SECTION HA

HEATER & AIR CONDITIONING SYSTEM

CONTENTS

PRECAUTION

PRECAUTIONS

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

INFOID:0000000008143744

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted.
Information necessary to service the system safely is included in the “SRS AIR BAG” and “SEAT BELT” of this Service Manual.

WARNING:

Always observe the following items for preventing accidental activation.

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision that would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see “SRS AIR BAG”.**
- **Never 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:

Always observe the following items for preventing accidental activation.

- **When working near the Air Bag Diagnosis Sensor Unit or other Air Bag System sensors with the ignition ON or engine running, never use air or electric power tools or strike near the sensor(s) with a hammer. Heavy vibration could activate the sensor(s) and deploy the air bag(s), possibly causing serious injury.**
- **When using air or electric power tools or hammers, always switch the ignition OFF, disconnect the battery, and wait at least 3 minutes before performing any service.**

Precaution Necessary for Steering Wheel Rotation after Battery Disconnect

INFOID:0000000008143745

NOTE:

- Before removing and installing any control units, first turn the push-button ignition switch to the LOCK position, then disconnect both battery cables.
- After finishing work, confirm that all control unit connectors are connected properly, then re-connect both battery cables.
- Always use CONSULT-III to perform self-diagnosis as a part of each function inspection after finishing work. If a DTC is detected, perform trouble diagnosis according to self-diagnosis results.

For vehicle with steering lock unit, if the battery is disconnected or discharged, the steering wheel will lock and cannot be turned.
If turning the steering wheel is required with the battery disconnected or discharged, follow the operation procedure below before starting the repair operation.

OPERATION PROCEDURE

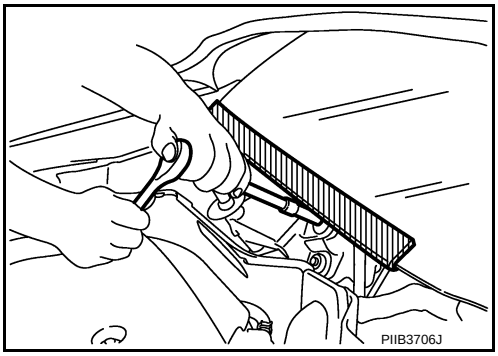
1. Connect both battery cables.
   NOTE:
   Supply power using jumper cables if battery is discharged.
2. Turn the push-button ignition switch to ACC position.
   (At this time, the steering lock will be released.)
3. Disconnect both battery cables. The steering lock will remain released with both battery cables disconnected and the steering wheel can be turned.
4. Perform the necessary repair operation.

5. When the repair work is completed, re-connect both battery cables. With the brake pedal released, turn the push-button ignition switch from ACC position to ON position, then to LOCK position. (The steering wheel will lock when the push-button ignition switch is turned to LOCK position.)
6. Perform self-diagnosis check of all control units using CONSULT-III.

Precaution for Procedure without Cowl Top Cover

INFOID:0000000008143746

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



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

INFOID:0000000008143747

WARNING:

- **CFC-12 (R-12) refrigerant and HFC-134a (R-134a) refrigerant are not compatible. If the refrigerants are mixed electric compressor failure is likely to occur. Refer to HA-20, "Check Refrigerant Leakage". 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 electric compressor oil for the HFC-134a (R-134a) A/C system and HFC-134a (R-134a) components. If electric compressor oil other than that specified is used, electric compressor failure is likely to occur.**
- **The specified HFC-134a (R-134a) electric compressor oil rapidly absorbs moisture from the atmosphere. The following handling precautions must be observed:**

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

Contaminated Refrigerant

INFOID:0000000008143748

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

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

- If the vehicle is within the warranty period, the air conditioner warranty is void. Please contact NISSAN Customer Affairs for further assistance.

General Refrigerant Precaution

INFOID:0000000008143749

WARNING:

- **Do not release refrigerant into the air. Use approved recovery/recycling equipment to capture the refrigerant every time an air conditioning system is discharged.**
- **Always wear eye and hand protection (goggles and gloves) when working with any refrigerant or air conditioning system.**
- **Do not store or heat refrigerant containers above 52°C (125°F).**
- **Do not heat a refrigerant container with an open flame; if container warming is required, place the bottom of the container in a warm pail of water.**
- **Do not intentionally drop, puncture, or incinerate refrigerant containers.**
- **Keep refrigerant away from open flames: poisonous gas will be produced if refrigerant burns.**
- **Refrigerant will displace oxygen, therefore be certain to work in well ventilated areas to prevent suffocation.**
- **Do not pressure test or leak test HFC-134a (R-134a) service equipment and/or vehicle air conditioning systems with compressed air during repair. Some mixtures of air and HFC-134a (R-134a) have been shown to be combustible at elevated pressures. These mixtures, if ignited, may cause injury or property damage. Additional health and safety information may be obtained from refrigerant manufacturers.**

CAUTION:

- **Wear electrically insulated gloves and pull out the service plug grip before inspection as procedures may require disconnecting high voltage connectors. Be sure to carry the removed service plug grip because other workers may install it by mistake.**
- **Never touch the high voltage connectors or terminals for 10 minutes after the service plug grip is removed.**

Precaution for Leak Detection Dye

INFOID:0000000008143750

- The A/C system does not contain a fluorescent leak detection dye.
- Do not use fluorescent leak detection dye in the A/C system.

A/C Identification Label

INFOID:0000000008143751

Vehicles with factory installed A/C systems have this identification label on the underside of hood.

Precaution for Electric Compressor Oil

INFOID:0000000008143752

- Use Electric Compressor ND-OIL 11 only for the electric compressor of the air conditioning system. Using other A/C oils may damage the system as they may conduct electricity.
- Electrical insulation performance may decrease significantly when even a small amount of oil other then Electric Compressor Oil ND-OIL 11 is contaminated in the refrigeration cycle, causing a DTC to be output.
- Avoid using the recovery/recycling equipment that has been used for vehicles with conventional A/C oil.
- Or wash the recovery/recycling equipment to thoroughly remove the conventional A/C oil.

Precaution for Service of Electric Compressor

INFOID:0000000008143753

- **Plug all openings to prevent moisture and foreign matter from entering.**
- **When the electric compressor is removed, store it in the same position as it is when mounted on the car.**
- **When replacing or repairing electric compressor, refer to HA-24, "Lubricant Adjusting Procedure for Compressor Replacement".**
- **After the electric compressor is installed, turn ignition switch (READY) and operate the electric compressor for more than two minutes.**

Precaution for Service Equipment

INFOID:0000000008143754

RECOVERY/RECYCLING EQUIPMENT

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

ELECTRONIC LEAK DETECTOR

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

PRECAUTION FOR ELECTRIC COMPRESSOR OIL

Use Electric Compressor Oil ND-OIL 11 only for the electric compressor of the air conditioning system. Using other A/C oils may damage the A/C system as they may conduct electricity.

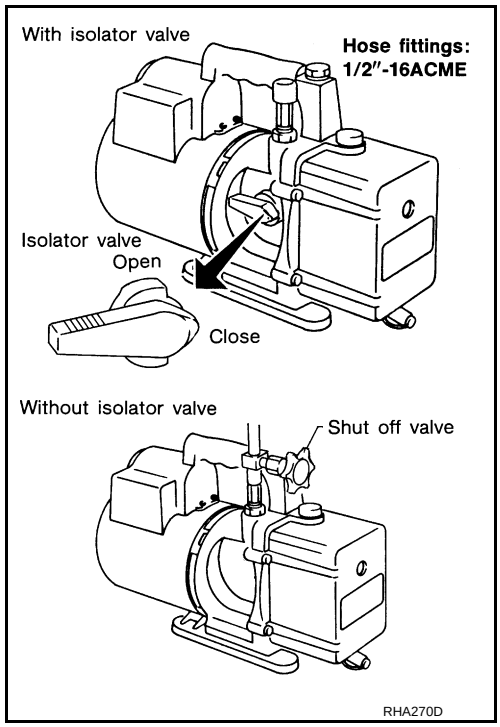
VACUUM PUMP

The electric compressor oil contained inside the vacuum pump is not compatible with the specified electric compressor 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 electric compressor oil may migrate out of the pump into the service hose. This is possible when the pump is switched off after evacuation (vacuuming) and hose is connected to it.

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

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

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

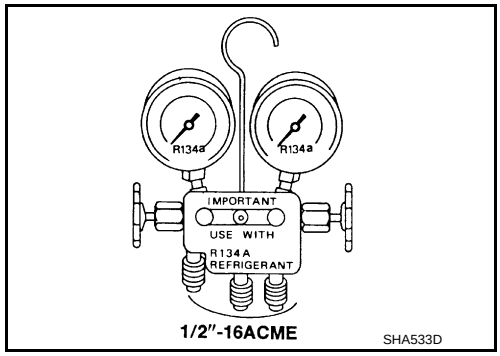


MANIFOLD GAUGE SET

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

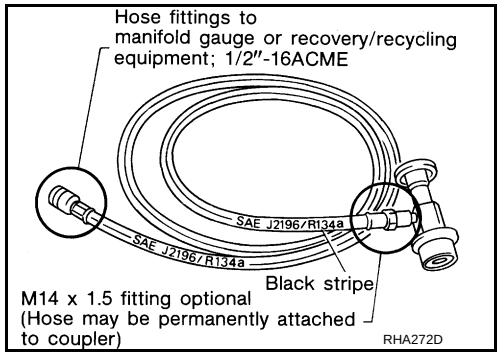
CAUTION:

Avoid using tools that have been used for vehicles with conventional A/C oil as much as possible. This will result in insulation performance deterioration. A tool that has been used three times or less can be reused if ann appropriate one is not available.



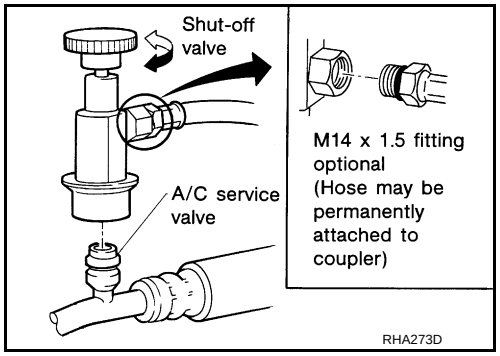
SERVICE HOSES

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



SERVICE COUPLERS

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



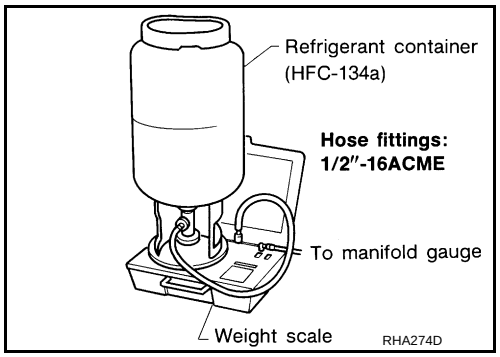
Shut-off valve rotation	A/C service valve
Clockwise	Open
Counterclockwise	Close

CAUTION:

Avoid using tools that have been used for vehicles with conventional A/C oil as much as possible. This will result in insulation performance deterioration. A tool that has been used three times or less can be reused if ann appropriate one is not available.

REFRIGERANT WEIGHT SCALE

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



CHARGING CYLINDER

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

High Voltage Precautions

INFOID:0000000008143755

WARNING:

- **Because hybrid vehicles and electric vehicles contain a high voltage battery, there is the risk of electric shock, electric leakage, or similar accidents if the high voltage component and vehicle are handled incorrectly. Be sure to follow the correct work procedures when performing inspection and maintenance.**
- **Be sure to remove the service plug in order to shut off the high voltage circuits before performing inspection or maintenance of high voltage system harnesses and parts.**
- **To prevent the removed service plug from being connected by mistake during the procedure, always carry it in your pocket or put it in the tool box.**
- **Be sure to wear insulating protective equipment consisting of glove, shoes, face shield, and glasses before beginning work on the high voltage system.**
- **Clearly identify the persons responsible for high voltage work and ensure that other persons do not touch the vehicle. When not working, cover high voltage parts with an insulating cover sheet or similar item to prevent other persons from contacting them.**

CAUTION:

There is the possibility of a malfunction occurring if the vehicle is changed to READY status while the service plug is removed. Therefore do not change the vehicle to READY status unless instructed to do so in the Service Manual.

HIGH VOLTAGE HARNESS AND EQUIPMENT IDENTIFICATION

The colors of the high voltage harnesses and connectors are all orange. Orange "High Voltage" labels are applied to the Li-ion battery and other high voltage devices. Do not carelessly touch these harnesses and parts.

HANDLING OF HIGH VOLTAGE HARNESS AND TERMINALS

Immediately insulate disconnected high voltage connectors and terminals with insulating tape.

REGULATIONS ON WORKERS WITH MEDICAL ELECTRONICS

WARNING:

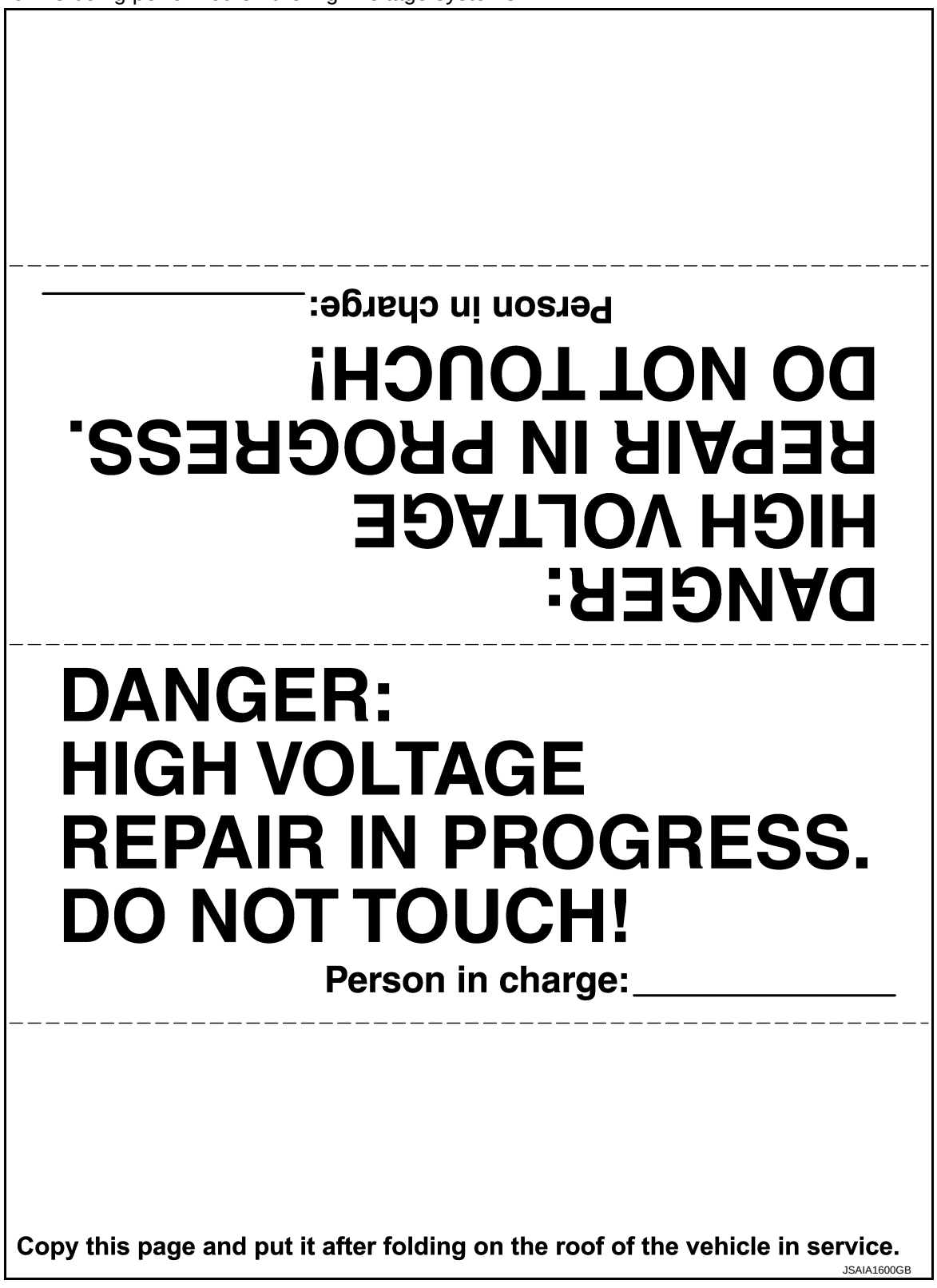
The vehicle contains parts that contain powerful magnets. If a person who is wearing a heart pacemaker or other medical device is close to these parts, the medical device may be affected by the magnets. Such persons must not perform work on the vehicle.

PROHIBITED ITEMS TO CARRY DURING THE WORK

Because this vehicle uses components that contain high voltage and powerful magnetism, due not carry any metal products which may cause short circuits, or any magnetic media (cash cards, prepaid cards, etc.) which may be damaged on your person when working.

POSTING A SIGN OF “DANGER! HIGH VOLTAGE AREA. KEEP OUT”

To call the attention of other workers, indicate "High voltage work in progress. Do not touch!" on vehicles where work is being performed on the high voltage systems.



PREPARATION

PREPARATION

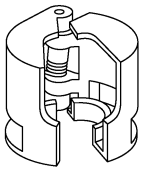
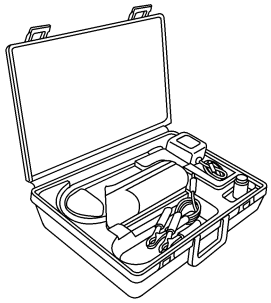
Special Service Tool

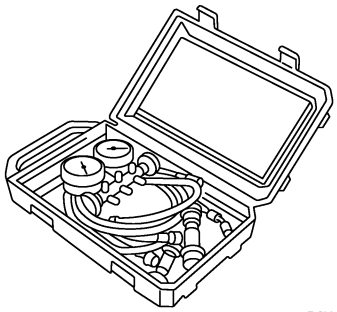
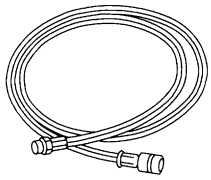
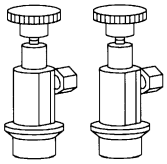
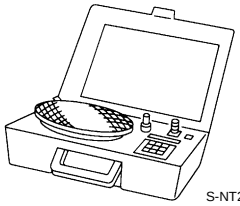
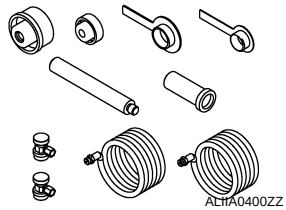
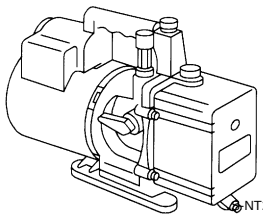
INFOID:0000000008143756

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
Disconnector tool set (J-45815)	 RJIA0391J	Disconnect one-touch joint connection
(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)

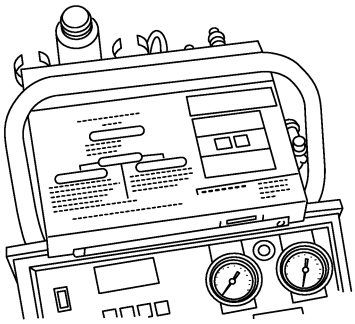
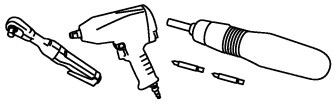
Tool number (Kent-Moore No.) Tool name		Description
(J-39183) Manifold gauge set (with hoses and couplers)	 RJIA0196E	Identification: • The gauge face indicates HFC-134a (R-134a). Fitting size: Thread size • 1/2″-16 ACME
Service hoses • High-pressure side hose (J-39501-72) • Low-pressure side hose (J-39502-72) • 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-48756) Altima HEV service tool kit* • — (J-48767) Hoses and service adaptors	 ALIIA0400ZZ	Hose and adaptor color: • Low side hose: Blue • High side hose: Red • Low side adaptor: Blue • High side adaptor: Red
(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

CAUTION:

*** Avoid using tools that have been used for vehicles with conventional A/C oil as much as possible. This will result in insulation performance deterioration. A tool that has been used three times or less can be reused if an appropriate one is not available.**

Commercial Service Tool

INFOID:0000000008143757

Tool number Tool name		Description
J-41810-NI Refrigerant identifier equipment HFC 134a (R-134a)*	 RJIA0197E	Checking refrigerant purity and system contamination
Power tool	 PIIB1407E	Removing bolts, screws and nuts

CAUTION:

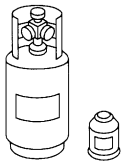
*** Avoid using tools that have been used for vehicles with conventional A/C oil as much as possible. This will result in insulation performance deterioration. A tool that has been used three times or less can be reused if an appropriate one is not available.**

Sealant or/and Lubricant

INFOID:0000000008143758

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
Refrigerant HFC-134a (R-134a)  S-NT196	Container color: Light blue Container marking: HFC-134a (R-134a) Fitting size: Thread size • large container 1/2” -16 ACME
Electric Compressor Oil ND-OIL 11*  S-NT197	Type: Electric Compressor Oil ND-OIL 11

CAUTION:

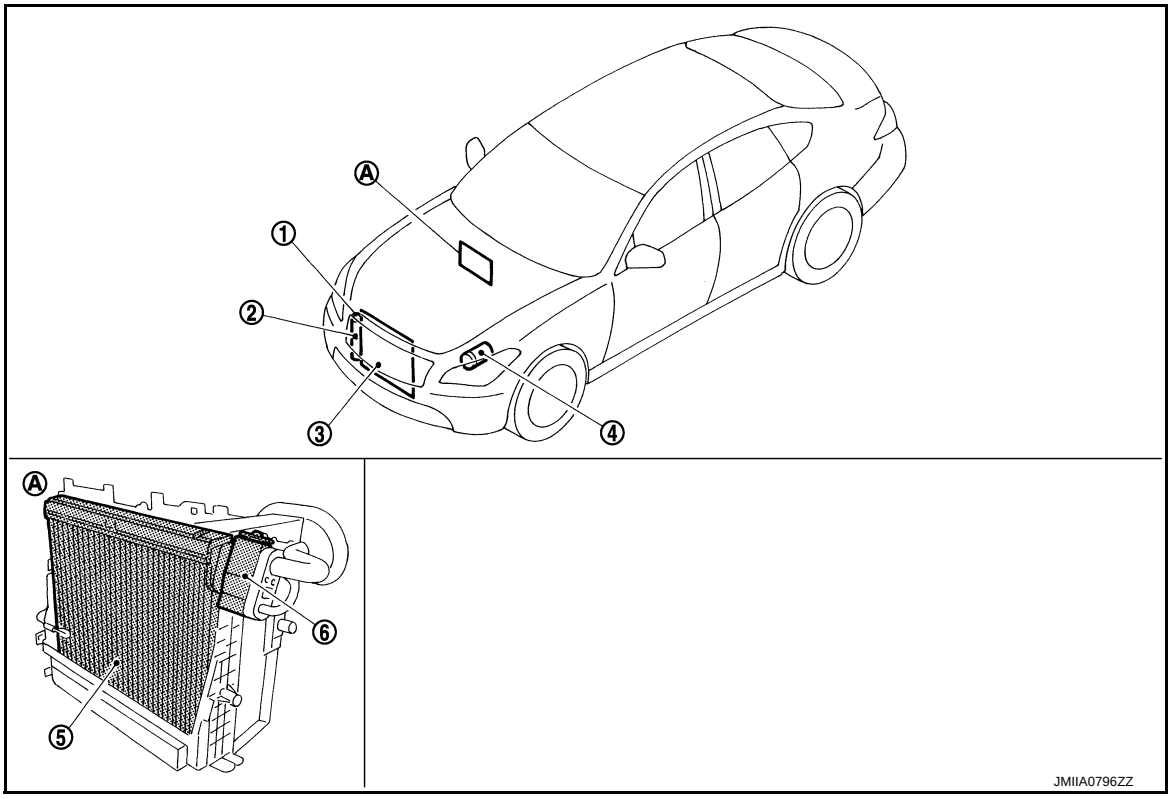
*** Avoid using tools that have been used for vehicles with conventional A/C oil as much as possible. This will result in insulation performance deterioration. A tool that has been used three times or less can be reused if an appropriate one is not available.**

SYSTEM DESCRIPTION

COMPONENT PARTS

Component Parts Location

INFOID:0000000008143759



1. Refrigerant pressure sensor
2. Liquid tank
3. Condenser
4. Compressor
5. Evaporator
6. Expansion valve

A. In the heater & cooling unit assembly

Component Description

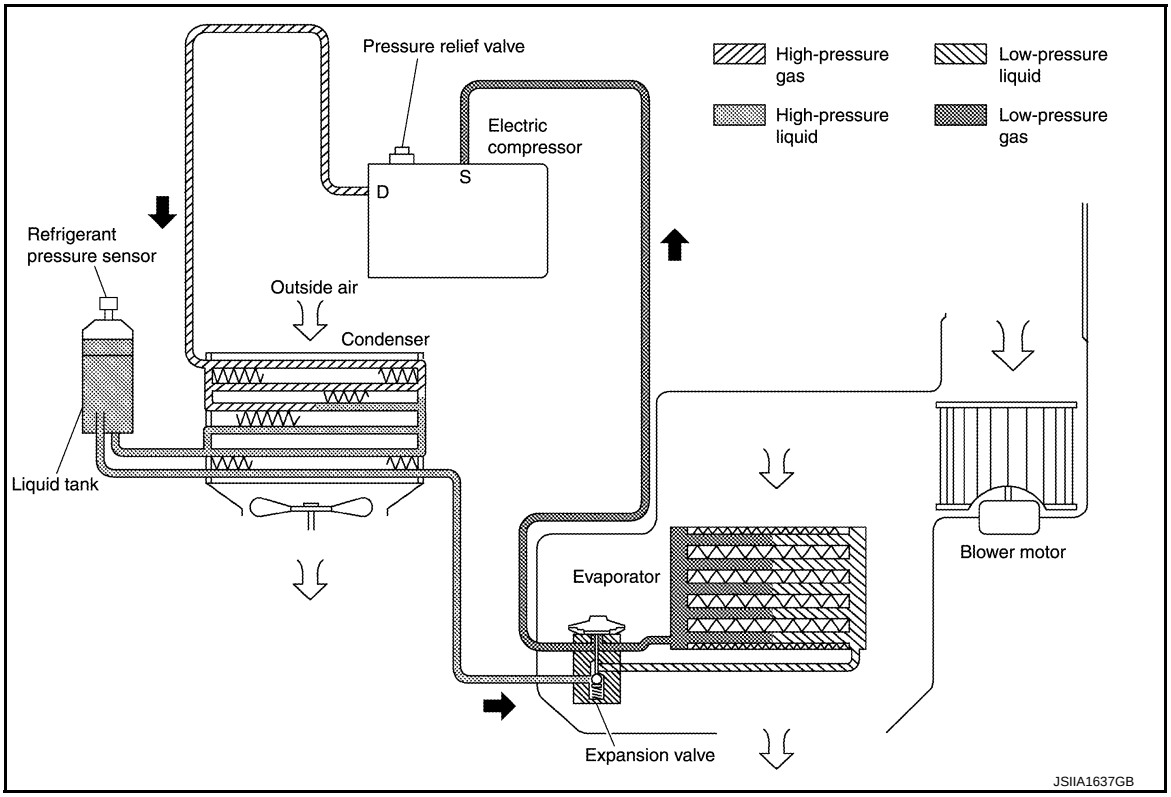
INFOID:0000000008143760

Component	Description
Compressor	Intakes, compresses, and discharges refrigerant, to circulate refrigerant inside the refrigerant cycle.
Condenser	Cools refrigerant discharged from compressor, and transforms it to liquid refrigerant.
Liquid tank	Eliminates foreign matter in refrigerant, and stores temporarily liquid refrigerant.
Refrigerant pressure sensor	Refer to EC-27, "Refrigerant Pressure Sensor".
Expansion valve	Transforms high-pressure liquid refrigerant to mist form low-pressure liquid refrigerant by drawing function.
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.

SYSTEM

System Diagram

INFOID:0000000008143761



System Description

INFOID:0000000008143762

REFRIGERANT CYCLE

Refrigerant Flow

The refrigerant from the compressor, flows the condenser with 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 evaporator from freezing up, the evaporator air temperature is monitored, and the voltage signal to the A/C auto amp. makes the A/C relay go OFF and stop the compressor.

REFRIGERANT SYSTEM PROTECTION

Refrigerant Pressure Sensor

- The refrigerant system is protected against excessively high- or low-pressures by the refrigerant pressure sensor, located on the liquid tank. 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.
- ECM turns the A/C relay to OFF and stops the compressor when the high-pressure side detected by refrigerant pressure sensor is following conditions;

- Approximately 2,65 MPa (27.0 kg/cm^2, 384.35 psi) or more
- Approximately 0.14 MPa (1.4 kg/cm^2, 20.3 psi) or less

Pressure Relief Valve

The refrigerant system is also protected by a pressure relief valve, located in the rear head of the compressor. 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 3,5 MPa (35.7 kg/cm^2, 507.6 psi)].

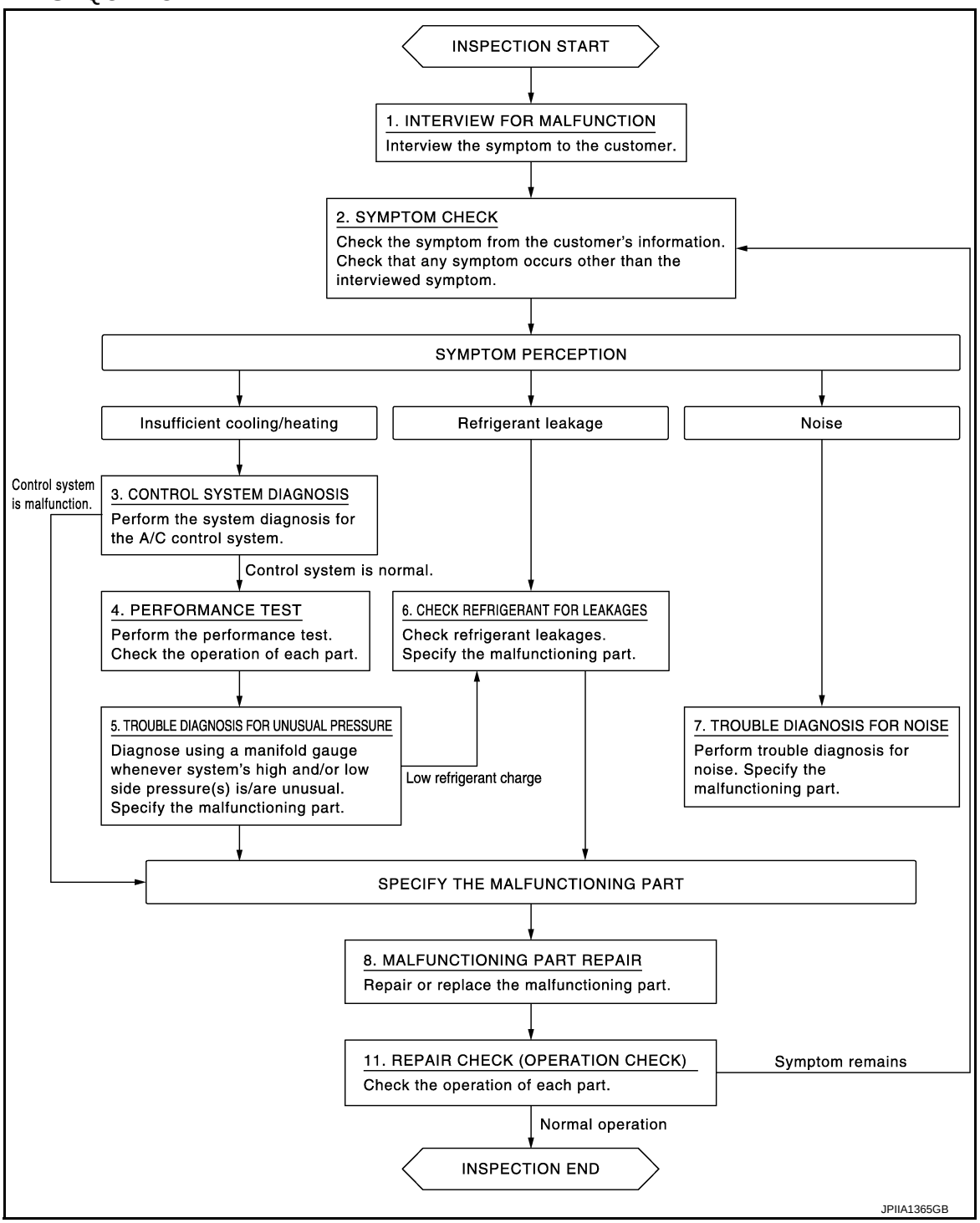
BASIC INSPECTION

DIAGNOSIS AND REPAIR WORKFLOW

Work Flow

INFOID:0000000008143763

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-57, "Work Flow".

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-25, "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-27, "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-20, "Check Refrigerant Leakage".

>> GO TO 8.

7.TROUBLE DIAGNOSIS FOR NOISE

Perform trouble diagnosis for noise. Specify the malfunctioning part. Refer to HA-29, "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?

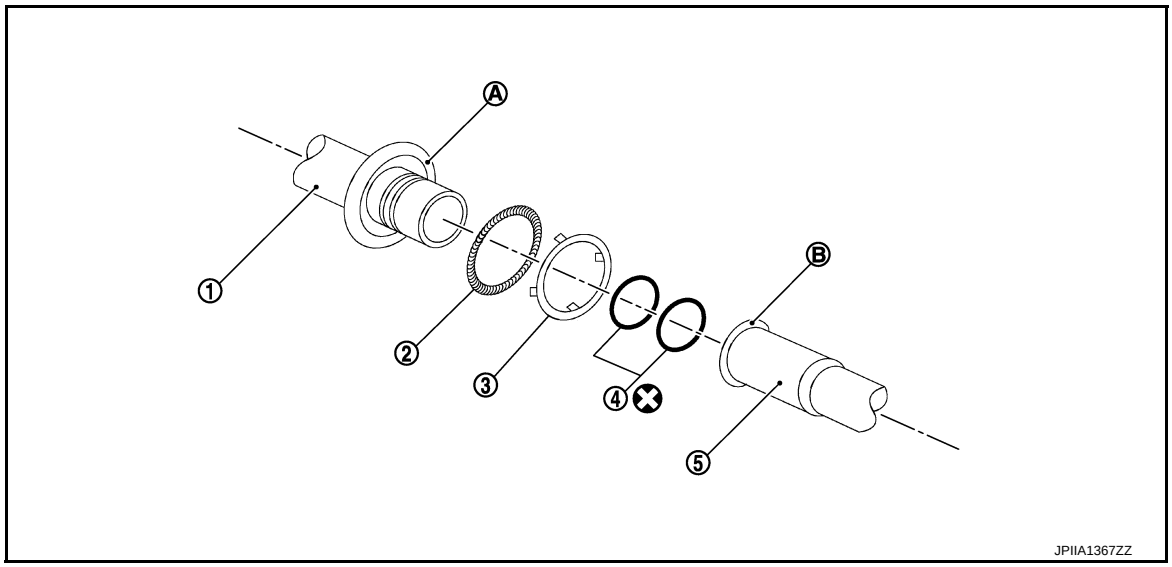
YES >> INSPECTION END
NO >> GO TO 2.

ONE-TOUCH JOINT

Exploded View

INFOID:0000000008143764

- One-touch joints are pipe joints which do not require tools while connecting pipes.
- Unlike a connection by conventional union nuts or flanges, tightening torque management for joint is not necessary.
- Use a disconnector when disconnecting a pipe connection. Refer to HA-10, "Special Service Tool".



1. Pipe (male-side)
2. Garter spring
3. Indicator ring
4. O-ring
5. Pipe (female-side)

A: Cage
B: Flare

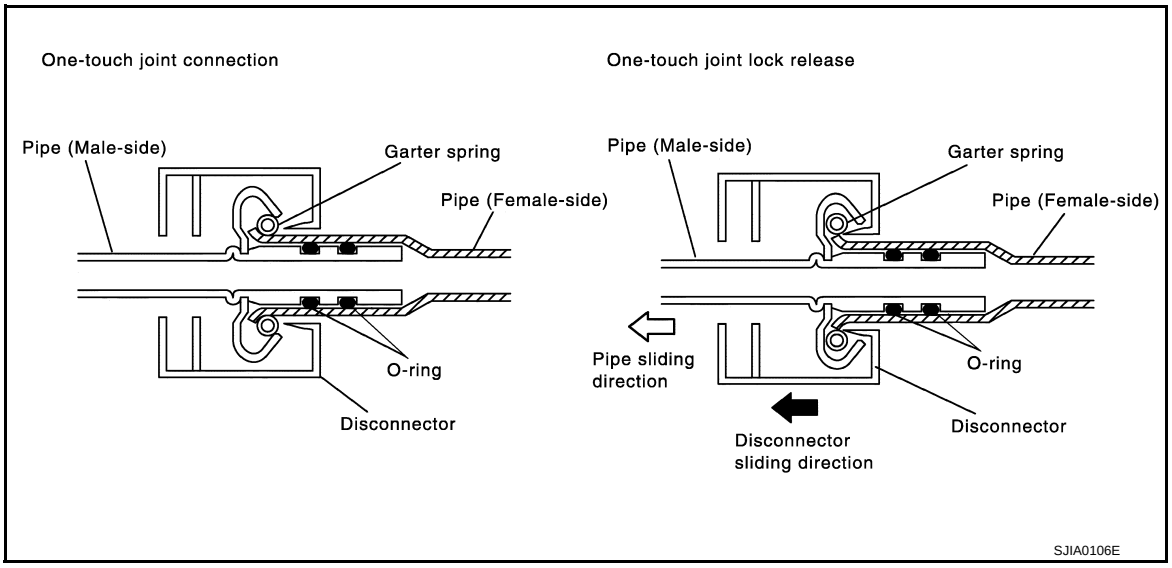
Refer to GI-5, "Components" for symbols in the figure.

NOTE:
- Garter spring cannot be removed from pipe (male-side) cage.
- Indicator ring remains near pipe joint. It is normal. (This is to check pipe connection condition during factory assembly.)

Removal and Installation

INFOID:0000000008143765

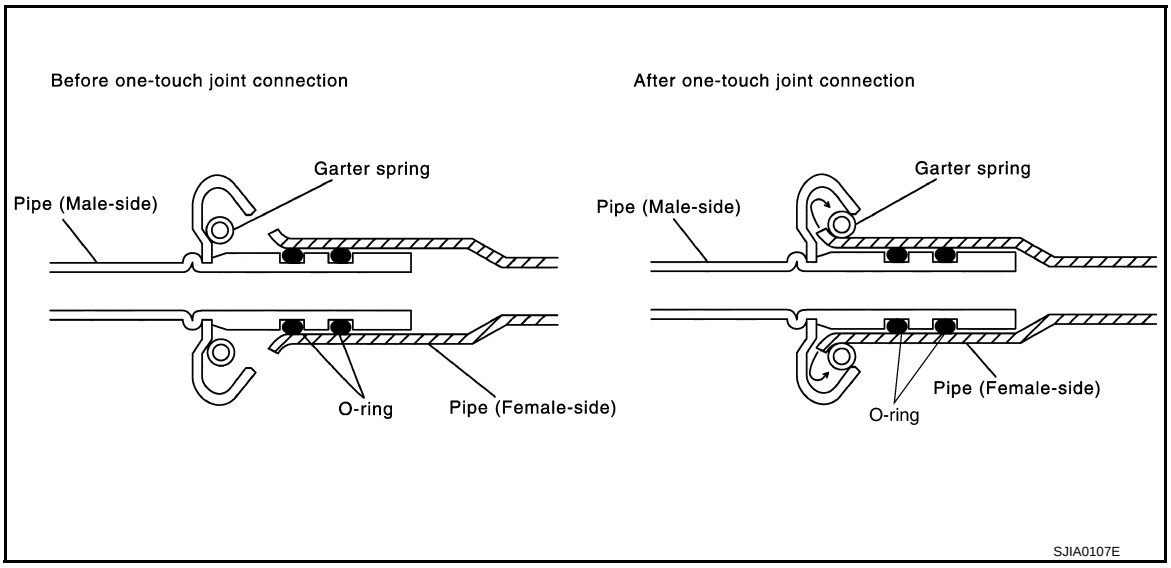
REMOVAL



1. Clean pipe joint and set a disconnector.

2. Slide disconnector in axial direction of pipe, and stretch garter spring using tapers of disconnector.
3. Slide disconnector further so that inner diameter of garter spring becomes larger than outer diameter of pipe (female-side) flare. Then pipe (male-side) can be pulled out and pipe connection can be disconnected.

INSTALLATION



1. Clean pipe joint, and then insert pipe (male-side) to pipe (female-side).
2. Press inserted pipe (male-side) further so that pipe (female-side) flare stretches garter spring.
3. When inner diameter of garter spring becomes larger than outer diameter of pipe (female-side) flare, garter spring gets over flare, fits between pipe (male-side) cage and pipe (female-side) flare, and fixes pipe joint.
   NOTE:
   When garter spring gets over flare and fits between pipe (male-side) cage and pipe (female-side) flare, it clicks.

CAUTION:

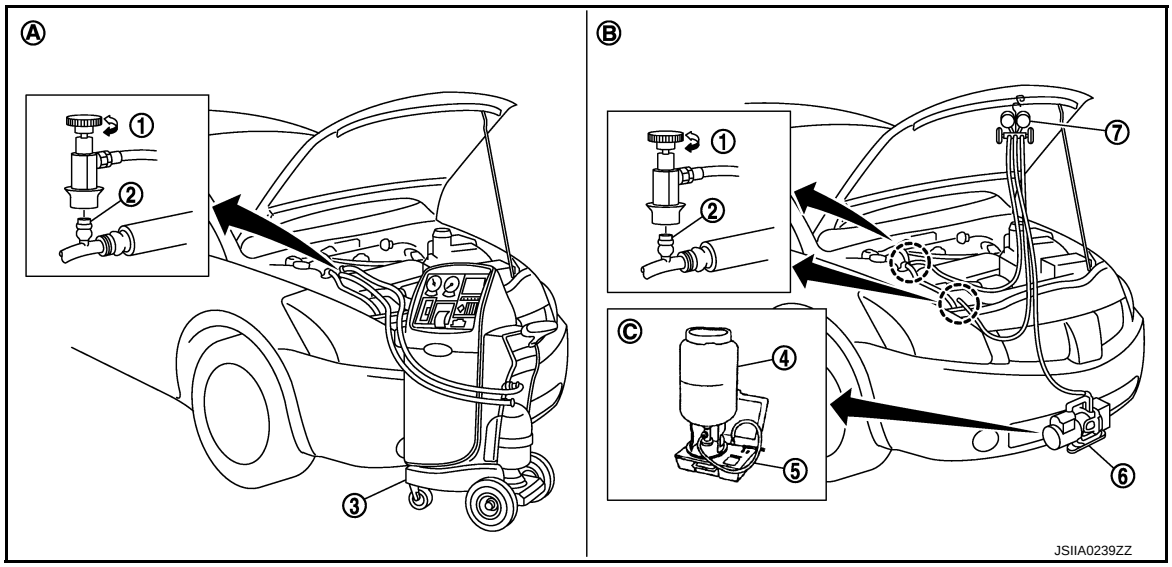
- **Connecting point of pipe (female-side) is thin and easily deformed. Always insert pipe (male-side) in the axial direction straight and slowly. Be careful not to deform pipe (female-side).**
- **Insert pipe securely until it clicks.**
- **Always check that pipe joint is not disconnected by pulling pipe (male-side) by hands after pipe connection is complete.**

REFRIGERANT

Description

INFOID:0000000008143766

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

Check Refrigerant Leakage

INFOID:0000000008143767

DETECTING LEAKAGES WITH FLUORESCENT INDICATOR

CAUTION:

Never use fluorescent indicators as these may reduce the insulation resistance.

CHECK REFRIGERANT LEAKAGE USING ELECTRICAL LEAK DETECTOR

CAUTION:

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

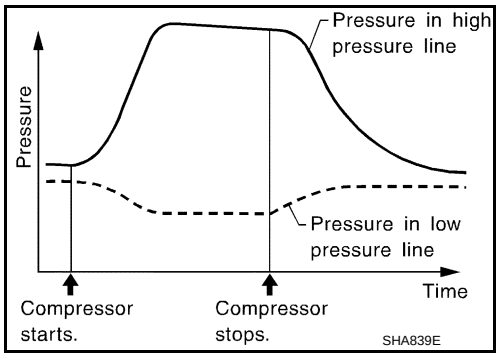
- **Never allow refrigerant vapor, shop chemical vapors, cigarette smoke, or others around the vehicle.**
- **Always check refrigerant leakage in a low air flow environment so that refrigerant may not disperse when leakage occurs.**

1. Connect recovery/recycling/recharging equipment (for HFC-134a) or manifold gauge set (J-39183) to A/C service valve.
2. Check that refregerant gas pressure is 345 kPa (3.52 kg/cm^2) or more when temperature is 16°C or more. When pressure is lower than the specified value, fully recover all refrigerant and then charge with refrigerant from the service can to the specified level.
   NOTE:
   Leakages may not be detected if refregerant gas pressure is 345 kPa (3.52 kg/cm^2) or less when temperature is 16°C or less.
3. 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-39183) probe.
   CAUTION:
   - **Even when a leakage point has been 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 for leakage inside cooling unit, operate blower fan motor for 15 minutes or more at the maximum fan speed, and then insert electrical leak detector probe into drain hose and leave it inserted 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.

4. Repair or replace parts where refrigerant leakage is detected. (Leakage is detected but leakage location is unknown. GO TO 5.)
5. Start the vehicle and set A/C controller as shown below.
   - A/C switch: ON
   - Mode switch: Ventilation set
   - Intake switch: Recirculation set
   - Temperature control switch or dial: Max. COLD
   - Fan (blower) speed: Max. speed set
6. Operate A/C for 2 minutes or longer.
7. Stop the A/C. Check again for refrigerant leakage. GO TO 3.

NOTE:
- Start refrigerant leakage check immediately after the A/C 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:0000000008143768

WARNING:
- **Always use HFC-134a for refregerant gas. 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 refregerant gas and libricant 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. Perform oil return operation. Refer to HA-23, "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 (for HFC-134a). 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 (for HFC-134a) to the A/C service valve.
5. Operate recovery/recycling/recharging equipment (for HFC-134a), 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:0000000008143769

WARNING:

- **Always use HFC-134a for refregerant gas. 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.**
- **When charging with refrigerant gas, charge with the prescribed amount from a new service can.**
- **Never breathe refregerant gas and libricant 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 manifold gauge (for HFC-134a) to the service valve.
2. Connect vacuum pump to manifold gauge and operate the pump. Apply vacuum to the cooler cycle for approximately 25 minutes or longer.
   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-20, "Check Refrigerant Leakage".
   CAUTION:
   Check the airtightness for 15 minutes or more if the parts are replaced.
4. If parts other than compressor were replaced, add compressor oil according to parts that were replaced. Refer to HA-23, "Lubricant Adjusting Procedure for Components Replacement Except Compressor".
5. Charge the A/C system from a service can with the specified amount of refrigerant.
6. Check that A/C system operates normally.
7. Disconnect the manifold gauge.
8. Install A/C service valve cap.
9. Refrigerant charge is complete.

LUBRICANT

Description

INFOID:0000000008143770

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 : Specified lubricant ND-OIL 11 (special oil for electric compressors)

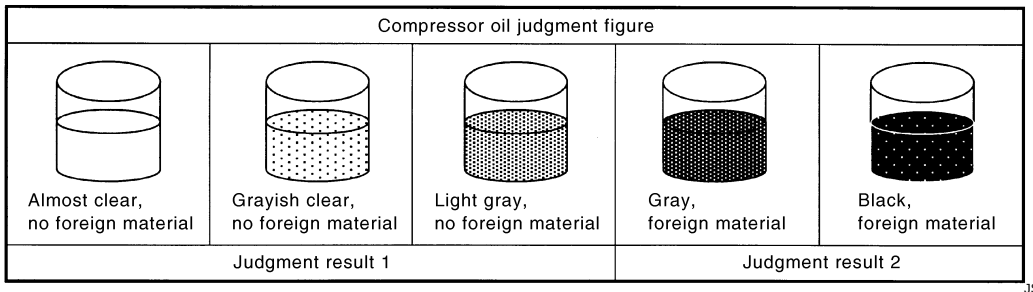
Inspection

INFOID:0000000008143771

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

1.COMPRESSOR OIL JUDGMENT

1. Remove the compressor. Refer to HA-30, "Removal and Installation".
2. Sample a compressor oil and judge on the figure.



JSIIA0927GB

Judgement result 1>>Replace compressor only.
Judgement result 2>>Replace compressor and liquid tank.

Perform Lubricant Return Operation

INFOID:0000000008143772

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

1. Set to the following conditions.
   - A/C switch: ON
   - Fan speed: Maximum speed set
   - Intake door position: Recirculation
   - Temperature setting: Full cold
2. Perfrom lubricant return operation for approximately 10 minutes.
3. Lubricant return operation is complete.

Lubricant Adjusting Procedure for Components Replacement Except Compressor

INFOID:0000000008143773

Fill with lubricant for the amount that is calculated according to the following conditions.
Example: Lubricant amount to be added when replacing evaporator and liquid tank [mℓ (US fl oz., Imp fl oz.)] = 45 (1.5, 1.6) + 15 (0.5, 0.5) + α

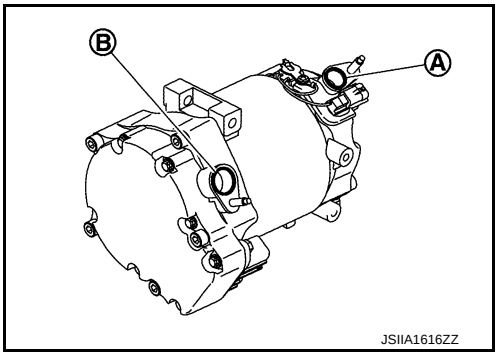
Conditions	Lubricant amount to be added to A/C system mℓ (US fl oz., Imp fl oz.)
Replace evaporator	45 (1.5, 1.6)
Replace condenser	30 (1.0, 1.1)

Conditions		Lubricant amount to be added to A/C system m ℓ (US fl oz., Imp fl oz.)
Replace liquid tank		15 (0.5, 0.5)
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

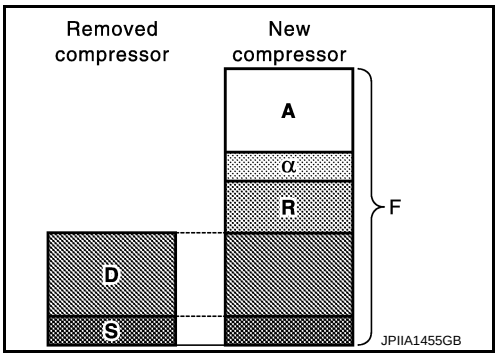
Lubricant Adjusting Procedure for Compressor Replacement

INFOID:0000000008143774

1. Drain lubricant from removed compressor and measure lubricant amount.
   1. Turn the compressor so that it faces downward, and drain the compressor oil from the high-pressure port (A) and low-pressure port (B).



   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 [150 (5.1, 5.3)]

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 condenser	30 (1.0, 1.1)
Replace liquid tank	15 (0.5, 0.5)

Example: Lubricant amount to be drained from a new compressor when replacing compressor and liquid tank [m ℓ (US fl oz., Imp fl oz.)] [D = 60 (2.0, 2.1), α = 5 (1.4, 1.4)]
150 (5.1, 5.3) – [60 (1.5, 1.6) + 20 (0.7, 0.7) + 15 (0.5, 0.5) + 5 (0.2, 0.2)] = 50 (1.7, 1.8)

3. Install compressor and check the operation.

PERFORMANCE TEST

Inspection

INFOID:0000000008143775

INSPECTION PROCEDURE

1. Connect recovery/recycling/recharging equipment (for HFC-134a) or manifold gauge.
2. 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
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 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-27, "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	23.2 (76.7)	6.3 – 8.6 (43.3 – 47.5)
	25.3 (77.5)	8.0 – 10.6 (46.4 – 51.1)
	28.9 (84.0)	11.5 – 14.4 (52.7 – 57.9)
	33.7 (92.6)	15.5 – 18.9 (59.9 – 66.0)
60 – 70	23.2 (76.7)	8.6 – 10.9 (47.5 – 51.6)
	25.3 (77.5)	10.6 – 13.1 (51.1 – 55.6)
	28.9 (84.0)	14.4 – 17.3 (57.9 – 63.1)
	33.7 (92.6)	18.9 – 22.1 (66.0 – 71.8)

AMBIENT AIR TEMPERATURE-TO-OPERATING PRESSURE TABLE

Fresh air		High-pressure (Discharge side) kPa (bar, kg/cm^2, psi)	Low-pressure (Suction side) kPa (bar, kg/cm^2, psi)
Relative humidity %	Air temperature °C (°F)		
50 – 70	25 (77)	1,120 – 1,370 (11.2 – 13.7, 11.4 – 13.8, 162.4 – 198.7)	191 – 233 (1.9 – 2.3, 1.9 – 2.4, 27.7 – 33.8)
	28.4 (83.1)	1,210 -– 1,480 (12.1 – 14.8, 12.3 – 15.1, 175.5 – 214.7)	194 – 237 (1.9 – 2.4, 2.0 – 2.4, 28.1 – 34.4)
	33.5 (92.3)	1,320 – 1,620 (13.2 – 16.2, 13.5 – 16.5, 191.5 – 235.0)	203 – 248 (2.0 – 2.5, 2.1 – 2.5, 29.4 – 36.0)
	39.3 (102.7)	1,370 – 1.670 (13.7 – 16.7, 13.8 – 17.0, 198.7 – 242.2)	245 – 300 (2.5 – 3.0, 2.5 – 3.0, 35.5 – 43.5)
	40 (104)	1,390 – 1.690 (13.9 – 16.9, 14.2 – 17.2, 201.6 – 245.1)	252 – 307 (2.5 – 3.0, 2.5 – 3.1, 36.5 – 44.5)

SYMPTOM DIAGNOSIS

REFRIGERATION SYSTEM SYMPTOMS

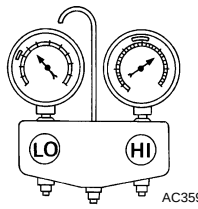
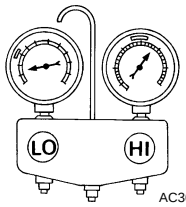
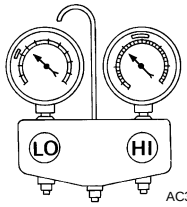
Trouble Diagnosis For Unusual Pressure

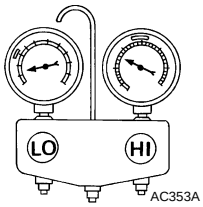
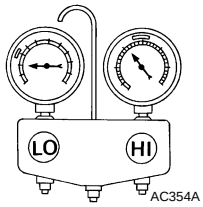
INFOID:0000000008143776

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:0000000008143777

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, 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.  AC353A	• 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 liquid tank. • Liquid tank becomes frosted.	Malfunction in inner liquid tank (clogged strainer).	Replace 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 .
	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.  AC354A	• 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 liquid tank.	• Collect all refrigerant. • Evacuate refrigerant cycle completely, and then refill it with the specified amount of refrigerant. At this time, always replace liquid tank.

NOISE

Symptom Table

INFOID:0000000008143778

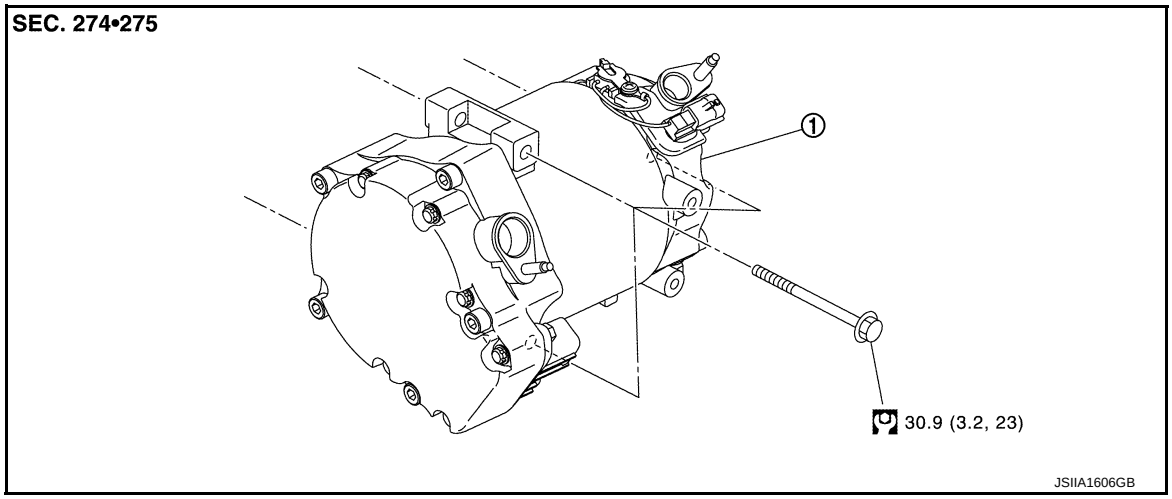
Symptom	Noise source	Probable cause	Corrective action
Unusual noise from compressor when A/C is ON.	Inside of compressor	Wear, breakage, or clogging of foreign material in inner parts.	Check compressor oil. Refer to HA-23, "Inspection".
	Compressor body	Loosened compressor mounting bolts.	Check bolts 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-34, "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

ELECTRIC COMPRESSOR

Exploded View

INFOID:0000000008143779



1. Electric compressor

: N·m (kg-m, ft-lb)

Removal and Installation

INFOID:0000000008143780

WARNING:

- **Because hybrid vehicles and electric vehicles contain a high voltage battery, there is the risk of electric shock, electric leakage, or similar accidents if the high voltage component and vehicle are handled incorrectly. Be sure to follow the correct work procedures when performing inspection and maintenance.**
- **Be sure to remove the service plug in order to shut off the high voltage circuits before performing inspection or maintenance of high voltage system harnesses and parts.**
- **Be sure to put the removed service plug in your pocket and carry it with you so that another person does not accidentally connect it while work is in progress.**
- **Be sure to wear insulating protective equipments consisting of glove, shoes and glasses/face shield before beginning work on the high voltage system.**
- **Clearly identify the persons responsible for high voltage work and ensure that other persons do not touch the vehicle. When not working, cover high voltage parts with an insulating cover sheet or similar item to prevent other persons from contacting them.**
- **Refer to HA-7, "High Voltage Precautions".**

CAUTION:

- **There is the possibility of a malfunction occurring if the vehicle is changed to READY status while the service plug is removed. Therefore do not change the vehicle to READY status unless instructed to do so in the Service Manual.**
- **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-23, "Perform Lubricant Return Operation".**

REMOVAL

WARNING:

Shut off high voltage circuit. Refer to GI-30, "How to Cut Off High Voltage".

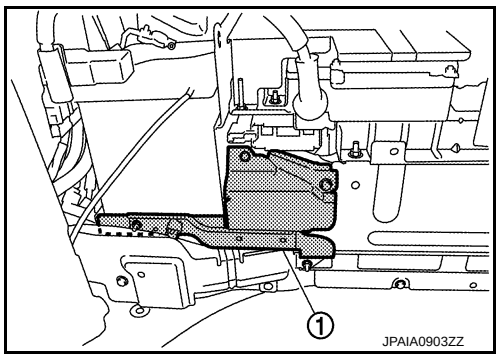
1. Check voltage in high voltage circuit. (Check that condenser are discharged.)

a. Remove trunk finisher front. Refer to INT-52, "TRUNK FINISHER FRONT : Removal and Installation".

b. Remove harness cover (1).

WARNING:

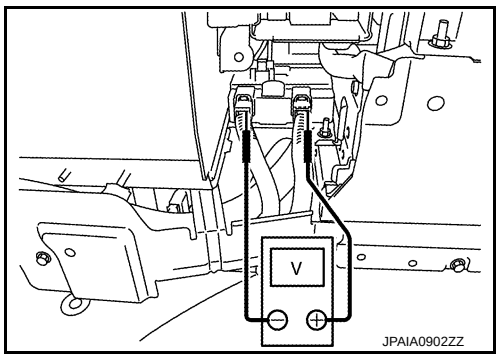
To prevent shock hazards, be sure to wear protective gear.



c. Measure voltage between high voltage harness terminals.

DANGER:

Touching high voltage components without using the appropriate protective equipment will cause electrocution.



Standard : 5 V or less

CAUTION:

For voltage measurements, use a tester which can measure to 500 V or higher.

2. Use a refrigerant collecting equipment (for HFC 134a) to discharge the refrigerant. Refer to HA-21, "Recycle Refrigerant".
3. Remove the following parts:
   - Air duct (inlet) : Refer to EM-26, "Exploded View".
   - Engine cover : Refer to EM-25, "Removal and Installation".
   - Air cleaner case (bank2) : Refer to EM-26, "Exploded View".
   - Air duct (bank2) : Refer to EM-26, "Exploded View".
   - Engine under cover : Refer to EXT-28, "ENGINE UNDER COVER : Removal and Installation".
4. Disconnect low voltage harness connector from electric compressor.

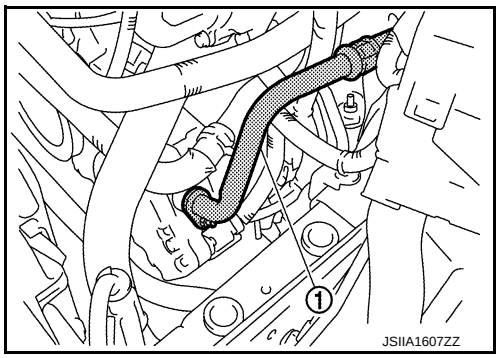
WARNING:

To prevent shock hazards, be sure to wear protective gear.

5. Remove mounting nut and disconnect low-pressure flexible hose (1) from electric compressor.

WARNING:

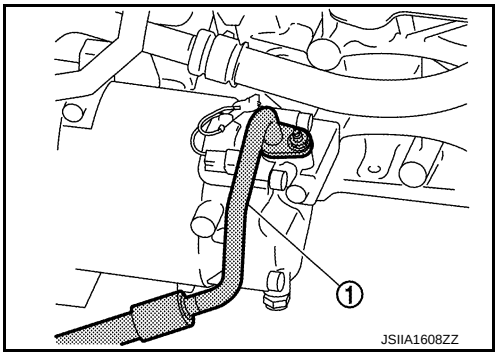
To prevent shock hazards, be sure to wear protective gear.



CAUTION:

To prevent the inclusion of foreign matter, cap or wrap the joint of the A/C piping and compressor with suitable material such as vinyl tape toavoid the entry of air.

6. Remove mounting nut and disconnect high-pressure flexible hose (1) from electric compressor.



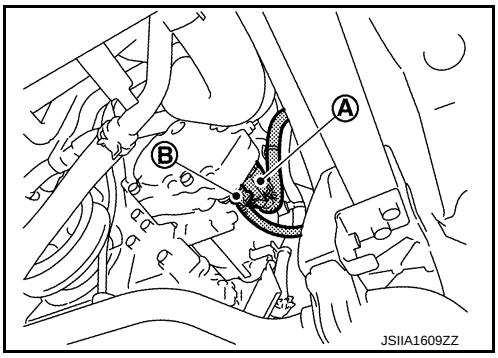
WARNING:

To prevent shock hazards, be sure to wear protective gear.

CAUTION:

To prevent the inclusion of foreign matter, cap or wrap the joint of the A/C piping and compressor with suitable material such as vinyl tape toavoid the entry of air.

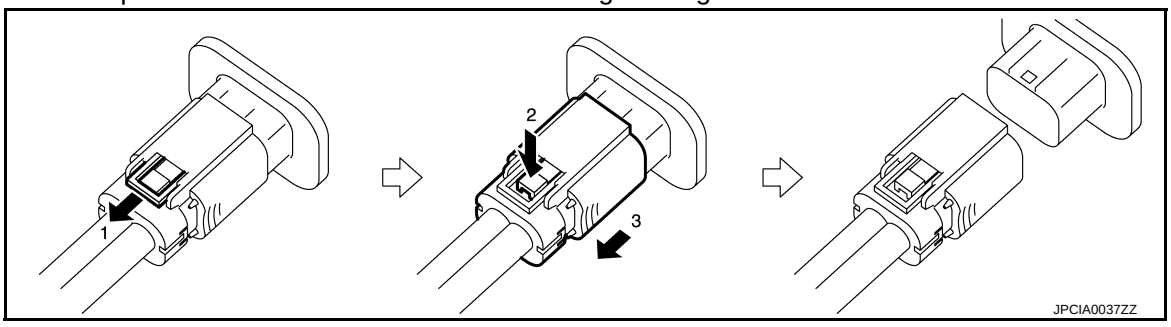
7. Disconnect high voltage harness connector (A) and low voltage harness connector (B) from electric compressor.



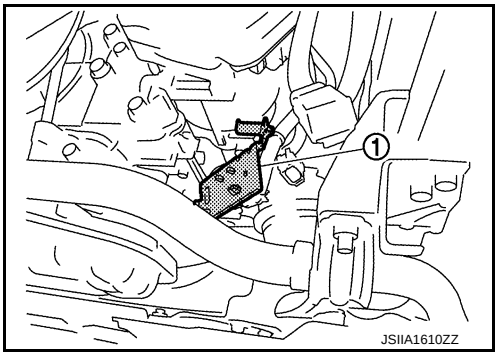
WARNING:

- **To prevent shock hazards, be sure to wear protective gear.**
- **To prevent shock hazards, immediately wrap insulating tape around disconnected high voltage connector terminals.**

- Follow the procedure below and disconnect the high voltage harness connector.



8. Remove harness bracket (1) from electric compressor.



WARNING:

To prevent shock hazards, be sure to wear protective gear.

9. Remove mounting bolts to remove electric compressor from lower side of the vehicle.

WARNING:

To prevent shock hazards, be sure to wear protective gear.

INSTALLATION

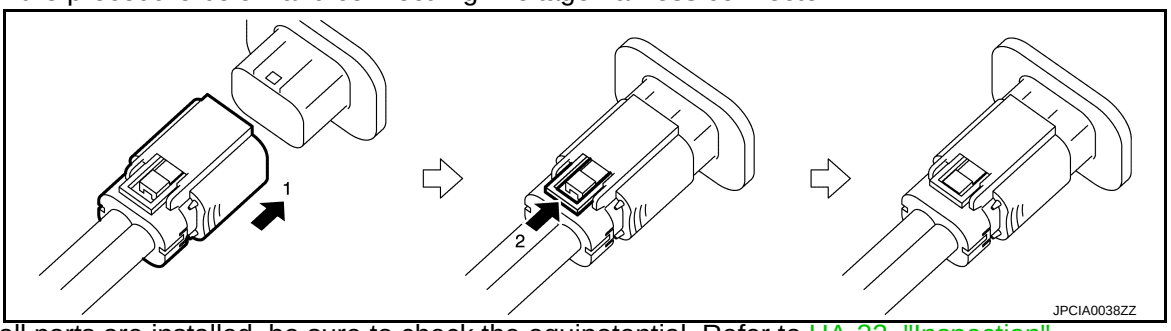
Note the following, and install in the reverse order of removal.

WARNING:

To prevent shock hazards, be sure to wear protective gear.

CAUTION:

- **Be sure to reinstall high voltage harness clips in their original positions. If a clip is damaged, replace it with a new clip before installing.**
- **Before installing the new compressor, adjust the compressor oil level. Refer to HA-24, "Lubricant Adjusting Procedure for Compressor Replacement".**
- **To prevent degradation in insulation performance, use special electric compressor oil as the compressor oil.**
- **In order to prevent conventional PAG oil from becoming mixed in, do not reuse recovered compressor oil and instead always use new oil. The use of oil including the conventional PAG oil may degrade the performance of insulation.**
- **To prevent performance degradation, do not use a fluorescent agent in order to detect refrigerant leakage. Also take care that a fluorescent agent does not enter the oil.**
- **To prevent leakage of refrigerant, replace the O-ring with a new one. Apply a coat of compressor oil to the O-ring prior to installation.**
- **Perform a check for refrigerant leakage when charging with refrigerant. Refer to HA-20, "Check Refrigerant Leakage".**
- **Set the vehicle to READY and operate the air-conditionier for at leaset 1 minute with the vehicle parked to perform a break-in.**
- Follow the procedure below and connect high voltage harness connector.



- After all parts are installed, be sure to check the equipotential. Refer to HA-33, "Inspection".

Inspection

INFOID:0000000008143781

EQUIPOTENTIAL TEST

After installing electric compressor, measure resistance below.

- Between electric compressor (aluminum part) and body (ground bolt)
- Between electric compressor (aluminum part) and traction motor inverter (aluminum part).

WARNING:

To prevent shock hazards, be sure to wear protective gear.

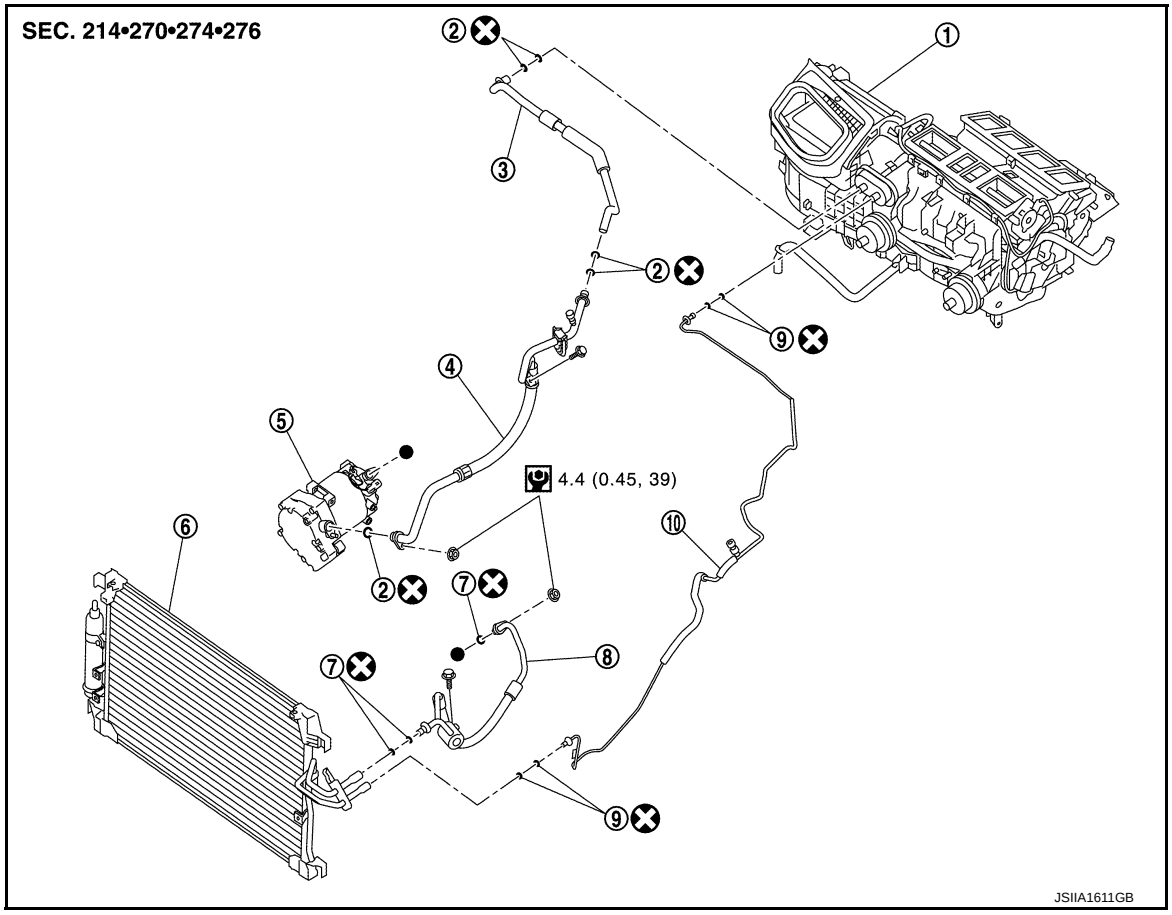
Standard : Less than 0.1 Ω

If the result deviates from the standard value, check for paint, oil, dirt, or other substance adhering to bolts or conductive mounting parts. If such substances are found, clean the surrounding area and remove the foreign substances.

COOLER PIPE AND HOSE

Exploded View

INFOID:0000000008143782



1. A/C unit assembly
2. O-ring
3. Low-pressure pipe
4. Low-pressure flexible hose
5. Electric compressor
6. Condenser assembly
7. O-ring
8. High-pressure flexible hose
9. O-ring
10. High-pressure pipe

: Always replace after every disassembly.

: N·m (kg-m, in-lb)

LOW-PRESSURE FLEXIBLE HOSE

LOW-PRESSURE FLEXIBLE HOSE : Removal and Installation

INFOID:0000000008143783

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-23, "Perform Lubricant Return Operation".

REMOVAL

1. Use a refrigerant collecting equipment (for HFC 134a) to discharge the refrigerant. Refer to HA-21, "Recycle Refrigerant".
2. Remove the following parts :
   - Air duct (inlet) : Refer to EM-26, "Exploded View".
   - Engine cover : Refer to EM-25, "Removal and Installation".
   - Air cleaner case (bank2) : Refer to EM-26, "Exploded View".
   - Air duct (bank2) : Refer to EM-26, "Exploded View".

- Cowl top cover LH : Refer to EXT-21, "Exploded View".

3. Remove mounting bolt from low-pressure flexible hose bracket.
4. Disconnect one-touch joint between low-pressure flexible hose and low-pressure pipe with disconnector (SST: 9253089916).

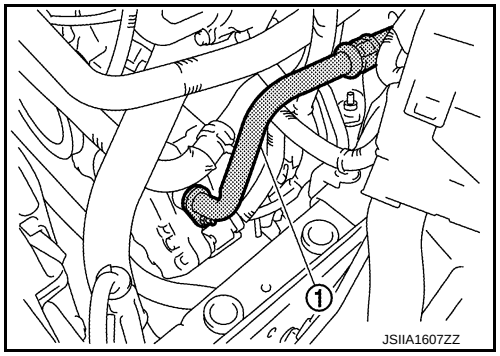
CAUTION:
To prevent the inclusion of foreign matter, cap or wrap the joint of the A/C piping with suitable material such as vinyl tape to avoid the entry of air.

5. Disconnect low-pressure flexible hose (1) from electric compressor.

WARNING:

To prevent shock hazards, be sure to wear protective gear.

CAUTION:
To prevent the inclusion of foreign matter, cap or wrap the joint of the A/C piping and electric compressor with suitable material such as vinyl tape to avoid the entry of air.



6. Remove low-pressure flexible hose from vehicle.

INSTALLATION

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

CAUTION:

- **To prevent degradation in insulation performance, use special electric compressor oil as the compressor oil.**
- **In order to prevent conventional PAG oil from becoming mixed in, do not reuse recovered compressor oil and instead always use new oil. The use of oil including the conventional PAG oil may degrade the performance of insulation.**
- **To prevent performance degradation, do not use a fluorescent agent in order to detect refrigerant leakage. Also take care that a fluorescent agent does not enter the oil.**
- **To prevent leakage of refrigerant, replace the O-ring with a new one. Apply a coat of compressor oil to the O-ring prior to installation.**
- **Female-side piping connection is thin and easy to deform. Slowly insert the male-side piping straight in axial direction.**
- **Insert piping securely until a click is heard.**
- **After piping connection is completed, pull male-side piping by hand to check that connection never come loose.**
- **Check for leakages when recharging refrigerant. Refer to HA-20, "Check Refrigerant Leakage".**

HIGH-PRESSURE FLEXIBLE HOSE

HIGH-PRESSURE FLEXIBLE HOSE : Removal and Installation

INFOID:0000000008143784

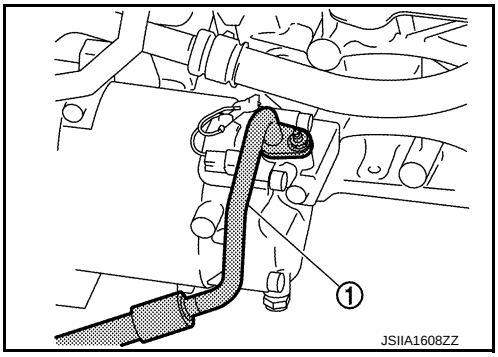
CAUTION:
Perform lubricant return operation before each refrigeration system disassembly. However, if a large amount of refrigerant or lubricant is detected, never perform lubricant return operation. Refer to HA-23, "Perform Lubricant Return Operation".

REMOVAL

1. Use a refrigerant collecting equipment (for HFC 134a) to discharge the refrigerant. Refer to HA-21, "Recycle Refrigerant".
2. Remove the following parts :
   - Air duct (inlet) : Refer to EM-26, "Exploded View".
   - Engine cover : Refer to EM-25, "Removal and Installation".
   - Air cleaner case (bank2) : Refer to EM-26, "Exploded View".
   - Air duct (bank2) : Refer to EM-26, "Exploded View".
3. Remove mounting bolt from high-pressure flexible hose bracket.

4. Disconnect one-touch joint between high-pressure flexible hose and condenser pipe assembly with disconnector (SST: 9253089912).
   CAUTION:
   To prevent the inclusion of foreign matter, cap or wrap the joint of the A/C piping with suitable material such as vinyl tape to avoid the entry of air.
5. Disconnect high-pressure flexible hose (1) from electric compressor.
   WARNING:
   To prevent shock hazards, be sure to wear protective gear.

   CAUTION:
   To prevent the inclusion of foreign matter, cap or wrap the joint of the A/C piping and electric compressor with suitable material such as vinyl tape to avoid the entry of air.



6. Remove high-pressure flexible hose from vehicle.

INSTALLATION

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

CAUTION:

- **To prevent degradation in insulation performance, use special electric compressor oil as the compressor oil.**
- **In order to prevent conventional PAG oil from becoming mixed in, do not reuse recovered compressor oil and instead always use new oil. The use of oil including the conventional PAG oil may degrade the performance of insulation.**
- **To prevent performance degradation, do not use a fluorescent agent in order to detect refrigerant leakage. Also take care that a fluorescent agent does not enter the oil.**
- **To prevent leakage of refrigerant, replace the O-ring with a new one. Apply a coat of compressor oil to the O-ring prior to installation.**
- **Female-side piping connection is thin and easy to deform. Slowly insert the male-side piping straight in axial direction.**
- **Insert piping securely until a click is heard.**
- **After piping connection is completed, pull male-side piping by hand to check that connection never come loose.**
- **Check for leakages when recharging refrigerant. Refer to HA-20, "Check Refrigerant Leakage".**

LOW-PRESSURE PIPE

LOW-PRESSURE PIPE : Removal and Installation

INFOID:0000000008143785

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-23, "Perform Lubricant Return Operation".

REMOVAL

1. Use a refrigerant collecting equipment (for HFC 134a) to discharge the refrigerant. Refer to HA-21, "Recycle Refrigerant".
2. Remove the following parts :
   - Air duct (inlet) : Refer to EM-26, "Exploded View".
   - Engine cover : Refer to EM-25, "Removal and Installation".
   - Cowl top cover LH : Refer to EXT-21, "Exploded View".
3. Remove mounting bolt from low-pressure flexible hose bracket.
4. Disconnect one-touch joint between low-pressure flexible hose and low-pressure pipe with disconnector (SST: 9253089916).
   CAUTION:

To prevent the inclusion of foreign matter, cap or wrap the joint of the A/C piping with suitable material such as vinyl tape to avoid the entry of air.

5. Disconnect one-touch joint between evaporator pipe assembly and low-pressure pipe with disconnector (SST: 9253089916).
   CAUTION:
   To prevent the inclusion of foreign matter, 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 low-pressure pipe from vehicle.

INSTALLATION

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

CAUTION:

- **To prevent degradation in insulation performance, use special electric compressor oil as the compressor oil.**
- **In order to prevent conventional PAG oil from becoming mixed in, do not reuse recovered compressor oil and instead always use new oil. The use of oil including the conventional PAG oil may degrade the performance of insulation.**
- **To prevent performance degradation, do not use a fluorescent agent in order to detect refrigerant leakage. Also take care that a fluorescent agent does not enter the oil.**
- **To prevent leakage of refrigerant, replace the O-ring with a new one. Apply a coat of compressor oil to the O-ring prior to installation.**
- **Female-side piping connection is thin and easy to deform. Slowly insert the male-side piping straight in axial direction.**
- **Insert piping securely until a click is heard.**
- **After piping connection is completed, pull male-side piping by hand to check that connection never come loose.**
- **Check for leakages when recharging refrigerant. Refer to HA-20, "Check Refrigerant Leakage".**

HIGH-PRESSURE PIPE

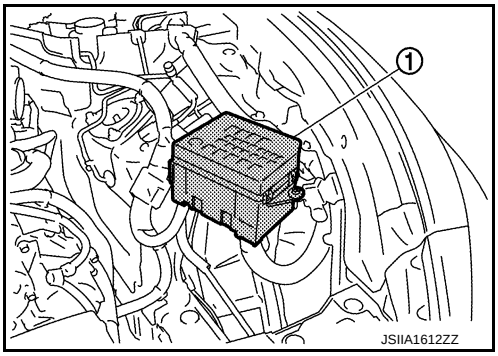
HIGH-PRESSURE PIPE : Removal and Installation

INFOID:0000000008143786

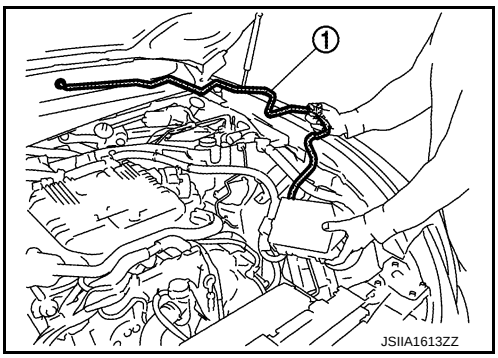
REMOVAL

1. Remove low-pressure flexible hose.Refer to HA-34, "LOW-PRESSURE FLEXIBLE HOSE : Removal and Installation".
2. Remove low-pressure pipe.Refer to HA-36, "LOW-PRESSURE PIPE : Removal and Installation".
3. Remove high-pressure flexible hose.Refer to HA-35, "HIGH-PRESSURE FLEXIBLE HOSE : Removal and Installation".
4. Remove high-pressure pipe from vehicle clip.
5. Disconnect one-touch joint between high-pressure pipe and condenser pipe assembly with disconnector (SST: 9253089908).
   CAUTION:
   To prevent the inclusion of foreign matter, 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 one-touch joint between evaporator pipe assembly and high-pressure pipe with disconnector (SST: 9253089908).
   CAUTION:
   To prevent the inclusion of foreign matter, cap or wrap the joint of the A/C piping with suitable material such as vinyl tape to avoid the entry of air.

7. Move junction box (1) to a position where it will not interfere with work.



8. Remove high-pressure pipe (1) from vehicle.



INSTALLATION

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

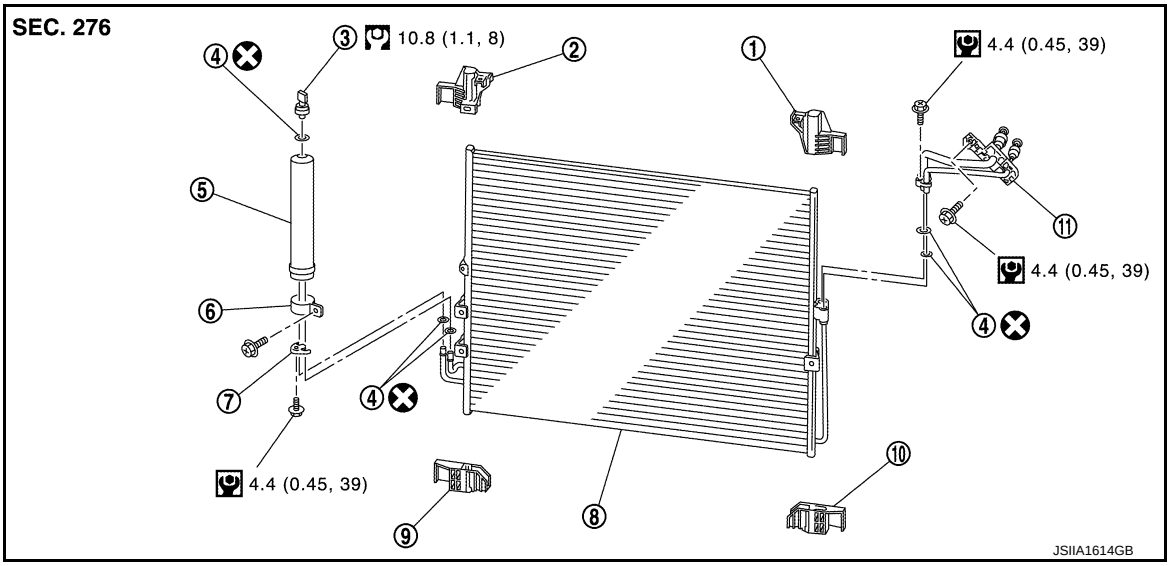
CAUTION:

- **To prevent degradation in insulation performance, use special electric compressor oil as the compressor oil.**
- **In order to prevent conventional PAG oil from becoming mixed in, do not reuse recovered compressor oil and instead always use new oil. The use of oil including the conventional PAG oil may degrade the performance of insulation.**
- **To prevent performance degradation, do not use a fluorescent agent in order to detect refrigerant leakage. Also take care that a fluorescent agent does not enter the oil.**
- **To prevent leakage of refrigerant, replace the O-ring with a new one. Apply a coat of compressor oil to the O-ring prior to installation.**
- **Female-side piping connection is thin and easy to deform. Slowly insert the male-side piping straight in axial direction.**
- **Insert piping securely until a click is heard.**
- **After piping connection is completed, pull male-side piping by hand to check that connection never come loose.**
- **Check for leakages when recharging refrigerant. Refer to HA-20, "Check Refrigerant Leakage".**

CONDENSER

Exploded View

INFOID:0000000008143787



1. Condenser upper bracket LH
2. Condenser upper bracket RH
3. Refrigerant pressure sensor
4. O-ring
5. Liquid tank
6. Liquid tank bracket
7. Bracket
8. Condenser
9. Condenser lower bracket RH
10. Condenser lower bracket LH
11. Condenser pipe assembly

: Always replace after every disassembly.

: N·m (kg-m, in-lb)

: N·m (kg-m, ft-lb)

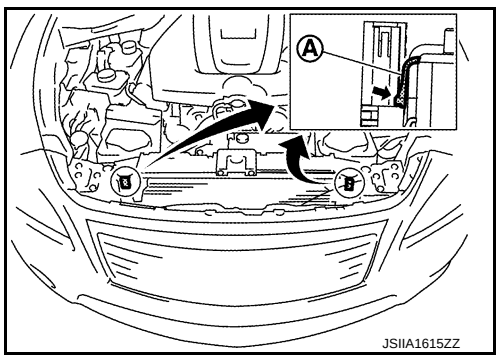
CONDENSER

CONDENSER : Removal and Installation

INFOID:0000000008143788

REMOVAL

1. Remove condenser pipe assembly. Refer to HA-40, "CONDENSER PIPE ASSEMBLY : Removal and Installation".
2. Remove hood lock support stay. Refer to DLK-141, "Exploded View".
3. Move sub radiator to a position where it will not interfere with work. Refer to HCO-10, "Exploded View".
4. Disconnect refrigerant pressure sensor connector, harness clip, and hood lock cable clip.
5. Disengage fixing pawl (A), then remove condenser from vehicle.



INSTALLATION

Install in the reverse order of removal.

CONDENSER PIPE ASSEMBLY

CONDENSER PIPE ASSEMBLY : Removal and Installation

INFOID:0000000008143789

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-23, "Perform Lubricant Return Operation".

REMOVAL

1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.Refer to HA-21, "Recycle Refrigerant".
2. Remove the following parts :
   - Air duct (inlet) : Refer to EM-26, "Exploded View".
   - Air cleaner case (bank2) : Refer to EM-26, "Exploded View".
3. Remove mounting bolt from high-pressure flexible hose bracket.
4. Disconnect one-touch joint between high-pressure flexible hose and condenser pipe assembly with disconnector (SST: 9253089912).
   CAUTION:
   To prevent the inclusion of foreign matter, 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 high-pressure pipe from vehicle clip.
6. Disconnect one-touch joint between high-pressure pipe and condenser pipe assembly with disconnector (SST: 9253089908).
   CAUTION:
   To prevent the inclusion of foreign matter, cap or wrap the joint of the A/C piping with suitable material such as vinyl tape to avoid the entry of air.
7. Remove mounting bolts from condenser pipe assembly, then remove condenser pipe assembly from vehicle.

INSTALLATION

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

CAUTION:
- **To prevent degradation in insulation performance, use special electric compressor oil as the compressor oil.**
- **In order to prevent conventional PAG oil from becoming mixed in, do not reuse recovered compressor oil and instead always use new oil. The use of oil including the conventional PAG oil may degrade the performance of insulation.**
- **To prevent performance degradation, do not use a fluorescent agent in order to detect refrigerant leakage. Also take care that a fluorescent agent does not enter the oil.**
- **To prevent leakage of refrigerant, replace the O-ring with a new one. Apply a coat of compressor oil to the O-ring prior to installation.**
- **Female-side piping connection is thin and easy to deform. Slowly insert the male-side piping straight in axial direction.**
- **Insert piping securely until a click is heard.**
- **After piping connection is completed, pull male-side piping by hand to check that connection never come loose.**
- **Check for leakages when recharging refrigerant. Refer to HA-20, "Check Refrigerant Leakage".**

LIQUID TANK

LIQUID TANK : Removal and Installation

INFOID:0000000008143790

REMOVAL

1. Remove condenser. Refer to HA-39, "CONDENSER : Removal and Installation".
2. Clean liquid tank and its surrounding area. Then remove dust and rust from liquid tank.
   CAUTION:
   Be sure to clean carefully.
3. Remove mounting bolts from liquid tank, then remove liquid tank.
   CAUTION:

To prevent the inclusion of foreign matter, cap or wrap the joint of the liquid tank and condenser with suitable material such as vinyl tape to avoid the entry of air.

INSTALLATION

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

CAUTION:

- **Check that liquid tank bracket is securely installed at protrusion of condenser. (Check that liquid tank bracket does not move to a position below center of liquid tank.)**
- **To prevent leakage of refrigerant, replace the O-ring with a new one. Apply a coat of compressor oil to the O-ring prior to installation.**

REFRIGERANT PRESSURE SENSOR

REFRIGERANT PRESSURE SENSOR : Removal and Installation

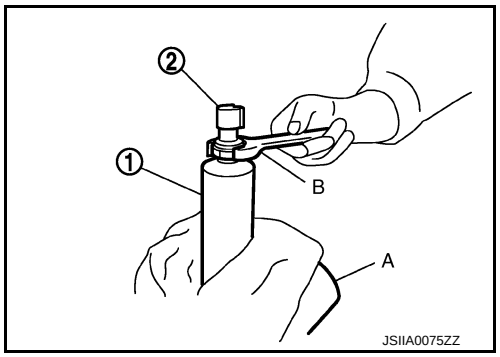
INFOID:0000000008143791

REMOVAL

1. Remove liquid tank. Refer to HA-40, "LIQUID TANK : Removal and Installation".
2. Fix the liquid tank (1) with a vise (A). Remove the refrigerant pressure sensor (2) with a wrench (B).

   CAUTION:

   - **Be careful not to damage liquid tank.**
   - **To prevent the inclusion of foreign matter, cap or wrap the joint of the refrigerant pressure sensor and liquid tank with suitable material such as vinyl tape to avoid the entry of air.**



INSTALLATION

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

CAUTION:

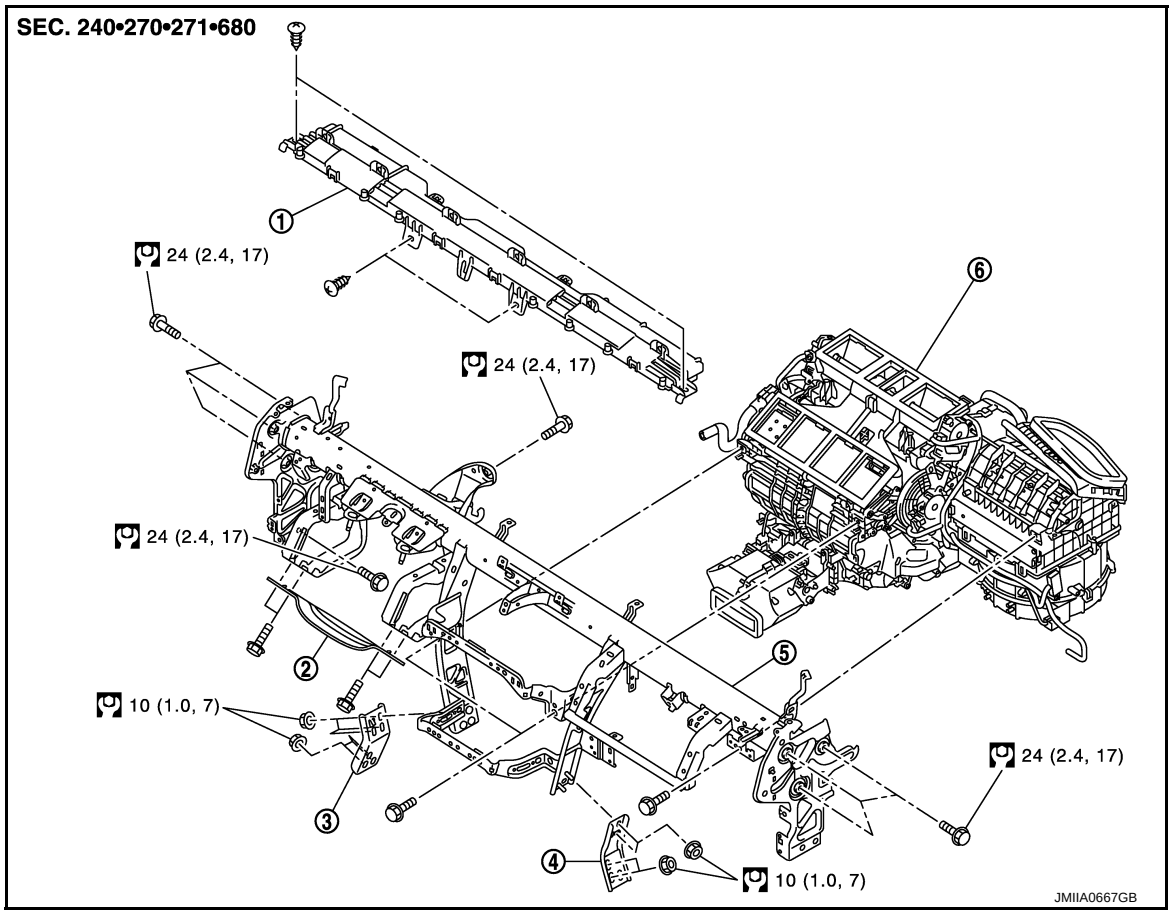
To prevent leakage of refrigerant, replace the O-ring with a new one. Apply a coat of compressor oil to the O-ring prior to installation.

HEATER & COOLING UNIT ASSEMBLY

Exploded View

INFOID:0000000008143792

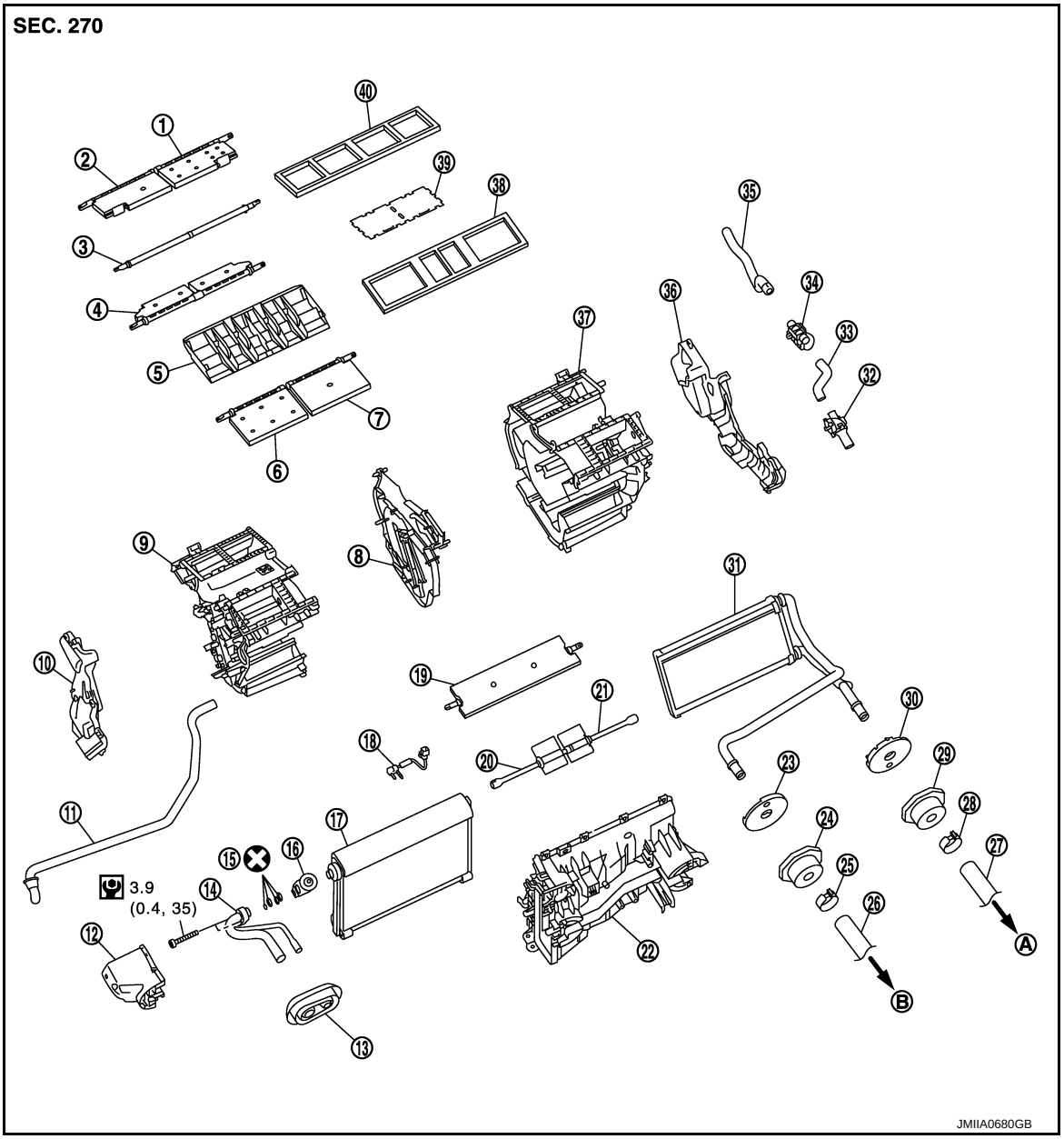
REMOVAL



1. PCB harness
2. Knee protector
3. Instrument stay LH
4. Instrument stay RH
5. Steering member
6. A/C unit assembly

: N·m (kg-m, ft-lb)

DISASSEMBLY



1. Ventilator door LH
2. Ventilator door RH
3. Foot door
4. Air mix door
5. Air guide plate
6. Heater door RH
7. Heater door LH
8. Heater & cooling unit case (center)
9. Heater & cooling unit case (right)
10. Foot duct RH
11. Drain hose
12. Evaporator pipe cover
13. Evaporator pipe grommet
14. Evaporator pipe assembly
15. O-ring
16. Expansion valve
17. Evaporator
18. Intake sensor
19. Defroster door
20. Upper ventilator door RH
21. Upper ventilator door LH
22. Cooling case
23. Heater pipe bracket RH
24. Heater pipe grommet RH
25. Clamp
26. Heater hose
27. Heater hose
28. Clamp
29. Heater pipe grommet LH
30. Hearter pipe bracket LH
31. Heater core
32. Aspirator
33. Aspirator duct (front)
34. Inside odor detecting sensor
35. Aspirator duct (rear)
36. Foot duct LH
37. Heater & cooling unit case (left)
38. Insulator
39. Net
40. Insulator

A. To heater pipe
B. To water outlet (rear)

: Always replace after every disassembly.

: N·m (kg-m, in-lb)

HEATER & COOLING UNIT ASSEMBLY

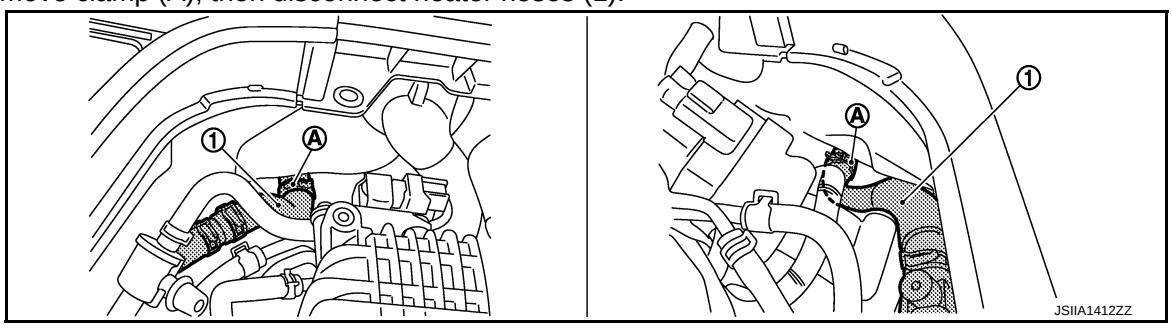
HEATER & COOLING UNIT ASSEMBLY : Removal and Installation

INFOID:0000000008143793

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-23, "Perform Lubricant Return Operation".

REMOVAL

1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant. Refer to HA-21, "Recycle Refrigerant".
2. Drain engine coolant from cooling system. Refer to CO-7, "Draining".
3. Remove cowl top cover. Refer to EXT-21, "Removal and Installation".
4. Remove engine cover. Refer to EM-25, "Removal and Installation".
5. Disconnect one-touch joint between evaporator pipe assembly and low-pressure pipe with disconnector (SST: 9253089916).
   CAUTION:
   To prevent the inclusion of foreign matter, 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 one-touch joint between evaporator pipe assembly and high-pressure pipe with disconnector (SST: 9253089908).
   CAUTION:
   To prevent the inclusion of foreign matter, cap or wrap the joint of the A/C piping with suitable material such as vinyl tape to avoid the entry of air.
7. Remove clamp (A), then disconnect heater hoses (1).



8. Remove instrument panel assembly. Refer to IP-13, "Removal and Installation".
9. Remove front defroster nozzle, side defroster nozzle and ventilator duct. Refer to VTL-12, "FRONT DEFROSTER NOZZLE : Removal and Installation", VTL-12, "SIDE DEFROSTER NOZZLE : Removal and Installation" and VTL-11, "VENTILATOR DUCT : Removal and Installation".
10. Remove instrument stay.
11. Disconnect drain hose from heater & cooling unit assembly.
12. Remove mounting bolts from A/C unit assembly.
13. Remove harness connector, harness clips, and bracket necessary to remove steering member. Move vehicle harness aside.
14. Remove steering column mounting bolts and nuts. Refer to .
15. Remove steering member mounting bolts.
16. Remove steering member from vehicle.
17. Remove A/C unit assembly from vehicle.
18. Separate blower unit and heater & cooling unit assembly

INSTALLATION

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

CAUTION:

- **To prevent degradation in insulation performance, use special electric compressor oil as the compressor oil.**
- **In order to prevent conventional PAG oil from becoming mixed in, do not reuse recovered compressor oil and instead always use new oil. The use of oil including the conventional PAG oil may degrade the performance of insulation.**
- **To prevent performance degradation, do not use a fluorescent agent in order to detect refrigerant leakage. Also take care that a fluorescent agent does not enter the oil.**
- **To prevent leakage of refrigerant, replace the O-ring with a new one. Apply a coat of compressor oil to the O-ring prior to installation.**
- **Female-side piping connection is thin and easy to deform. Slowly insert the male-side piping straight in axial direction.**
- **Insert piping securely until a click is heard.**
- **After piping connection is completed, pull male-side piping by hand to check that connection never come loose.**
- **Check for leakages when recharging refrigerant. Refer to HA-20, "Check Refrigerant Leakage".**

NOTE:

Refer to CO-8, "Refilling" when filling radiator with engine coolant.

HEATER CORE

HEATER CORE : Removal and Installation

INFOID:0000000008143794

REMOVAL

1. Remove heater & cooling unit assembly. Refer to HA-44, "HEATER & COOLING UNIT ASSEMBLY : Removal and Installation".
2. Remove heater pipe grommet.
3. Remove mounting screw, then remove heater pipe bracket.
4. Remove foot duct LH. Refer to VTL-13, "FOOT DUCT : Removal and Installation".
5. Slide heater core to left side.

INSTALLATION

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

NOTE:

Refer to CO-8, "Refilling" when filling radiator with engine coolant.

EVAPORATOR

EVAPORATOR : Removal and Installation

INFOID:0000000008143795

REMOVAL

1. Remove heater & cooling unit assembly. Refer to HA-44, "HEATER & COOLING UNIT ASSEMBLY : Removal and Installation".
2. Remove heater core. Refer to HA-45, "HEATER CORE : Removal and Installation".
3. Remove mounting bolts, then remove expansion valve from evaporator.
   CAUTION:
   To prevent the inclusion of foreign matter, cap or wrap the joint of evaporator and expansion valve with suitable material such as vinyl tape to avoid the entry of air.
4. Remove mounting screws, then remove cooling case.
5. Remove evaporator assembly from cooling case.

INSTALLATION

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

CAUTION:

- **To prevent leakage of refrigerant, replace the O-ring with a new one. Apply a coat of compressor oil to the O-ring prior to installation.**
- **Female-side piping connection is thin and easy to deform. Slowly insert the male-side piping straight in axial direction.**
- **Insert piping securely until a click is heard.**

- **After piping connection is completed, pull male-side piping by hand to check that connection never come loose.**
- **Mark the mounting position of intake sensor bracket prior to removal so that the reinstalled sensor can be located in the same position.**
- **Check for leakages when recharging refrigerant. Refer to HA-20, "Check Refrigerant Leakage".**

EVAPORATOR PIPE ASSEMBLY

EVAPORATOR PIPE ASSEMBLY : Removal and Installation

INFOID:0000000008143796

REMOVAL

1. Remove heater & cooling unit assembly. Refer to HA-44, "HEATER & COOLING UNIT ASSEMBLY : Removal and Installation".
2. Remove mounting screws, then remove evaporator pipe cover.
3. Remove mounting bolts, then remove evaporator pipe assembly and expansion valve from evaporator.
   CAUTION:
   To prevent the inclusion of foreign matter, cap or wrap the joint of evaporator pipe assembly, evaporator and expansion valve with suitable material such as vinyl tape to avoid the entry of air.

INSTALLATION

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

CAUTION:

- **To prevent leakage of refrigerant, replace the O-ring with a new one. Apply a coat of compressor oil to the O-ring prior to installation.**
- **Check for leakages when recharging refrigerant. Refer to HA-20, "Check Refrigerant Leakage".**

EXPANSION VALVE

EXPANSION VALVE : Removal and Installation

INFOID:0000000008143797

REMOVAL

1. Remove heater & cooling unit assembly. Refer to HA-44, "HEATER & COOLING UNIT ASSEMBLY : Removal and Installation".
2. Remove mounting screws, then remove evaporator pipe cover.
3. Remove mounting bolts, then remove evaporator pipe assembly and expansion valve from evaporator.
   CAUTION:
   To prevent the inclusion of foreign matter, cap or wrap the joint of evaporator pipe assembly, evaporator and expansion valve with suitable material such as vinyl tape to avoid the entry of air.

INSTALLATION

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

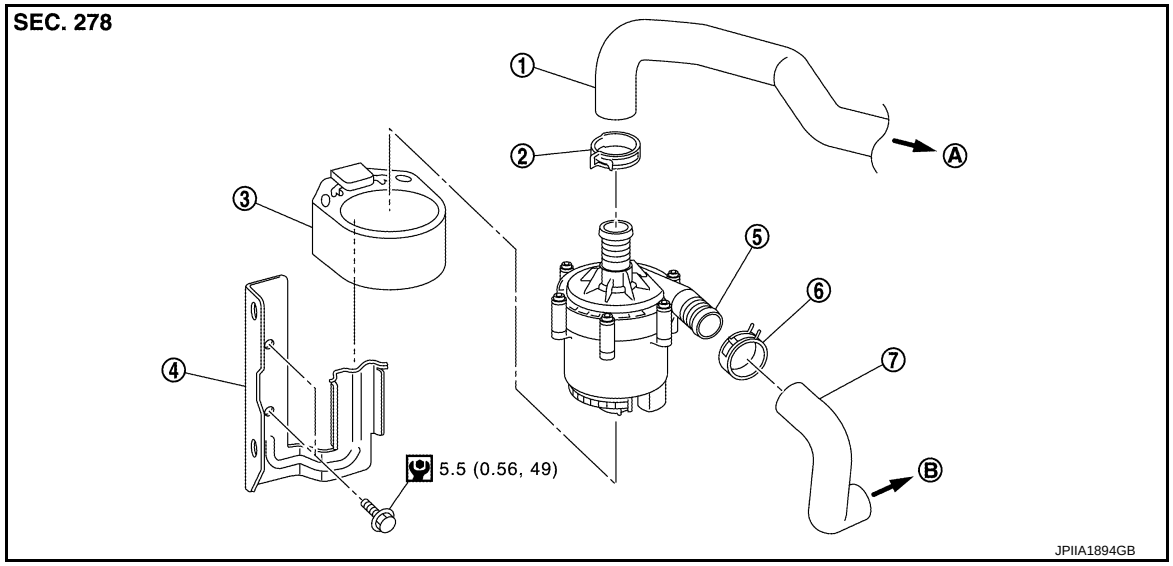
CAUTION:

- **To prevent leakage of refrigerant, replace the O-ring with a new one. Apply a coat of compressor oil to the O-ring prior to installation.**
- **Check for leakages when recharging refrigerant. Refer to HA-20, "Check Refrigerant Leakage".**

HEATER PUMP

Exploded View

INFOID:0000000008143798



1.	Water hose	2.	Clamp	3.	Mount rubber
4.	Heater pump bracket	5.	Heater pump	6.	Clamp
7.	Water hose				
A.	To heater core	B.	To oil cooler		

: N·m (kg-m, in-lb)

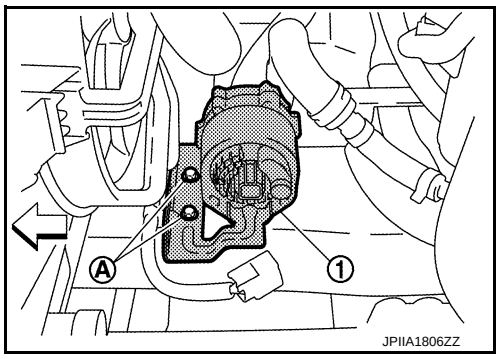
Removal and Installation

INFOID:0000000008143799

REMOVAL

1. Drain engine coolant from cooling system. Refer to CO-7, "Draining".
2. Remove engine under cover. Refer to EXT-28, "ENGINE UNDER COVER : Removal and Installation".
3. Disconnect heater pump connector from heater pump.
4. Disconnect water hose from heater pump.
5. Remove mounting bolts (A), then remove heater pump (1).

⇦ :Vehicle front



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-7, "Draining" when filling radiator with engine coolant.

SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

Compressor

INFOID:0000000008143800

Model (manufacturer)	AES28AV3AA (Panasonic)
Type	Electric drive scroll type (Include inverter)

Lubricant

INFOID:0000000008143801

Name	At the time of factory shipment	AE10* (Exclusive use for electric compressor)
	For service use	ND-OIL11* (Exclusive use for electric compressor)
Capacity m ℓ (US fl oz., lmp fl oz.)	Total in system	150 (5.07, 5.3)
	Compressor (service part) charging amount	150 (5.07, 5.3)

* These two lubricant is compatible.

Refrigerant

INFOID:0000000008143802

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