/recharging equipment. (Collect the refrigerant from the high-pressure hose and low-pressure hose of recovery/recycling/recharging equipment.)
8. Install A/C service valve cap.
9. Refrigerant charge is complete.

LUBRICANT

Description

INFOID:0000000013550790

MAINTENANCE OF LUBRICANT LEVEL

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

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

Name : ND-OIL 8

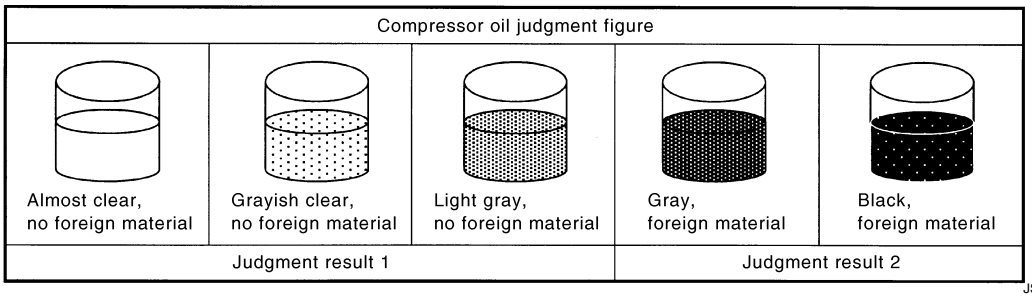
Inspection

INFOID:0000000013550791

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

1.COMPRESSOR OIL JUDGMENT

1. Remove compressor. Refer to HA-25, "Removal and Installation".
2. Sample a compressor oil and judge on the figure.



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Judgement result 1>>Replace compressor only.
Judgement result 2>>Replace compressor and desiccant cartridge (liquid tank).

Perform Lubricant Return Operation

INFOID:0000000013550792

CAUTION:
If a large amount of refrigerant or lubricant leakage is detected, never perform lubricant return operation.

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

Lubricant Adjusting Procedure for Components Replacement Except Compressor

INFOID:0000000013550793

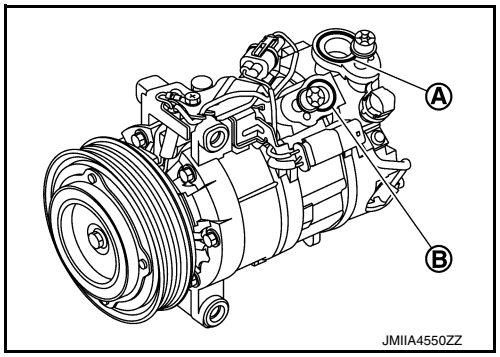
Fill with lubricant for the amount that is calculated according to the following conditions.
Example: Lubricant amount to be added when replacing evaporator and desiccant cartridge (liquid tank) [mℓ (US fl oz., Imp fl oz.)] = 45 (1.5, 1.6) + 30 (1.0, 1.1) + α

Conditions		Lubricant amount to be added to A/C system m ℓ (US fl oz., Imp fl oz.)
Replace evaporator		45 (1.5, 1.6)
Replace desiccant cartridge (liquid tank)		30 (1.0, 1.1)
Refrigerant leakage is detected	Large amount leakage	30 (1.0, 1.1)
	Small amount leakage	—
Lubricant amount that is recycled together with refrigerant during recycle operation		α

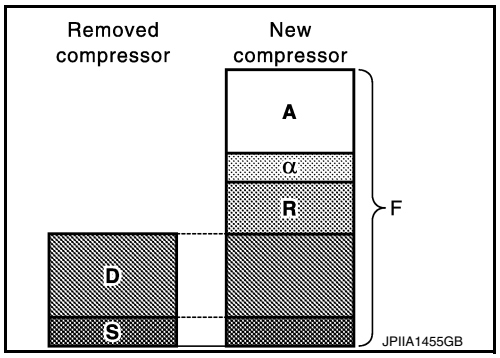
Lubricant Adjusting Procedure for Compressor Replacement

INFOID:0000000013550794

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



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



Amount to be drained (A) [m ℓ (US fl oz., Imp fl oz.)] = F – (D + S + R + α)

F : Lubricant amount that a new compressor contains [120 (4.1, 4.2)]

D : Lubricant amount that is drained from removed compressor

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

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

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

CAUTION:

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

Conditions	Lubricant amount to be added to A/C system m ℓ (US fl oz., Imp fl oz.)
Replace evaporator	45 (1.5, 1.6)
Replace desiccant cartridge (liquid tank)	30 (1.0, 1.1)

Example: Lubricant amount to be drained from a new compressor when replacing compressor and desiccant cartridge (liquid tank) [m ℓ (US fl oz., Imp fl oz.)] [D = 60 (2.0, 2.1), α = 5 (0.2, 0.2)]
120 (4.1, 4.2) – [60 (2.0, 2.1) + 20 (0.7, 0.7) + 30 (1.0, 1.1) + 5 (0.2, 0.2)] = 5 (0.2, 0.2)

3. Install compressor and check the operation.

PERFORMANCE TEST

Inspection

INFOID:0000000013550795

INSPECTION PROCEDURE

1. Connect recovery/recycling/recharging equipment (for HFC-134a) or manifold gauge. Refer to HA-15, "Description".
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 speed	Maximum speed set

3. Maintain test condition until A/C system becomes stable. (Approximately 15 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-22, "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	15 (59)	2.6 – 4.1 (37 – 39)
	20 (68)	6.1 – 8.1 (43 – 47)
	25 (77)	10.1 – 12.6 (50 – 55)
60 – 70	15 (59)	4.1 – 5.7 (39 – 42)
	20 (68)	8.1 – 10.1 (47 – 50)
	25 (77)	12.6 – 15.1 (55 – 59)

AMBIENT AIR TEMPERATURE-TO-OPERATING PRESSURE TABLE

Fresh air		High-pressure (Discharge side) kPa (kg/cm^2, psi)	Low-pressure (Suction side) kPa (kg/cm^2, psi)
Relative humidity %	Air temperature °C (°F)		
50 – 60	25 (77)	830 – 920 (8.5 – 9.4, 120.4 – 133.4)	150 – 170 (1.5 – 1.7, 21.8 – 24.7)
	30 (86)	990 – 1,100 (10.1 – 11.2, 143.6 – 159.5)	180 – 210 (1.8 – 2.1, 26.1 – 30.5)
	35 (95)	1,160 – 1,290 (11.8 – 13.2, 168.2 – 187.1)	220 – 250 (2.2 – 2.6, 31.9 – 36.3)
	40 (104)	1,350 – 1,500 (13.8 – 15.3, 195.8 – 217.5)	260 – 290 (2.7 – 3.0, 37.7 – 42.1)

Fresh air		High-pressure (Discharge side) kPa (kg/cm^2, psi)	Low-pressure (Suction side) kPa (kg/cm^2, psi)
Relative humidity %	Air temperature °C (°F)		
60 – 70	25 (77)	920 – 1,010 (9.4 – 10.3, 133.4 – 146.5)	170 – 190 (1.7 – 1.9, 24.7 – 27.6)
	30 (86)	1,100 – 1,210 (11.2 – 12.3, 159.5 – 175.5)	210 – 240 (2.1 – 2.4, 30.5 – 34.8)
	35 (95)	1,290 – 1,430 (13.2 – 14.6, 187.1 – 207.4)	250 – 280 (2.6 – 2.9, 36.3 – 40.6)
	40 (104)	1,500 – 1,650 (15.3 – 16.8, 217.5 – 239.3)	290 – 320 (3.0 – 3.3, 42.1 – 46.4)

SYMPTOM DIAGNOSIS

REFRIGERATION SYSTEM SYMPTOMS

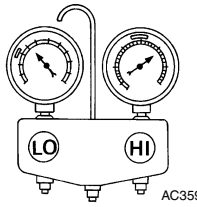
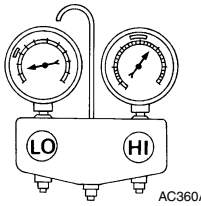
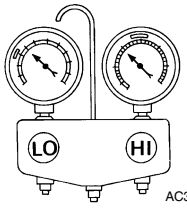
Trouble Diagnosis For Unusual Pressure

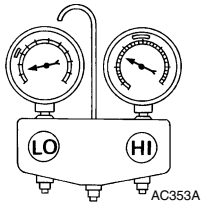
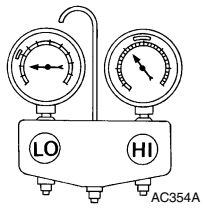
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Diagnose using a manifold gauge whenever system's high and/or low side pressure(s) is/are unusual. The marker above the gauge scale in the following tables indicates the standard (usual) pressure range. Refer to above table (Ambient air temperature-to-operating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

Symptom Table

INFOID:0000000013550797

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
Both high- and low-pressure sides are too high.  AC359A	The pressure returns to normal soon after sprinkling water on condenser.	Overfilled refrigerant.	Collect all refrigerant, evacuate refrigerant cycle again, and then refill it with the specified amount of refrigerant.
	Air flow to condenser is insufficient.	Insufficient condenser cooling performance. • Poor fan rotation of radiator and condenser. • Improper installation of air guide. • Clogged or dirty condenser fins.	• Repair or replace malfunctioning parts. • Clean and repair condenser fins.
	When compressor is stopped, a high-pressure reading quickly drops by approximately 196 kPa (2 kg/cm^2, 28 psi). It then gradually decreases.	Air mixed in refrigerant cycle.	Collect all refrigerant, evacuate refrigerant cycle again, and then refill it with the specified amount of refrigerant.
	• Low-pressure pipe is cooler than the outlet of evaporator. • Low-pressure pipe is frosted.	Expansion valve opened too much (excessive flow of refrigerant).	Replace expansion valve.
High-pressure side is excessively high and low-pressure side is too low.  AC360A	High-pressure pipe and upper side of condenser become hot, however, desiccant cartridge (liquid tank) does not become so hot.	Clogged or crushed high-pressure pipe located between compressor and condenser.	Repair or replace the malfunctioning parts.
High-pressure side is too low and low-pressure side is too high.  AC356A	• The readings of both sides become equal soon after compressor operation stops. • There is no temperature difference between high- and low-pressure sides.	Malfunction in compressor system (insufficient compressor pressure operation). • Damage or breakage of valve. • Malfunctioning gaskets.	Replace compressor.

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
Both high- and low-pressure sides are too low.  	• The area around evaporator outlet does not become cold. • The area around evaporator inlet becomes frosted.	Clogged expansion valve. • Breakage of temperature sensor. • Clogging by foreign material.	Eliminate foreign material from expansion valve, or replace it.
	• There is a temperature difference between the areas around outlet and inlet pipes of desiccant cartridge (liquid tank). • Desiccant cartridge (liquid tank) becomes frosted.	Malfunction in inner desiccant cartridge (liquid tank).	Replace desiccant cartridge (liquid tank)
	Evaporator becomes frosted.	Clogged or crushed low-pressure pipe.	Repair or replace malfunctioning parts.
		Malfunction in intake air temperature sensor.	Check intake sensor system. Refer to HAC-53, "DTC Description".
	There is a small temperature difference between the high and low pressure pipes for refrigerant cycle.	• Shortage of refrigerant. • Leakage of refrigerant.	• Check for leakage. • Collect all refrigerant, evacuate refrigerant cycle again, and then refill it with the specified amount of refrigerant.
Low-pressure side sometimes becomes negative.  	• Sometimes the area around evaporator outlet does not become cold. • Sometimes the area around evaporator inlet is frosted.	• Icing caused by the mixing of water in cooler cycle. • Deteriorated dryer in desiccant cartridge (liquid tank).	• Collect all refrigerant. • Evacuate refrigerant cycle completely, and then refill it with the specified amount of refrigerant. At this time, always replace desiccant cartridge (liquid tank)

NOISE

Symptom Table

INFOID:0000000013550798

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-18, "Inspection".
	Compressor body	Loosened compressor mounting bolts.	Check bolts for tightness. Refer to HA-25, "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-27, "Exploded View".
Unusual noise from expansion valve when A/C is ON.	Expansion valve	Shortage of refrigerant.	• 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.

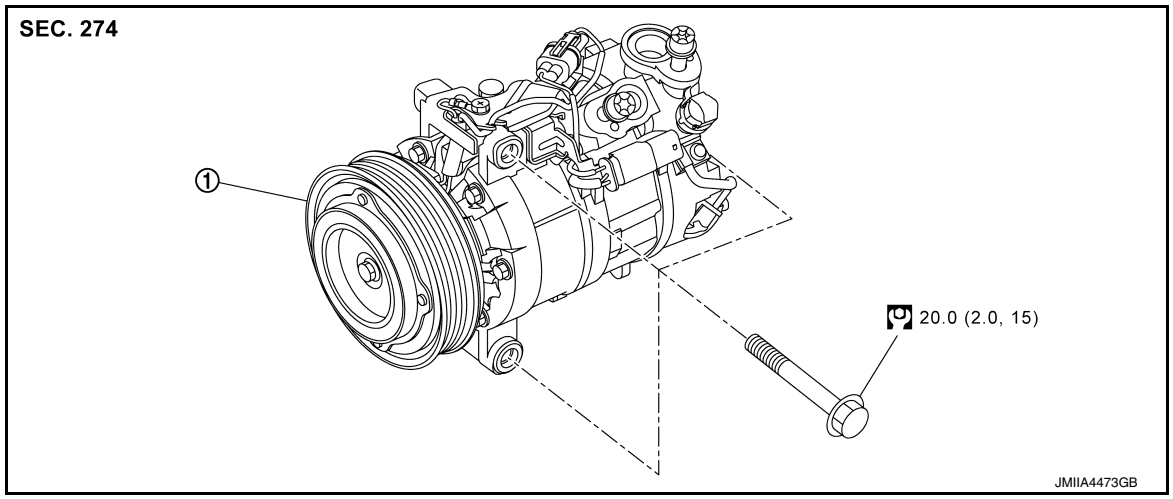
REMOVAL AND INSTALLATION

COMPRESSOR

Exploded View

INFOID:0000000013550799

REMOVAL



① Compressor

: N·m (kg-m, ft-lb)

Removal and Installation

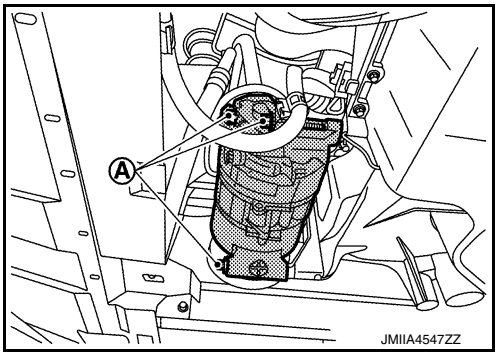
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CAUTION:
Perform lubricant return operation before each refrigeration system disassembly. However, if a large amount of refrigerant or lubricant is detected, never perform lubricant return operation. Refer to HA-18, "Perform Lubricant Return Operation".

REMOVAL

1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant. Refer to HA-16, "Recycle Refrigerant".
2. Remove engine cover. Refer to EM-20, "Removal and Installation".
3. Remove engine under cover. Refer to EXT-44, "ENGINE UNDER COVER : Removal and Installation".
4. Remove air duct (intake). Refer to EM-23, "Removal and Installation".
5. Remove drive belt. Refer to EM-13, "Removal and Installation".
6. Disconnect low-pressure flexible hose from compressor. Refer to HA-28, "LOW-PRESSURE FLEXIBLE HOSE : Removal and Installation".
7. Disconnect high-pressure flexible hose from compressor. Refer to HA-28, "HIGH-PRESSURE FLEXIBLE HOSE : Removal and Installation".
8. Disconnect harness connector.

9. Remove mounting bolts Ⓐ, and then remove compressor.



INSTALLATION

Note the following items, and then install in the reverse order of removal.

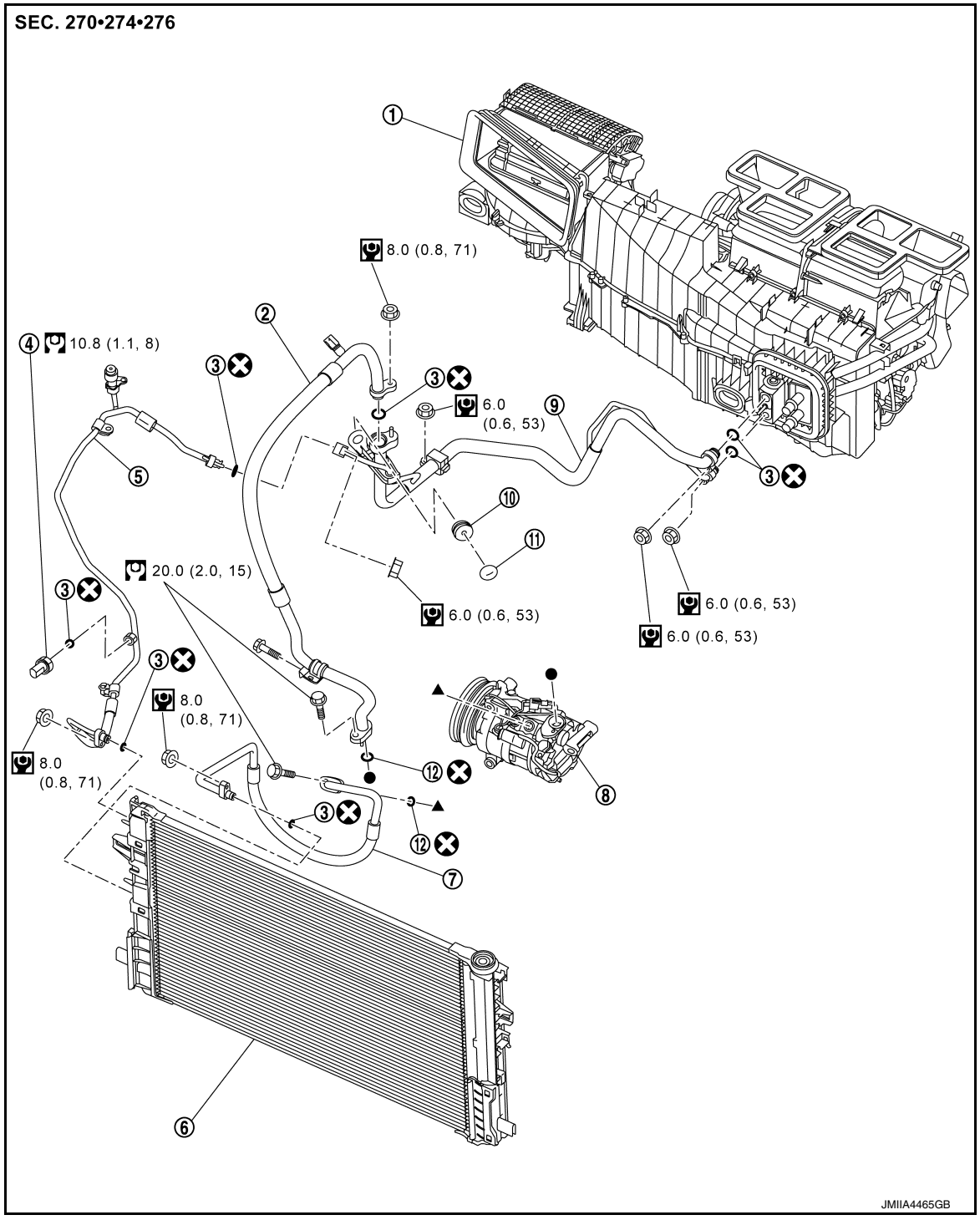
CAUTION:

- **Perform lubricant adjusting procedure before installing new compressor. Refer to HA-19, "Lubricant Adjusting Procedure for Compressor Replacement".**
- **Replace O-rings with new ones. Then apply compressor oil to them when installing.**
- **Check tension of the drive belt after installing compressor. Refer to EM-14, "Inspection".**
- **Use a refrigerant collecting equipment (for HFC-134a) to charge the refrigerant. Refer to HA-17, "Charge Refrigerant".**
- **Check for leakages when recharging refrigerant. Refer to HA-15, "Leak Test".**
- **Perform the operations when replacing compressor. Refer to HAC-51, "Description".**

COOLER PIPE AND HOSE

Exploded View

INFOID:0000000013550801



① A/C unit assembly
② Low-pressure flexible hose
③ O-ring
④ Refrigerant pressure sensor
⑤ High-pressure pipe
⑥ Condenser assembly
⑦ High-pressure flexible hose
⑧ Compressor
⑨ Internal heat exchanger pipe
⑩ Grommet
⑪ Clip
⑫ Seal washer

⊗ : Always replace after every disassembly.

: N·m (kg-m, in-lb)

: N·m (kg-m, ft-lb)

●, ▲ : Indicates that the part is connected at pints with same symbol in actual vehicle.

LOW-PRESSURE FLEXIBLE HOSE

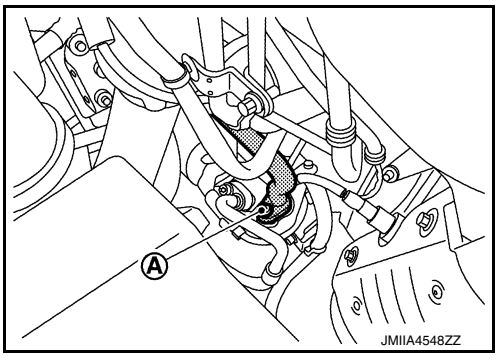
LOW-PRESSURE FLEXIBLE HOSE : Removal and Installation

INFOID:0000000013550802

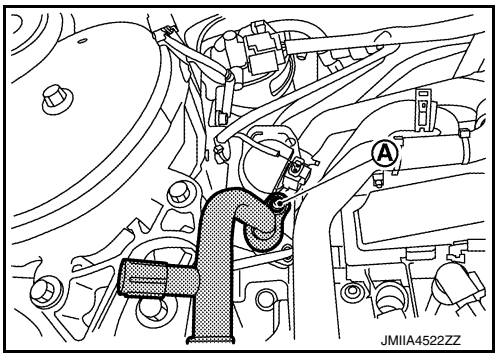
CAUTION:
Perform lubricant return operation before each refrigeration system disassembly. However, if a large amount of refrigerant or lubricant is detected, never perform lubricant return operation. Refer to HA-18, "Perform Lubricant Return Operation".

REMOVAL

1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant. Refer to HA-16, "Recycle Refrigerant".
2. Remove engine cover. Refer to EM-20, "Removal and Installation".
3. Remove mounting bolt Ⓐ, and then disconnect low-pressure flexible hose from compressor.
   CAUTION:
   Cap or wrap the joint of the A/C piping and compressor with suitable material such as vinyl tape to avoid the entry of air.



4. Remove mounting bolt Ⓐ, and then disconnect low-pressure flexible hose from internal heat exchanger pipe.
   CAUTION:
   Cap or wrap the joint of the A/C piping with suitable material such as vinyl tape to avoid the entry of air.



5. Remove low-pressure flexible hose.

INSTALLATION

Note the following items, and then install in the reverse order of removal.

CAUTION:
- **Replace O-rings and seal washer with new ones. Then apply compressor oil to them when installing.**
- **Use a refrigerant collecting equipment (for HFC-134a) to charge the refrigerant. Refer to HA-17, "Charge Refrigerant".**
- **Check for leakages when recharging refrigerant. Refer to HA-15, "Leak Test".**

HIGH-PRESSURE FLEXIBLE HOSE

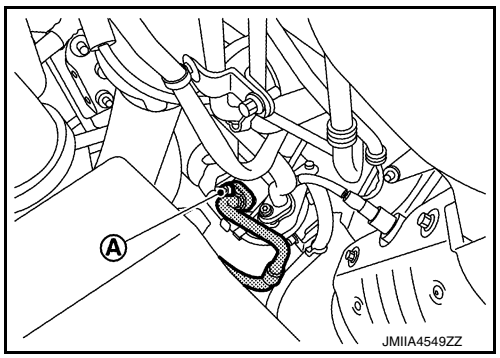
HIGH-PRESSURE FLEXIBLE HOSE : Removal and Installation

INFOID:0000000013550803

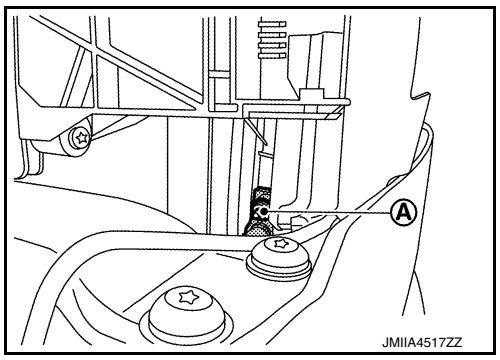
CAUTION:
Perform lubricant return operation before each refrigeration system disassembly. However, if a large amount of refrigerant or lubricant is detected, never perform lubricant return operation. Refer to HA-18, "Perform Lubricant Return Operation".

REMOVAL

1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant. Refer to HA-16, "Recycle Refrigerant".
2. Remove engine cover.
3. Remove mounting bolt Ⓐ, and then disconnect high-pressure flexible hose from compressor.
   CAUTION:
   Cap or wrap the joint of the A/C piping and compressor with suitable material such as vinyl tape to avoid the entry of air.



4. Remove front bumper fascia assembly. Refer to EXT-21, "Removal and Installation".
5. Remove mounting bolt Ⓐ, and then disconnect high-pressure flexible hose from condenser.
   CAUTION:
   Cap or wrap the joint of the A/C piping with suitable material such as vinyl tape to avoid the entry of air.



6. Remove high-pressure flexible hose.

INSTALLATION

Note the following items, and then install in the reverse order of removal.

CAUTION:

- **Replace O-rings with new ones. Then apply compressor oil to them when installing.**
- **Use a refrigerant collecting equipment (for HFC-134a) to charge the refrigerant. Refer to HA-17, "Charge Refrigerant".**
- **Check for leakages when recharging refrigerant. Refer to HA-15, "Leak Test".**

HIGH-PRESSURE PIPE

HIGH-PRESSURE PIPE : Removal and Installation

INFOID:0000000013550804

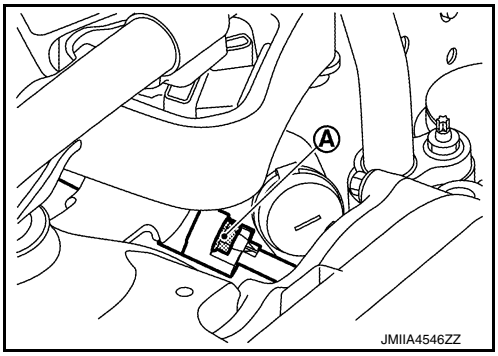
CAUTION:

Perform lubricant return operation before each refrigeration system disassembly. However, if a large amount of refrigerant or lubricant is detected, never perform lubricant return operation. Refer to HA-18, "Perform Lubricant Return Operation".

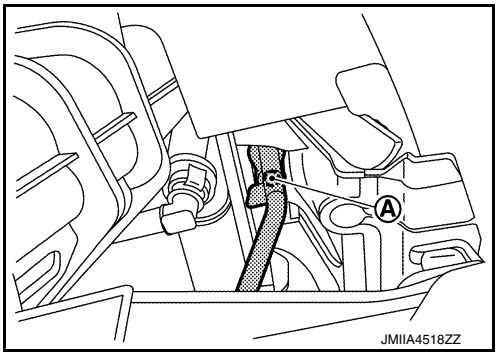
REMOVAL

1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant. Refer to HA-16, "Recycle Refrigerant".

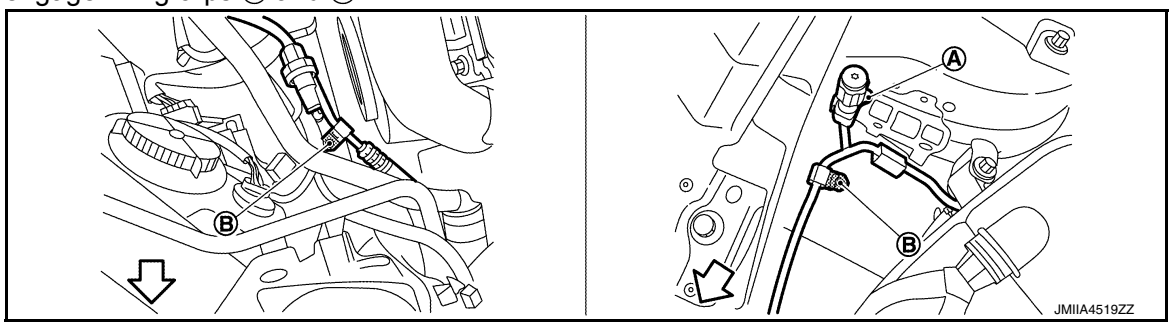
2. Remove mounting bolt Ⓐ, and then disconnect high-pressure pipe from internal heat exchanger pipe.
CAUTION:
Cap or wrap the joint of the A/C piping with suitable material such as vinyl tape to avoid the entry of air.



3. Remove front bumper fascia assembly. Refer to EXT-21, "Removal and Installation".
4. Move reservoir tank secure work space so that high-pressure pipe can be easily removed. Refer to CO-13, "Removal and Installation".
5. Remove mounting bolt Ⓐ, and then disconnect high-pressure pipe.
CAUTION:
Cap or wrap the joint of the A/C piping with suitable material such as vinyl tape to avoid the entry of air.



6. Disconnect refrigerant pressure sensor harness connector.
7. Disengage fixing clips Ⓐ and Ⓑ.



⇦ : Vehicle front

8. Remove high-pressure pipe from the vehicle.

INSTALLATION

Note the following items, and then install in the reverse order of removal.

CAUTION:
- **Replace O-rings with new ones. Then apply compressor oil to them when installing.**
- **Use a refrigerant collecting equipment (for HFC-134a) to charge the refrigerant. Refer to HA-17, "Charge Refrigerant".**
- **Check for leakages when recharging refrigerant. Refer to HA-15, "Leak Test".**

INTERNAL HEAT EXCHANGER PIPE

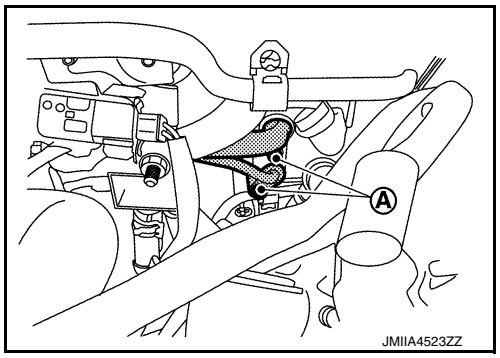
INTERNAL HEAT EXCHANGER PIPE : Removal and Installation

INFOID:0000000013550805

CAUTION:
Perform lubricant return operation before each refrigeration system disassembly. However, if a large amount of refrigerant or lubricant is detected, never perform lubricant return operation. Refer to HA-18, "Perform Lubricant Return Operation".

REMOVAL

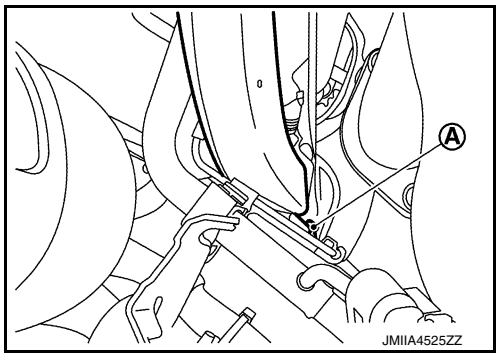
1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant. Refer to HA-16, "Recycle Refrigerant".
2. Remove mounting nuts Ⓐ, and then disconnect internal heat exchanger pipe from expansion valve.
CAUTION:
Cap or wrap the joint of the A/C piping with suitable material such as vinyl tape to avoid the entry of air.



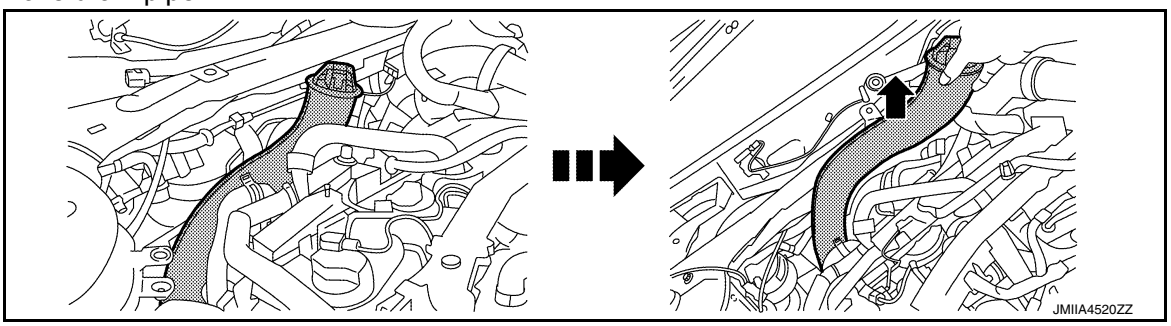
3. Disconnect low-pressure flexible hose from internal heat exchanger pipe. Refer to HA-28, "LOW-PRESSURE FLEXIBLE HOSE : Removal and Installation".
4. Disconnect high-pressure pipe from internal heat exchanger pipe. Refer to HA-28, "HIGH-PRESSURE FLEXIBLE HOSE : Removal and Installation".
5. Remove cowl top cover. Refer to EXT-35, "Removal and Installation".
6. Remove connecting strut. Refer to EM-95, "Removal and Installation".
7. Move coolant circulation pump secure work space. Refer to HA-43, "Removal and Installation".
8. Remove drain pipe.

a. Disconnect harness clips.

b. Remove mounting nut Ⓐ.



c. Remove drain pipe.



9. Remove internal heat exchanger pipe.

INSTALLATION

Note the following items, then install in the reverse order of removal.

CAUTION:
- **Replace O-rings with new ones. Then apply compressor oil to them when installing.**
- **Use a refrigerant collecting equipment (for HFC-134a) to charge the refrigerant. Refer to HA-17, "Charge Refrigerant".**
- **Check for leakages when recharging refrigerant. Refer to HA-15, "Leak Test".**

REFRIGERANT PRESSURE SENSOR

REFRIGERANT PRESSURE SENSOR : Removal and Installation

INFOID:0000000013550806

CAUTION:
Perform lubricant return operation before each refrigeration system disassembly. However, if a large amount of refrigerant or lubricant is detected, never perform lubricant return operation. Refer to HA-18, "Perform Lubricant Return Operation".

REMOVAL

1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant. Refer to HA-16, "Recycle Refrigerant".
2. Clean refrigerant pressure sensor and its surrounding area, and then remove dust and rust from refrigerant pressure sensor.
   CAUTION:
   Be sure to clean carefully.
3. Disconnect refrigerant pressure sensor connector.
4. Use a adjustable wrench or other tool to hold the refrigerant pressure sensor mounting block, and then remove the refrigerant pressure sensor.
   CAUTION:
   Cap or wrap the joint of the high-pressure pipe with suitable material such as vinyl tape avoid the entry of air.

INSTALLATION

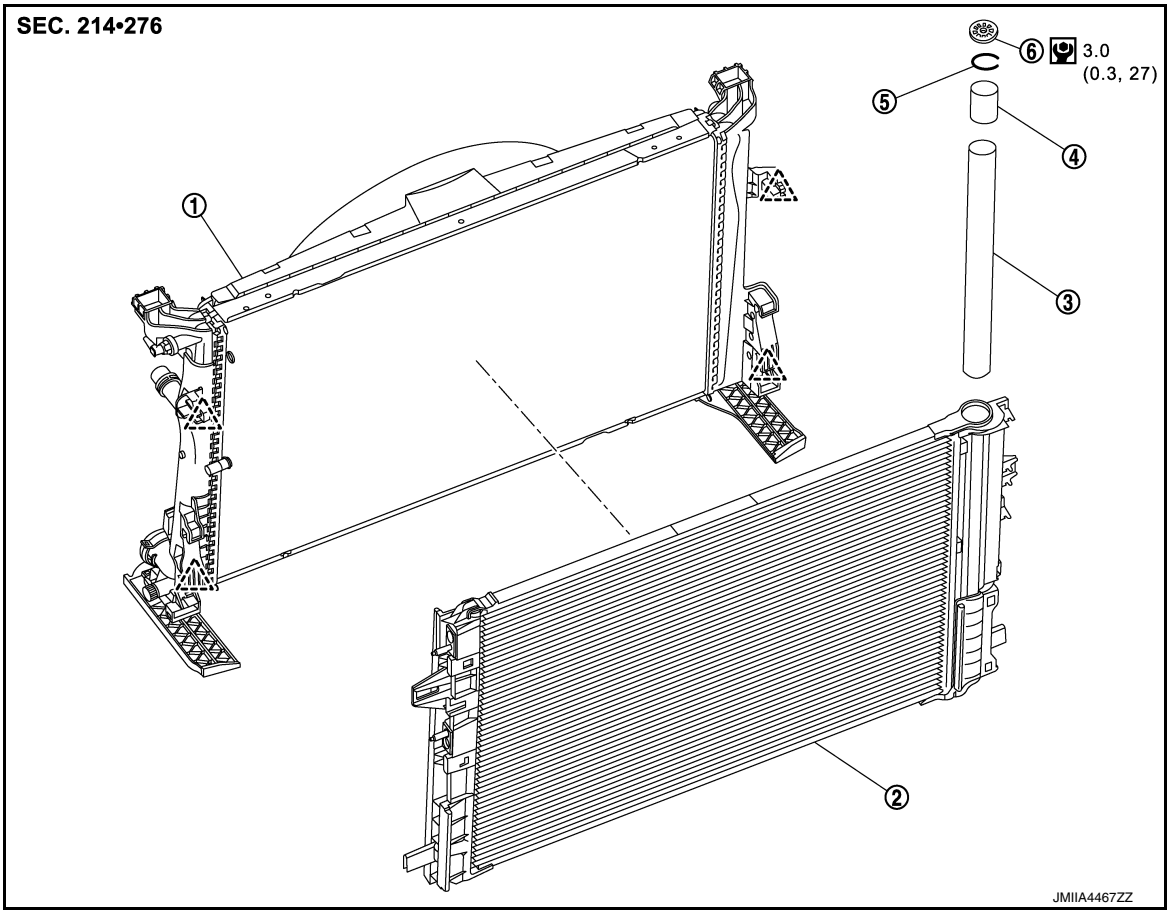
Note the following items, and then install in the reverse order of removal.

CAUTION:
- **Replace O-ring with new one. Then apply compressor oil to them when installing.**
- **Use a refrigerant collecting equipment (for HFC-134a) to charge the refrigerant. Refer to HA-17, "Charge Refrigerant".**
- **Check for leakages when recharging refrigerant. Refer to HA-15, "Leak Test".**

CONDENSER

Exploded View

INFOID:0000000013550807



① Radiator	② Condenser	③ Desiccant cartridge (liquid tank)
④ Drier head	⑤ Snap ring	⑥ Drier cap
: Pawl		
: N·m (kg-m, in-lb)		

CONDENSER

CONDENSER : Removal and Installation

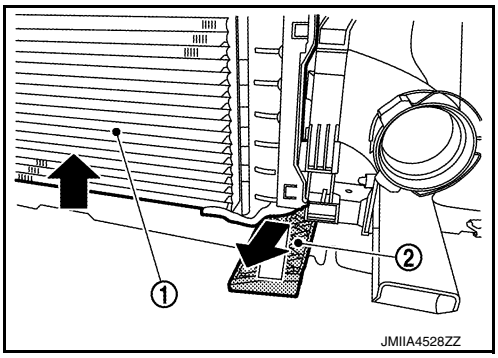
INFOID:0000000013550808

CAUTION:
Perform lubricant return operation before each refrigeration system disassembly. However, if a large amount of refrigerant or lubricant is detected, never perform lubricant return operation. Refer to HA-18, "Perform Lubricant Return Operation".

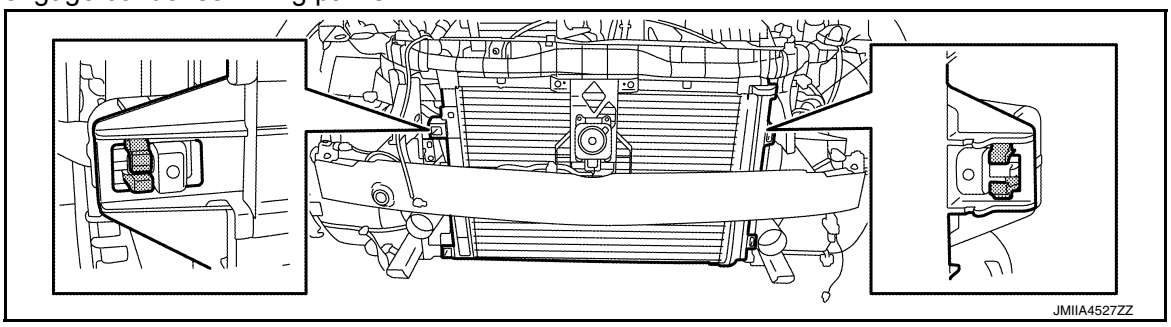
REMOVAL

1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant. Refer to HA-16, "Recycle Refrigerant".
2. Remove charge air cooler. Refer to EM-37, "Removal and Installation".
3. Remove air guide (LH and RH). Refer to DLK-236, "Exploded View".
4. Drain engine coolant. Refer to CO-7, "Draining".
5. Remove radiator hose. Refer to CO-13, "Removal and Installation".
6. Disconnect high-pressure flexible hose from condenser. Refer to HA-28, "HIGH-PRESSURE FLEXIBLE HOSE : Removal and Installation".

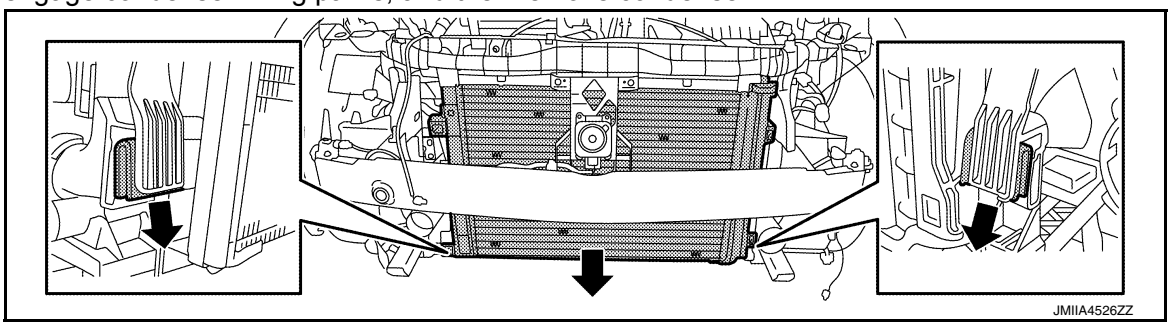
7. Disconnect high-pressure pipe from condenser. Refer to HA-29, "HIGH-PRESSURE PIPE : Removal and Installation".
8. Lift up the condenser and radiator ①, and then remove radiator bracket ② (LH and RH).



9. Disengage condenser fixing pawls.



10. Disengage condenser fixing pawls, and then remove condenser.



INSTALLATION

Note the following items, and then install in the reverse order of removal.

CAUTION:

- **Replace O-rings with new ones. Then apply compressor oil to them when installing.**
- **Use a refrigerant collecting equipment (for HFC-134a) to charge the refrigerant. Refer to HA-17, "Charge Refrigerant".**
- **Check for leakages when recharging refrigerant. Refer to HA-15, "Leak Test".**

DESICCANT CARTRIDGE

DESICCANT CARTRIDGE : Removal and Installation

INFOID:0000000013550809

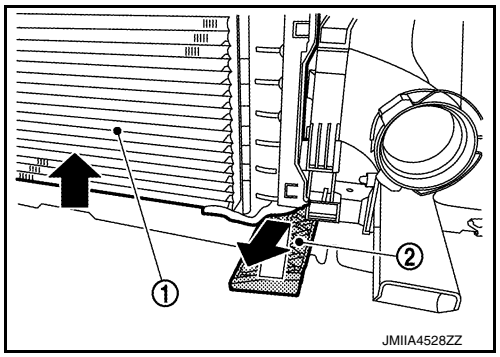
CAUTION:

Perform lubricant return operation before each refrigeration system disassembly. However, if a large amount of refrigerant or lubricant is detected, never perform lubricant return operation. Refer to HA-18, "Perform Lubricant Return Operation".

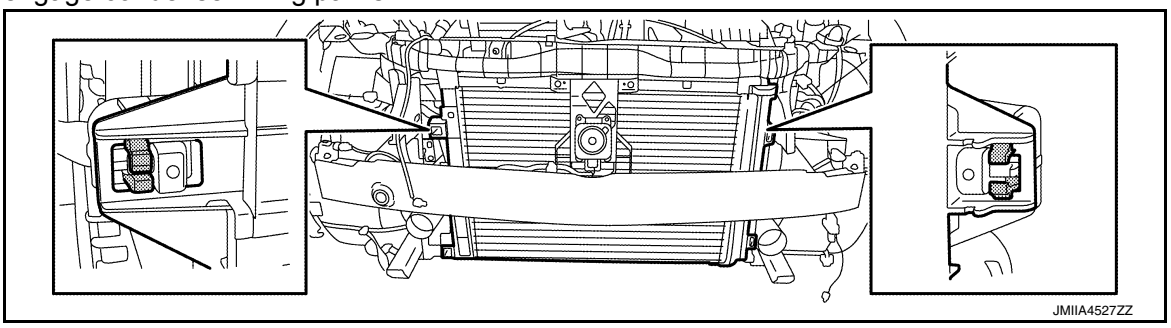
REMOVAL

1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant. Refer to HA-16, "Recycle Refrigerant".
2. Remove air duct (inlet). Refer to EM-23, "Removal and Installation".
3. Remove charge air cooler. Refer to EM-37, "Removal and Installation".

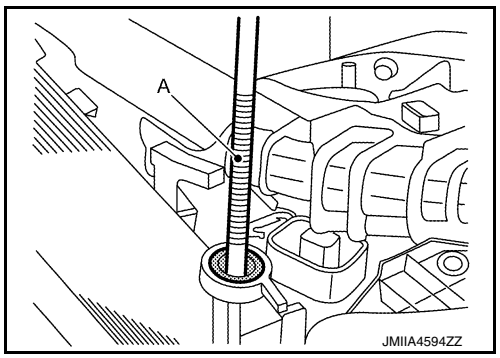
4. Remove air guide (LH and RH). Refer to DLK-236, "Exploded View".
5. Drain engine coolant. Refer to CO-7, "Draining".
6. Remove radiator hose. Refer to CO-13, "Removal and Installation".
7. Disconnect high-pressure flexible hose from condenser. Refer to HA-28, "HIGH-PRESSURE FLEXIBLE HOSE : Removal and Installation".
8. Disconnect high-pressure pipe from condenser. Refer to HA-29, "HIGH-PRESSURE PIPE : Removal and Installation".
9. Lift up the radiator ①, and then remove radiator bracket ② (LH and RH).



10. Disengage condenser fixing pawls.



11. Remove drier cap.
12. Remove snap ring.
13. Remove drier head using a bolt (A).



14. Remove desiccant cartridge.

INSTALLATION

Note the following items, and then install in the reverse order of removal.

CAUTION:

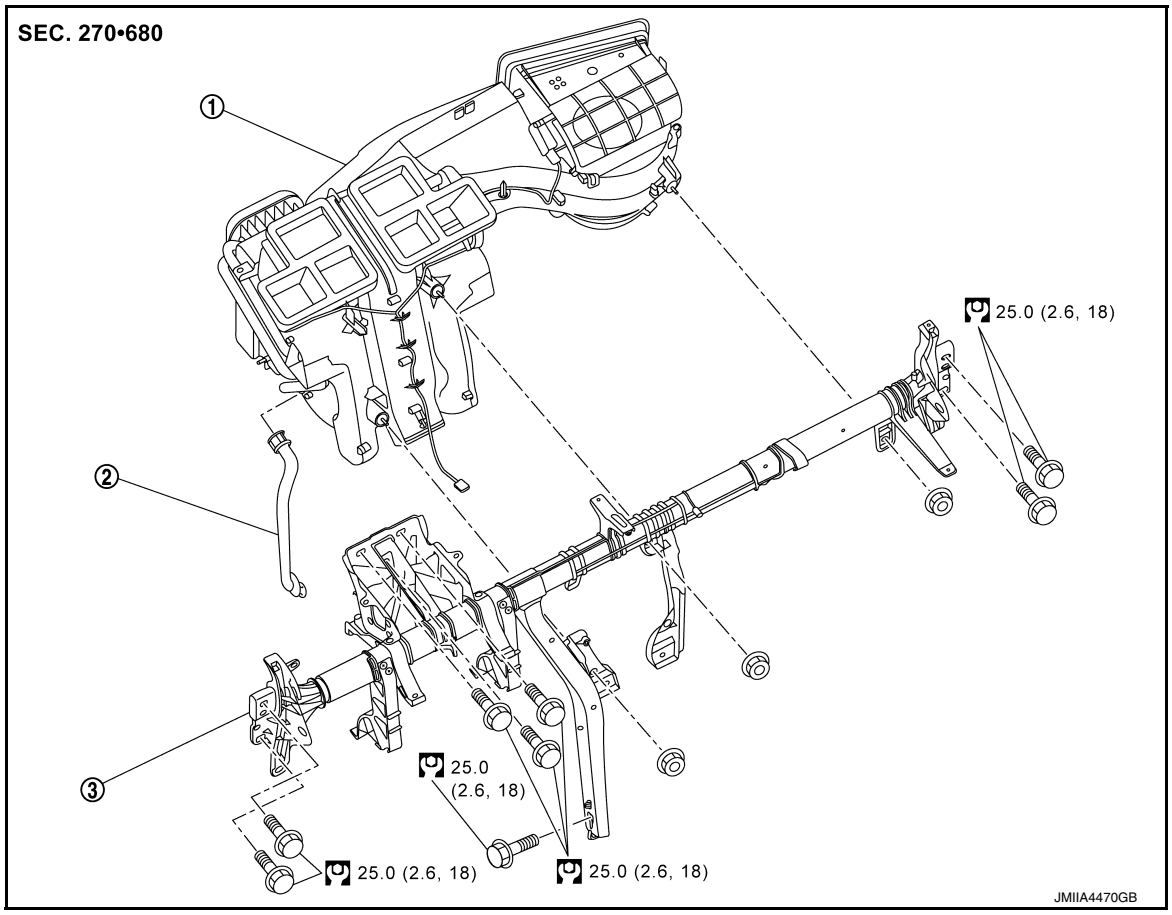
- **Use a refrigerant collecting equipment (for HFC-134a) to charge the refrigerant. Refer to HA-17, "Charge Refrigerant".**
- **Check for leakages when recharging refrigerant. Refer to HA-15, "Leak Test".**

HEATER & COOLING UNIT ASSEMBLY

Exploded View

INFOID:0000000013550810

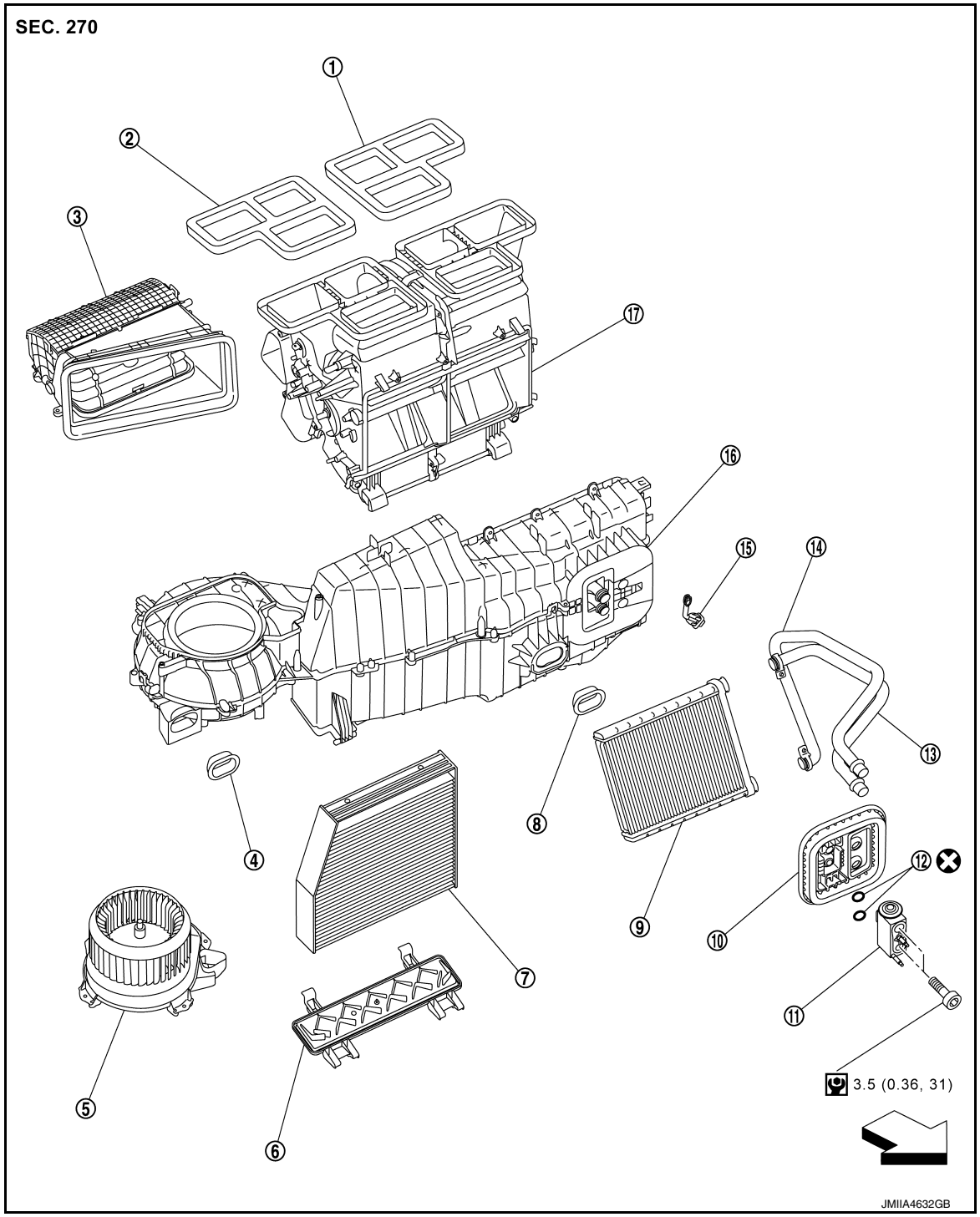
REMOVAL



① A/C unit assembly ② Drain hose ③ Steering member

: N·m (kg-m, ft-lb)

DISASSEMBLY



① Ventilator packing LH
② Ventilator packing RH
③ Intake box case
④ Grommet
⑤ Blower motor assembly
⑥ Air conditioner flitter cover
⑦ Air conditioner flitter
⑧ Grommet
⑨ Heater core
⑩ Packing
⑪ Expansion valve
⑫ O-ring
⑬ Heater pipe
⑭ Heater pipe
⑮ Intake sensor
⑯ Evaporator case
⑰ Blower unit case
⇦ : Vehicle front

: Always replace after every disassembly.

: N·m (kg-m, in-lb)

HEATER & COOLING UNIT ASSEMBLY

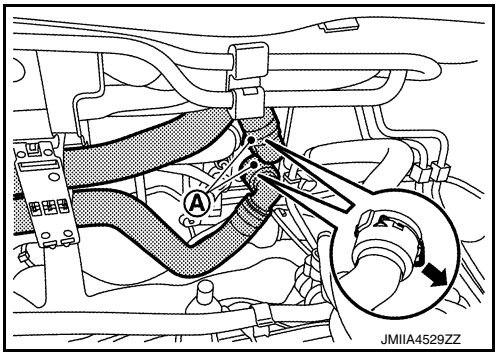
HEATER & COOLING UNIT ASSEMBLY : Removal and Installation

INFOID:0000000013550811

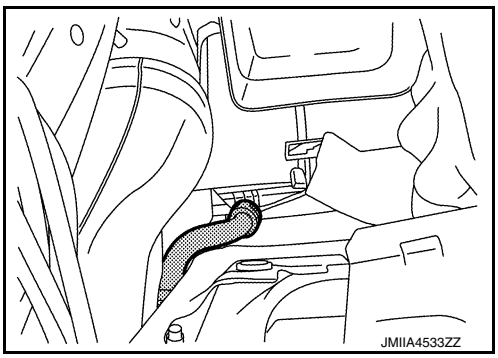
CAUTION:
Perform lubricant return operation before each refrigeration system disassembly. However, if a large amount of refrigerant or lubricant is detected, never perform lubricant return operation. Refer to HA-18, "Perform Lubricant Return Operation".

REMOVAL

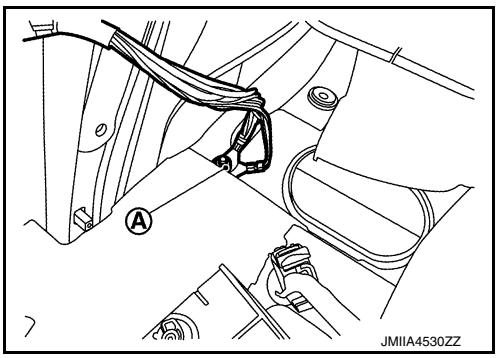
1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant. Refer to HA-16, "Recycle Refrigerant".
2. Drain engine coolant from cooling system. Refer to CO-7, "Draining".
3. Disconnect internal heat exchanger pipe from expansion valve. Refer to HA-30, "INTERNAL HEAT EXCHANGER PIPE : Removal and Installation".
4. Disengage fixing clamps Ⓐ, and then disconnect heater hoses.



5. Remove instrument panel assembly. Refer to IP-13, "Removal and Installation".
6. Disconnect drain hose from A/C unit assembly.

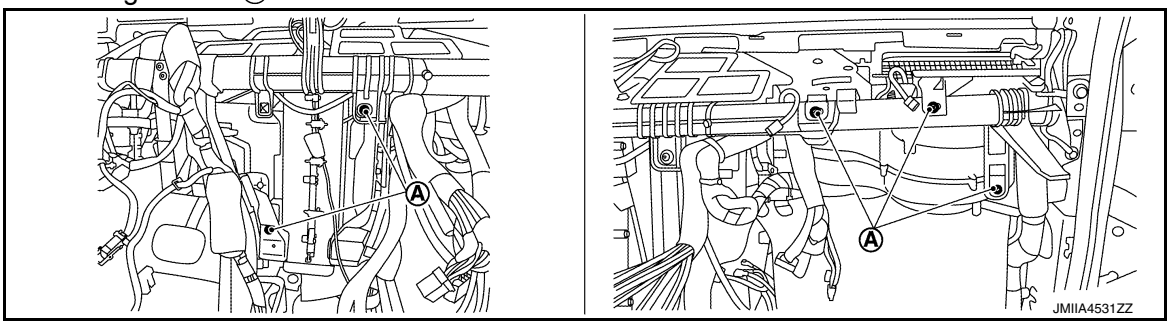


7. Remove ground wire mounting bolt Ⓐ.

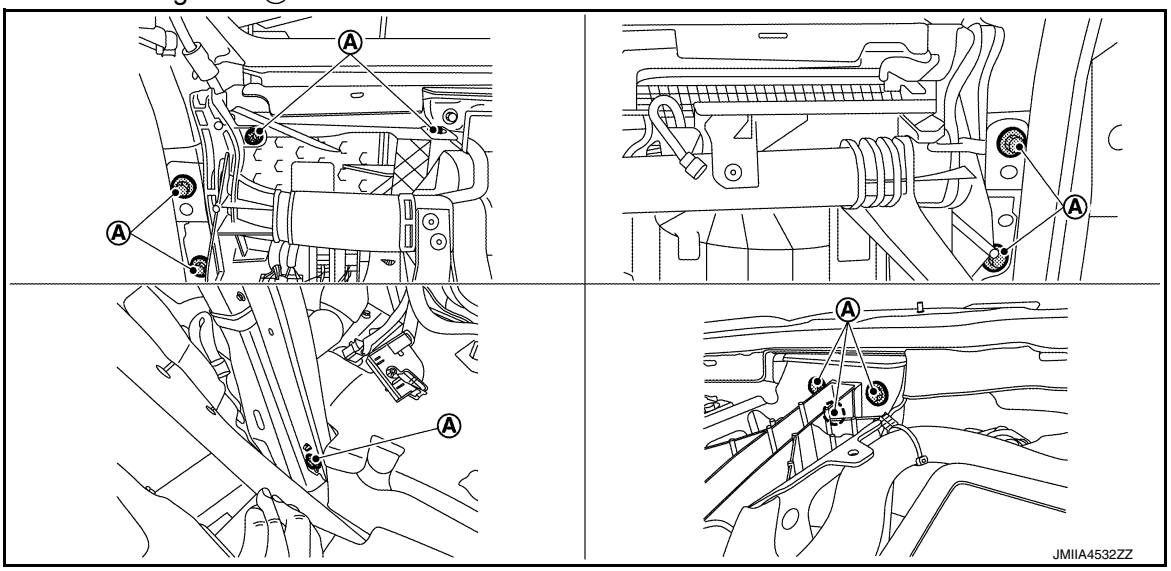


8. Remove harness fixing screws, and then remove harness connectors and harness clips necessary to remove steering member. Move vehicle harness aside.

9. Remove steering column mounting bolts, and then move steering column assembly to secure work space. Refer to ST-9, "Exploded View".
10. Remove fixing screws Ⓐ.



11. Remove Steering member mounting bolt from BCM bracket lower side.
12. Remove mounting bolts Ⓐ.



13. Remove steering member from vehicle.
14. Remove A/C unit assembly from vehicle.

INSTALLATION

Note the following items, and then install in the reverse order of removal.

CAUTION:

- **Replace O-rings with new ones. Then apply compressor oil to them when installing.**
- **Use a refrigerant collecting equipment (for HFC-134a) to charge the refrigerant. Refer to HA-17, "Charge Refrigerant".**
- **Check for leakages when recharging refrigerant. Refer to HA-15, "Leak Test".**

NOTE:

Refer to CO-9, "Refilling" when filling radiator with engine coolant.

HEATER CORE

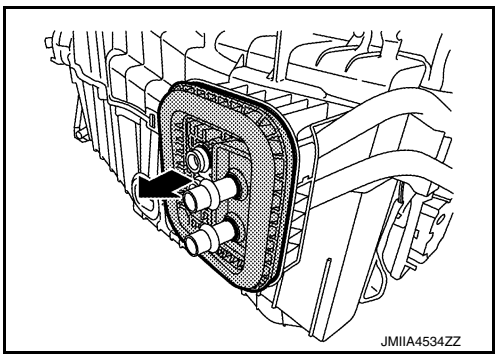
HEATER CORE : Removal and Installation

INFOID:0000000013550812

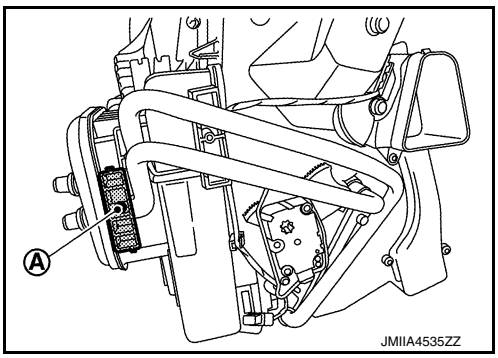
REMOVAL

1. Remove A/C unit assembly. Refer to HA-38, "HEATER & COOLING UNIT ASSEMBLY : Removal and Installation".
2. Remove front foot duct LH. Refer to VTL-11, "FRONT FOOT DUCT : Removal and Installation".

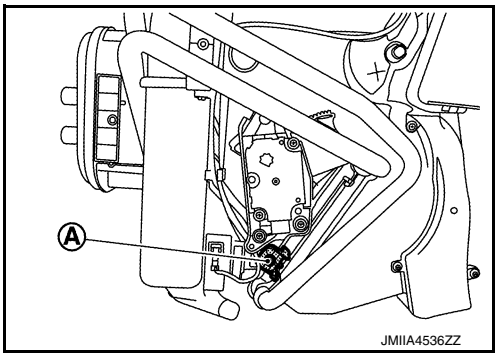
3. Remove packing.



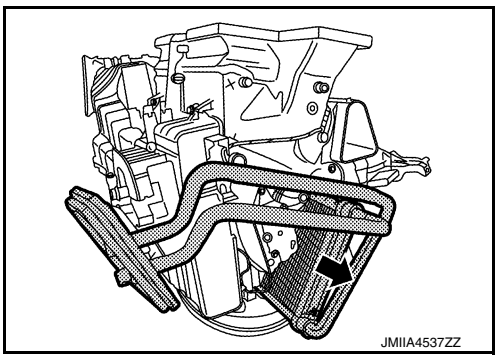
4. Remove fixing screw Ⓐ, and then remove heater pipe cover.



5. Remove fixing screw Ⓐ, and then remove heater pipe bracket.



6. Slide heater core to left side, and then remove heater core.



INSTALLATION

Note the following item, and then install in the reverse order of removal.

NOTE:

Refer to CO-9, "Refilling" when filling radiator with engine coolant.

EVAPORATOR

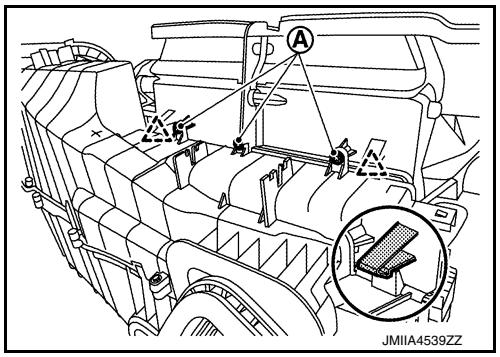
EVAPORATOR : Removal and Installation

INFOID:0000000013550813

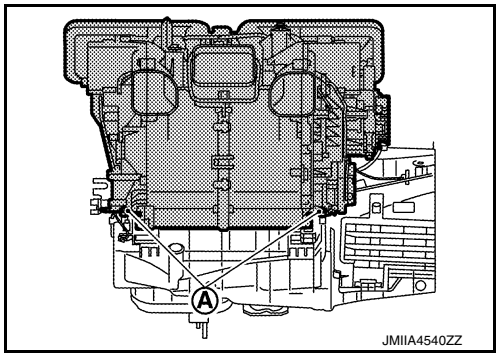
REMOVAL

1. Remove A/C unit assembly. Refer to HA-38, "HEATER & COOLING UNIT ASSEMBLY : Removal and Installation".
2. Remove heater core. Refer to HA-39, "HEATER CORE : Removal and Installation".
3. Remove front foot duct (LH and RH). Refer to VTL-11, "FRONT FOOT DUCT : Removal and Installation".
4. Remove fixing screws Ⓐ, and then disengage fixing pawls.

: Pawl

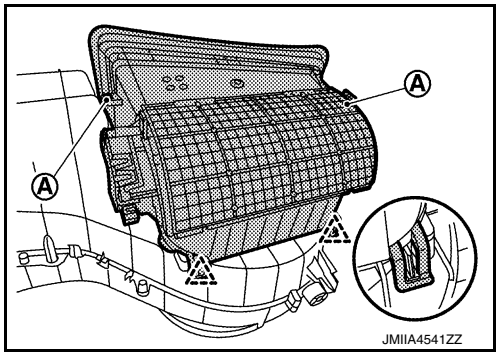


5. Remove fixing screws Ⓐ, and then remove blower unit case.



6. Remove fixing screws Ⓐ and disengage fixing pawls, and then remove intake box case.

: Pawl



7. Remove the following parts after removing evaporator.
   - Expansion valve. Refer to HA-41, "EXPANSION VALVE : Removal and Installation".
   - Intake sensor. Refer to HAC-126, "Removal and Installation".

INSTALLATION

Note the following items, and then install in the reverse order of removal.

CAUTION:

- **Replace O-rings with new ones. Then apply compressor oil to them when installing.**
- **Mark the mounting position of intake sensor bracket prior to removal so that the reinstalled sensor can be located in the same position.**
- **Use a refrigerant collecting equipment (for HFC-134a) to charge the refrigerant. Refer to HA-17, "Charge Refrigerant".**
- **Check for leakages when recharging refrigerant. Refer to HA-15, "Leak Test".**

EXPANSION VALVE

EXPANSION VALVE : Removal and Installation

INFOID:0000000013550814

REMOVAL

1. Disconnect internal heat exchanger pipe from expansion valve. Refer to HA-30, "INTERNAL HEAT EXCHANGER PIPE : Removal and Installation".
2. Remove mounting bolts, and then remove expansion valve.
   CAUTION:
   Cap or wrap the joint of evaporator and expansion valve with suitable material such as vinyl tape to avoid the entry of air.

INSTALLATION

Note the following items, and then install in the reverse order of removal.

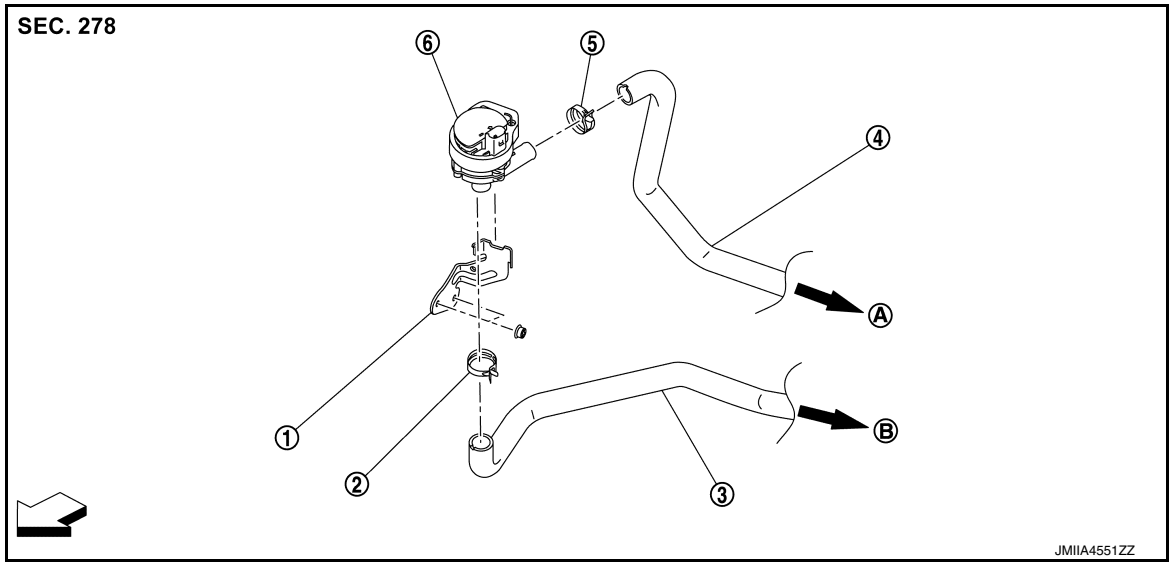
CAUTION:

- **Replace O-rings with new ones. Then apply compressor oil to them when installing.**
- **Use a refrigerant collecting equipment (for HFC-134a) to charge the refrigerant. Refer to HA-17, "Charge Refrigerant".**
- **Check for leakages when recharging refrigerant. Refer to HA-15, "Leak Test".**

COOLANT CIRCULATION PUMP

Exploded View

INFOID:0000000013550815



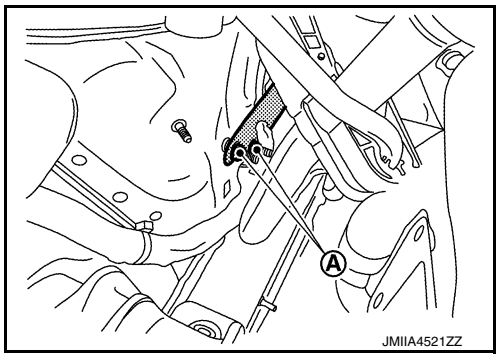
① Coolant circulation pump bracket ② Clamp ③ Water hose
④ Water hose ⑤ Clamp ⑥ Coolant circulation pump
Ⓐ To heater core Ⓑ To thermostat
⇦ : Vehicle front

Removal and Installation

INFOID:0000000013550816

REMOVAL

1. Drain engine coolant. Refer to CO-7, "Draining".
2. Disconnect coolant circulation pump harness connector.
3. Disconnect clamps, and then disconnect water hoses from coolant circulation pump.
4. Remove coolant circulation pump from coolant circulation pump bracket.
5. Remove mounting nuts Ⓐ, and then remove coolant circulation pump bracket.



INSTALLATION

Note the following items, and install in the reverse order of removal.

CAUTION:

After removing the heater pump from the mount rubber, be sure to reinstall the heater pump to its original position to securely install water hose.

NOTE:

Refer to CO-9, "Refilling" when filling radiator with engine coolant.

SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

Compressor

INFOID:0000000013550817

Model		6SAS14C
Type		Variable displacement swash plate
Displacement cm^3 (cu in)/rev	Maximum	140 (8.6)
Direction of rotation		Clockwise (viewed from clutch)
Drive belt		Poly V

Lubricant

INFOID:0000000013550818

Name		ND-OIL8
Capacity m ℓ (US fl oz., Imp fl oz.)	Total in system	120 (4.1, 4.2)
	Compressor (service part) charging amount	120 (4.1, 4.2)

Refrigerant

INFOID:0000000013550819

Type	HFC-134a (R-134a)
Capacity kg (lb)	0.65 (1.43)

Belt Tension

INFOID:0000000013550820

Refer to EM-102, "Drive Belt".