

SECTION HA

HEATER & AIR CONDITIONING SYSTEM

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BASIC INSPECTION

DIAGNOSIS AND REPAIR WORKFLOW

Work Flow

INFOID:000000001093748

DETAILED FLOW

1. LISTEN TO CUSTOMER COMPLAINT

Listen to customer complaint. (Get detailed information about the conditions and environment when the symptom occurs.)

>> GO TO 2.

2. VERIFY THE SYMPTOM WITH OPERATIONAL CHECK

Verify the symptom with operational check. Refer to [HAC-6, "Description & Inspection"](#).

>> GO TO 3.

3. GO TO APPROPRIATE TROUBLE DIAGNOSIS

Go to appropriate trouble diagnosis (Refer to [HAC-108, "Diagnosis Chart By Symptom"](#)).

>> GO TO 4.

4. REPAIR OR REPLACE

Repair or replace the specific parts

>> GO TO 5.

5. FINAL CHECK

Final check.

Is the inspection result normal?

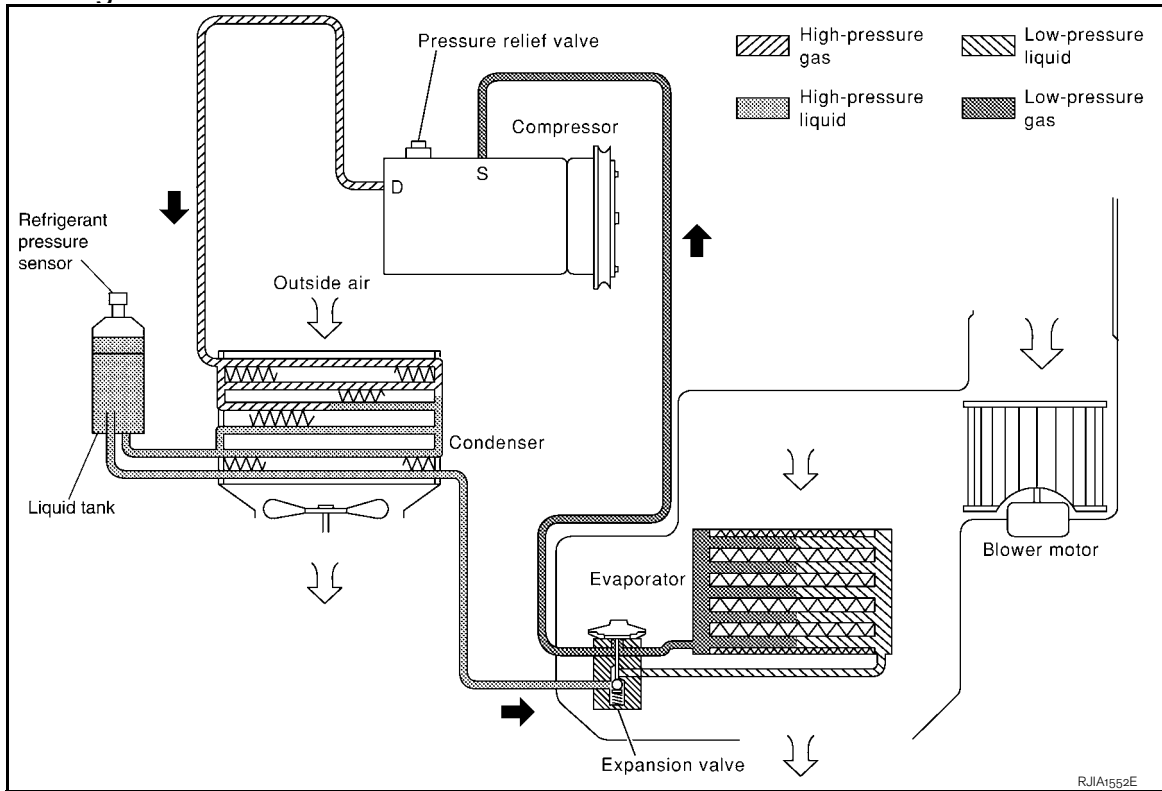
YES >> CHECK OUT

NO >> GO TO 3.

FUNCTION DIAGNOSIS

REFRIGERATION SYSTEM

System Diagram



System Description

INFOID:000000001093750

REFRIGERANT CYCLE

Refrigerant Flow

The refrigerant flows from the compressor, through the condenser with liquid tank, through the evaporator, and back to the compressor. The refrigerant evaporation in the evaporator is controlled by an externally equalized expansion valve, located inside the evaporator case.

Freeze Protection

To prevent evaporator frozen up, the evaporator air temperature is monitored, and the voltage signal to the display and A/C auto amp. will make 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 condenser. If the system pressure rises above, or falls below the specifications, the refrigerant pressure sensor detects the pressure inside the refrigerant line and sends the voltage signal to the ECM. ECM makes the A/C relay go OFF and stops the compressor when pressure on the high-pressure side detected by refrigerant pressure sensor is over about 3,119 kPa (31.8 kg/cm², 452 psi), or below about 118 kPa (1.2 kg/cm², 17 psi).

Pressure Relief Valve

The refrigerant system is also protected by a pressure relief valve, located in the rear head of the compressor. When the pressure of refrigerant in the system increases to an unusual level [more than 3,628 kPa (37 kg/cm², 526 psi)], the release port on the pressure relief valve automatically opens and releases refrigerant into the atmosphere.

LUBRICANT

REFRIGERATION SYSTEM

< FUNCTION DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER (HR/MR)]

Maintenance of Lubricant Quantity in Compressor

The lubricant in the compressor circulates through the system with the refrigerant. Add lubricant to compressor when replacing any component or after a large refrigerant leakage occurred. It is important to maintain the specified amount.

If lubricant quantity is not maintained properly, the following malfunctions may result:

- Lack of lubricant: May lead to a seized compressor.
- Excessive lubricant: Inadequate cooling (thermal exchange interference)

Lubricant

Name

: Nissan A/C System Oil Type S

Component Parts Location

INFOID:000000001093751

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

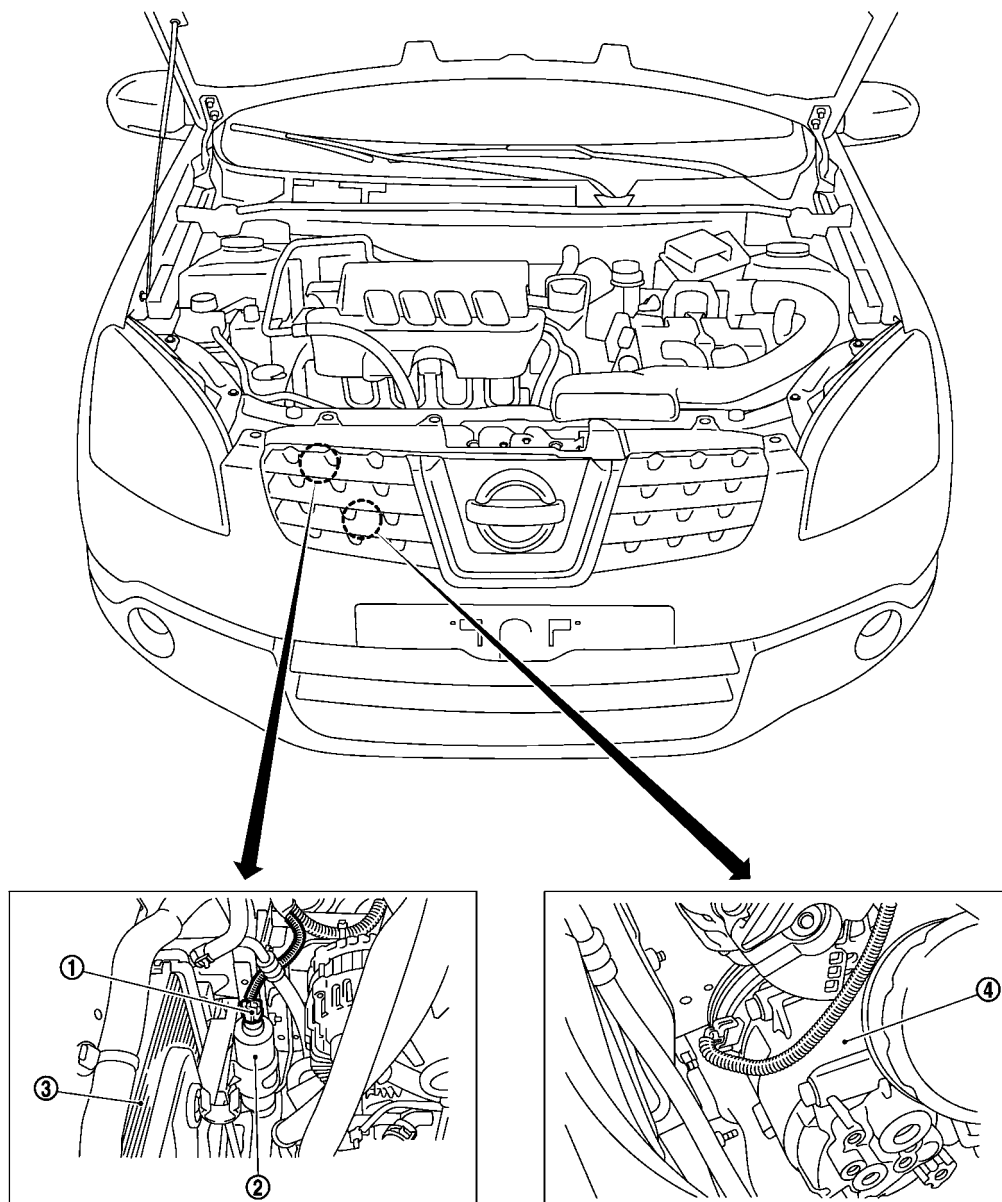
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REFRIGERATION SYSTEM

< FUNCTION DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER (HR/MR)]

SEC. 214•270•271•274•276



1. Refrigerant pressure sensor
4. Compressor

2. Liquid tank

3. Radiator

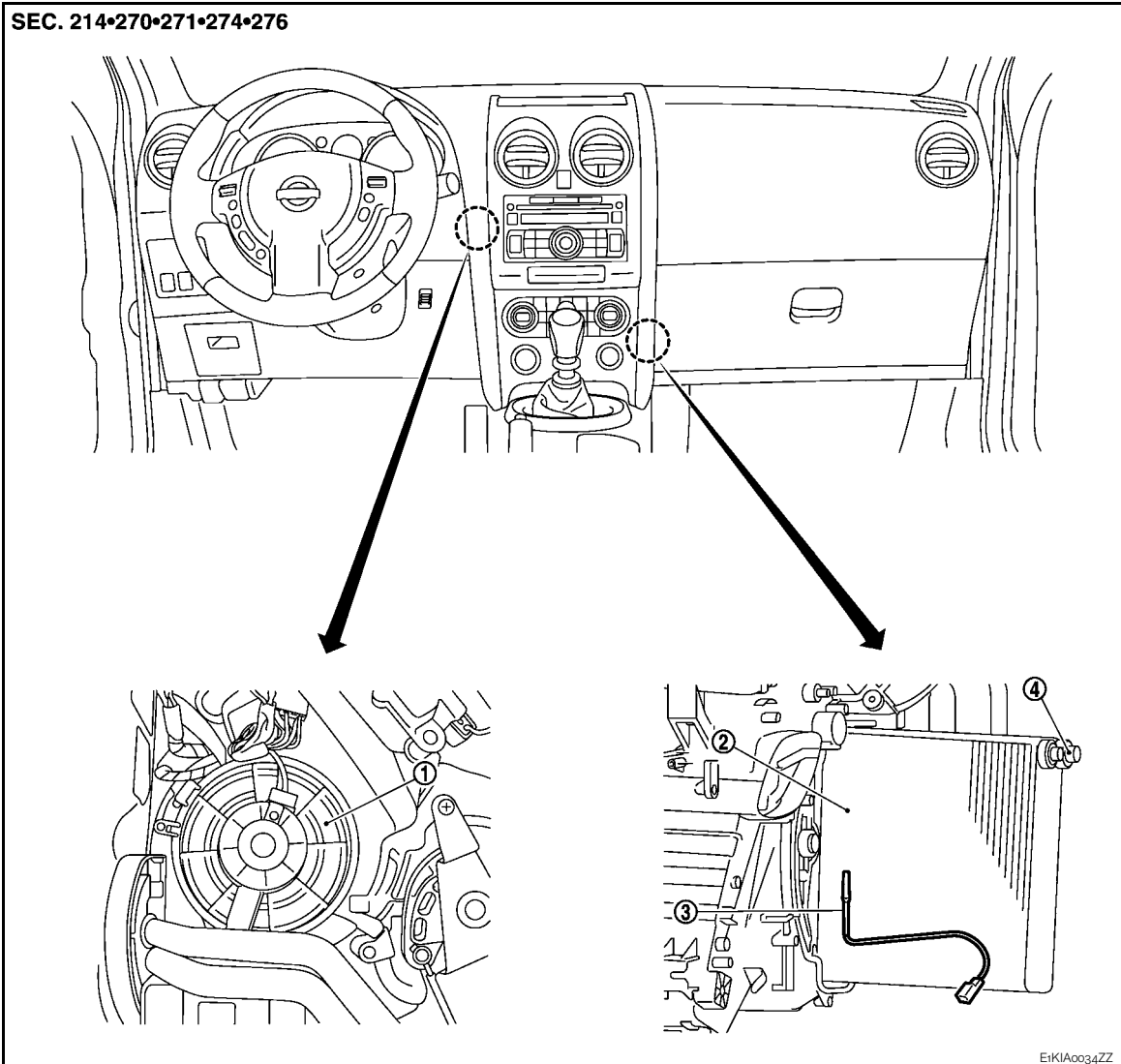
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REFRIGERATION SYSTEM

< FUNCTION DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER (HR/MR)]

SEC. 214•270•271•274•276



1. Blower motor assembly
2. Evaporator
3. Intake sensor (AT only)
4. Expansion valve

Component Description

INFOID:0000000001093752

Component	Description
Compressor	Intakes, compresses, and discharges refrigerant, then conveys it to condenser.
Condenser	Condenses refrigerant, and then conveys it to liquid tank.
Liquid tank	Drives moisture out of refrigerant, eliminates foreign matter, then conveys refrigerant to expansion valve.
Refrigerant pressure sensor	Refer to HAC-70, "Component Inspection" .
Expansion valve	Vaporizes refrigerant, controls the amount of flow, then conveys refrigerant to evaporator.
Evaporator	Cools passing air, and then conveys it to compressor.
Blower motor	Takes in air in the vehicle or fresh outside air, and then adjusts room temperature by air conditioning.

REFRIGERATION SYSTEM SYMPTOMS

< SYMPTOM DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER (HR/MR)]

SYMPTOM DIAGNOSIS

REFRIGERATION SYSTEM SYMPTOMS

SYMPTOM DIAGNOSIS PROCEDURE

SYMPTOM DIAGNOSIS PROCEDURE : Trouble Diagnosis For Unusual Pressure

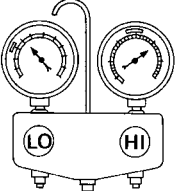
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Whenever system's high and/or low side pressure(s) is/are unusual, diagnose using a manifold gauge. The marker above the gauge scale in the following tables indicates the standard (usual) pressure range. Since the standard (usual) pressure, however,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

BOTH HIGH- AND LOW-PRESSURE SIDES ARE TOO HIGH

BOTH HIGH- AND LOW-PRESSURE SIDES ARE TOO HIGH : Symptom Table

INFOID:0000000001093756

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
Both high- and low-pressure sides are too high.  AC359A	The pressure returns to normal is reduced soon after water is splashed on condenser.	Excessive refrigerant charge in refrigeration cycle.	Reduce refrigerant until specified pressure is obtained.
	Air suction by cooling fan is insufficient.	Insufficient condenser cooling performance. ↓ 1. Condenser fins are clogged. 2. Improper fan rotation of cooling fan.	- Clean condenser. - Check and repair cooling fan as necessary.
	- Low-pressure pipe is not cold. - When compressor is stopped high-pressure value quickly drops by approximately 196 kPa (2 kg/cm², 28 psi). It then decreases gradually thereafter.	Poor heat exchange in condenser (After compressor operation stops, high-pressure decreases too slowly.). ↓ Air in refrigeration cycle.	Evacuate repeatedly and re-charge system.
	Engine tends to overheat.	Engine cooling systems malfunction.	Check and repair each engine cooling system.
	- An area of the low-pressure pipe is colder than areas near the evaporator outlet. - Low-pressure pipe is sometimes covered with frost.	- Excessive liquid refrigerant on low-pressure side. - Excessive refrigerant discharge flow. - Expansion valve is open a little compared with the specification. ↓ Improper expansion valve adjustment.	Replace expansion valve.

HIGH-PRESSURE SIDE IS TOO HIGH AND LOW-PRESSURE SIDE IS TOO LOW

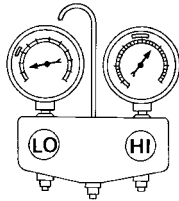
HIGH-PRESSURE SIDE IS TOO HIGH AND LOW-PRESSURE SIDE IS TOO LOW : Symptom Table

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REFRIGERATION SYSTEM SYMPTOMS

< SYMPTOM DIAGNOSIS >

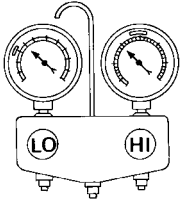
[AUTOMATIC AIR CONDITIONER (HR/MR)]

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
High-pressure side is too high and low-pressure side is too low.  AC360A	Upper side of condenser and high-pressure side are hot, however, liquid tank is not so hot.	High-pressure tube or parts located between compressor and condenser are clogged or crushed.	• Check and repair or replace malfunctioning parts. • Check lubricant for contamination.

HIGH-PRESSURE SIDE IS TOO LOW AND LOW-PRESSURE SIDE IS TOO HIGH

HIGH-PRESSURE SIDE IS TOO LOW AND LOW-PRESSURE SIDE IS TOO HIGH : Symptom Table

INFOID:000000001093758

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
High-pressure side is too low and low-pressure side is too high.  AC366A	High- and low-pressure sides become equal soon after compressor operation stops.	Compressor pressure operation is improper. ↓ Damaged inside compressor packings.	Replace compressor.
	No temperature difference between high- and low-pressure sides.	Compressor pressure operation is improper. ↓ Damaged inside compressor packings.	Replace compressor.

BOTH HIGH- AND LOW-PRESSURE SIDES ARE TOO LOW

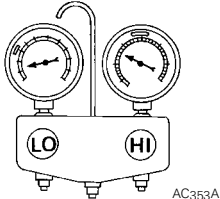
BOTH HIGH- AND LOW-PRESSURE SIDES ARE TOO LOW : Symptom Table

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REFRIGERATION SYSTEM SYMPTOMS

< SYMPTOM DIAGNOSIS >

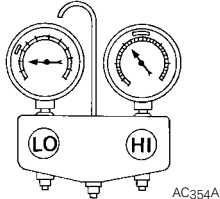
[AUTOMATIC AIR CONDITIONER (HR/MR)]

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
Both high- and low-pressure sides are too low.  AC353A	- There is a big temperature difference between liquid tank outlet and inlet. Outlet temperature is extremely low. - Liquid tank inlet and expansion valve are frosted.	Liquid tank inside is slightly clogged.	- Replace liquid tank. - Check lubricant for contamination.
	- Temperature of expansion valve inlet is extremely low as compared with areas near liquid tank. - Expansion valve inlet is frosted. - Temperature difference occurs somewhere in high-pressure side.	High-pressure pipe located between liquid tank and expansion valve is clogged.	- Check and repair malfunctioning parts. - Check lubricant for contamination.
	Expansion valve and liquid tank are warm or slightly cool when touched.	Low refrigerant charge. ↓ Leaking fittings or components.	Check refrigerant for leaks. Refer to HA-30, "Refrigerant Leaks" .
	There is a big temperature difference between expansion valve inlet and outlet while the valve itself is frosted.	Expansion valve closes a little compared with the specification. ↓ 1. Improper expansion valve adjustment. 2. Malfunctioning expansion valve. 3. Outlet and inlet may be clogged.	- Remove foreign particles by using compressed air. - Replace expansion valve. - Check lubricant for contamination.
	An area of the low-pressure pipe is colder than areas near the evaporator outlet.	Low-pressure pipe is clogged or crushed.	- Check and repair malfunctioning parts. - Check lubricant for contamination.
	Air flow volume is not enough or is too low.	Evaporator is frozen.	- Check intake sensor circuit. Refer to HAC-59, "Diagnosis Procedure". - Replace compressor. - Repair evaporator fins. - Replace evaporator. - Refer to HAC-62, "Diagnosis Procedure".

LOW-PRESSURE SIDE SOMETIMES BECOMES NEGATIVE

LOW-PRESSURE SIDE SOMETIMES BECOMES NEGATIVE : Symptom Table

INFOID:000000001093760

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
Low-pressure side sometimes becomes negative.  AC354A	- Air conditioning system does not function and does not cyclically cool the compartment air. - The system constantly functions for a certain period of time after compressor is stopped and restarted.	Refrigerant does not discharge cyclically. ↓ Moisture is frozen at expansion valve outlet and inlet. ↓ Water is mixed with refrigerant.	- Drain water from refrigerant or replace refrigerant. - Replace liquid tank.

LOW-PRESSURE SIDE BECOMES NEGATIVE

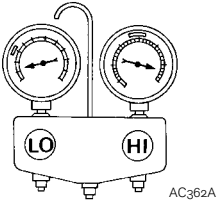
REFRIGERATION SYSTEM SYMPTOMS

< SYMPTOM DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER (HR/MR)]

LOW-PRESSURE SIDE BECOMES NEGATIVE : Symptom Table

INFOID:000000001093761

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
Low-pressure side becomes negative.  AC362A	Liquid tank or front/rear side of expansion valve's pipe is frosted or wet with dew.	High-pressure side is closed and refrigerant does not flow. ↓ Expansion valve or liquid tank is frosted.	Leave the system at rest until no frost is present. Start it again to check whether or not the malfunction is caused by water or foreign particles. • If water is the cause, initially cooling is okay. Then the water freezes causing a blockage. Drain water from refrigerant or replace refrigerant. • If due to foreign particles, remove expansion valve and remove the particles with dry and compressed air (not shop air). • If either of the above methods cannot correct the malfunction, replace expansion valve. • Replace liquid tank. • Check lubricant for contamination.

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PRECAUTION

PRECAUTIONS

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

INFOID:0000000001115386

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 SRC and SB section of this Service Manual.

WARNING:

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

Precaution Necessary for Steering Wheel Rotation After Battery Disconnect

INFOID:0000000001115391

NOTE:

- This Procedure is applied only to models with Intelligent Key system and NATS (NISSAN ANTI-THEFT SYSTEM).
- Remove and install all control units after disconnecting both battery cables with the ignition knob in the "LOCK" position.
- Always use CONSULT-III to perform self-diagnosis as a part of each function inspection after finishing work. If DTC is detected, perform trouble diagnosis according to self-diagnostic results.

For models equipped with the Intelligent Key system and NATS, an electrically controlled steering lock mechanism is adopted on the key cylinder.

For this reason, if the battery is disconnected or if the battery is discharged, the steering wheel will lock and steering wheel rotation will become impossible.

If steering wheel rotation is required when battery power is interrupted, follow the 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. Use the Intelligent Key or mechanical key to turn the ignition switch to the "ACC" position. At this time, the steering lock will be released.
3. Disconnect both battery cables. The steering lock will remain released and the steering wheel can be rotated.
4. Perform the necessary repair operation.
5. When the repair work is completed, return the ignition switch to the "LOCK" position before connecting the battery cables. (At this time, the steering lock mechanism will engage.)
6. Perform a self-diagnosis check of all control units using CONSULT-III.

Precaution for Procedure without Cowl Top Cover

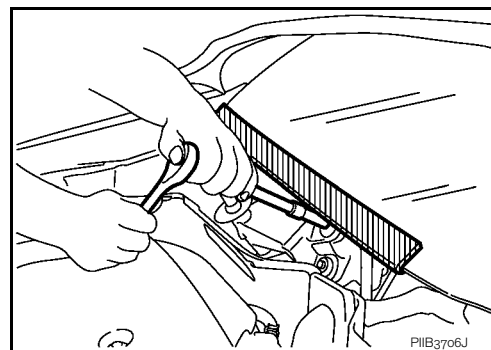
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PRECAUTIONS

[AUTOMATIC AIR CONDITIONER (HR/MR)]

< PRECAUTION >

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



INFOID:000000001115398

Precautions For Xenon Headlamp Service

WARNING:

Comply with the following warnings to prevent any serious accident.

- Disconnect the battery cable (negative terminal) or the power supply fuse before installing, removing, or touching the xenon headlamp (bulb included). The xenon headlamp contains high-voltage generated parts.
- Never work with wet hands.
- Check the xenon headlamp ON-OFF status after assembling it to the vehicle. Never turn the xenon headlamp ON in other conditions. Connect the power supply to the vehicle-side connector. (Turning it ON outside the lamp case may cause fire or visual impairments.)
- Never touch the bulb glass immediately after turning it OFF. It is extremely hot.

CAUTION:

Comply with the following cautions to prevent any error and malfunction.

- Install the xenon bulb securely. (Insufficient bulb socket installation may melt the bulb, the connector, the housing, etc. by high-voltage leakage or corona discharge.)
- Never perform HID circuit inspection with a tester.
- Never touch the xenon bulb glass with hands. Never put oil and grease on it.
- Dispose of the used xenon bulb after packing it in thick vinyl without breaking it.
- Never wipe out dirt and contamination with organic solvent (thinner, gasoline, etc.).

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

INFOID:000000001093766

CAUTION:

- CFC-12 (R-12) refrigerant and HFC-134a (R-134a) refrigerant are not compatible. These refrigerants must never be mixed, even in the smallest amounts. If the refrigerants are mixed and compressor malfunction is likely occur.
- Use only specified lubricant for the HFC-134a (R-134a) A/C system and HFC-134a (R-134a) components. If lubricant other than that specified is used, compressor malfunction is likely to occur.
- The specified HFC-134a (R-134a) lubricant 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, never remove the caps (unseal) until just before connecting the components. Connect all refrigerant loop components as quickly as possible to minimize the entry of moisture into system.
 - Only use the specified lubricant from a sealed container. Immediately reseal containers of lubricant. Without proper sealing, lubricant will become moisture saturated and should not be used.
 - Never allow lubricant (Nissan A/C System Oil Type S) to come in contact with styrene foam parts. Damage may result.

General Refrigerant Precaution

INFOID:000000001093767

WARNING:

- Avoid breathing A/C refrigerant and lubricant vapor or mist. Exposure may irritate eyes, nose and throat. Use only approved recovery/recycling equipment to discharge HFC-134a (R-134a) refrigerant. If accidental system discharge occurs, ventilate work area before resuming service. Additional health and safety information may be obtained from refrigerant and lubricant manufacturers.

PRECAUTIONS

[AUTOMATIC AIR CONDITIONER (HR/MR)]

< PRECAUTION >

- Never 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.
- Never store or heat refrigerant containers above 52°C (126°F).
- Never 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.
- Never 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.
- Never pressure test or leak test HFC-134a (R-134a) service equipment and/or vehicle air conditioning systems with compressed air during repair. Some mixtures of air and HFC-134a (R-134a) have been shown to be combustible at elevated pressures. These mixtures, if ignited, may cause injury or property damage. Additional health and safety information may be obtained from refrigerant manufacturers.

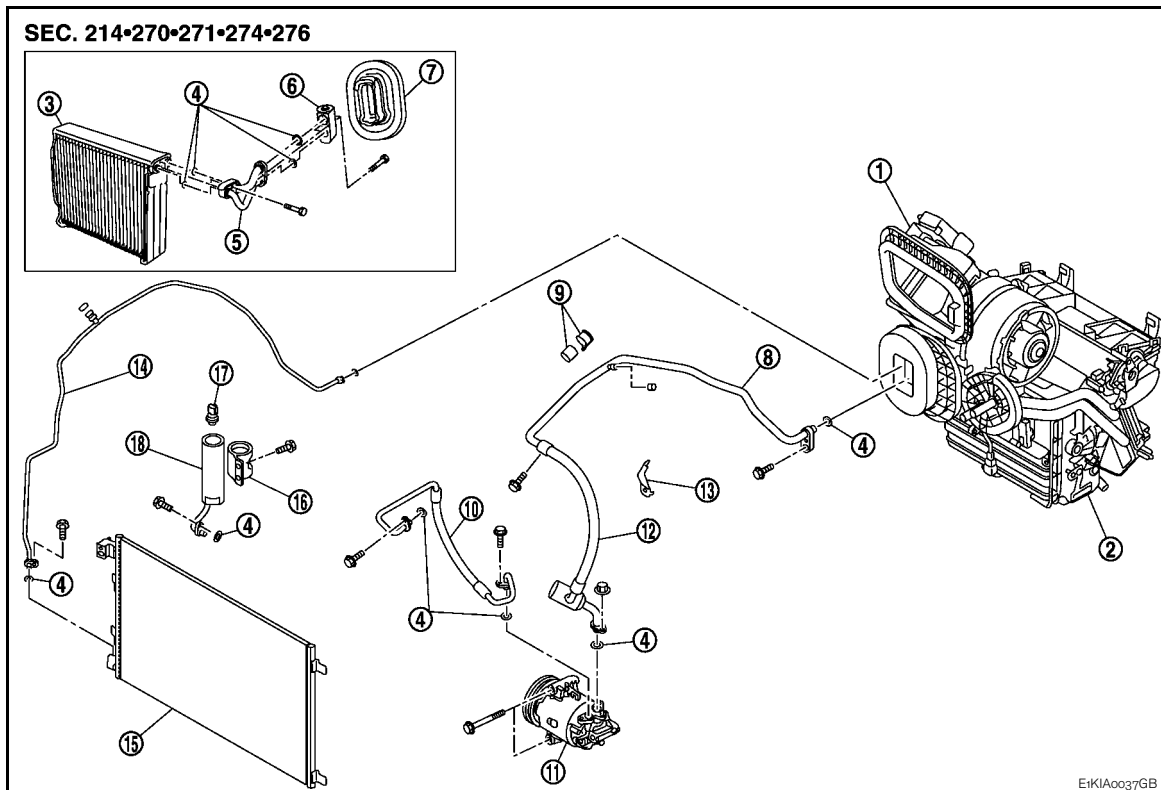
Refrigerant Connection

INFOID:000000001093768

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

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

O-RING AND REFRIGERANT CONNECTION



- | | | |
|---------------------------------|--|---|
| 1. Heater sealing | 2. Expansion valve | 3. O-ring |
| 4. Evaporator | 5. Low pressure pipe 1 and high pressure pipe 2 assembly | 6. Connector pipe fixing bolt |
| 7. High pressure pipe 1 | 8. Condenser assembly | 9. Fixing bolt |
| 10. Compressor | 11. Heater & cooling unit assembly | 12. Heater & blower unit assembly |
| 13. Refrigerant pressure sensor | 14. Liquid tank | 15. Pipe fixing bolt |
| 16. Low pressure flexible hose | 17. Low & high pipe bracket support | 18. Low pressure flexible hose and pipe 2 |

PRECAUTIONS

< PRECAUTION >

[AUTOMATIC AIR CONDITIONER (HR/MR)]

- | | | |
|--------------------------------|---|------------------------------|
| 19. Pipes fixing clip | 20. Low pressure pipe 2 fixing clamp assembly | 21. Liquid tank fixing screw |
| 22. Liquid tank fixing bracket | 23. High pressure flexible hose | |

CAUTION:

The new and former refrigerant connections use different O-ring configurations. Never confuse O-rings since they are not interchangeable. If a wrong O-ring is installed, refrigerant may leak at the connection.

O-Ring Part Numbers and Specifications

Connection type	Piping connection point		Part number	QTY	O-ring size
New	Low pressure pipe 2 to expansion valve		92473 N8210	1	16
	High pressure flexible pipe 1 to condenser		92472 N8210	1	12
	High pressure pipe 1 to expansion valve		92471 N8210	1	8
	Low pressure pipe 1 and high pressure pipe 2 assembly to expansion valve	Inlet	92475 71L00	1	12
		Outlet	92475 72L00	1	16
	Low pressure pipe 1 and high pressure pipe 2 assembly to evaporator	Inlet	92475 71L00	1	12
		Outlet	92475 72L00	1	16
	High pressure pipe 1 to liquid tank		92471 N8210	1	8
	Compressor to low pressure flexible hose		92474 N8210	2	19
	Compressor to high pressure flexible hose		92474 N8210	2	12
	Liquid tank to condenser		92473 N8210	1	16

WARNING:

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

CAUTION:

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

- When the compressor is removed, store it in the same way as it is when mounted on the car. Failure to do so will cause lubricant to enter the low-pressure chamber.
- When connecting tubes, always use a torque wrench and a back-up wrench.
- After disconnecting tubes, immediately plug all openings to prevent entry of dust and moisture.
- When installing an air conditioner in the vehicle, connect the pipes at the final stage of the operation. 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.
- Thoroughly remove moisture from the refrigeration system before charging the refrigerant.
- Always replace used O-rings.
- When connecting tube, apply lubricant to circle of the O-rings shown in illustration. Be careful not to apply lubricant to threaded portion.

Name : Nissan A/C System Oil Type S

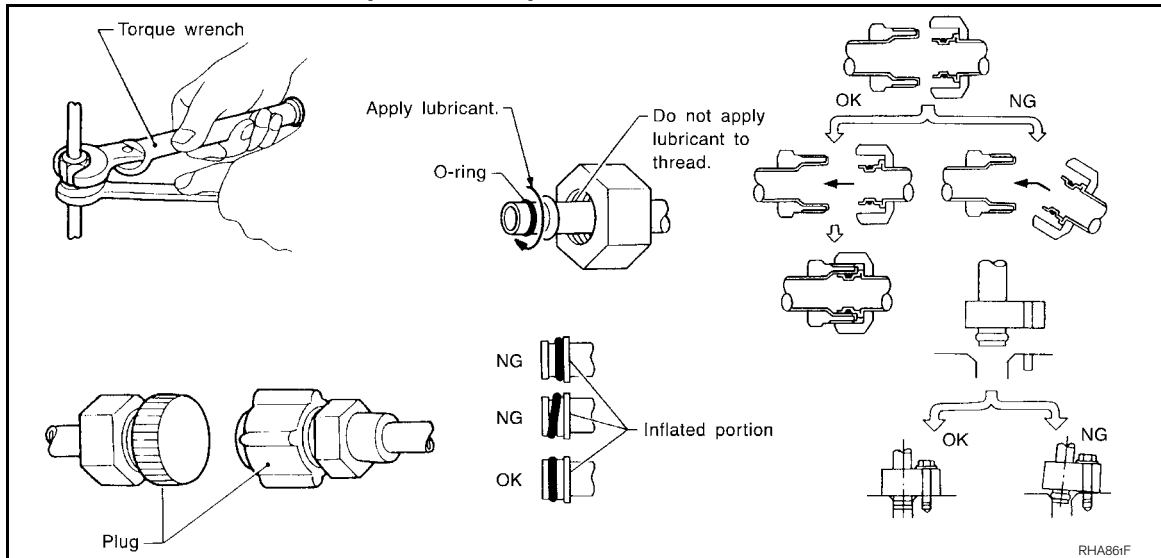
- O-ring must be closely attached to the groove portion of tube.
- When replacing the O-ring, be careful not to damage O-ring and tube.
- Connect tube until a click can be heard, then tighten the nut or bolt by hand. Make sure that the O-ring is installed to tube correctly.

PRECAUTIONS

[AUTOMATIC AIR CONDITIONER (HR/MR)]

< PRECAUTION >

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



Service Equipment

INFOID:000000001093769

RECOVERY/RECYCLING 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

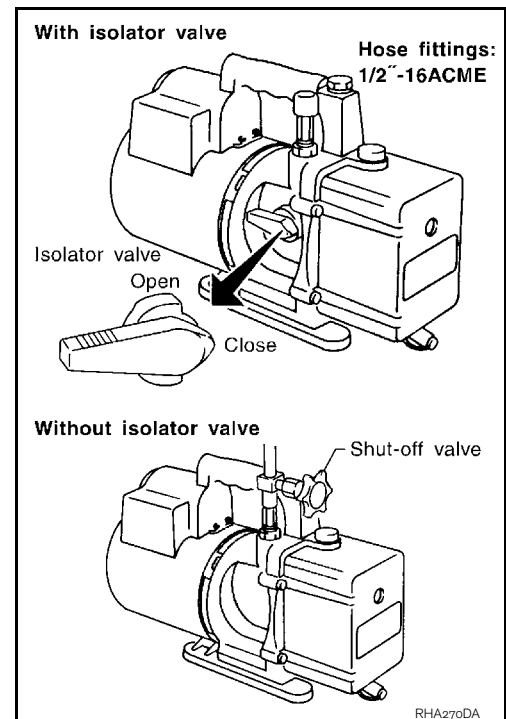
Be certain to follow the manufacturer's instructions for tester operation and tester maintenance.

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 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 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.



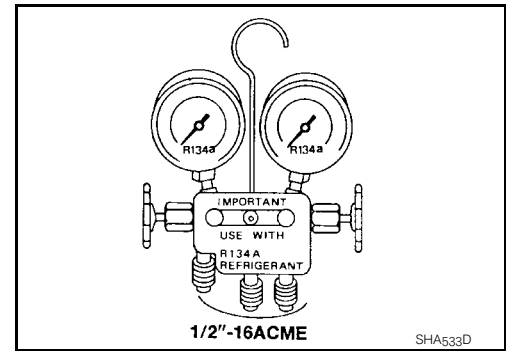
MANIFOLD GAUGE SET

PRECAUTIONS

[AUTOMATIC AIR CONDITIONER (HR/MR)]

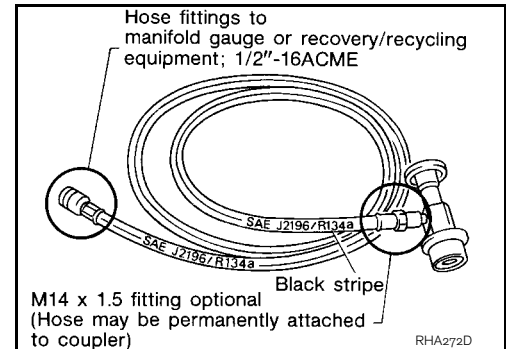
< PRECAUTION >

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

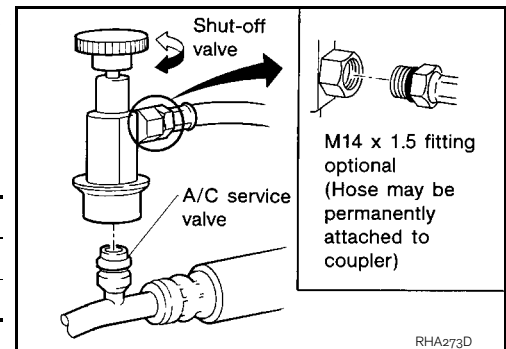
Be certain that the service hoses display the markings described (colored hose with black stripe). All hoses must include positive shut-off devices (either manual or automatic) near the end of the hoses opposite to the manifold gauge.



SERVICE COUPLERS

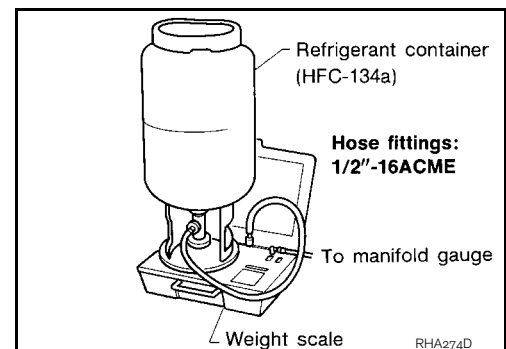
Never attempt to connect HFC-134a (R-134a) service couplers to a CFC-12 (R-12) A/C system. The HFC-134a (R-134a) couplers will not properly connect to the CFC-12 (R-12) system. However, if an improper connection is attempted, discharging and contamination may occur.

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



REFRIGERANT WEIGHT SCALE

Verify that no refrigerant other than HFC-134a (R-134a) and specified lubricants 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.

COMPRESSOR

General Precautions

INFOID:0000000001093770

CAUTION:

- Plug all openings to prevent moisture and foreign matter from entering.
- When the compressor is removed, store it in the same way as it is when mounted on the car.
- When replacing or repairing compressor, follow "Maintenance of Lubricant Quantity in Compressor" exactly. Refer to [HA-27, "Adjustment"](#).
- Keep friction surfaces between clutch and pulley clean. If the surface is contaminated with lubricant, wipe it off by using a clean waste cloth moistened with thinner.
- After compressor service operation, turn the compressor shaft by hand more than five turns in both directions. This will equally distribute lubricant inside the compressor. After the compressor is installed, let the engine idle and operate the compressor for one hour.
- After replacing the compressor magnet clutch, apply voltage to the new one and check for normal operation.

LEAK DETECTION DYE

< PRECAUTION >

[AUTOMATIC AIR CONDITIONER (HR/MR)]

LEAK DETECTION DYE

General Precautions

INFOID:000000001093771

CAUTION:

- The A/C system contains a fluorescent leak detection dye used for locating refrigerant leaks. An ultraviolet (UV) lamp is required to illuminate the dye when inspecting for leaks.
- Always wear fluorescence enhancing UV safety goggles to protect your eyes and enhance the visibility of the fluorescent dye.
- The fluorescent dye leak detector is not a replacement for an electrical leak detector (SST: J-41995). The fluorescent dye leak detector should be used in conjunction with an electrical leak detector (SST: J-41995) to pin-point refrigerant leaks.
- For the purpose of safety and customer's satisfaction, read and follow all manufacture's operating instructions and precautions prior to performing the work.
- A compressor shaft seal should not necessarily be repaired because of dye seepage. The compressor shaft seal should only be repaired after confirming the leak with an electrical leak detector (SST: J-41995).
- Always remove any remaining dye from the leak area after repairs are completed to avoid a misdiagnosis during a future service.
- Never allow dye to come into contact with painted body panels or interior components. If dye is spilled, clean immediately with the approved dye cleaner. Fluorescent dye left on a surface for an extended period of time cannot be removed.
- 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 will remain for three years or a little over unless a compressor malfunction occurs.

IDENTIFICATION

NOTE:

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

IDENTIFICATION LABEL FOR VEHICLE

Vehicles with factory installed fluorescent dye have the identification label on the front side of hood.

PREPARATION

PREPARATION

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

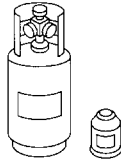
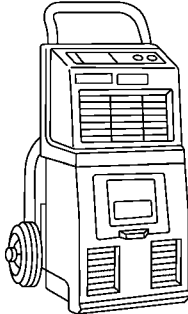
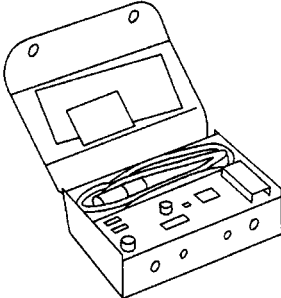
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Never mix HFC-134a (R-134a) refrigerant and/or its specified lubricant with CFC-12 (R-12) refrigerant and/or its lubricant.

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.

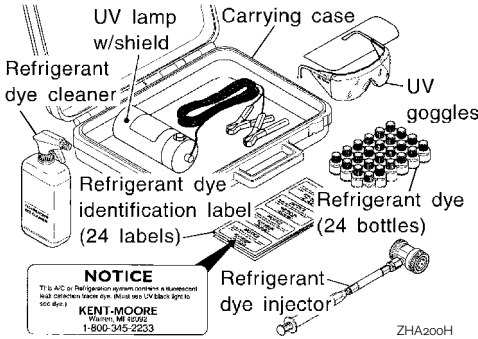
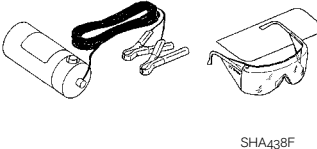
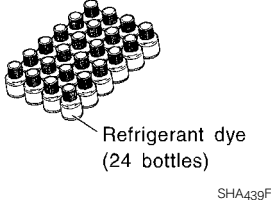
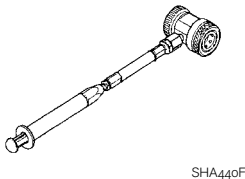
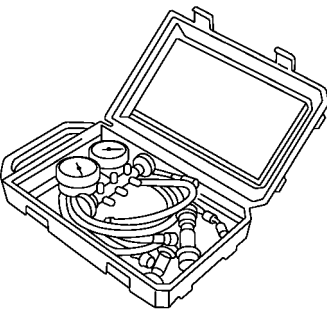
Adapters that convert one size fitting to another must never be used: refrigerant/lubricant contamination will occur and compressor malfunction will result.

Tool number 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
KLH00-PAGS0 Nissan A/C System Oil Type S (DH-PS)	 S-NT197	Type: Polyalkylene glycol oil (PAG), type S (DH-PS) Application: HFC-134a (R-134a) wobble (swash) plate compressors (Nissan only) Lubricity: 40 m ℓ (1.4 Imp fl oz.)
Recovery/Recycling/ Recharging equipment (ACR4)	 RJI A0195E	Function: Refrigerant recovery and recycling and recharging
Electrical leak detector	 A/C leak detector SHA705EB	Power supply: DC 12V (Cigarette lighter)

PREPARATION

[AUTOMATIC AIR CONDITIONER (HR/MR)]

< PREPARATION >

Tool number Tool name		Description
(J-43926) Refrigerant dye leak detection kit Kit includes: (J-42220) UV lamp and UV safety goggles (J-41459) HFC-134a (R-134a) dye injector Use with J-41447, 1/4 ounce bottle (J-41447) HFC-134a (R-134a) fluorescent leak detection dye (Box of 24, 1/4 ounce bottles) (J-43872) Refrigerant dye cleaner		Power supply: DC 12V (Battery terminal)
(J-42220) UV lamp and UV safety goggles		Power supply: DC 12V (Battery terminal) For checking refrigerant leak when fluorescent dye is installed in A/C system Includes: UV lamp and UV safety goggles
(J-41447) HFC-134a (R-134a) fluorescent leak detection dye (Box of 24, 1/4 ounce bottles)		Application: For HFC-134a (R-134a) PAG oil Container: 1/4 ounce (7.4 cc) bottle (Includes self-adhesive dye identification labels for affixing to vehicle after charging system with dye.)
(J-41459) HFC-134a (R-134a) dye injector Use with J-41447, 1/4 ounce bottle		For injecting 1/4 ounce of fluorescent leak detection dye into A/C system.
(J-43872) Refrigerant dye cleaner		For cleaning dye spills.
Manifold gauge set (with hoses and couplers)		Identification: • The gauge face indicates HFC-134a (R-134a). Fitting size: Thread size • 1/2" -16 ACME

PREPARATION

< PREPARATION >

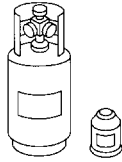
[AUTOMATIC AIR CONDITIONER (HR/MR)]

Sealant or/and Lubricant

INFOID:000000001093774

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
Nissan A/C System Oil Type S (DH-PS)  S-NT197	Type: Polyalkylene glycol oil (PAG), type S (DH-PS) Application: HFC-134a (R-134a) swash plate compressors (Nissan only) Capacity: 40 mℓ (1.4 US fl oz., 1.4 Imp fl oz.)

cardiagn.com

ON-VEHICLE MAINTENANCE

LUBRICANT

Adjustment

INFOID:000000001093775

LUBRICANT RETURN OPERATION

Adjust the lubricant quantity according to the test group shown below.

1.CHECK LUBRICANT RETURN OPERATION

Can lubricant return operation be performed?

- A/C system works properly.
- There is no evidence of a large amount of lubricant leakage.

CAUTION:**If excessive lubricant leakage is noted, never perform the lubricant return operation.**Is it successful?

YES >> GO TO 2.

NO >> GO TO 3.

2.PERFORM LUBRICANT RETURN OPERATION, PROCEEDING AS FOLLOWS

1. Start the engine, and set to the following conditions:
 - Engine speed: Idling to 1,200 rpm
 - A/C switch: ON
 - Blower speed: Max. position
 - Temp. control: Optional [Set so that intake air temperature is 25 to 30°C (77 to 86°F).]
 - Intake position: Recirculation (REC)
2. Perform lubricant return operation for about 10 minutes.
3. Stop the engine.

>> GO TO 3.

3.CHECK REPLACEMENT PART

Should the compressor be replaced?

YES >> Refer to "LUBRICANT ADJUSTING PROCEDURE FOR COMPRESSOR REPLACEMENT".

NO >> Refer to "LUBRICANT ADJUSTING PROCEDURE FOR COMPONENTS REPLACEMENT EXCEPT COMPRESSOR".

LUBRICANT ADJUSTING PROCEDURE FOR COMPONENTS REPLACEMENT EXCEPT COMPRESSOR

After replacing any of the following major components, add the correct amount of lubricant to the system.

Amount of lubricant to be added:

Part replaced	Lubricant to be added to system	Remarks
	Amount of lubricant mℓ (US fl oz., Imp fl oz.)	
Evaporator	75 (2.5, 2.6)	—
Condenser	35 (1.2, 1.2)	—
Liquid tank	10 (0.3, 0.4)	—
In case of refrigerant leak	30 (1.0, 1.1)	Large leak
	—	Small leak ^{*1}

^{*1}: If the refrigerant leak is small, no addition of lubricant is needed.

LUBRICANT ADJUSTING PROCEDURE FOR COMPRESSOR REPLACEMENT

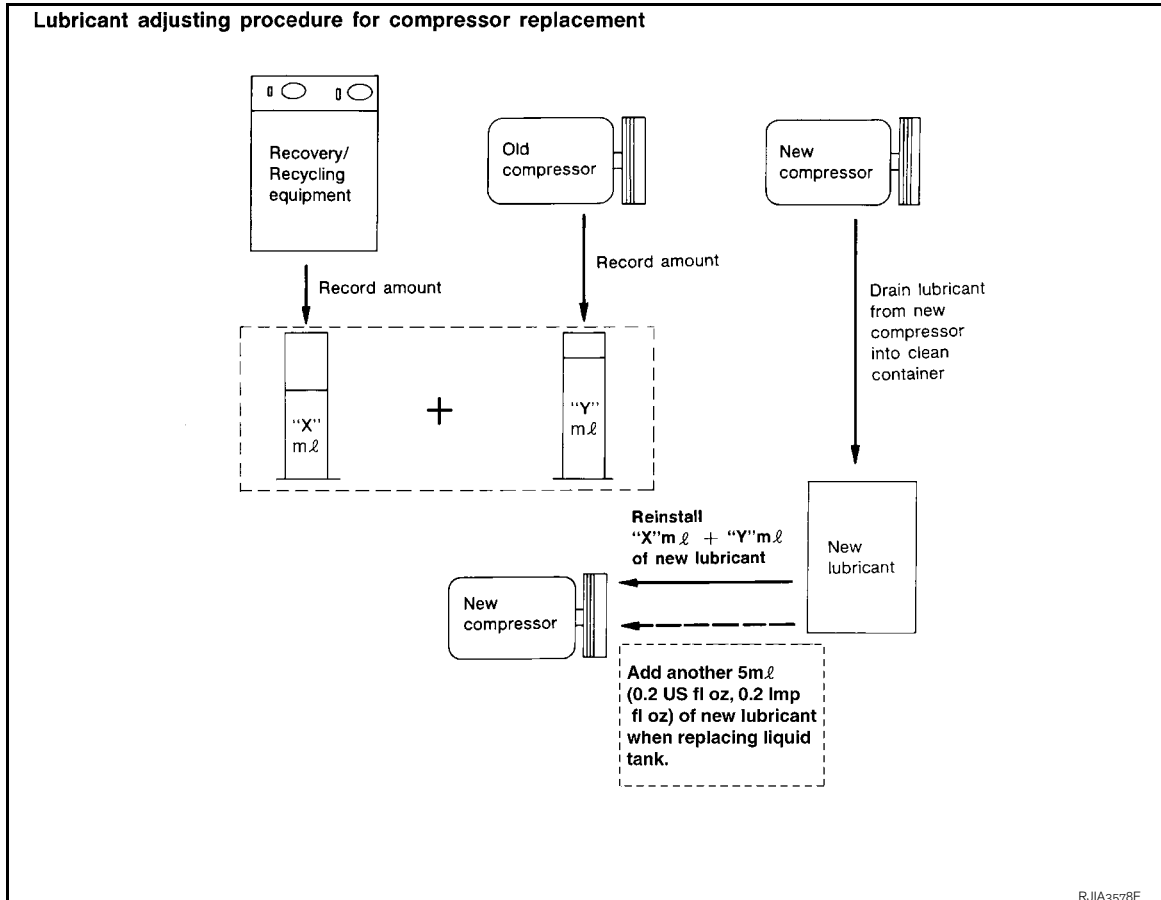
LUBRICANT

< ON-VEHICLE MAINTENANCE >

[AUTOMATIC AIR CONDITIONER (HR/MR)]

1. Before connecting recovery/recycling recharging equipment to vehicle, check recovery/recycling recharging equipment gauges. No refrigerant pressure should be displayed. If NG, recover refrigerant from equipment lines.
2. Connect recovery/recycling recharging equipment to vehicle. Confirm refrigerant purity in supply tank using recovery/recycling recharging equipment and refrigerant identifier. If NG, refer to [HA-17, "Working with HFC-134a \(R-134a\)"](#).
3. Confirm refrigerant purity in vehicle A/C system using recovery/recycling recharging equipment and refrigerant identifier. If NG, refer to [HA-17, "Working with HFC-134a \(R-134a\)"](#).
4. Discharge refrigerant into the refrigerant recovery/recycling equipment. Measure lubricant discharged into the recovery/recycling equipment.
5. Drain the lubricant from the old (removed) compressor into a graduated container and recover the amount of lubricant drained.
6. Drain the lubricant from the new compressor into a separate, clean container.
7. Measure an amount of new lubricant installed equal to amount drained from old compressor. Add this lubricant to new compressor through the suction port opening.
8. Measure an amount of new lubricant equal to the amount recovered during discharging. Add this lubricant to new compressor through the suction port opening.
9. If the liquid tank also needs to be replaced, add another 5 mℓ (0.2 US fl oz., 0.2 Imp fl oz.) of lubricant at this time.

Do not add this 5 mℓ (0.2 US fl oz., 0.2 Imp fl oz.) of lubricant when replaces the compressor only.



REFRIGERATION SYSTEM

< ON-VEHICLE MAINTENANCE >

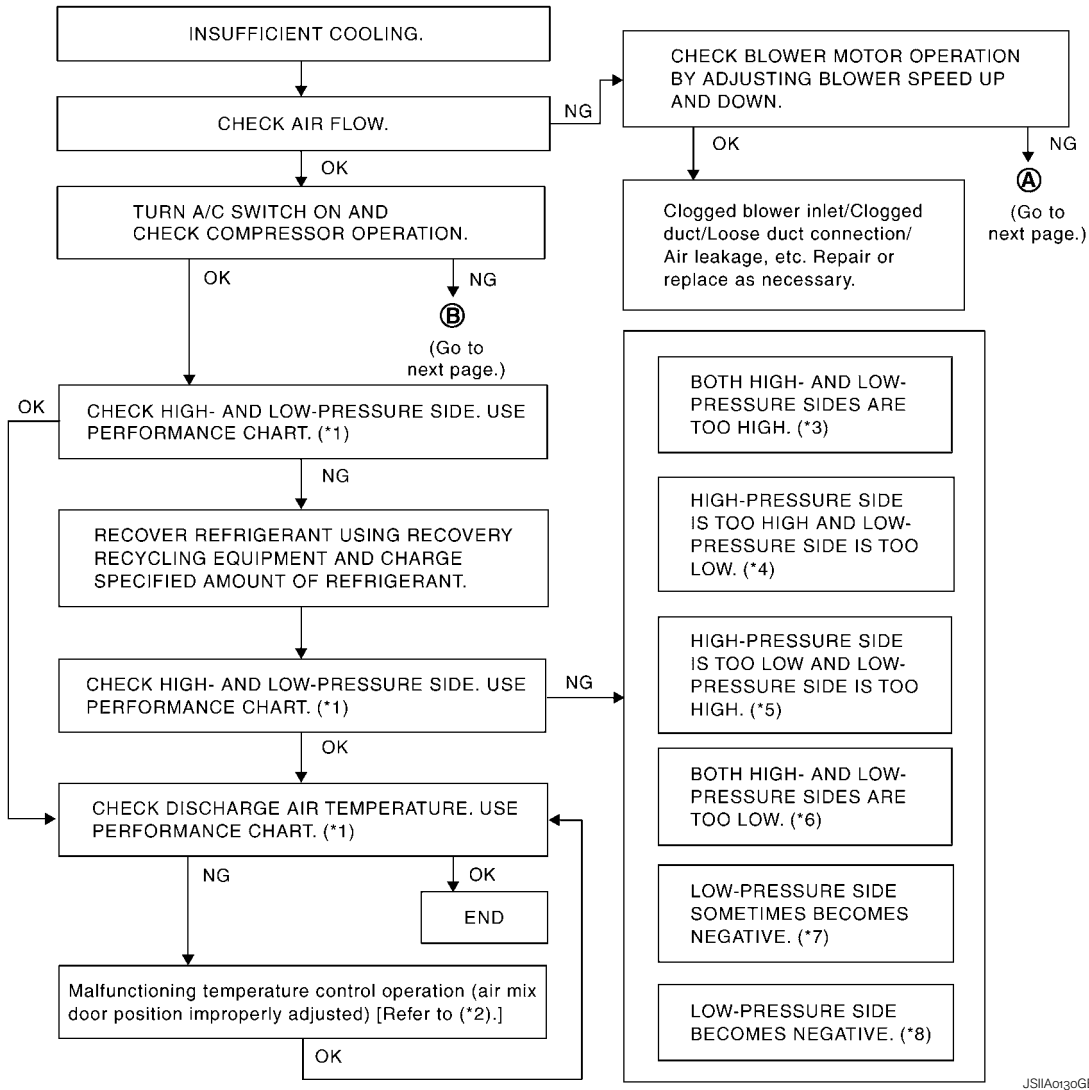
[AUTOMATIC AIR CONDITIONER (HR/MR)]

REFRIGERATION SYSTEM

Inspection

INFOID:000000001093776

PERFORMANCE TEST DIAGNOSIS



JSIIA0130GB

*2 [HAC-54, "Diagnosis Procedure"](#)

*3 [HA-12, "BOTH HIGH- AND LOW-PRESSURE SIDES ARE TOO HIGH : Symptom Table"](#)

*4 [HA-12, "HIGH-PRESSURE SIDE IS TOO HIGH AND LOW-PRESSURE SIDE IS TOO LOW : Symptom Table"](#)

*5 [HA-13, "HIGH-PRESSURE SIDE IS TOO LOW AND LOW-PRESSURE SIDE IS TOO HIGH : Symptom Table"](#)

*6 [HA-13, "BOTH HIGH- AND LOW-PRESSURE SIDES ARE TOO LOW : Symptom Table"](#)

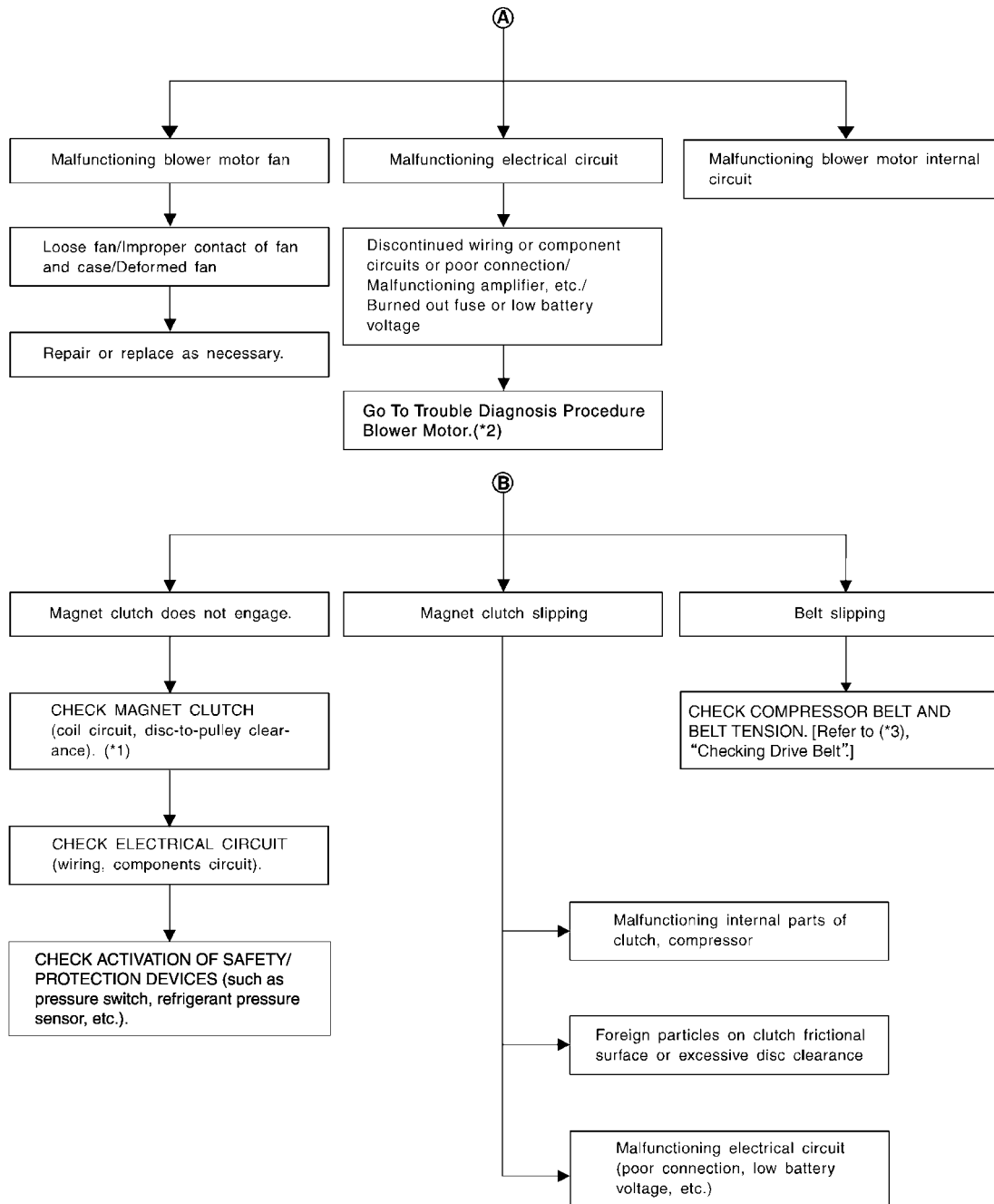
*7 [HA-14, "LOW-PRESSURE SIDE SOMETIMES BECOMES NEGATIVE : Symptom Table"](#)

*8 [HA-15, "LOW-PRESSURE SIDE BECOMES NEGATIVE : Symptom Table"](#)

REFRIGERATION SYSTEM

< ON-VEHICLE MAINTENANCE >

[AUTOMATIC AIR CONDITIONER (HR/MR)]



SJIA1642E

*2 [HAC-62. "Diagnosis Procedure"](#)

*3 [EM-15. "Checking"](#) (HR engine models) or [EM-134. "Checking"](#) (MR engine models)

Refrigerant Leaks

INFOID:000000001093778

Perform a visual inspection of all refrigeration parts, fittings, hoses and components for signs of A/C lubricant leakage, damage and corrosion. A/C lubricant leakage may indicate an area of refrigerant leakage. Allow extra inspection time in these areas when using either an electrical leak detector or fluorescent dye leak detector (SST: J-42220).

If dye is observed, confirm the leak with an electrical leak detector. It is possible a prior leak was repaired and not properly cleaned.

REFRIGERATION SYSTEM

< ON-VEHICLE MAINTENANCE >

[AUTOMATIC AIR CONDITIONER (HR/MR)]

When searching for leaks, do not stop when one leak is found but continue to check for additional leaks at all system components and connections.

When searching for refrigerant leaks using an electrical leak detector, move the probe along the suspected leak area at 1 to 2 inches per second and no further than 1/4 inch from the component.

CAUTION:

Moving the electrical leak detector probe slower and closer to the suspected leak area will improve the chances of finding a leak.

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FLUORESCENT LEAK DETECTOR**Inspection**

INFOID:000000001093779

CHECKING SYSTEM FOR LEAKS USING THE FLUORESCENT LEAK DETECTOR

1. Check A/C system for leaks using the UV lamp and safety goggles (SST: J-42220) in a low sunlight area (area without windows preferable). Illuminate all components, fittings and lines. The dye will appear as a bright green/yellow area at the point of leakage. Fluorescent dye observed at the evaporator drain opening indicates an evaporator core assembly (tubes, core or expansion valve) leak.
2. If the suspected area is difficult to see, use an adjustable mirror or wipe the area with a clean shop rag or cloth, with the UV lamp for dye residue.
3. After the leak is repaired, remove any residual dye using dye cleaner (SST: J-43872) to prevent future misdiagnosis.
4. Perform a system performance check and verify the leak repair with an approved electrical leak detector.

NOTE:

Other gases in the work area or substances on the A/C components, for example, anti-freeze, windshield washer fluid, solvents and lubricants, may falsely trigger the leak detector. Make sure the surfaces to be checked are clean.

Clean with a dry cloth or blow off with shop air.

Do not allow the sensor tip of the detector to contact with any substance. This can also cause false readings and may damage the detector.

DYE INJECTION

(This procedure is only necessary when recharging the system or when the compressor has seized and was replaced.)

1. Check A/C system static (at rest) pressure. Pressure must be at least 345 kPa (3.52 kg/cm², 50 psi).
2. Pour one bottle (1/4 ounce / 7.4 cc) of the A/C refrigerant dye into the injector tool (SST: J-41459).
3. Connect the injector tool to the A/C low-pressure side service valve.
4. Start the engine and switch A/C ON.
5. When the A/C operating (compressor running), inject one bottle (1/4 ounce / 7.4 cc) of fluorescent dye through the low-pressure service valve using dye injector tool (SST: J-41459) (refer to the manufacture's operating instructions).
6. With the engine still running, disconnect the injector tool from the service valve.

CAUTION:

Be careful the A/C system or replacing a component, pour the dye directly into the open system connection and proceed with the service procedures.

7. Operate the A/C system for a minimum of 20 minutes to mix the dye with the system oil. Depending on the leak size, operating conditions and location of the leak, it may take from minutes to days for the dye to penetrate a leak and become visible.
8. Attach a blue label as necessary.

ELECTRICAL LEAK DETECTOR

< ON-VEHICLE MAINTENANCE >

[AUTOMATIC AIR CONDITIONER (HR/MR)]

ELECTRICAL LEAK DETECTOR

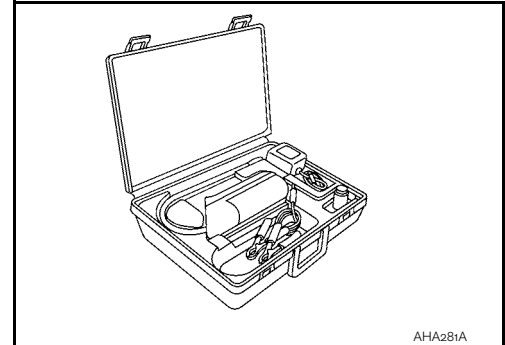
Inspection

INFOID:000000001093780

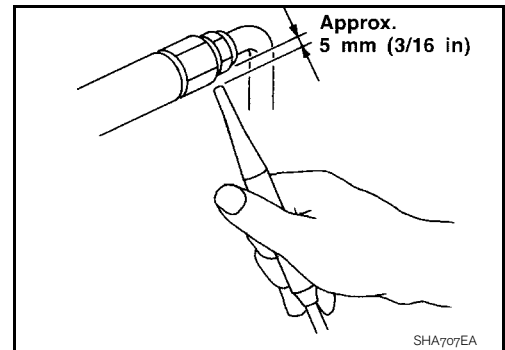
PRECAUTIONS FOR HANDLING LEAK DETECTOR

When performing a refrigerant leak check, use an electrical leak detector (SST: J-41995) or equivalent. Ensure that the instrument is calibrated and set properly per the operating instructions.

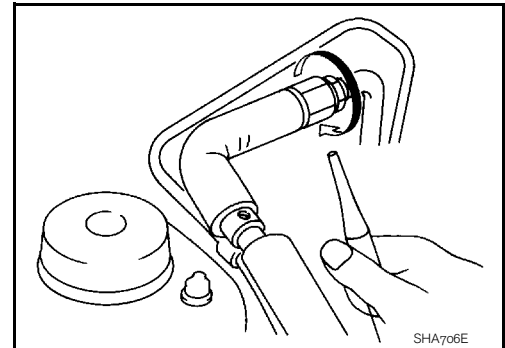
The leak detector is a delicate device. In order to use the leak detector properly, read the operating instructions and perform any specified maintenance.



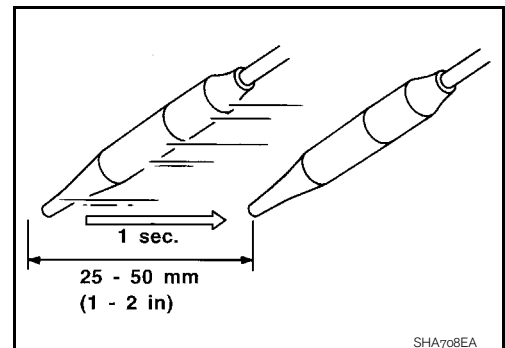
1. Position probe approximately 5 mm (3/16 in) away from point to be checked.



2. When testing, circle each fitting completely with probe.



3. Move probe along component approximately 25 to 50 mm (1 to 2 in)/sec.



CHECKING PROCEDURE

To prevent inaccurate or false readings, make sure there is no refrigerant vapor, shop chemicals, or cigarette smoke in the vicinity of the vehicle. Perform the leak test in calm area (low air/wind movement) so that the leaking refrigerant is not dispersed.

1. Stop the engine.

ELECTRICAL LEAK DETECTOR

< ON-VEHICLE MAINTENANCE >

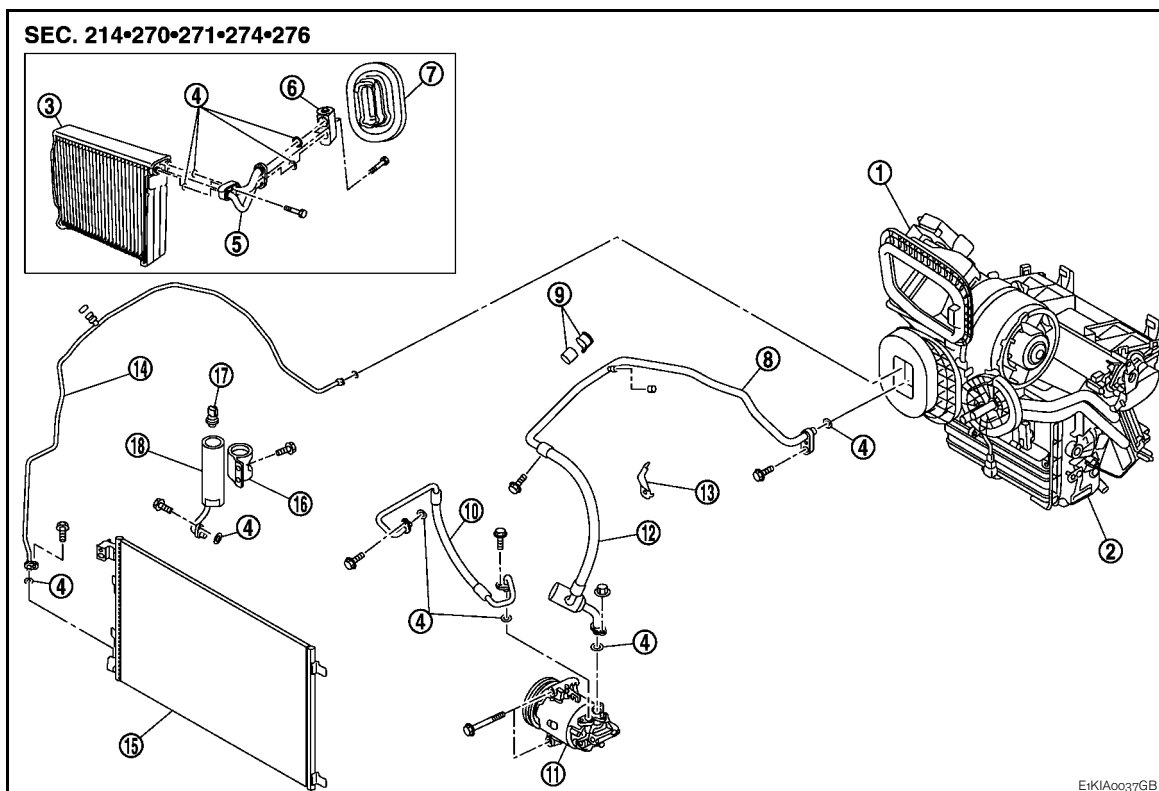
[AUTOMATIC AIR CONDITIONER (HR/MR)]

2. Connect a suitable A/C manifold gauge set (SST: J-39183) to the A/C service valves.
3. Check if the A/C refrigerant pressure is at least 345 kPa (3.52 kg/cm², 50 psi) above 16°C (61°F). If less than specification, recover/evacuate and recharge the system with the specified amount of refrigerant.

NOTE:

At temperatures below 16°C (61°F), leaks may not be detected since the system may not reach 345 kPa (3.52 kg/cm², 50 psi).

4. Perform the leak test from the high-pressure side (compressor discharge a to evaporator inlet j) to the low-pressure side (evaporator drain hose k to shaft seal p). Perform a leak check for the following areas carefully. Clean the component to be checked and move the leak detected probe completely around the connection/component.



- | | | |
|-------------------------------------|--|--|
| 1. Heater & blower unit assembly | 2. Heater & cooling unit assembly | 3. Evaporator |
| 4. O-ring | 5. Low pressure pipe 1 and high pressure pipe 2 assembly | 6. Expansion valve |
| 7. Heater sealing | 8. Low pressure flexible hose and pipe 2 | 9. Low pressure pipe 2 fixing clamp assembly |
| 10. High pressure flexible hose | 11. Compressor | 12. Low pressure flexible hose |
| 13. Low & high pipe bracket support | 14. High pressure pipe 1 | 15. Condenser assembly |
| 16. Liquid tank fixing bracket | 17. Refrigerant pressure sensor | 18. Liquid tank |

Compressor

Check the fitting of high- and low-pressure flexible hoses, relief valve and shaft seal.

Condenser

Check the fitting of condenser pipe assembly, high-pressure flexible hose and pipe.

Liquid tank

Check the fitting of radiator & condenser assembly and refrigerant pressure sensor.

Service valves

Check all around the service valves. Ensure service valve caps are secured on the service valves (to prevent leaks).

NOTE:

After removing A/C manifold gauge set from service valves, wipe any residue from valves to prevent any false readings by leak detector.

Cooling unit (Evaporator)

ELECTRICAL LEAK DETECTOR

< ON-VEHICLE MAINTENANCE >

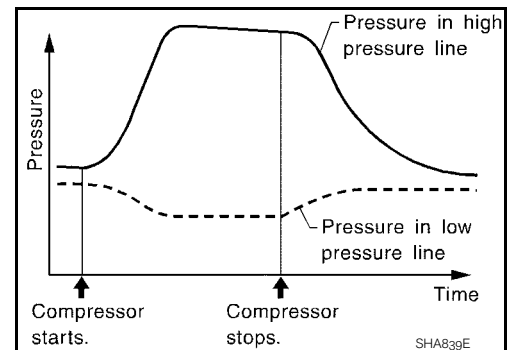
[AUTOMATIC AIR CONDITIONER (HR/MR)]

With engine OFF, turn blower fan on "High" for at least 15 seconds to dissipate any refrigerant trace in the cooling unit. Wait a minimum of 10 minutes accumulation time (refer to the manufacturer's recommended procedure for actual wait time) before inserting the leak detector probe into the drain hose. Keep the probe inserted for at least 10 seconds. Use caution not to contaminate the probe tip with water or dirt that may be in the drain hose.

5. If a leak detector detects a leak, verify at least once by blowing compressed air into area of suspected leak, then repeat check as outlined above.
6. Do not stop when one leak is found. Continue to check for additional leaks at all system components. If no leaks are found, perform steps 7 - 10.
7. Start the engine.
8. Set the A/C control as follows;
 - a. A/C switch: ON
 - b. MODE door position: VENT (Ventilation)
 - c. Intake door position: Recirculation
 - d. Temperature setting: Max. cold
 - e. Fan speed: High
9. Run engine at 1,500 rpm for at least 2 minutes.

10. Stop the engine and perform leak check again following steps 4 through 6 above.

Refrigerant leaks should be checked immediately after stopping the engine. Begin with the leak detector at the compressor. The pressure on the high-pressure side will gradually drop after refrigerant circulation stops and pressure on the low-pressure side will gradually rise, as shown in the graph. Some leaks are more easily detected when pressure is high.



11. Before connecting recovery/recycling recharging equipment to vehicle, check recovery/recycling recharging equipment gauges. No refrigerant pressure should be displayed. If pressure is displayed, recover refrigerant from equipment lines and then check refrigerant purity.
12. Confirm refrigerant purity in supply tank using recovery/recycling recharging equipment and refrigerant identifier.
13. Confirm refrigerant purity in vehicle A/C system using recovery/recycling recharging equipment and refrigerant identifier.
14. Discharge A/C system using approved refrigerant recovery equipment. Repair the leaking fitting or component if necessary.
15. Evacuate and recharge A/C system and perform the leak test to confirm no refrigerant leaks.
16. Perform A/C performance test to ensure system works properly.

REFRIGERATION SYSTEM

< ON-VEHICLE REPAIR >

[AUTOMATIC AIR CONDITIONER (HR/MR)]

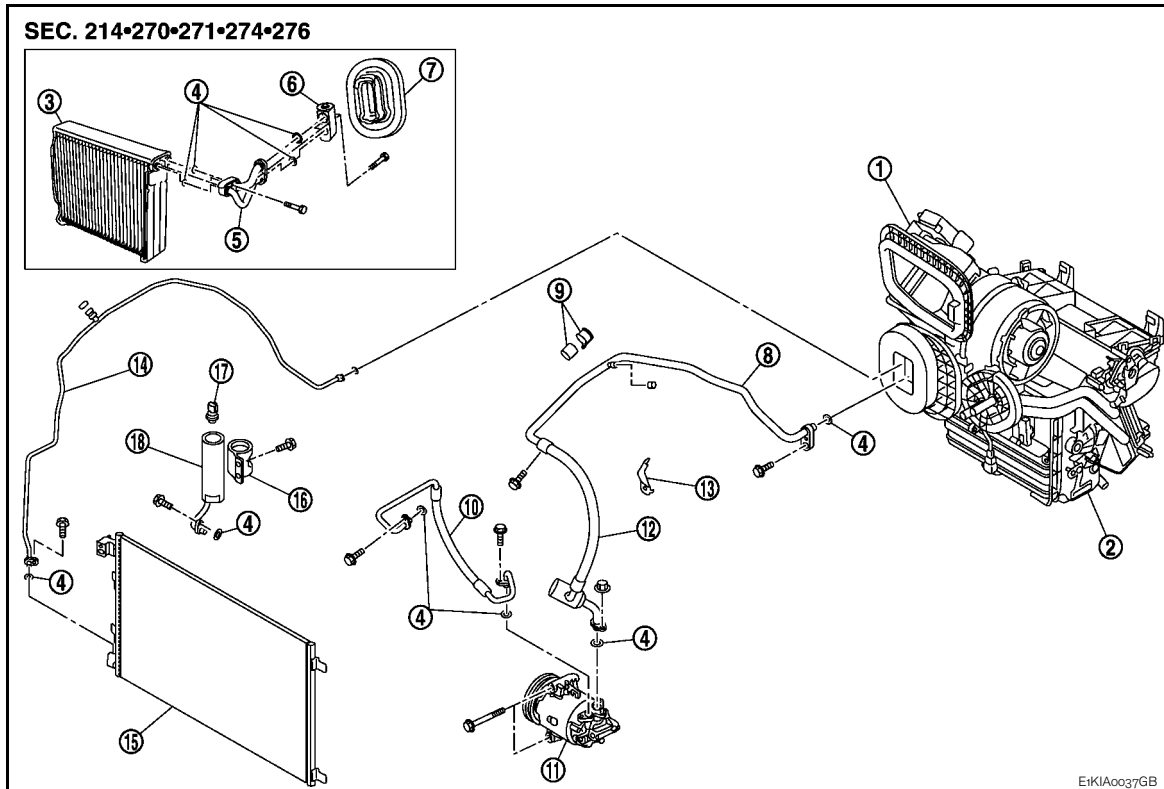
ON-VEHICLE REPAIR

REFRIGERATION SYSTEM

Exploded View

INFOID:000000001093781

Refer to [HA-18, "Refrigerant Connection"](#).



- | | | |
|-------------------------------------|--|--|
| 1. Heater & blower unit assembly | 2. Heater & cooling unit assembly | 3. Evaporator |
| 4. O-ring | 5. Low pressure pipe 1 and high pressure pipe 2 assembly | 6. Expansion valve |
| 7. Heater sealing | 8. Low pressure flexible hose and pipe 2 | 9. Low pressure pipe 2 fixing clamp assembly |
| 10. High pressure flexible hose | 11. Compressor | 12. Low pressure flexible hose |
| 13. Low & high pipe bracket support | 14. High pressure pipe 1 | 15. Condenser assembly |
| 16. Liquid tank fixing bracket | 17. Refrigerant pressure sensor | 18. Liquid tank |

Inspection After Installation

INFOID:000000001093782

SETTING OF SERVICE TOOLS AND EQUIPMENT

Discharging Refrigerant

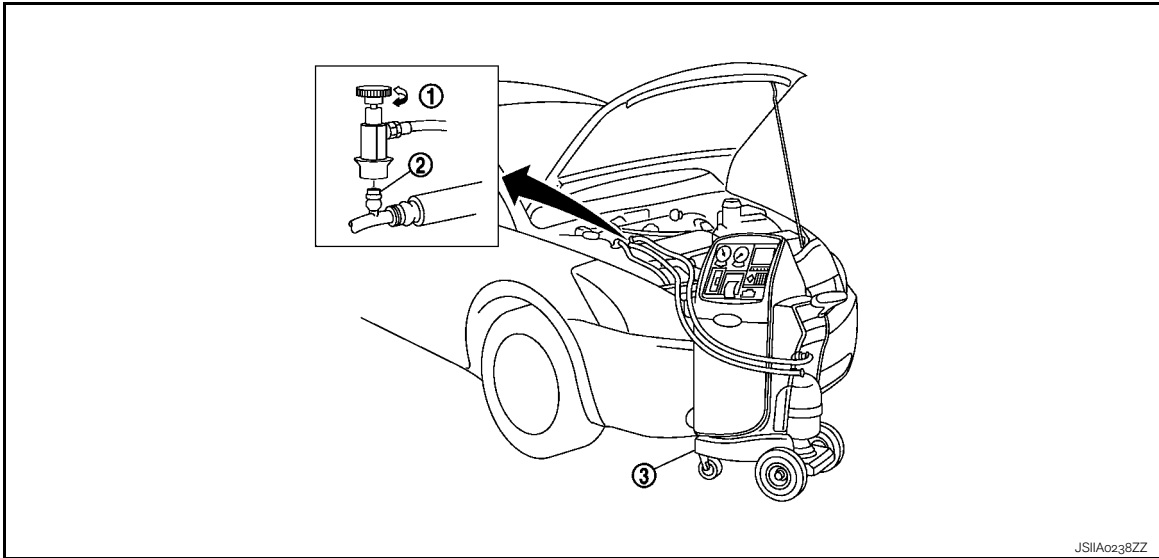
WARNING:

Avoid breathing A/C refrigerant and lubricant vapor or mist. Exposure may irritate eyes, nose and throat. Remove HFC-134a (R-134a) from 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]. If accidental system discharge occurs, ventilate work area before resuming service. Additional health and safety information may be obtained from refrigerant and lubricant manufacturers.

REFRIGERATION SYSTEM

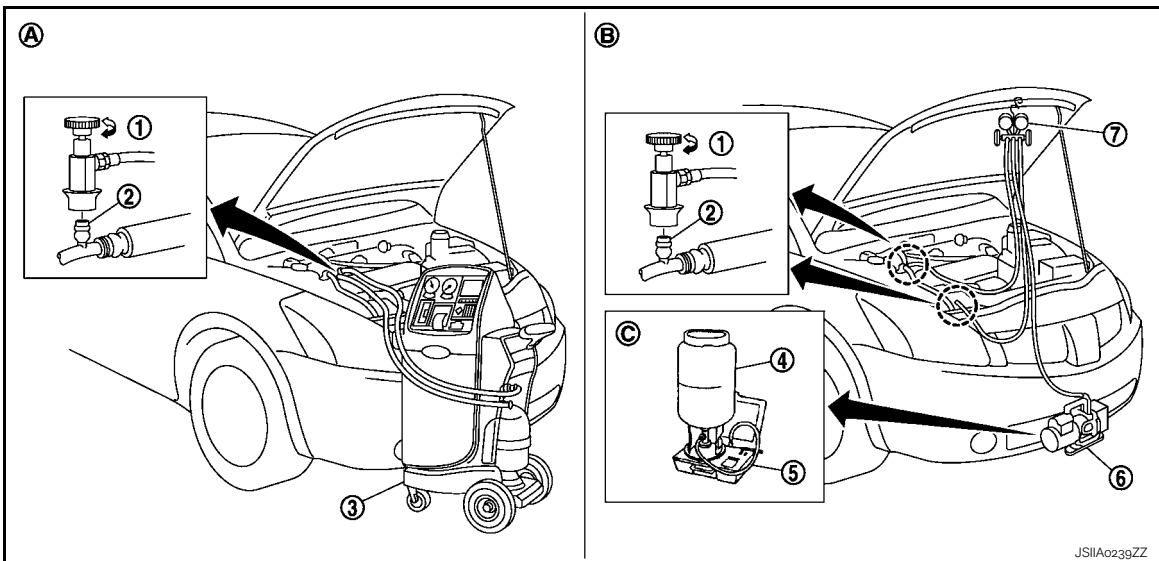
< ON-VEHICLE REPAIR >

[AUTOMATIC AIR CONDITIONER (HR/MR)]



- 1. Shut-off valve
- 2. A/C service valve
- 3. Recovery/Recycling/Recharging equipment

Evacuating System and Charging Refrigerant

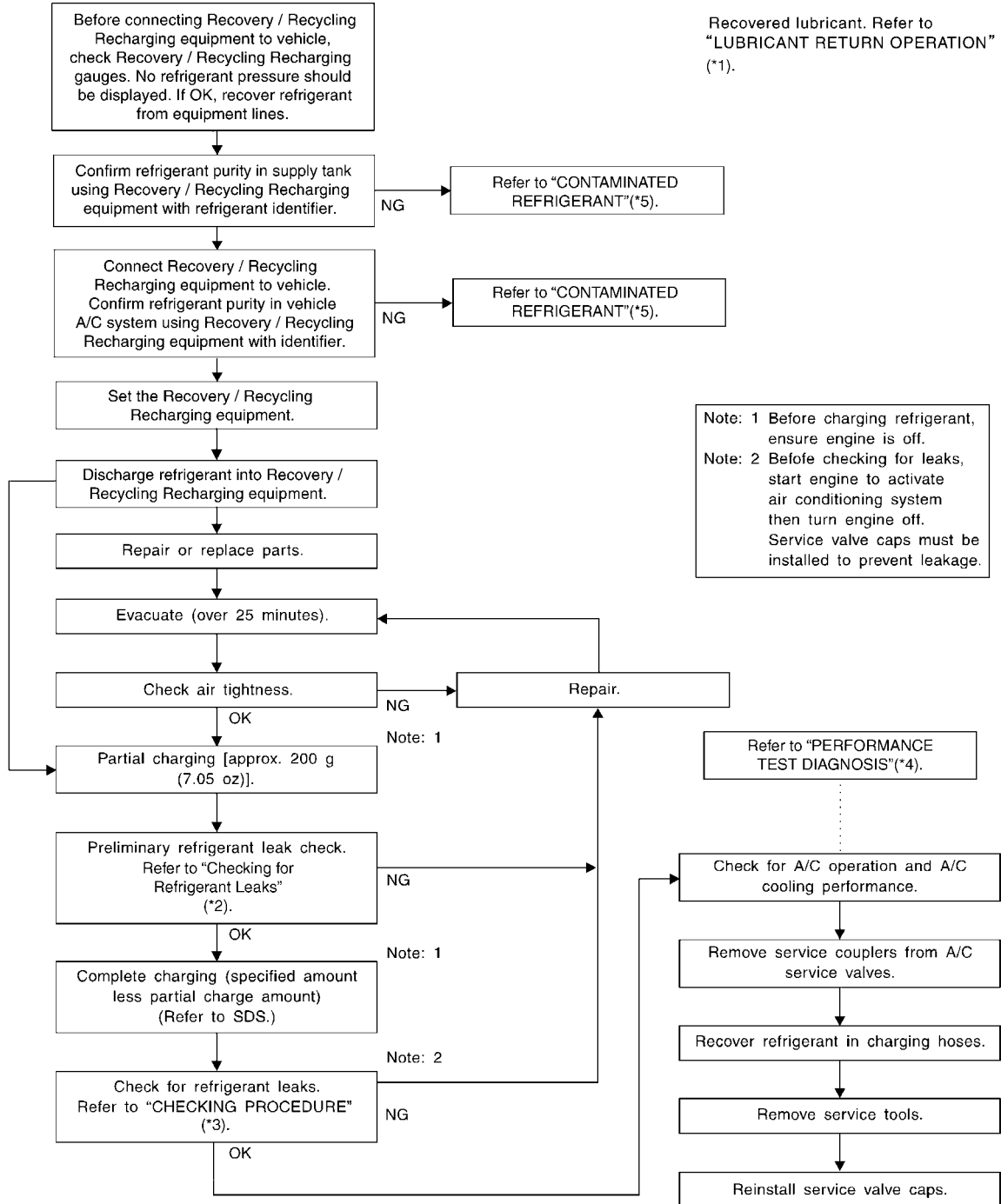


- 1. Shut-off valve
 - 2. A/C service valve
 - 3. Recovery/Recycling/Recharging equipment
 - 4. Refrigerant container (HFC-134a)
 - 5. Weight scale (J-39650)
 - 6. Vacuum pump (J-39649)
 - 7. Manifold gauge set (J-39183)
- A. Preferred (best) method B. Alternative method C. For charging

REFRIGERATION SYSTEM

< ON-VEHICLE REPAIR >

[AUTOMATIC AIR CONDITIONER (HR/MR)]



*1 [HA-27, "Adjustment"](#)

*2 "REFRIGERANT LEAKS" in [HA-30, "Refrigerant Leaks"](#).

*3 "CHECKING PROCEDURE" in [HA-29, "Inspection"](#).

*4 "PERFORMANCE TEST DIAGNOSIS" in [HA-29, "Inspection"](#).

*5 "CONTAMINATED REFRIGERANT" in [HAC-118, "Working with HFC-134a \(R-134a\)"](#).

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COMPRESSOR

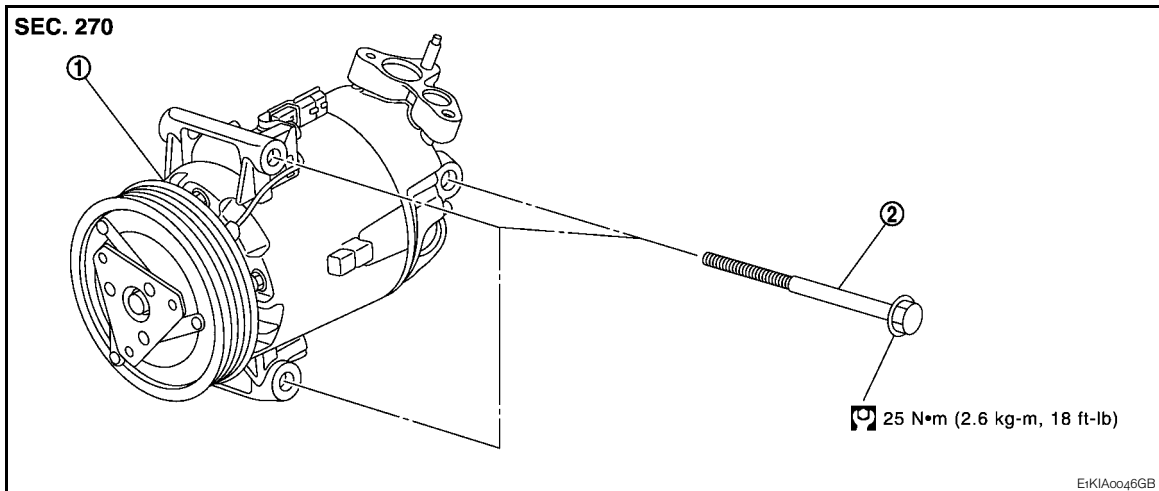
< ON-VEHICLE REPAIR >

[AUTOMATIC AIR CONDITIONER (HR/MR)]

COMPRESSOR

Exploded View

INFOID:000000001093783



1. Compressor
2. Compressor fixing bolt

Refer to [GI-4, "Components"](#) for symbols in the figure.

Removal and Installation

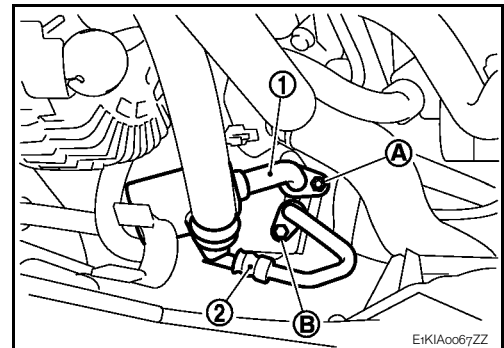
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REMOVAL

1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
2. Remove engine cover ornament.
3. Remove air intake hoses (RH) and air duct (LH). Refer to [EM-27, "Removal and Installation"](#) (HR engine models) or [EM-144, "Removal and Installation"](#) (MR engine models).
4. Remove engine undercover, using power tools.
5. Drain engine coolant from radiator. Refer to [CO-9, "Draining"](#) (HR engine models) or [CO-30, "Draining"](#) (MR engine models).
6. Remove drive belt. Refer to [EM-16, "Removal and Installation"](#) (HR engine models) or [EM-134, "Removal and Installation"](#) (MR engine models).
7. Remove lower radiator hose from engine. Refer to [CO-13, "Exploded View"](#) (HR engine models) or [CO-34, "Exploded View"](#) (MR engine models).
8. Remove mounting nuts (A) from low-pressure flexible hose (1) and mounting bolt (B) from high-pressure flexible hose (2).
9. Remove low-pressure flexible hose, and, high-pressure flexible hose from compressor.

CAUTION:

Cap or wrap the joint of compressor, low-pressure flexible hose and high-pressure flexible hose with suitable material such as vinyl tape to avoid the entry of air.

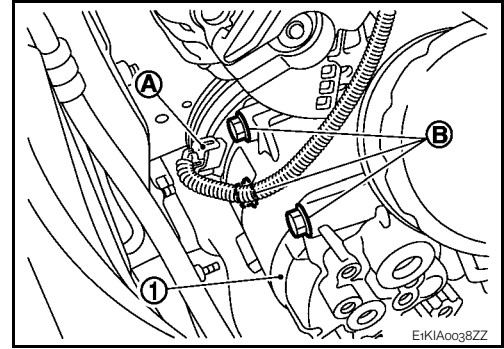


COMPRESSOR

< ON-VEHICLE REPAIR >

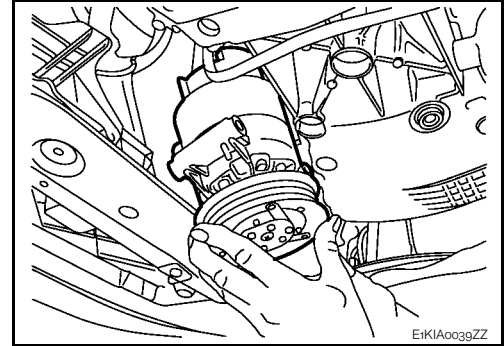
[AUTOMATIC AIR CONDITIONER (HR/MR)]

10. Remove compressor harness connector (A), then remove mounting bolts (B) from compressor (1), using power tools.



11. Remove the compressor from the vehicle.

Compressor fixing bolt to engine
: 25 N·m (2.6 kg-m, 18.5 ft-lb)



INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

- Replace O-rings of low-pressure flexible hose and high-pressure flexible hose with new ones, and then apply compressor oil to it when installing it.
- When recharging refrigerant, check for leaks.

LOW-PRESSURE FLEXIBLE HOSE AND PIPE 2

< ON-VEHICLE REPAIR >

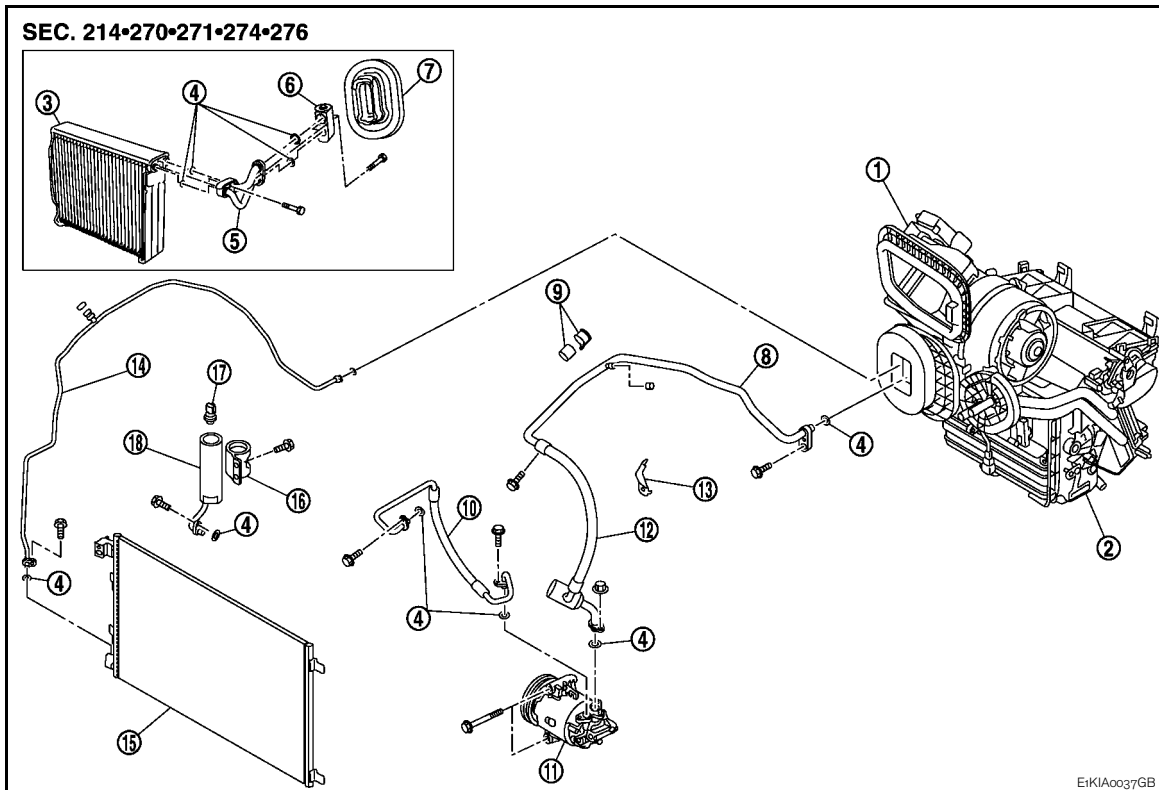
[AUTOMATIC AIR CONDITIONER (HR/MR)]

LOW-PRESSURE FLEXIBLE HOSE AND PIPE 2

Exploded View

INFOID:000000001093786

Refer to [HA-18, "Refrigerant Connection"](#).



- | | | |
|-------------------------------------|--|--|
| 1. Heater & blower unit assembly | 2. Heater & cooling unit assembly | 3. Evaporator |
| 4. O-ring | 5. Low pressure pipe 1 and high pressure pipe 2 assembly | 6. Expansion valve |
| 7. Heater sealing | 8. Low pressure flexible hose and pipe 2 | 9. Low pressure pipe 2 fixing clamp assembly |
| 10. High pressure flexible hose | 11. Compressor | 12. Low pressure flexible hose |
| 13. Low & high pipe bracket support | 14. High pressure pipe 1 | 15. Condenser assembly |
| 16. Liquid tank fixing bracket | 17. Refrigerant pressure sensor | 18. Liquid tank |

Removal and Installation

INFOID:000000001093787

REMOVAL

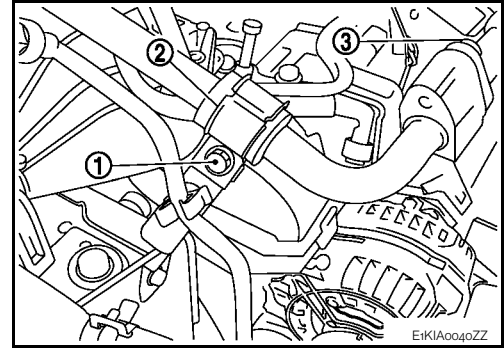
1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
2. Remove air intake hose (RH side), and air duct (LH). Refer to [EM-35, "Removal and Installation"](#) (HR engine), [EM-155, "Removal and Installation"](#) (ER engine).

LOW-PRESSURE FLEXIBLE HOSE AND PIPE 2

< ON-VEHICLE REPAIR >

[AUTOMATIC AIR CONDITIONER (HR/MR)]

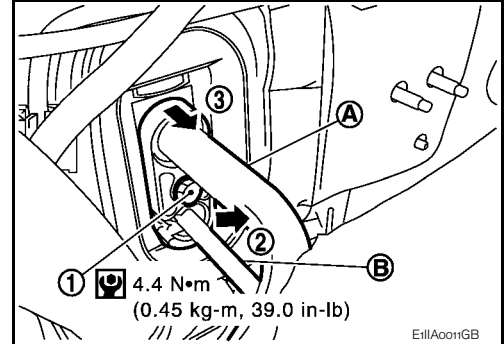
3. Remove mounting bolt (1) and clamp (2), from low pressure pipe bracket support.
4. Remove low and high-pressure maintaining clip, from both pipes, then remove fixing bolt (3).
5. Remove engine room insulator fixing clip from cowl top.



6. Pull engine room insulator, then remove pipes bracket fixing bolt (1), from expansion valve, and release pipes fixing bracket, as shown in order (1) to (3), from high pressure pipe (B), to remove low pressure flexible hose and pipe2 (A) from expansion valve.

CAUTION:

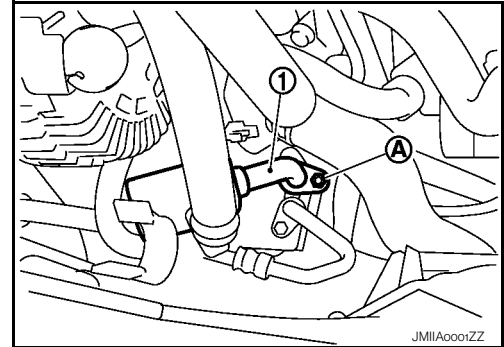
Cap or wrap the joint of the low pressure flexible hose and pipe 2, and expansion valve exit with suitable material such as vinyl tape to avoid the entry of air.



7. Remove low pressure flexible hose fixing nut (A), from air conditioner compressor, and remove low pressure flexible hose (1).

CAUTION:

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



INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

- Replace O-rings of low-pressure flexible hose and low-pressure pipe 2 with new ones, and then apply compressor oil to it when installing it.
- 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 make sure that connection does not come loose.
- When recharging refrigerant, check for leaks.

HIGH-PRESSURE FLEXIBLE HOSE

< ON-VEHICLE REPAIR >

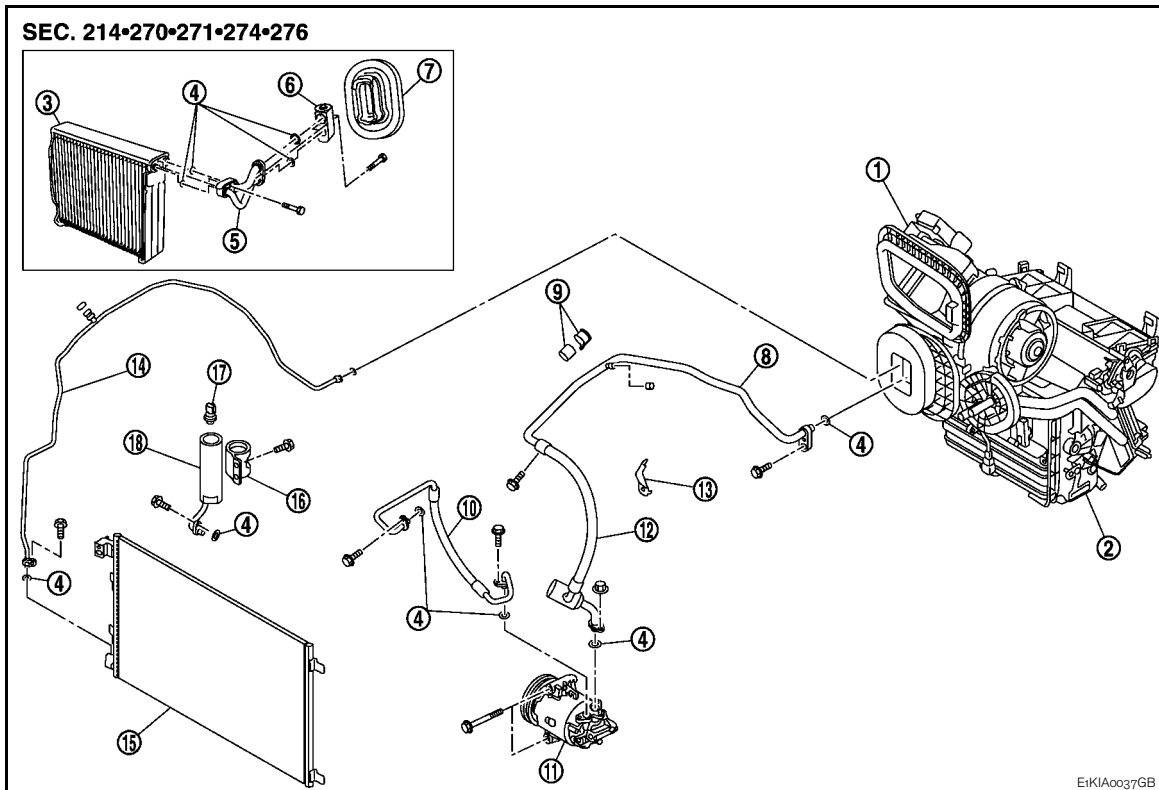
[AUTOMATIC AIR CONDITIONER (HR/MR)]

HIGH-PRESSURE FLEXIBLE HOSE

Exploded View

INFOID:000000001093788

Refer to [HA-18, "Refrigerant Connection"](#).



- | | | |
|-------------------------------------|--|--|
| 1. Heater & blower unit assembly | 2. Heater & cooling unit assembly | 3. Evaporator |
| 4. O-ring | 5. Low pressure pipe 1 and high pressure pipe 2 assembly | 6. Expansion valve |
| 7. Heater sealing | 8. Low pressure flexible hose and pipe 2 | 9. Low pressure pipe 2 fixing clamp assembly |
| 10. High pressure flexible hose | 11. Compressor | 12. Low pressure flexible hose |
| 13. Low & high pipe bracket support | 14. High pressure pipe 1 | 15. Condenser assembly |
| 16. Liquid tank fixing bracket | 17. Refrigerant pressure sensor | 18. Liquid tank |

Removal and Installation

INFOID:000000001093789

REMOVAL

1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
2. Remove engine cover ornament. Refer to [EM-146, "Exploded View"](#) (MR engine models).
3. Remove air intake hose (RH) and air duct (LH). Refer to [EM-27, "Exploded View"](#) (HR engine models) or [EM-144, "Exploded View"](#) (MR engine models).
4. Remove front grille. Refer to [EXT-17, "Removal and Installation"](#).

HIGH-PRESSURE FLEXIBLE HOSE

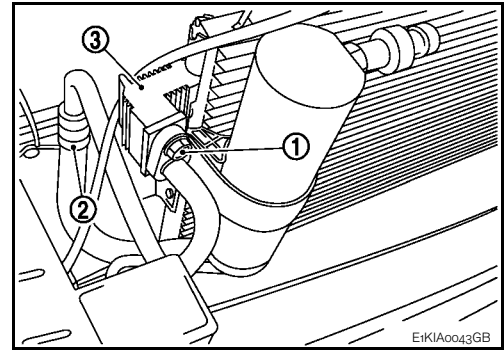
< ON-VEHICLE REPAIR >

[AUTOMATIC AIR CONDITIONER (HR/MR)]

5. Remove high pressure flexible hose fixing bolt (1) from condenser (3), then pull high pressure flexible hose (2) to remove it from condenser.

CAUTION:

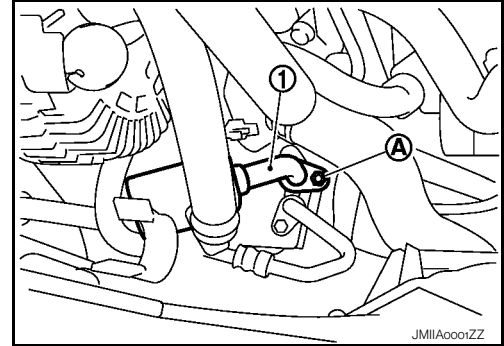
Cap or wrap the joint of high-pressure flexible hose and condenser assembly with suitable material such as vinyl tape to avoid the entry of air.



6. Remove high pressure flexible hose fixing bolt (A) from compressor, then pull high pressure flexible hose (1) to remove it from compressor. Remove high pressure flexible hose.

CAUTION:

Cap or wrap the joint of compressor and high-pressure flexible hose with suitable material such as vinyl tape to avoid the entry of air.



High pressure fixing bolt to condenser

: 4.4 N·m (0.45 kg-m, 39 in-lb)

High pressure fixing bolt to compressor

: 4.4 N·m (0.45 kg-m, 39 in-lb)

INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

- Replace O-rings of high-pressure flexible hose with new ones, and then apply compressor oil to it when installing it.
- 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 make sure that connection does not come loose.
- When recharging refrigerant, check for leaks.

HIGH-PRESSURE PIPE 1 (ENGINE COMPARTMENT)

< ON-VEHICLE REPAIR >

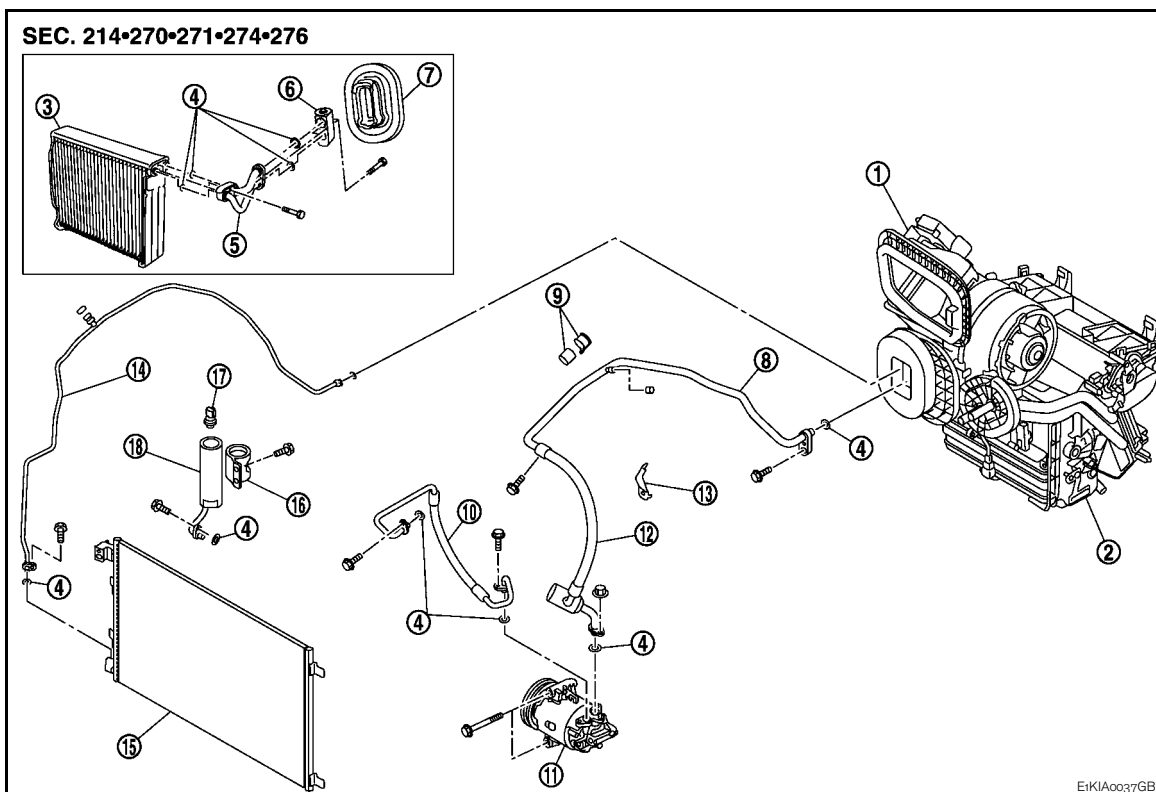
[AUTOMATIC AIR CONDITIONER (HR/MR)]

HIGH-PRESSURE PIPE 1 (ENGINE COMPARTMENT)

Exploded View

INFOID:000000001093790

Refer to [HA-18, "Refrigerant Connection"](#).



- | | | |
|-------------------------------------|--|--|
| 1. Heater & blower unit assembly | 2. Heater & cooling unit assembly | 3. Evaporator |
| 4. O-ring | 5. Low pressure pipe 1 and high pressure pipe 2 assembly | 6. Expansion valve |
| 7. Heater sealing | 8. Low pressure flexible hose and pipe 2 | 9. Low pressure pipe 2 fixing clamp assembly |
| 10. High pressure flexible hose | 11. Compressor | 12. Low pressure flexible hose |
| 13. Low & high pipe bracket support | 14. High pressure pipe 1 | 15. Condenser assembly |
| 16. Liquid tank fixing bracket | 17. Refrigerant pressure sensor | 18. Liquid tank |

Removal and Installation

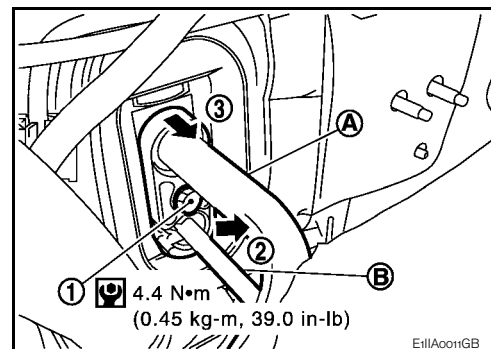
INFOID:000000001093791

REMOVAL

1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
2. Remove intake hose (RH) and air duct (LH). Refer to [EM-35, "Removal and Installation"](#) [EM-155, "Removal and Installation"](#) (MR engine).
3. Pull engine room insulator, then remove pipes bracket fixing bolt (1), from expansion valve, then release pipe fixing bracket as shown in order (1) to (3) from high pressure pipe 1 (B), to disconnect it from expansion valve.

CAUTION:

Cap or wrap the joint of the high pressure pipe 1, and expansion valve in, with suitable material such as vinyl tape to avoid the entry of air.

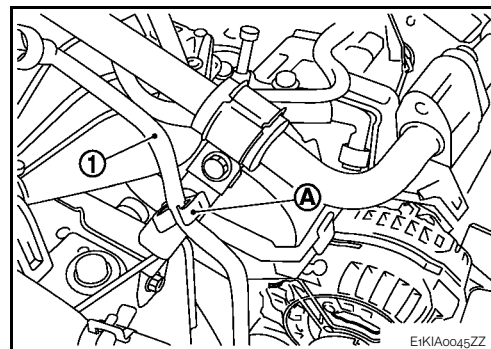


HIGH-PRESSURE PIPE 1 (ENGINE COMPARTMENT)

< ON-VEHICLE REPAIR >

[AUTOMATIC AIR CONDITIONER (HR/MR)]

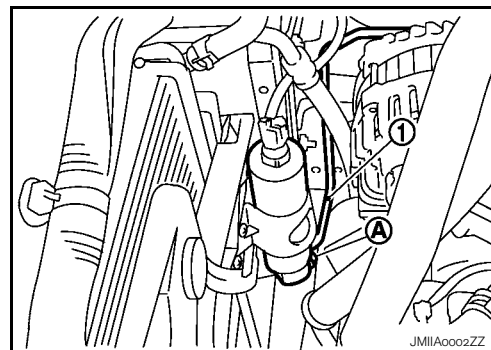
4. Remove high pressure pipe 1 (1) from clip (A).



Remove high-pressure pipe 1 mounting bolt (A) from liquid tank, then remove high-pressure pipe 1 (1).

CAUTION:

Cap or wrap the joint of the high pressure pipe 1, and liquid tank, with suitable material such as vinyl tape to avoid the entry of air.



INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

- Replace O-rings of high-pressure pipe 1 with new ones, and then apply compressor oil to it when installing it.
- 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 make sure that connection does not come loose.
- When recharging refrigerant, check for leaks.

LOW-PRESSURE PIPE 1 AND HIGH-PRESSURE PIPE 2

< ON-VEHICLE REPAIR >

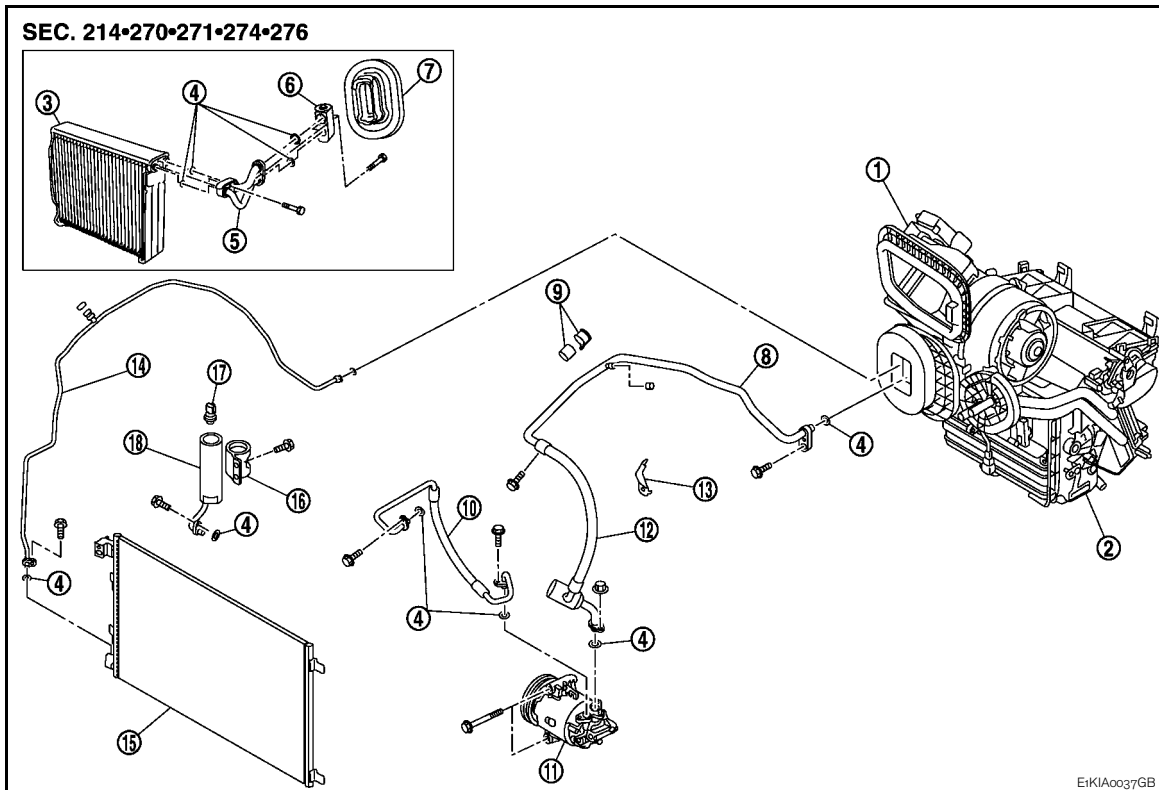
[AUTOMATIC AIR CONDITIONER (HR/MR)]

LOW-PRESSURE PIPE 1 AND HIGH-PRESSURE PIPE 2

Exploded View

INFOID:000000001093792

Refer to [HA-18, "Refrigerant Connection"](#).



- | | | |
|-------------------------------------|--|--|
| 1. Heater & blower unit assembly | 2. Heater & cooling unit assembly | 3. Evaporator |
| 4. O-ring | 5. Low pressure pipe 1 and high pressure pipe 2 assembly | 6. Expansion valve |
| 7. Heater sealing | 8. Low pressure flexible hose and pipe 2 | 9. Low pressure pipe 2 fixing clamp assembly |
| 10. High pressure flexible hose | 11. Compressor | 12. Low pressure flexible hose |
| 13. Low & high pipe bracket support | 14. High pressure pipe 1 | 15. Condenser assembly |
| 16. Liquid tank fixing bracket | 17. Refrigerant pressure sensor | 18. Liquid tank |

Removal and Installation

INFOID:000000001093793

REMOVAL

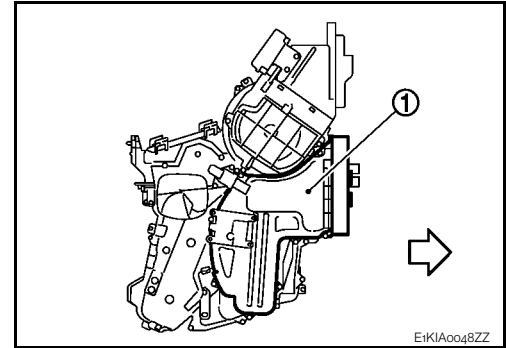
1. Set the temperature at 18°C (60°F), and then disconnect the battery cable from the negative terminal.
 2. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
 3. Remove high-pressure pipe 1 and low pressure pipe 2 from expansion valve. Refer to [HA-45, "Removal and Installation"](#) and [HA-41, "Removal and Installation"](#).
- CAUTION:**
Cap or wrap the joint of the, high-pressure pipe 1, low-pressure pipe 2, and the expansion valve with suitable material such as vinyl tape to avoid the entry of air.
4. Remove heater cooling fixing clamp, and heater hoses. Refer to [CO-13, "Exploded View"](#) (HR engine models) or [CO-34, "Exploded View"](#) (MR engine models).
 5. Remove instrument panel. Refer to [IP-12, "Removal and Installation"](#).
 6. Remove foot duct (RH / LH). Refer to [VTL-48, "FOOT DUCTS : Removal and Installation"](#).
 7. Remove steering column. Refer to [ST-10, "Removal and Installation"](#).
 8. Disconnect Heater and cooling unit harness connectors from steering member main harness.

LOW-PRESSURE PIPE 1 AND HIGH-PRESSURE PIPE 2

< ON-VEHICLE REPAIR >

[AUTOMATIC AIR CONDITIONER (HR/MR)]

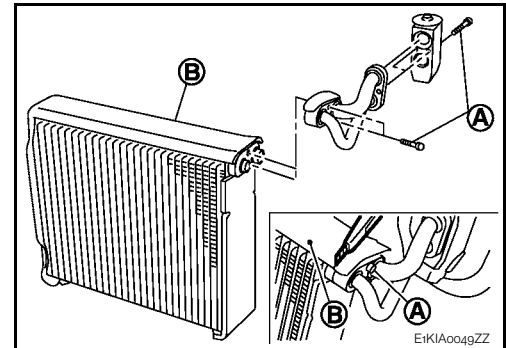
9. Remove steering member. Refer to [ST-15, "Removal and Installation"](#).
10. Remove heater and cooling assembly. Refer to [VTL-32, "Removal and Installation"](#).
11. Remove mounting screws, and then remove evaporator cover (1).



12. Using a thin cutter, cut the evaporator insulator (B), and then remove fixing bolt (A), and low-pressure pipe 1 and high-pressure pipe 2 assembly.

CAUTION:

Cap or wrap the joint of expansion valve, high-pressure pipe 2 and low-pressure pipe 1 with suitable material such as vinyl tape to avoid the entry of air.



INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

- Replace O-rings of high-pressure pipe 1, 2 and low-pressure pipe 1, 2 with new ones, and then apply compressor oil to it when installing it.
- 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 make sure that connection does not come loose.
- When recharging refrigerant, check for leaks.

CONDENSER

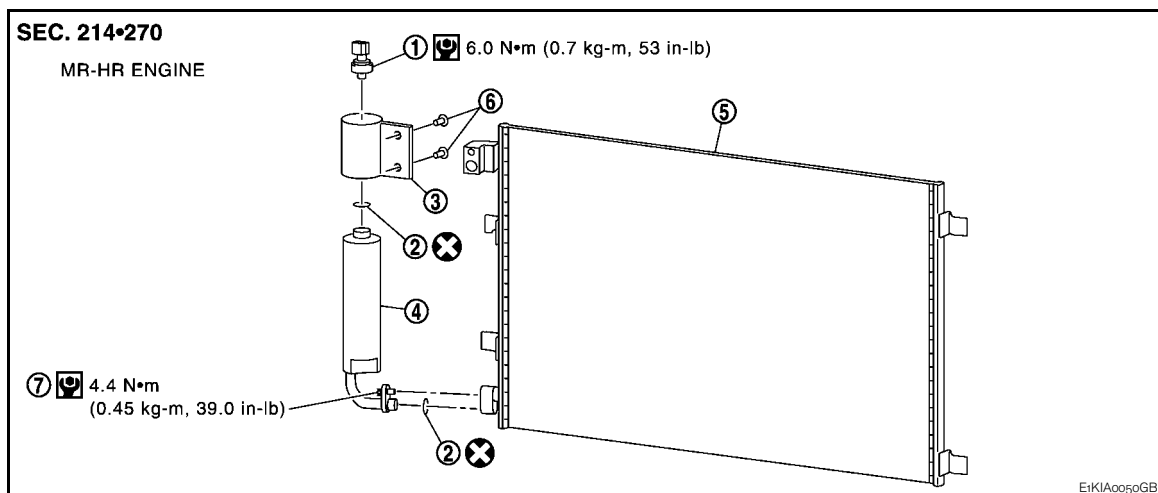
< ON-VEHICLE REPAIR >

[AUTOMATIC AIR CONDITIONER (HR/MR)]

CONDENSER

Exploded View

INFOID:000000001093794



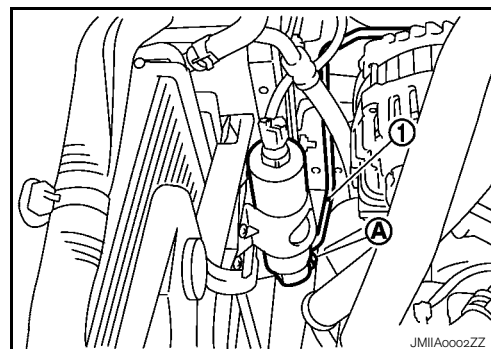
- | | | |
|---------------------------------|--------------|-----------------------------|
| 1. Refrigerant pressure sensor | 2. O-ring | 3. Liquid tank bracket |
| 4. Liquid tank | 5. Condenser | 6. Liquid tank fixing screw |
| 7. Liquid tank pipe fixing bolt | | |

Removal and Installation

INFOID:000000001093795

REMOVAL

- Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
- Remove engine cover ornament. Refer to [EM-146, "Exploded View"](#) (MR engine models).
- Remove front grille. Refer to [EXT-17, "Removal and Installation"](#).
- Remove radiator hose, and drain coolant. Refer to [CO-9, "Draining"](#) (HR engine models) or [CO-30, "Draining"](#) (MR engine models).
- Remove upper radiator fixing bracket. Refer to [CO-13, "Exploded View"](#) (HR engine models) or [CO-34, "Exploded View"](#) (MR engine models).
- Remove radiator air-guide duct (RH). Refer to [CO-13, "Exploded View"](#) (HR engine models) or [CO-34, "Exploded View"](#) (MR engine models).
- Remove high-pressure pipe 1 (1) fixing bolt (A) and high pressure pipe from liquid tank. Refer to [HA-47, "Removal and Installation"](#).
- Remove high-pressure flexible pipe 1 from condenser. Refer to [HA-43, "Removal and Installation"](#).
CAUTION:
Cap or wrap the joint of low and high-pressure pipe 1 and condenser with suitable material such as vinyl tape to avoid the entry of air.
- Remove harness connector from refrigerant pressure sensor.
- Remove liquid tank pipes and liquid tank from condenser and radiator. Refer to [HA-51, "Removal and Installation"](#), Refer to [CO-13, "Removal and Installation"](#) (HR engine models) or [CO-35, "Removal and Installation"](#) (MR engine models).
CAUTION:
Cap or wrap the joint of liquid tank pipes and condenser with suitable material such as vinyl tape to avoid the entry of air.
- Remove radiator fixing brackets. Refer to [CO-13, "Exploded View"](#) (HR engine models) or [CO-34, "Exploded View"](#) (MR engine models).



CONDENSER

< ON-VEHICLE REPAIR >

[AUTOMATIC AIR CONDITIONER (HR/MR)]

12. Release radiator maintaining pawls, then pull-up the condenser assembly to release it from radiator. Refer to [CO-13, "Removal and Installation"](#) (HR engine models) or [CO-35, "Removal and Installation"](#) (MR engine models).
13. Maintain radiator pushing back.
14. Pull upward to remove condenser.

CAUTION:

Take care do not damaged condenser or radiator.

INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

- Replace O-rings of high-pressure flexible hose and high-pressure pipe 1 with new ones, and then apply compressor oil to it when installing it.
- 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 make sure that connection does not come loose.
- When recharging refrigerant, check for leaks.

LIQUID TANK

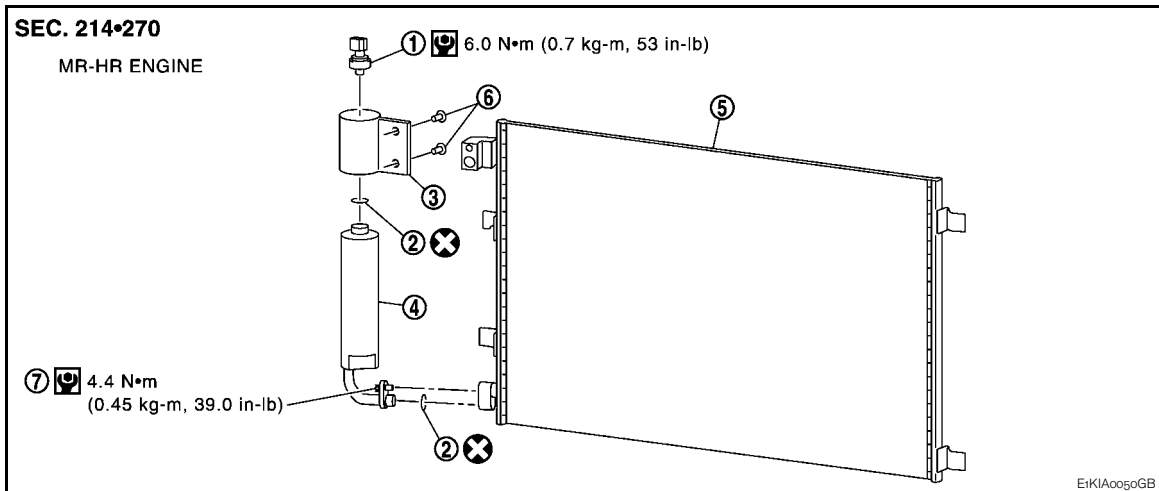
< ON-VEHICLE REPAIR >

[AUTOMATIC AIR CONDITIONER (HR/MR)]

LIQUID TANK

Exploded View

INFOID:000000001093798



- | | | |
|---------------------------------|--------------|-----------------------------|
| 1. Refrigerant pressure sensor | 2. O-ring | 3. Liquid tank bracket |
| 4. Liquid tank | 5. Condenser | 6. Liquid tank fixing screw |
| 7. Liquid tank pipe fixing bolt | | |

Removal and Installation

INFOID:000000001093799

REMOVAL

1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
2. Remove engine cover ornament. Refer to [EM-146, "Exploded View"](#) (MR engine models).
3. Clean liquid tank and its surrounding area, and remove dust and rust from liquid tank.

CAUTION:

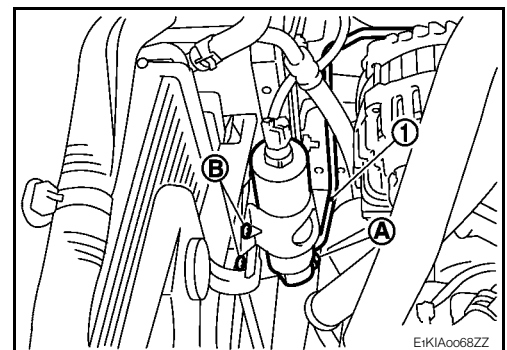
Be sure to clean carefully.

4. Disconnect refrigerant sensor harness connector. Refer to [HA-52, "Removal and Installation"](#).
5. Remove liquid tank bracket support mounting screws (B).
6. Remove high pressure pipe 1 (1) mounting bolt (A) from liquid tank. Refer to [HA-45, "Removal and Installation"](#).
7. Remove liquid tank high pressure pipe mounting bolt (A) from condenser.
8. Remove liquid tank pipe bracket fixing screw.

CAUTION:

Cap or wrap the joint of high pressure pipe, liquid tank pipes and condenser with suitable material such as vinyl tape to avoid the entry of air.

9. Remove liquid tank assembly.



INSTALLATION

Install liquid tank, and then install liquid tank bracket on condenser.

CAUTION:

- Make sure liquid tank bracket is securely installed at protrusion of condenser. (Make sure liquid tank bracket does not move to a position below center of liquid tank.)
- Replace O-rings of A/C piping with new ones, and then apply compressor oil to it when installing it.
- When recharging refrigerant, check for leaks.

REFRIGERANT PRESSURE SENSOR

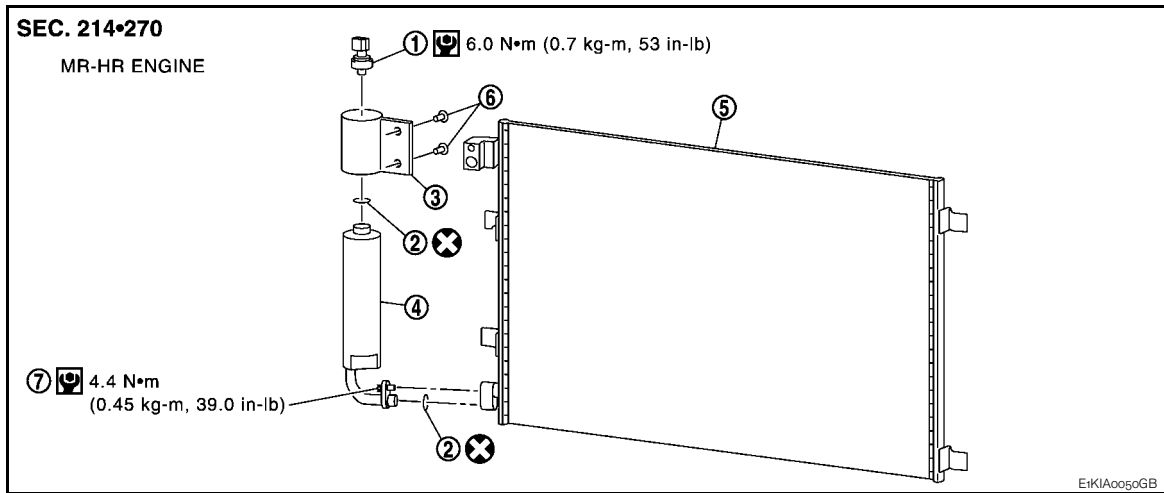
< ON-VEHICLE REPAIR >

[AUTOMATIC AIR CONDITIONER (HR/MR)]

REFRIGERANT PRESSURE SENSOR

Exploded View

INFOID:000000001093800



- | | | |
|---------------------------------|--------------|-----------------------------|
| 1. Refrigerant pressure sensor | 2. O-ring | 3. Liquid tank bracket |
| 4. Liquid tank | 5. Condenser | 6. Liquid tank fixing screw |
| 7. Liquid tank pipe fixing bolt | | |

Removal and Installation

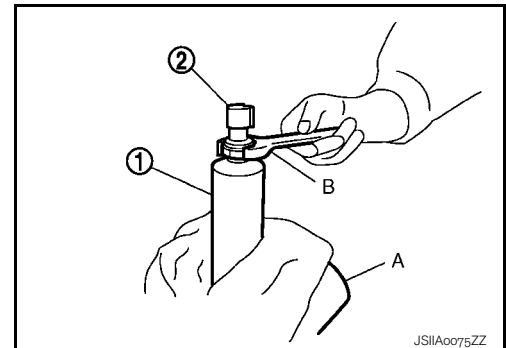
INFOID:000000001093801

REMOVAL

1. Remove liquid tank. Refer to [HA-51, "Exploded View"](#).
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.



INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

- Apply compressor oil to O-ring of refrigerant pressure sensor when installing it.
- When recharging refrigerant, check for leaks.

EVAPORATOR

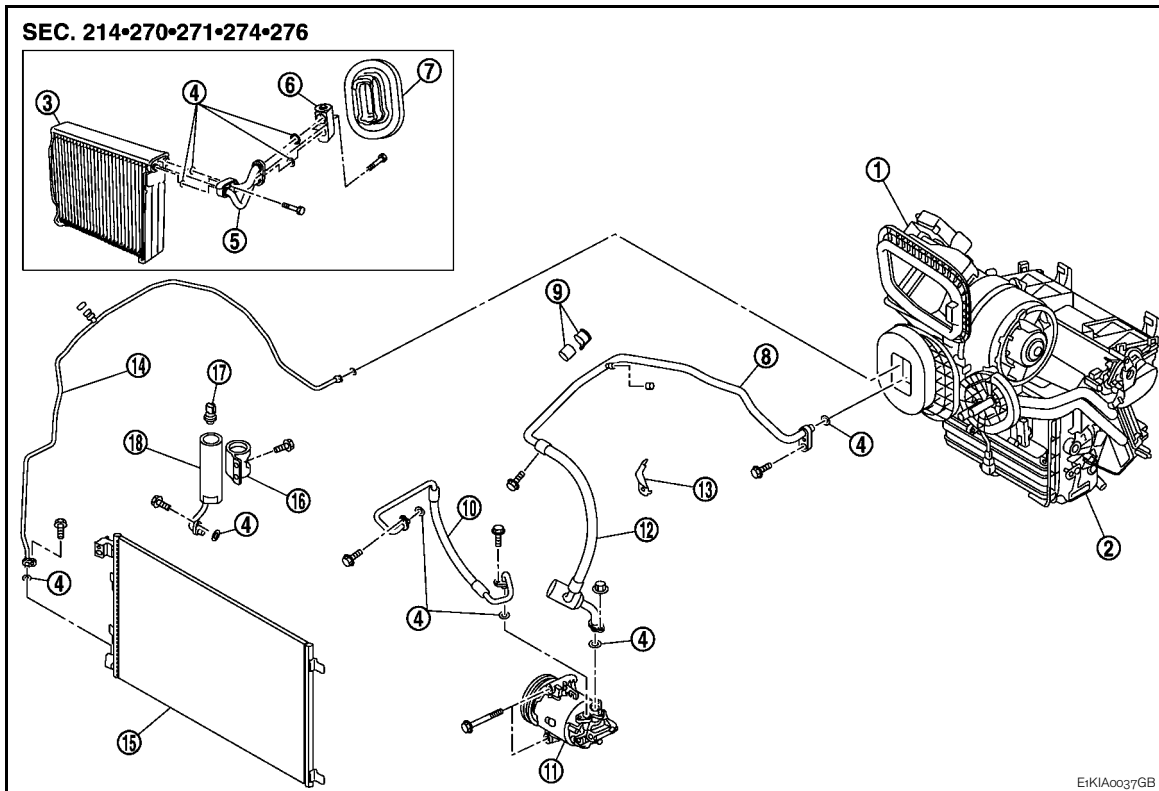
< ON-VEHICLE REPAIR >

[AUTOMATIC AIR CONDITIONER (HR/MR)]

EVAPORATOR

Exploded View

INFOID:000000001093802



Removal and Installation

INFOID:000000001093803

REMOVAL

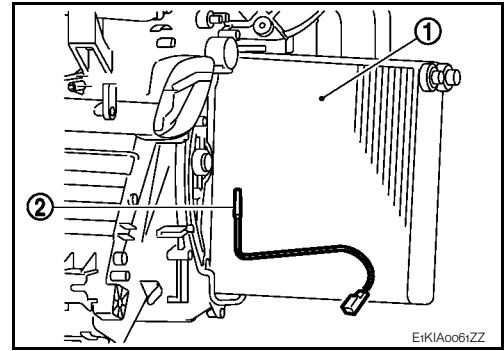
1. Remove low-pressure pipe 2 and high-pressure pipe 1 from expansion valve. Refer to [HA-41. "Removal and Installation"](#). Refer to [HA-45. "Removal and Installation"](#).
CAUTION:
Cap or wrap the joint of expansion valve, low-pressure pipe 2 and high-pressure pipe 1 with suitable material such as vinyl tape to avoid the entry of air.
2. Remove heater and cooling fixing clamp and hoses. Refer to [VTL-32. "Removal and Installation"](#), Refer to [CO-13. "Removal and Installation"](#) (HR engine models) or [CO-35. "Removal and Installation"](#) (MR engine models).
3. Remove heater and cooling unit assembly. Refer to [VTL-32. "Removal and Installation"](#).
4. Remove evaporator cover fixing screws and cover. Refer to [HA-53. "Removal and Installation"](#).

EVAPORATOR

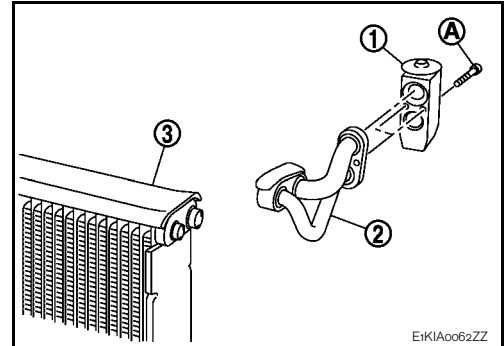
< ON-VEHICLE REPAIR >

[AUTOMATIC AIR CONDITIONER (HR/MR)]

5. Slide evaporator (1) and intake sensor (2) from heater and cooling unit assembly.
6. Remove evaporator assembly.



7. Cut upper insulator (3) and remove mounting bolt (A), expansion valve (1) and pressure pipe assembly (2), from evaporator.



INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

- Replace O-rings of low-pressure pipe 1 and high-pressure pipe 2 with new ones, and then apply compressor oil to it when installing it.
- 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 make sure that connection does not come loose.
- O-rings are different from low-pressure flexible hose (high-pressure pipe 1) and low-pressure pipe 1 (high-pressure pipe 2).
- Mark the mounting position of intake sensor bracket prior to removal so that the reinstalled sensor can be located in the same position.
- When recharging refrigerant, check for leaks.

[AUTOMATIC AIR CONDITIONER (HR/MR)]

INFOID:0000000001093804



- INFOID:0000000001093805

E1KIA0062ZZ

EXPANSION VALVE

< ON-VEHICLE REPAIR >

[AUTOMATIC AIR CONDITIONER (HR/MR)]

INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

- Replace O-rings of evaporator with new ones, and then apply compressor oil to it when installing it.
- O-rings are different from low-pressure pipe 1 (high-pressure pipe 1) and low-pressure pipe 2 (high-pressure pipe 2).
- When recharging refrigerant, check for leaks.

SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE DATA AND SPECIFICATIONS (SDS)

[AUTOMATIC AIR CONDITIONER (HR/MR)]

SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

Compressor

INFOID:0000000001093806

Model	CALSONICKANSEI	
Type	Variable displacement swash plate	
Displacement cm ³ (cu in)/rev	Max.	120 (7.32)
	Min.	6 (0.37)
Cylinder bore × stroke (Max.) mm (in.)	32 × 29 (1.26 × 1.14)	
Direction of rotation	Clockwise (viewed from clutch)	
Drive belt	Poly V 7 groove (HR engine), Poly V 6 groove (MR engine)	

Lubricant

INFOID:0000000001093807

Model	CALSONICKANSEI	
Name	Nissan A/C System Oil Type S (DH-PS)	
Capacity mℓ (US fl oz, Imp fl oz)	Total in system	150 (5.03, 5.3)
	Compressor (Service part) charging amount	150 (5.03, 5.3)

Refrigerant

INFOID:0000000001093808

Type	HFC-134a (R-134a)
Capacity kg (lb)	—

Engine Idling Speed

INFOID:0000000001093809

Refer to [EC-360, "Idle Speed"](#) (HR engine models with EURO-OBD), [EC-637, "Idle Speed"](#) (HR engine models without EURO-OBD), [EC-981, "Idle Speed"](#) (MR engine models with EURO-OBD) or [EC-1257, "Idle Speed"](#) (MR engine models without EURO-OBD).

Belt Tension

INFOID:0000000001093810

Refer to [EM-15, "Tension Adjustment"](#) (HR engine models) or [EM-134, "Tension Adjustment"](#) (MR engine models).

BASIC INSPECTION

DIAGNOSIS AND REPAIR WORKFLOW

Work Flow

INFOID:000000001093876

DETAILED FLOW

1. LISTEN TO CUSTOMER COMPLAINT

Listen to customer complaint. (Get detailed information about the conditions and environment when the symptom occurs.)

>> GO TO 2.

2. VERIFY THE SYMPTOM WITH OPERATIONAL CHECK

Verify the symptom with operational check. Refer to [HAC-6, "Description & Inspection"](#).

>> GO TO 3.

3. GO TO APPROPRIATE TROUBLE DIAGNOSIS

Go to appropriate trouble diagnosis (Refer to [HAC-108, "Diagnosis Chart By Symptom"](#)).

>> GO TO 4.

4. REPAIR OR REPLACE

Repair or replace the specific parts

>> GO TO 5.

5. FINAL CHECK

Final check.

Is the inspection result normal?

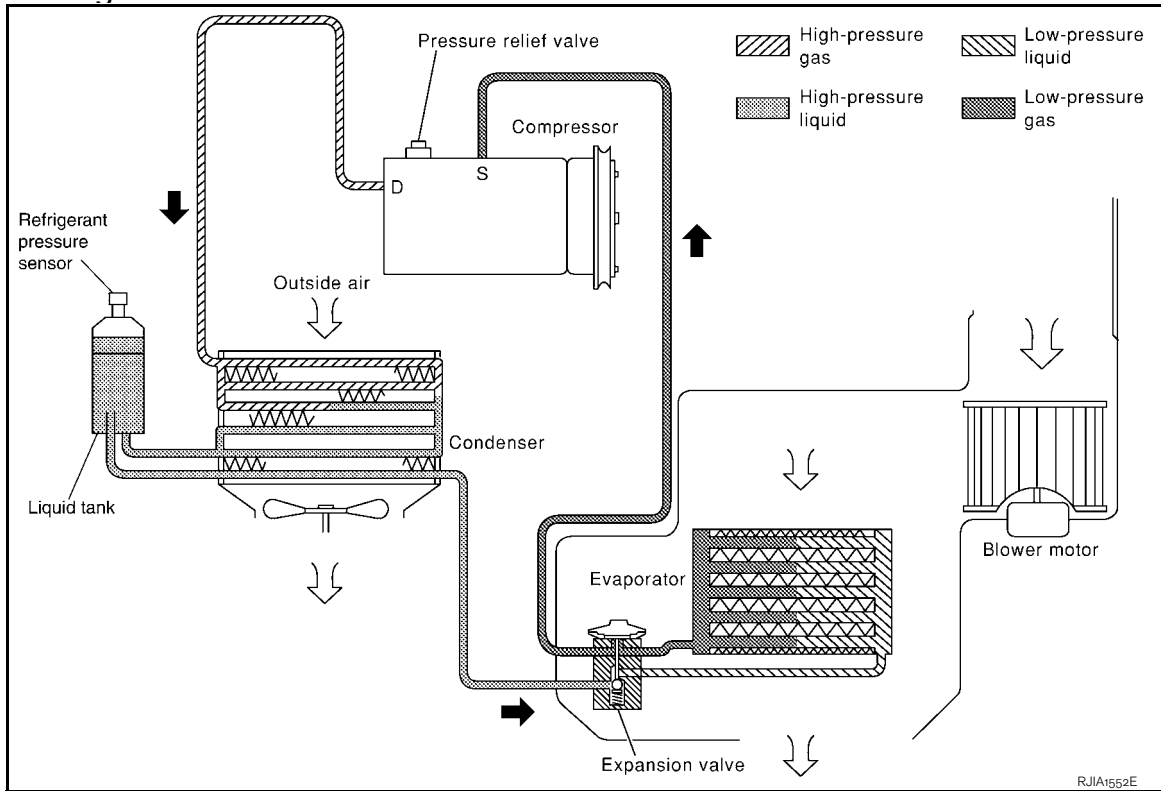
YES >> CHECK OUT

NO >> GO TO 3.

FUNCTION DIAGNOSIS

REFRIGERATION SYSTEM

System Diagram



System Description

INFOID:000000001093878

REFRIGERANT CYCLE

Refrigerant Flow

The refrigerant flows from the compressor, through the condenser with liquid tank, through the evaporator, and back to the compressor. The refrigerant evaporation in the evaporator is controlled by an externally equalized expansion valve, located inside the evaporator case.

Freeze Protection

To prevent evaporator frozen up, the evaporator air temperature is monitored, and the voltage signal to the display and A/C auto amp. will make 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 condenser. If the system pressure rises above, or falls below the specifications, the refrigerant pressure sensor detects the pressure inside the refrigerant line and sends the voltage signal to the ECM. ECM makes the A/C relay go OFF and stops the compressor when pressure on the high-pressure side detected by refrigerant pressure sensor is over about 3,119 kPa (31.8 kg/cm², 452 psi), or below about 118 kPa (1.2 kg/cm², 17 psi).

Pressure Relief Valve

The refrigerant system is also protected by a pressure relief valve, located in the rear head of the compressor. When the pressure of refrigerant in the system increases to an unusual level [more than 3,628 kPa (37 kg/cm², 526 psi)], the release port on the pressure relief valve automatically opens and releases refrigerant into the atmosphere.

LUBRICANT

REFRIGERATION SYSTEM

< FUNCTION DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER (K9K)]

Maintenance of Lubricant Quantity in Compressor

The lubricant in the compressor circulates through the system with the refrigerant. Add lubricant to compressor when replacing any component or after a large refrigerant leakage occurred. It is important to maintain the specified amount.

If lubricant quantity is not maintained properly, the following malfunctions may result:

- Lack of lubricant: May lead to a seized compressor.
- Excessive lubricant: Inadequate cooling (thermal exchange interference)

Lubricant

Name : Nissan A/C System Oil Type S

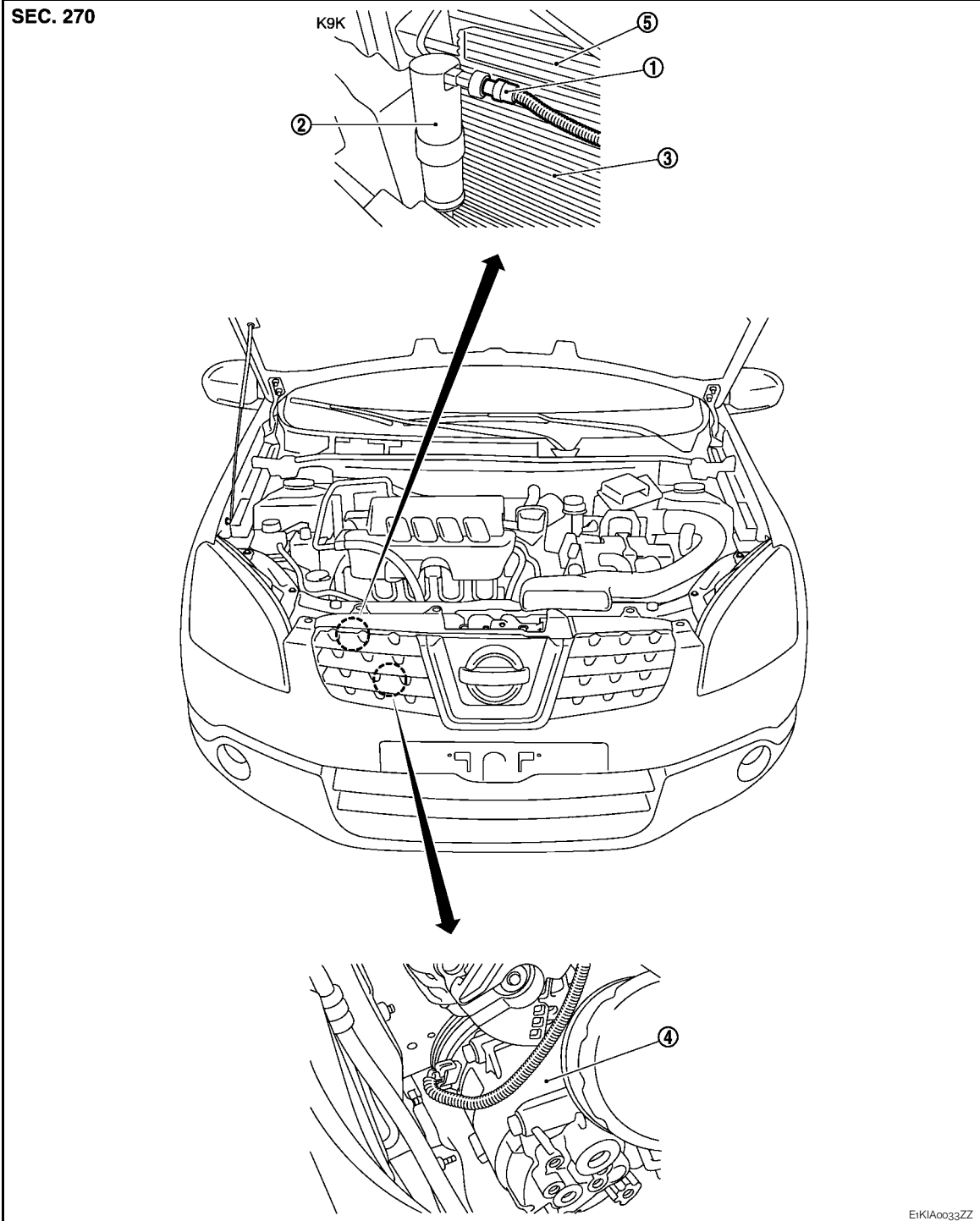
Component Parts Location

INFOID:0000000001093879

REFRIGERATION SYSTEM

< FUNCTION DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER (K9K)]



1. Refrigerant pressure sensor
4. Compressor

2. Liquid tank
5. Radiator

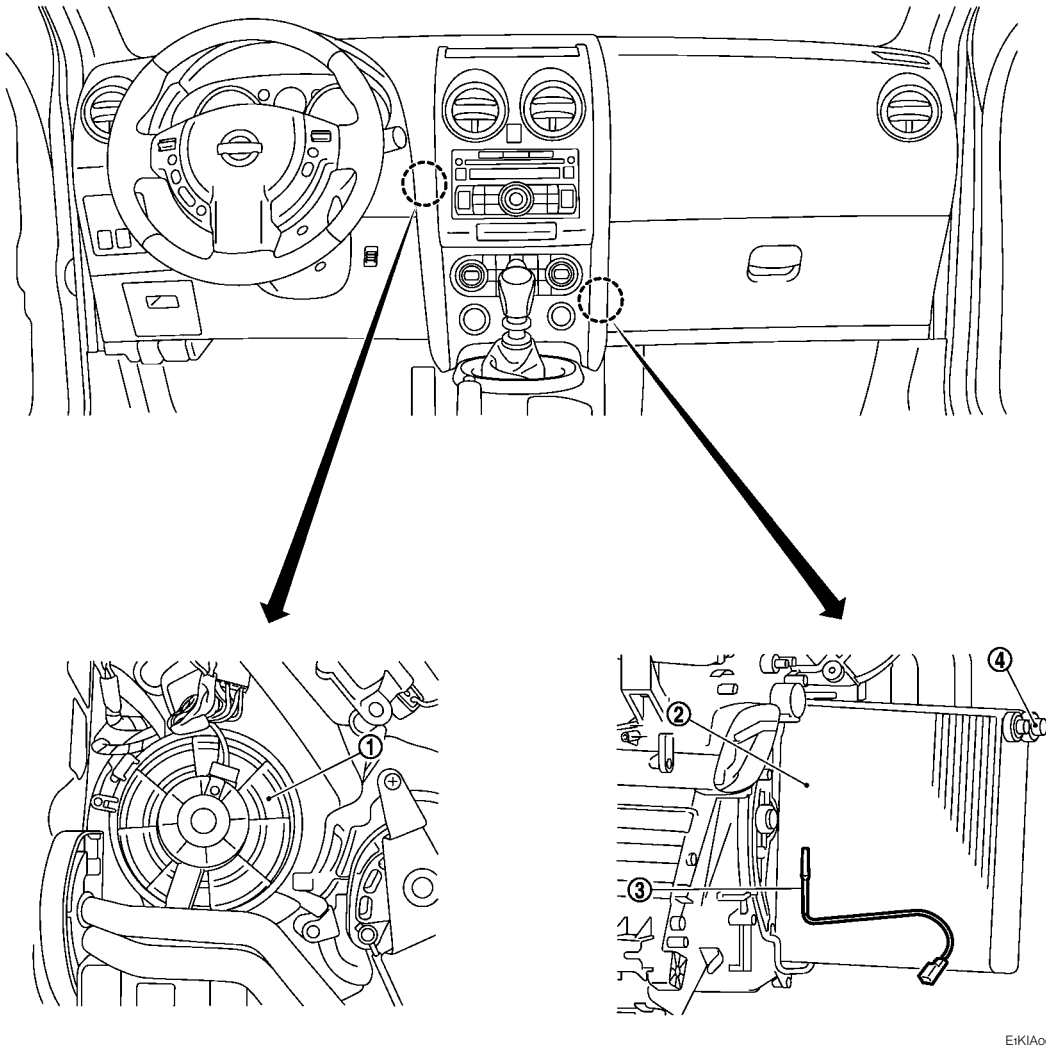
3. Condenser

REFRIGERATION SYSTEM

< FUNCTION DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER (K9K)]

SEC. 214•270•271•274•276



1. Blower motor assembly
2. Evaporator
3. Intake sensor (AT only)
4. Expansion valve

Component Description

INFOID:000000001093880

Component	Description
Compressor	Intakes, compresses, and discharges refrigerant, then conveys it to condenser.
Condenser	Condenses refrigerant, and then conveys it to liquid tank.
Liquid tank	Drives moisture out of refrigerant, eliminates foreign matter, then conveys refrigerant to expansion valve.
Refrigerant pressure sensor	Refer to HAC-70. "Component Inspection" .
Expansion valve	Vaporizes refrigerant, controls the amount of flow, then conveys refrigerant to evaporator.
Evaporator	Cools passing air, and then conveys it to compressor.
Blower motor	Takes in air in the vehicle or fresh outside air, and then adjusts room temperature by air conditioning.

REFRIGERATION SYSTEM SYMPTOMS

< SYMPTOM DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER (K9K)]

SYMPTOM DIAGNOSIS

REFRIGERATION SYSTEM SYMPTOMS

SYMPTOM DIAGNOSIS PROCEDURE

SYMPTOM DIAGNOSIS PROCEDURE : Trouble Diagnosis For Unusual Pressure

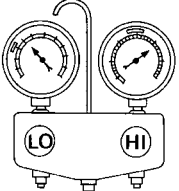
INFOID:000000001093883

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

BOTH HIGH- AND LOW-PRESSURE SIDES ARE TOO HIGH

BOTH HIGH- AND LOW-PRESSURE SIDES ARE TOO HIGH : Symptom Table

INFOID:000000001093884

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
Both high- and low-pressure sides are too high.  AC359A	The pressure returns to normal is reduced soon after water is splashed on condenser.	Excessive refrigerant charge in refrigeration cycle.	Reduce refrigerant until specified pressure is obtained.
	Air suction by cooling fan is insufficient.	Insufficient condenser cooling performance. ↓ 1. Condenser fins are clogged. 2. Improper fan rotation of cooling fan.	- Clean condenser. - Check and repair cooling fan as necessary.
	- Low-pressure pipe is not cold. - When compressor is stopped high-pressure value quickly drops by approximately 196 kPa (2 kg/cm², 28 psi). It then decreases gradually thereafter.	Poor heat exchange in condenser (After compressor operation stops, high-pressure decreases too slowly.). ↓ Air in refrigeration cycle.	Evacuate repeatedly and re-charge system.
	Engine tends to overheat.	Engine cooling systems malfunction.	Check and repair each engine cooling system.
	- An area of the low-pressure pipe is colder than areas near the evaporator outlet. - Low-pressure pipe is sometimes covered with frost.	- Excessive liquid refrigerant on low-pressure side. - Excessive refrigerant discharge flow. - Expansion valve is open a little compared with the specification. ↓ Improper expansion valve adjustment.	Replace expansion valve.

HIGH-PRESSURE SIDE IS TOO HIGH AND LOW-PRESSURE SIDE IS TOO LOW

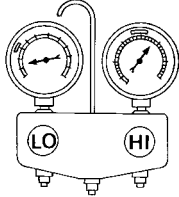
HIGH-PRESSURE SIDE IS TOO HIGH AND LOW-PRESSURE SIDE IS TOO LOW : Symptom Table

INFOID:000000001093885

REFRIGERATION SYSTEM SYMPTOMS

< SYMPTOM DIAGNOSIS >

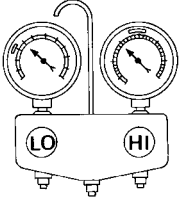
[AUTOMATIC AIR CONDITIONER (K9K)]

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
High-pressure side is too high and low-pressure side is too low.  AC360A	Upper side of condenser and high-pressure side are hot, however, liquid tank is not so hot.	High-pressure tube or parts located between compressor and condenser are clogged or crushed.	• Check and repair or replace malfunctioning parts. • Check lubricant for contamination.

HIGH-PRESSURE SIDE IS TOO LOW AND LOW-PRESSURE SIDE IS TOO HIGH

HIGH-PRESSURE SIDE IS TOO LOW AND LOW-PRESSURE SIDE IS TOO HIGH : Symptom Table

INFOID:000000001093886

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
High-pressure side is too low and low-pressure side is too high.  AC356A	High- and low-pressure sides become equal soon after compressor operation stops.	Compressor pressure operation is improper. ↓ Damaged inside compressor packings.	Replace compressor.
	No temperature difference between high- and low-pressure sides.	Compressor pressure operation is improper. ↓ Damaged inside compressor packings.	Replace compressor.

BOTH HIGH- AND LOW-PRESSURE SIDES ARE TOO LOW

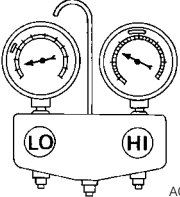
BOTH HIGH- AND LOW-PRESSURE SIDES ARE TOO LOW : Symptom Table

INFOID:000000001093887

REFRIGERATION SYSTEM SYMPTOMS

< SYMPTOM DIAGNOSIS >

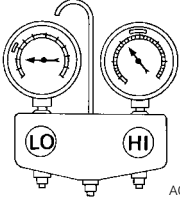
[AUTOMATIC AIR CONDITIONER (K9K)]

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
Both high- and low-pressure sides are too low.  AC353A	- There is a big temperature difference between liquid tank outlet and inlet. Outlet temperature is extremely low. - Liquid tank inlet and expansion valve are frosted.	Liquid tank inside is slightly clogged.	- Replace liquid tank. - Check lubricant for contamination.
	- Temperature of expansion valve inlet is extremely low as compared with areas near liquid tank. - Expansion valve inlet is frosted. - Temperature difference occurs somewhere in high-pressure side.	High-pressure pipe located between liquid tank and expansion valve is clogged.	- Check and repair malfunctioning parts. - Check lubricant for contamination.
	Expansion valve and liquid tank are warm or slightly cool when touched.	Low refrigerant charge. ↓ Leaking fittings or components.	Check refrigerant for leaks. Refer to HA-81, "Refrigerant Leaks" .
	There is a big temperature difference between expansion valve inlet and outlet while the valve itself is frosted.	Expansion valve closes a little compared with the specification. ↓ 1. Improper expansion valve adjustment. 2. Malfunctioning expansion valve. 3. Outlet and inlet may be clogged.	- Remove foreign particles by using compressed air. - Replace expansion valve. - Check lubricant for contamination.
	An area of the low-pressure pipe is colder than areas near the evaporator outlet.	Low-pressure pipe is clogged or crushed.	- Check and repair malfunctioning parts. - Check lubricant for contamination.
	Air flow volume is not enough or is too low.	Evaporator is frozen.	- Check intake sensor circuit. Refer to HAC-86, "Diagnosis Procedure". - Replace compressor. - Repair evaporator fins. - Replace evaporator. - Refer to HAC-62, "Diagnosis Procedure".

LOW-PRESSURE SIDE SOMETIMES BECOMES NEGATIVE

LOW-PRESSURE SIDE SOMETIMES BECOMES NEGATIVE : Symptom Table

INFOID:000000001093888

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
Low-pressure side sometimes becomes negative.  AC354A	- Air conditioning system does not function and does not cyclically cool the compartment air. - The system constantly functions for a certain period of time after compressor is stopped and restarted.	Refrigerant does not discharge cyclically. ↓ Moisture is frozen at expansion valve outlet and inlet. ↓ Water is mixed with refrigerant.	- Drain water from refrigerant or replace refrigerant. - Replace liquid tank.

LOW-PRESSURE SIDE BECOMES NEGATIVE

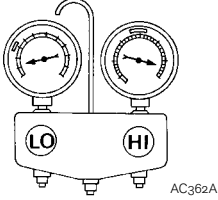
REFRIGERATION SYSTEM SYMPTOMS

< SYMPTOM DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER (K9K)]

LOW-PRESSURE SIDE BECOMES NEGATIVE : Symptom Table

INFOID:000000001093889

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
Low-pressure side becomes negative.  AC362A	Liquid tank or front/rear side of expansion valve's pipe is frosted or wet with dew.	High-pressure side is closed and refrigerant does not flow. ↓ Expansion valve or liquid tank is frosted.	Leave the system at rest until no frost is present. Start it again to check whether or not the malfunction is caused by water or foreign particles. • If water is the cause, initially cooling is okay. Then the water freezes causing a blockage. Drain water from refrigerant or replace refrigerant. • If due to foreign particles, remove expansion valve and remove the particles with dry and compressed air (not shop air). • If either of the above methods cannot correct the malfunction, replace expansion valve. • Replace liquid tank. • Check lubricant for contamination.

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PRECAUTION

PRECAUTIONS

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

INFOID:0000000001115387

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 SRC and SB section of this Service Manual.

WARNING:

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

Precaution Necessary for Steering Wheel Rotation After Battery Disconnect

INFOID:0000000001115390

NOTE:

- This Procedure is applied only to models with Intelligent Key system and NATS (NISSAN ANTI-THEFT SYSTEM).
- Remove and install all control units after disconnecting both battery cables with the ignition knob in the "LOCK" position.
- Always use CONSULT-III to perform self-diagnosis as a part of each function inspection after finishing work. If DTC is detected, perform trouble diagnosis according to self-diagnostic results.

For models equipped with the Intelligent Key system and NATS, an electrically controlled steering lock mechanism is adopted on the key cylinder.

For this reason, if the battery is disconnected or if the battery is discharged, the steering wheel will lock and steering wheel rotation will become impossible.

If steering wheel rotation is required when battery power is interrupted, follow the 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. Use the Intelligent Key or mechanical key to turn the ignition switch to the "ACC" position. At this time, the steering lock will be released.
3. Disconnect both battery cables. The steering lock will remain released and the steering wheel can be rotated.
4. Perform the necessary repair operation.
5. When the repair work is completed, return the ignition switch to the "LOCK" position before connecting the battery cables. (At this time, the steering lock mechanism will engage.)
6. Perform a self-diagnosis check of all control units using CONSULT-III.

Precaution for Procedure without Cowl Top Cover

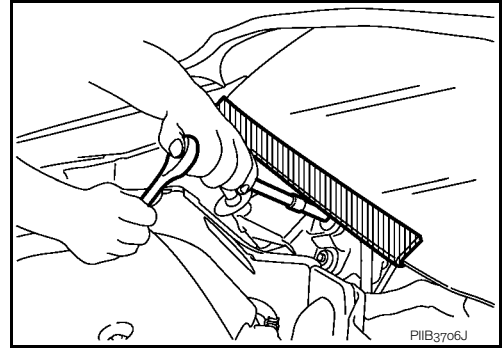
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PRECAUTIONS

< PRECAUTION >

[AUTOMATIC AIR CONDITIONER (K9K)]

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



Precautions For Xenon Headlamp Service

INFOID:000000001115399

WARNING:

Comply with the following warnings to prevent any serious accident.

- Disconnect the battery cable (negative terminal) or the power supply fuse before installing, removing, or touching the xenon headlamp (bulb included). The xenon headlamp contains high-voltage generated parts.
- Never work with wet hands.
- Check the xenon headlamp ON-OFF status after assembling it to the vehicle. Never turn the xenon headlamp ON in other conditions. Connect the power supply to the vehicle-side connector. (Turning it ON outside the lamp case may cause fire or visual impairments.)
- Never touch the bulb glass immediately after turning it OFF. It is extremely hot.

CAUTION:

Comply with the following cautions to prevent any error and malfunction.

- Install the xenon bulb securely. (Insufficient bulb socket installation may melt the bulb, the connector, the housing, etc. by high-voltage leakage or corona discharge.)
- Never perform HID circuit inspection with a tester.
- Never touch the xenon bulb glass with hands. Never put oil and grease on it.
- Dispose of the used xenon bulb after packing it in thick vinyl without breaking it.
- Never wipe out dirt and contamination with organic solvent (thinner, gasoline, etc.).

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

INFOID:000000001093894

CAUTION:

- CFC-12 (R-12) refrigerant and HFC-134a (R-134a) refrigerant are not compatible. These refrigerants must never be mixed, even in the smallest amounts. If the refrigerants are mixed and compressor malfunction is likely occur.
- Use only specified lubricant for the HFC-134a (R-134a) A/C system and HFC-134a (R-134a) components. If lubricant other than that specified is used, compressor malfunction is likely to occur.
- The specified HFC-134a (R-134a) lubricant 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, never remove the caps (unseal) until just before connecting the components. Connect all refrigerant loop components as quickly as possible to minimize the entry of moisture into system.
 - Only use the specified lubricant from a sealed container. Immediately reseal containers of lubricant. Without proper sealing, lubricant will become moisture saturated and should not be used.
 - Never allow lubricant (Nissan A/C System Oil Type S) to come in contact with styrene foam parts. Damage may result.

General Refrigerant Precaution

INFOID:000000001093895

WARNING:

- Avoid breathing A/C refrigerant and lubricant vapor or mist. Exposure may irritate eyes, nose and throat. Use only approved recovery/recycling equipment to discharge HFC-134a (R-134a) refrigerant. If accidental system discharge occurs, ventilate work area before resuming service. Additional health and safety information may be obtained from refrigerant and lubricant manufacturers.

PRECAUTIONS

< PRECAUTION >

[AUTOMATIC AIR CONDITIONER (K9K)]

- Never 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.
- Never store or heat refrigerant containers above 52°C (126°F).
- Never 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.
- Never 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.
- Never pressure test or leak test HFC-134a (R-134a) service equipment and/or vehicle air conditioning systems with compressed air during repair. Some mixtures of air and HFC-134a (R-134a) have been shown to be combustible at elevated pressures. These mixtures, if ignited, may cause injury or property damage. Additional health and safety information may be obtained from refrigerant manufacturers.

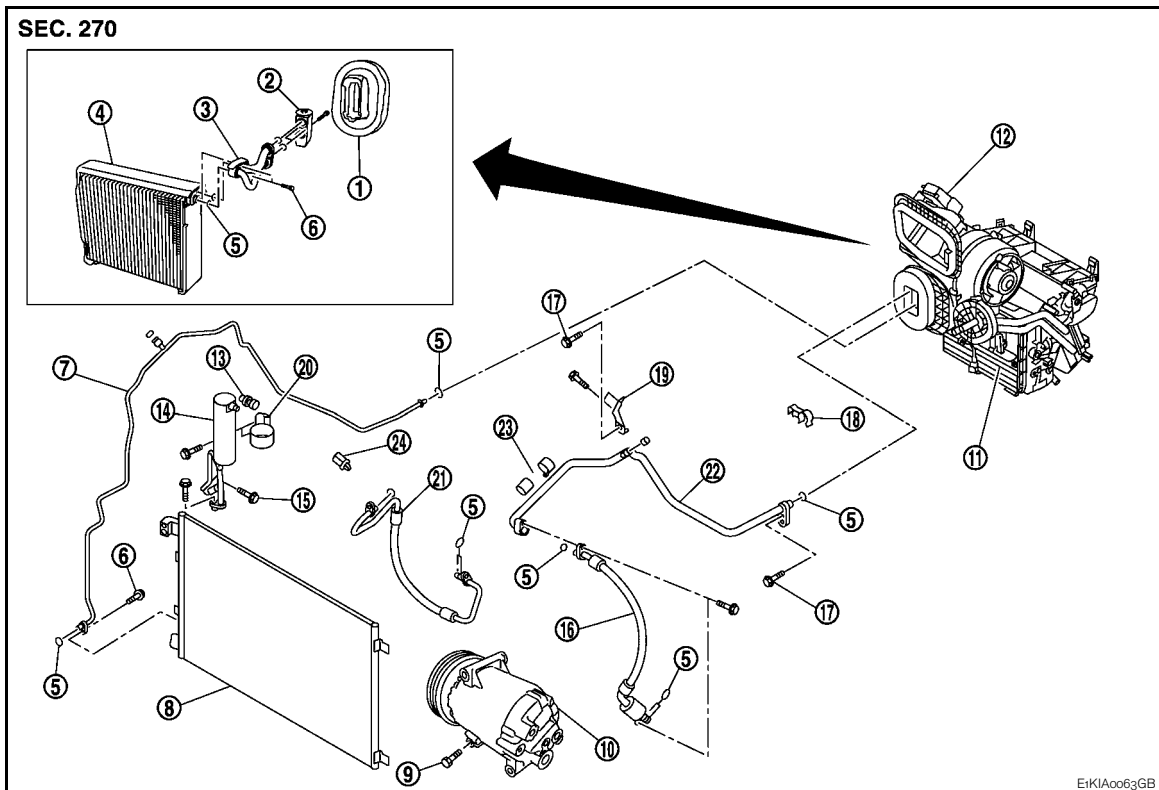
Refrigerant Connection

INFOID:000000001093896

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

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

O-RING AND REFRIGERANT CONNECTION



- | | | |
|---------------------------------|------------------------------------|--|
| 1. Heater sealing | 2. Expansion valve | 3. Low pressure pipe 1 and high pressure pipe 2 assembly |
| 4. Evaporator | 5. O-ring | 6. Connector pipe fixing bolt |
| 7. High pressure pipe 1 | 8. Condenser assembly | 9. Fixing bolt |
| 10. Compressor | 11. Heater & cooling unit assembly | 12. Heater & blower unit assembly |
| 13. Refrigerant pressure sensor | 14. Liquid tank | 15. Liquid tank fixing screw |
| 16. Low pressure flexible hose | 17. Fixing bolt | 18. Pipes fixing clip |

PRECAUTIONS

< PRECAUTION >

[AUTOMATIC AIR CONDITIONER (K9K)]

- | | | |
|--------------------------------------|---|---------------------------------|
| 19. Low & high pressure pipe bracket | 20. Liquid tank fixing bracket | 21. High pressure flexible hose |
| 22. Low pressure pipe 2 | 23. Low pressure pipe fixing clamp assembly | 24. Pipe mantening clip |

CAUTION:

The new and former refrigerant connections use different O-ring configurations. Never confuse O-rings since they are not interchangeable. If a wrong O-ring is installed, refrigerant may leak at the connection.

O-Ring Part Numbers and Specifications

Connection type	Piping connection point		Part number	QTY	O-ring size
New	Low pressure flexible hose to Low pressure pipe 2		92473 N8210	1	16
	Low pressure pipe 2 to expansion valve		92473 N8210	1	16
	High pressure flexible pipe 1 to condenser		92472 N8210	1	12
	High pressure pipe 1 to expansion valve		92471 N8210	1	8
	Low pressure pipe 1 and high pressure	Inlet	92475 71L00	1	12
	pipe 2 assembly to expansion valve	Outlet	92475 72L00	1	16
	Low pressure pipe 1 and high pressure	Inlet	92475 71L00	1	12
	pipe 2 assembly to evaporator	Outlet	92475 72L00	1	16
	High pressure pipe 1 to liquid tank		92471 N8210	1	8
	Compressor to low pressure flexible hose		01-57-112	2	19
	Compressor to high pressure flexible hose		01-57-112	2	12
	Liquid tank to condenser		92473 N8210	2	16

WARNING:

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

CAUTION:

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

- When the compressor is removed, store it in the same way at it is when mounted on the car. Failure to do so will cause lubricant to enter the low-pressure chamber.
- When connecting tubes, always use a torque wrench and a back-up wrench.
- After disconnecting tubes, immediately plug all openings to prevent entry of dust and moisture.
- When installing an air conditioner in the vehicle, connect the pipes at the final stage of the operation. 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.
- Thoroughly remove moisture from the refrigeration system before charging the refrigerant.
- Always replace used O-rings.
- When connecting tube, apply lubricant to circle of the O-rings shown in illustration. Be careful not to apply lubricant to threaded portion.

Name : Nissan A/C System Oil Type S

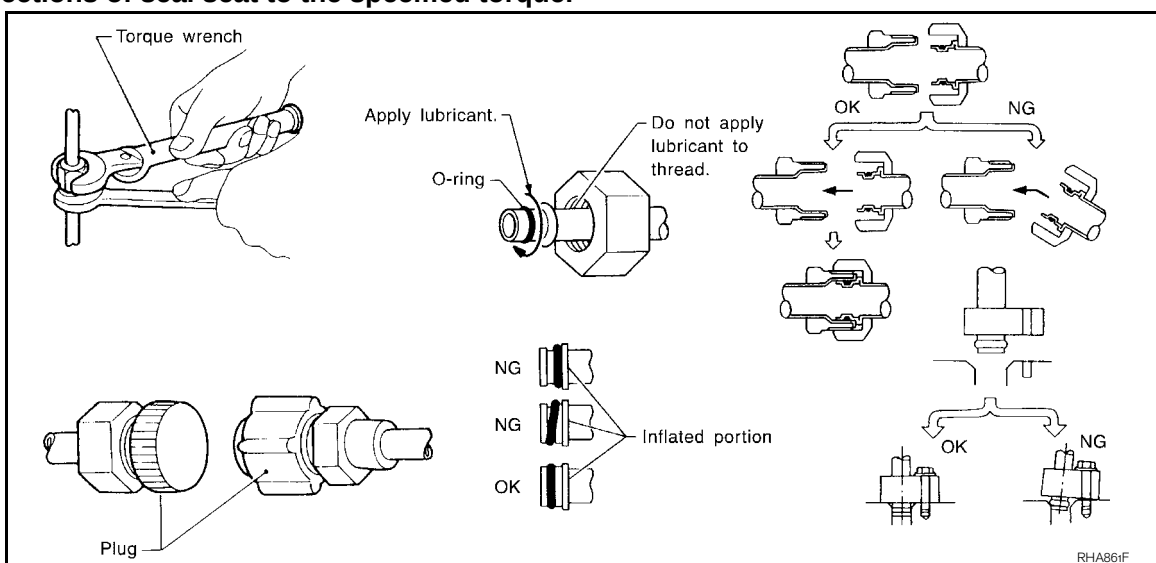
- O-ring must be closely attached to the groove portion of tube.
- When replacing the O-ring, be careful not to damage O-ring and tube.
- Connect tube until a click can be heard, then tighten the nut or bolt by hand. Make sure that the O-ring is installed to tube correctly.

PRECAUTIONS

[AUTOMATIC AIR CONDITIONER (K9K)]

< PRECAUTION >

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



Service Equipment

INFOID:000000001093897

RECOVERY/RECYCLING 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.

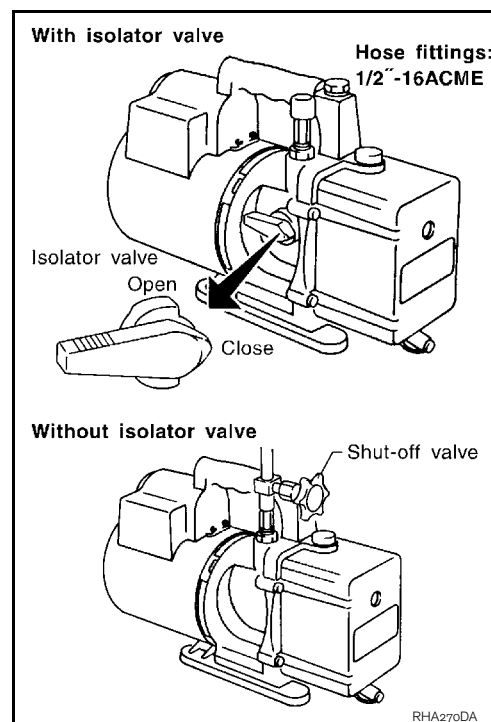
VACUUM PUMP

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 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 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.



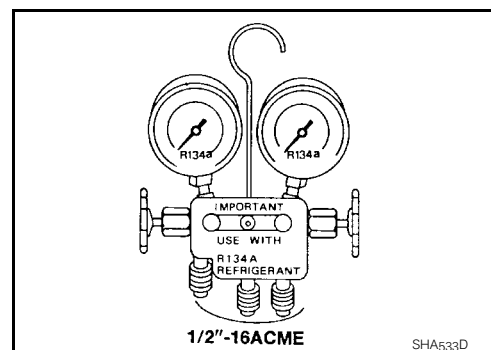
MANIFOLD GAUGE SET

PRECAUTIONS

< PRECAUTION >

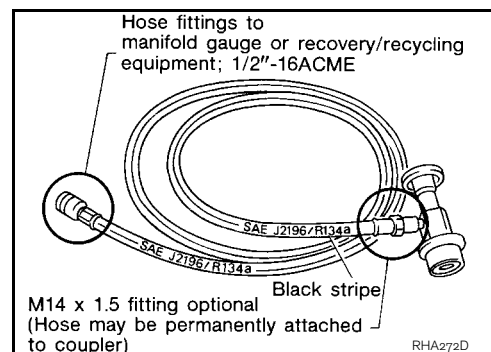
[AUTOMATIC AIR CONDITIONER (K9K)]

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

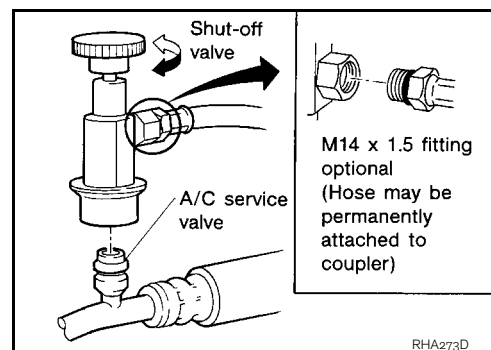
Be certain that the service hoses display the markings described (colored hose with black stripe). All hoses must include positive shut-off devices (either manual or automatic) near the end of the hoses opposite to the manifold gauge.



SERVICE COUPLERS

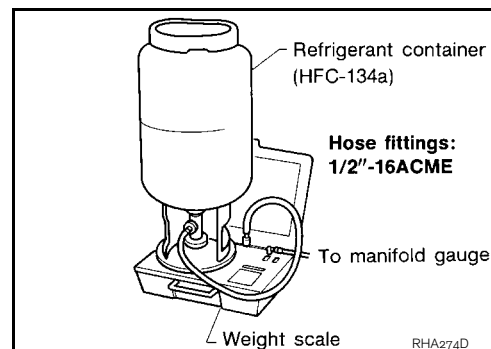
Never attempt to connect HFC-134a (R-134a) service couplers to a CFC-12 (R-12) A/C system. The HFC-134a (R-134a) couplers will not properly connect to the CFC-12 (R-12) system. However, if an improper connection is attempted, discharging and contamination may occur.

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



REFRIGERANT WEIGHT SCALE

Verify that no refrigerant other than HFC-134a (R-134a) and specified lubricants 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.

COMPRESSOR

General Precautions

INFOID:000000001093898

CAUTION:

- Plug all openings to prevent moisture and foreign matter from entering.
- When the compressor is removed, store it in the same way at it is when mounted on the car.
- When replacing or repairing compressor, follow "Maintenance of Lubricant Quantity in Compressor" exactly. Refer to [HA-78, "Adjustment"](#).
- Keep friction surfaces between clutch and pulley clean. If the surface is contaminated with lubricant, wipe it off by using a clean waste cloth moistened with thinner.
- After compressor service operation, turn the compressor shaft by hand more than five turns in both directions. This will equally distribute lubricant inside the compressor. After the compressor is installed, let the engine idle and operate the compressor for one hour.
- After replacing the compressor magnet clutch, apply voltage to the new one and check for normal operation.

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LEAK DETECTION DYE

< PRECAUTION >

[AUTOMATIC AIR CONDITIONER (K9K)]

LEAK DETECTION DYE

General Precautions

INFOID:000000001093899

CAUTION:

- The A/C system contains a fluorescent leak detection dye used for locating refrigerant leaks. An ultraviolet (UV) lamp is required to illuminate the dye when inspecting for leaks.
- Always wear fluorescence enhancing UV safety goggles to protect your eyes and enhance the visibility of the fluorescent dye.
- The fluorescent dye leak detector is not a replacement for an electrical leak detector (SST: J-41995). The fluorescent dye leak detector should be used in conjunction with an electrical leak detector (SST: J-41995) to pin-point refrigerant leaks.
- For the purpose of safety and customer's satisfaction, read and follow all manufacture's operating instructions and precautions prior to performing the work.
- A compressor shaft seal should not necessarily be repaired because of dye seepage. The compressor shaft seal should only be repaired after confirming the leak with an electrical leak detector (SST: J-41995).
- Always remove any remaining dye from the leak area after repairs are completed to avoid a misdiagnosis during a future service.
- Never allow dye to come into contact with painted body panels or interior components. If dye is spilled, clean immediately with the approved dye cleaner. Fluorescent dye left on a surface for an extended period of time cannot be removed.
- 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 will remain for three years or a little over unless a compressor malfunction occurs.

IDENTIFICATION

NOTE:

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

IDENTIFICATION LABEL FOR VEHICLE

Vehicles with factory installed fluorescent dye have the identification label on the front side of hood.

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PREPARATION

< PREPARATION >

[AUTOMATIC AIR CONDITIONER (K9K)]

PREPARATION

PREPARATION

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

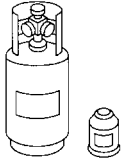
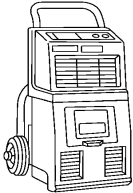
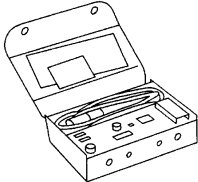
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Never mix HFC-134a (R-134a) refrigerant and/or its specified lubricant with CFC-12 (R-12) refrigerant and/ or its lubricant.

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.

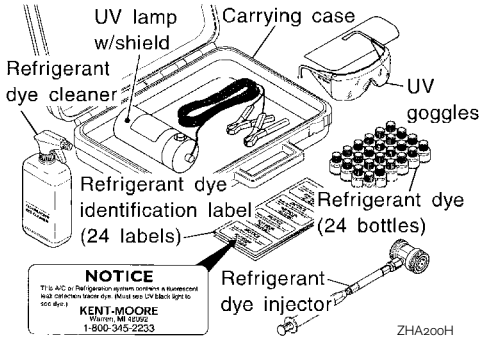
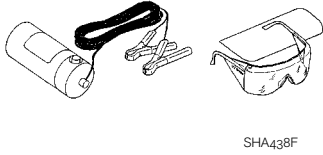
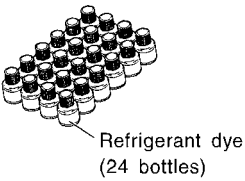
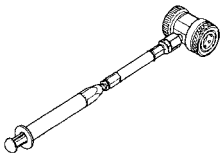
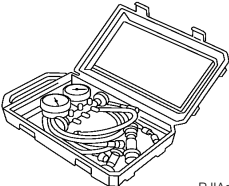
Adapters that convert one size fitting to another must never be used: refrigerant/lubricant contamination will occur and compressor malfunction will result.

Tool number 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
KLH00-PAGS0 Nissan A/C System Oil Type S(DH-PS)  S-NT197	Type: Polyalkylene glycol oil (PAG), type S (DH-PS) Application: HFC-134a (R-134a) wobble (swash) plate compressors (Nissan only) Lubricity: 40 m ℓ (1.4 Imp fl oz.)
Recovery/Recycling/ Recharging equipment (ACR4)  RJA0195E	Function: Refrigerant recovery and recycling and recharging
Electrical leak detector  A/C leak detector SHA705EB	Power supply: DC 12V (Cigarette lighter)

PREPARATION

< PREPARATION >

[AUTOMATIC AIR CONDITIONER (K9K)]

Tool number Tool name	Description
(J-43926) Refrigerant dye leak detection kit Kit includes: (J-42220) UV lamp and UV safety goggles (J-41459) HFC-134a (R-134a) dye injector Use with J-41447, 1/4 ounce bottle (J-41447) HFC-134a (R-134a) fluorescent leak detection dye (Box of 24, 1/4 ounce bottles) (J-43872) Refrigerant dye cleaner	 Power supply: DC 12V (Battery terminal)
(J-42220) UV lamp and UV safety goggles	 Power supply: DC 12V (Battery terminal) For checking re- frigerant leak when fluorescent dye is in- stalled in A/C system Includes: UV lamp and UV safety goggles
(J-41447) HFC-134a (R-134a) fluorescent leak detection dye (Box of 24, 1/4 ounce bottles)	 Application: For HFC-134a (R-134a) PAG oil Container: 1/4 ounce (7.4 cc) bottle (Includes self-adhesive dye identification labels for affixing to vehicle after charging system with dye.)
(J-41459) HFC-134a (R-134a) dye injector Use with J-41447, 1/4 ounce bottle	 For injecting 1/4 ounce of fluorescent leak detection dye into A/C system.
(J-43872) Refrigerant dye cleaner	 For cleaning dye spills.
Manifold gauge set (with hoses and couplers)	 Identification: • The gauge face indicates HFC-134a (R-134a). Fitting size: Thread size • 1/2"-16 ACME

Sealant or/and Lubricant

INFOID:0000000001093902

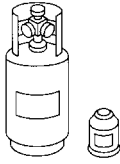
PREPARATION

< PREPARATION >

[AUTOMATIC AIR CONDITIONER (K9K)]

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
Nissan A/C System Oil Type S (DH-PS)  S-NT197	Type: Polyalkylene glycol oil (PAG), type S (DH-PS) Application: HFC-134a (R-134a) swash plate compressors (Nissan only) Capacity: 40 mℓ (1.4 US fl oz., 1.4 Imp fl oz.)

ON-VEHICLE MAINTENANCE

LUBRICANT

Adjustment

INFOID:000000001093903

LUBRICANT RETURN OPERATION

Adjust the lubricant quantity according to the test group shown below.

1. CHECK LUBRICANT RETURN OPERATION

Can lubricant return operation be performed?

- A/C system works properly.
- There is no evidence of a large amount of lubricant leakage.

CAUTION:**If excessive lubricant leakage is noted, never perform the lubricant return operation.**Is it successful?

YES >> GO TO 2.

NO >> GO TO 3.

2. PERFORM LUBRICANT RETURN OPERATION, PROCEEDING AS FOLLOWS

1. Start the engine, and set to the following conditions:
 - Engine speed: Idling to 1,200 rpm
 - A/C switch: ON
 - Blower speed: Max. position
 - Temp. control: Optional [Set so that intake air temperature is 25 to 30°C (77 to 86°F).]
 - Intake position: Recirculation (REC)
2. Perform lubricant return operation for about 10 minutes.
3. Stop the engine.

>> GO TO 3.

3. CHECK REPLACEMENT PART

Should the compressor be replaced?

YES >> Refer to "LUBRICANT ADJUSTING PROCEDURE FOR COMPRESSOR REPLACEMENT".

NO >> Refer to "LUBRICANT ADJUSTING PROCEDURE FOR COMPONENTS REPLACEMENT EXCEPT COMPRESSOR".

LUBRICANT ADJUSTING PROCEDURE FOR COMPONENTS REPLACEMENT EXCEPT COMPRESSOR

After replacing any of the following major components, add the correct amount of lubricant to the system.

Amount of lubricant to be added:

Part replaced	Lubricant to be added to system	Remarks
	Amount of lubricant mℓ (US fl oz., Imp fl oz.)	
Evaporator	75 (2.5, 2.6)	—
Condenser	35 (1.2, 1.2)	—
Liquid tank	10 (0.3, 0.4)	—
In case of refrigerant leak	30 (1.0, 1.1)	Large leak
	—	Small leak ^{*1}

^{*1}: If the refrigerant leak is small, no addition of lubricant is needed.

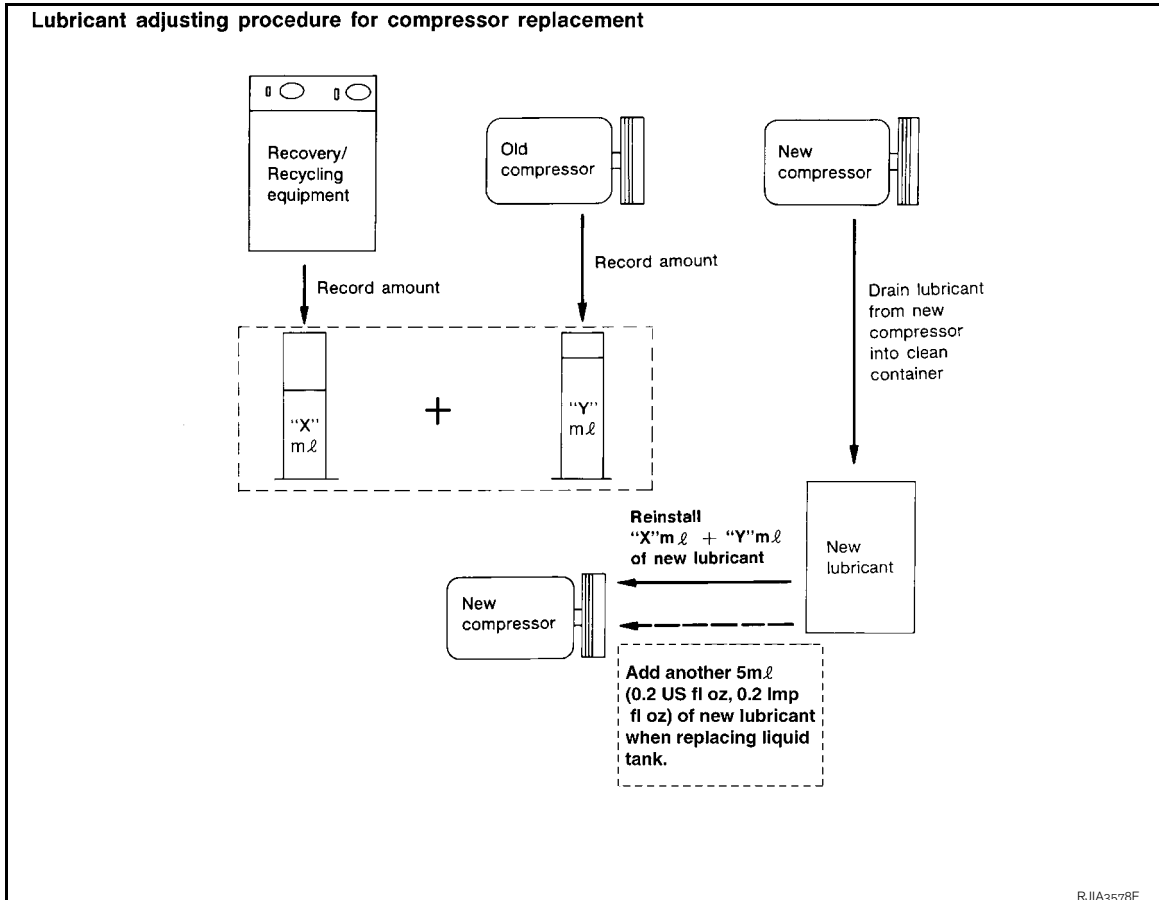
LUBRICANT ADJUSTING PROCEDURE FOR COMPRESSOR REPLACEMENT

LUBRICANT

< ON-VEHICLE MAINTENANCE >

[AUTOMATIC AIR CONDITIONER (K9K)]

1. Before connecting recovery/recycling recharging equipment to vehicle, check recovery/recycling recharging equipment gauges. No refrigerant pressure should be displayed. If NG, recover refrigerant from equipment lines.
 2. Connect recovery/recycling recharging equipment to vehicle. Confirm refrigerant purity in supply tank using recovery/recycling recharging equipment and refrigerant identifier. If NG, refer to [HA-68, "Working with HFC-134a \(R-134a\)"](#).
 3. Confirm refrigerant purity in vehicle A/C system using recovery/recycling recharging equipment and refrigerant identifier. If NG, refer to [HA-68, "Working with HFC-134a \(R-134a\)"](#).
 4. Discharge refrigerant into the refrigerant recovery/recycling equipment. Measure lubricant discharged into the recovery/recycling equipment.
 5. Drain the lubricant from the old (removed) compressor into a graduated container and recover the amount of lubricant drained.
 6. Drain the lubricant from the new compressor into a separate, clean container.
 7. Measure an amount of new lubricant installed equal to amount drained from old compressor. Add this lubricant to new compressor through the suction port opening.
 8. Measure an amount of new lubricant equal to the amount recovered during discharging. Add this lubricant to new compressor through the suction port opening.
 9. If the liquid tank also needs to be replaced, add another 5 mℓ (0.2 US fl oz., 0.2 Imp fl oz.) of lubricant at this time.
- Do not add this 5 mℓ (0.2 US fl oz., 0.2 Imp fl oz.) of lubricant when replaces the compressor only.



REFRIGERATION SYSTEM

< ON-VEHICLE MAINTENANCE >

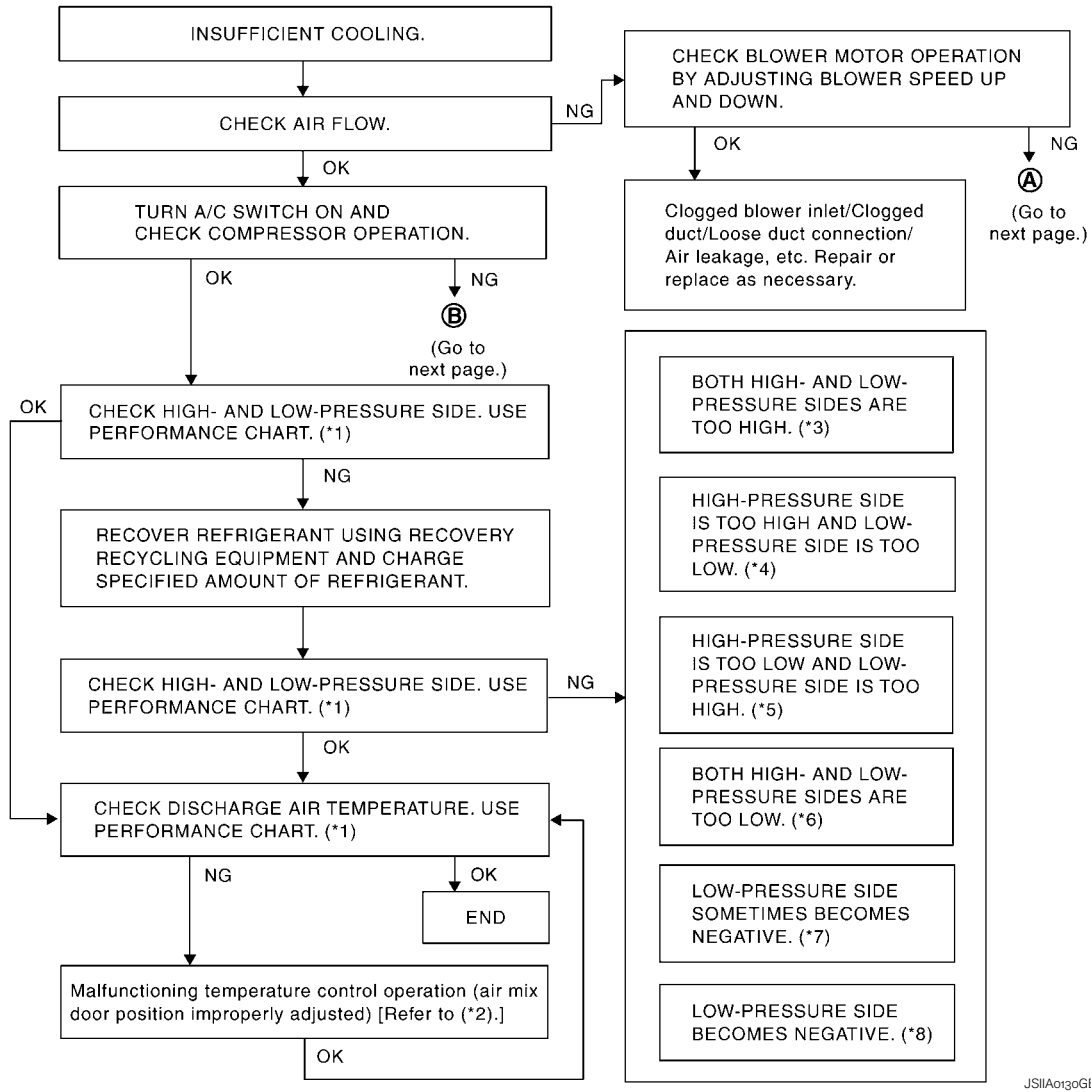
[AUTOMATIC AIR CONDITIONER (K9K)]

REFRIGERATION SYSTEM

Inspection

INFOID:000000001093904

PERFORMANCE TEST DIAGNOSIS



JSIIA0130GB

*2 [HAC-54, "Diagnosis Procedure"](#)

*3 [HA-63, "BOTH HIGH- AND LOW-PRESSURE SIDES ARE TOO HIGH : Symptom Table"](#)

*4 [HA-63, "HIGH-PRESSURE SIDE IS TOO HIGH AND LOW-PRESSURE SIDE IS TOO LOW : Symptom Table"](#)

*5 [HA-64, "HIGH-PRESSURE SIDE IS TOO LOW AND LOW-PRESSURE SIDE IS TOO HIGH : Symptom Table"](#)

*6 [HA-64, "BOTH HIGH- AND LOW-PRESSURE SIDES ARE TOO LOW : Symptom Table"](#)

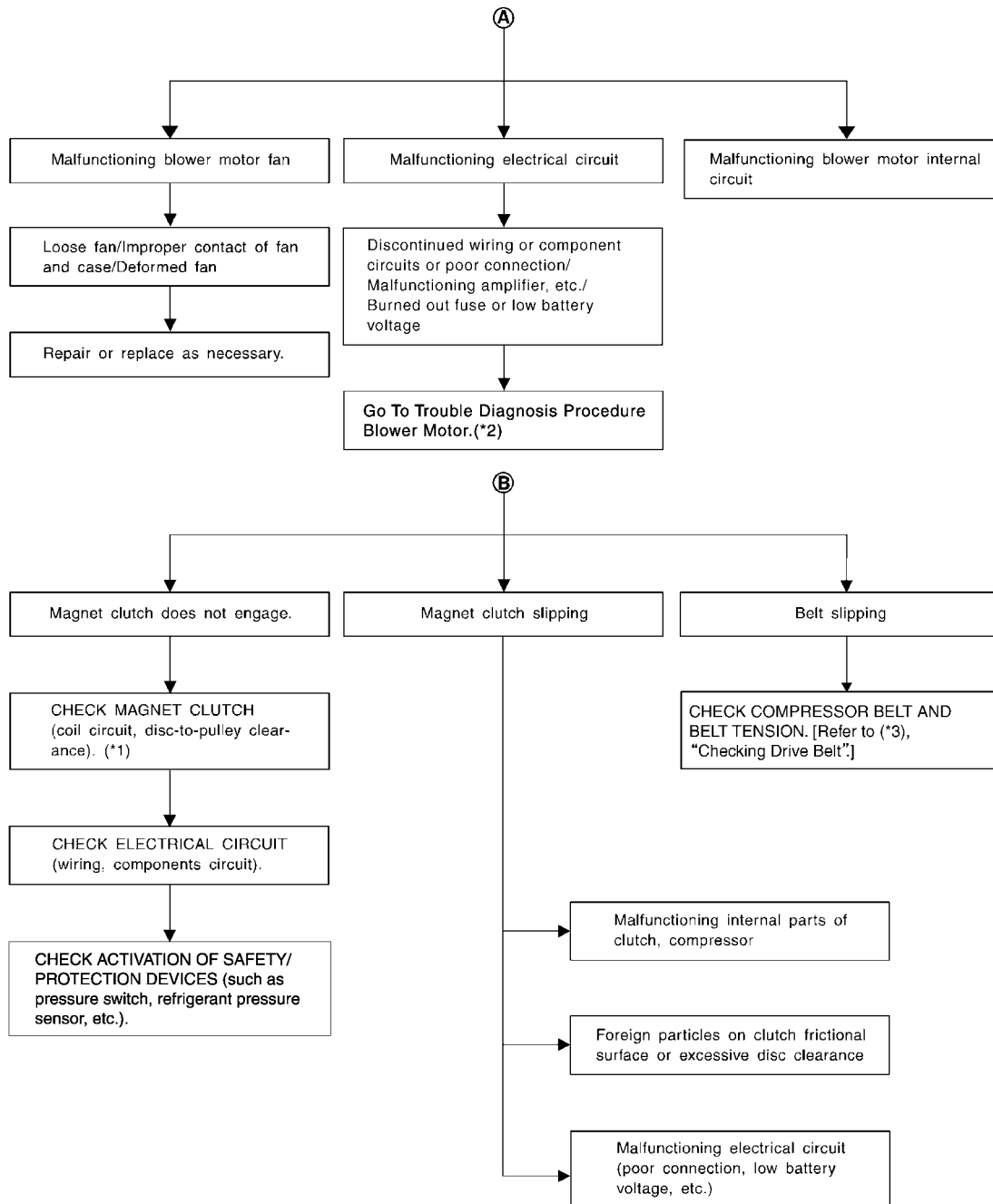
*7 [HA-65, "LOW-PRESSURE SIDE SOMETIMES BECOMES NEGATIVE : Symptom Table"](#)

*8 [HA-66, "LOW-PRESSURE SIDE BECOMES NEGATIVE : Symptom Table"](#)

REFRIGERATION SYSTEM

< ON-VEHICLE MAINTENANCE >

[AUTOMATIC AIR CONDITIONER (K9K)]



SJIA1642E

*2 [HAC-62, "Diagnosis Procedure"](#)

*3 [EM-259, "Inspection and Adjustment"](#)

Refrigerant Leaks

INFOID:000000001093906

Perform a visual inspection of all refrigeration parts, fittings, hoses and components for signs of A/C lubricant leakage, damage and corrosion. A/C lubricant leakage may indicate an area of refrigerant leakage. Allow extra inspection time in these areas when using either an electrical leak detector or fluorescent dye leak detector (SST: J-42220).

If dye is observed, confirm the leak with an electrical leak detector. It is possible a prior leak was repaired and not properly cleaned.

REFRIGERATION SYSTEM

< ON-VEHICLE MAINTENANCE >

[AUTOMATIC AIR CONDITIONER (K9K)]

When searching for leaks, do not stop when one leak is found but continue to check for additional leaks at all system components and connections.

When searching for refrigerant leaks using an electrical leak detector, move the probe along the suspected leak area at 1 to 2 inches per second and no further than 1/4 inch from the component.

CAUTION:

Moving the electrical leak detector probe slower and closer to the suspected leak area will improve the chances of finding a leak.

FLUORESCENT LEAK DETECTOR

< ON-VEHICLE MAINTENANCE >

[AUTOMATIC AIR CONDITIONER (K9K)]

FLUORESCENT LEAK DETECTOR

Inspection

INFOID:000000001093907

CHECKING SYSTEM FOR LEAKS USING THE FLUORESCENT LEAK DETECTOR

1. Check A/C system for leaks using the UV lamp and safety goggles (SST: J-42220) in a low sunlight area (area without windows preferable). Illuminate all components, fittings and lines. The dye will appear as a bright green/yellow area at the point of leakage. Fluorescent dye observed at the evaporator drain opening indicates an evaporator core assembly (tubes, core or expansion valve) leak.
2. If the suspected area is difficult to see, use an adjustable mirror or wipe the area with a clean shop rag or cloth, with the UV lamp for dye residue.
3. After the leak is repaired, remove any residual dye using dye cleaner (SST: J-43872) to prevent future misdiagnosis.
4. Perform a system performance check and verify the leak repair with an approved electrical leak detector.

NOTE:

Other gases in the work area or substances on the A/C components, for example, anti-freeze, windshield washer fluid, solvents and lubricants, may falsely trigger the leak detector. Make sure the surfaces to be checked are clean.

Clean with a dry cloth or blow off with shop air.

Do not allow the sensor tip of the detector to contact with any substance. This can also cause false readings and may damage the detector.

DYE INJECTION

(This procedure is only necessary when recharging the system or when the compressor has seized and was replaced.)

1. Check A/C system static (at rest) pressure. Pressure must be at least 345 kPa (3.52 kg/cm², 50 psi).
2. Pour one bottle (1/4 ounce / 7.4 cc) of the A/C refrigerant dye into the injector tool (SST: J-41459).
3. Connect the injector tool to the A/C low-pressure side service valve.
4. Start the engine and switch A/C ON.
5. When the A/C operating (compressor running), inject one bottle (1/4 ounce / 7.4 cc) of fluorescent dye through the low-pressure service valve using dye injector tool (SST: J-41459) (refer to the manufacture's operating instructions).
6. With the engine still running, disconnect the injector tool from the service valve.

CAUTION:

Be careful the A/C system or replacing a component, pour the dye directly into the open system connection and proceed with the service procedures.

7. Operate the A/C system for a minimum of 20 minutes to mix the dye with the system oil. Depending on the leak size, operating conditions and location of the leak, it may take from minutes to days for the dye to penetrate a leak and become visible.
8. Attach a blue label as necessary.

ELECTRICAL LEAK DETECTOR

< ON-VEHICLE MAINTENANCE >

[AUTOMATIC AIR CONDITIONER (K9K)]

ELECTRICAL LEAK DETECTOR

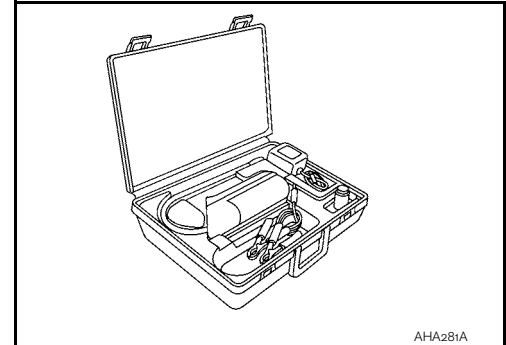
Inspection

INFOID:000000001093908

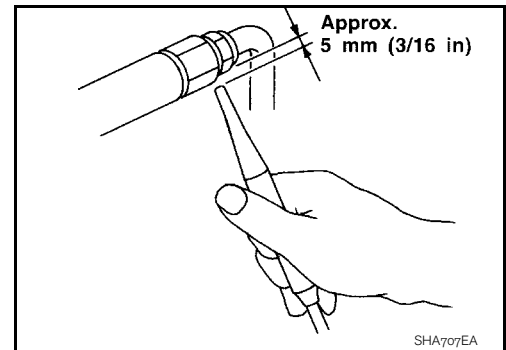
PRECAUTIONS FOR HANDLING LEAK DETECTOR

When performing a refrigerant leak check, use an electrical leak detector (SST: J-41995) or equivalent. Ensure that the instrument is calibrated and set properly per the operating instructions.

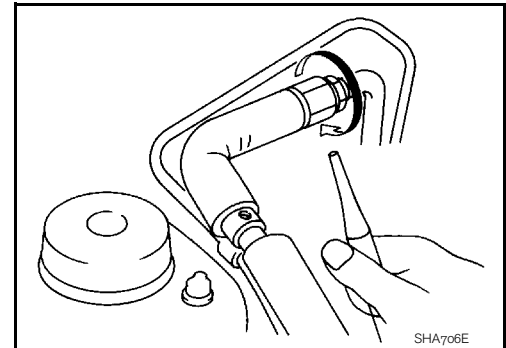
The leak detector is a delicate device. In order to use the leak detector properly, read the operating instructions and perform any specified maintenance.



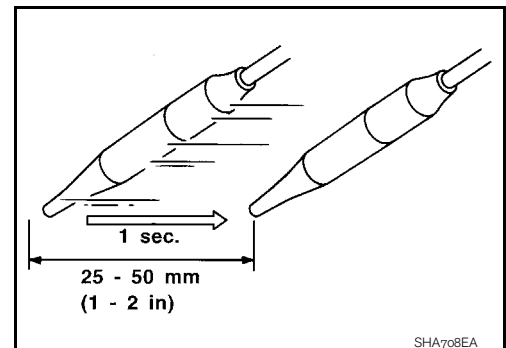
1. Position probe approximately 5 mm (3/16 in) away from point to be checked.



2. When testing, circle each fitting completely with probe.



3. Move probe along component approximately 25 to 50 mm (1 to 2 in)/sec.



CHECKING PROCEDURE

To prevent inaccurate or false readings, make sure there is no refrigerant vapor, shop chemicals, or cigarette smoke in the vicinity of the vehicle. Perform the leak test in calm area (low air/wind movement) so that the leaking refrigerant is not dispersed.

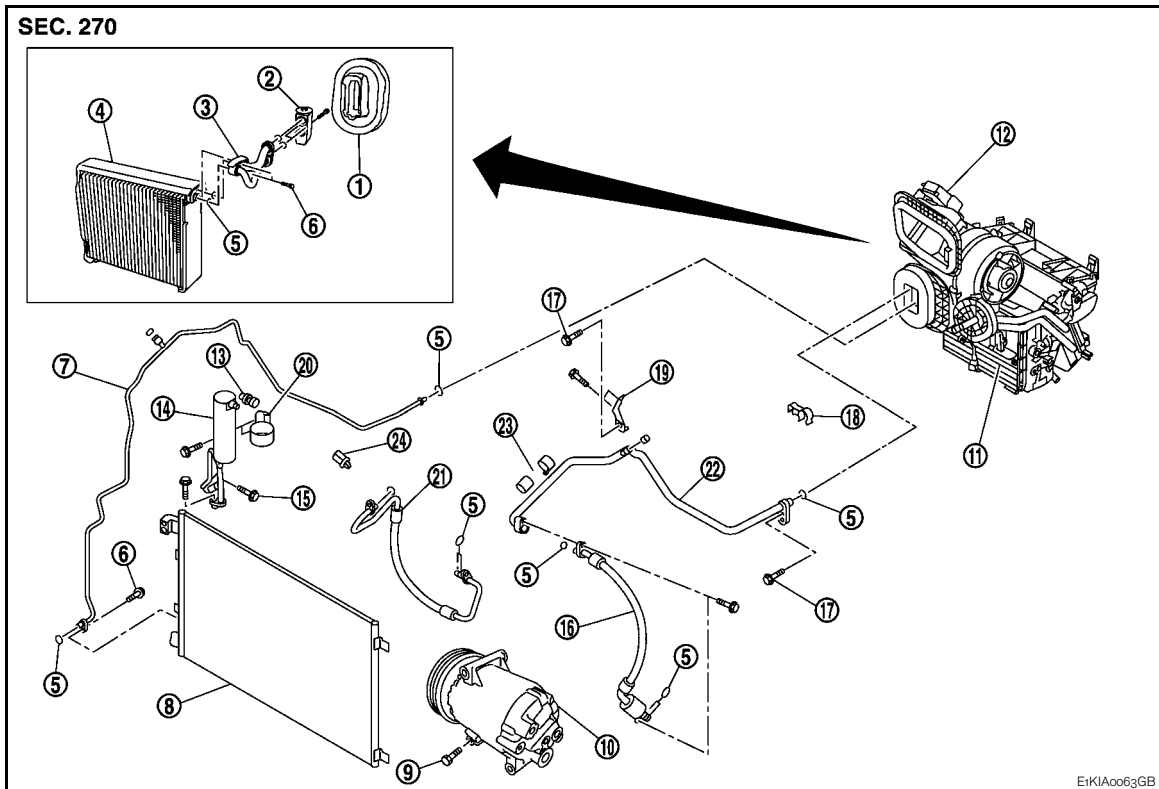
1. Stop the engine.

ELECTRICAL LEAK DETECTOR

< ON-VEHICLE MAINTENANCE >

[AUTOMATIC AIR CONDITIONER (K9K)]

2. Connect a suitable A/C manifold gauge set (SST: J-39183) to the A/C service valves.
3. Check if the A/C refrigerant pressure is at least 345 kPa (3.52 kg/cm², 50 psi) above 16°C (61°F). If less than specification, recover/evacuate and recharge the system with the specified amount of refrigerant.
NOTE:
At temperatures below 16°C (61°F), leaks may not be detected since the system may not reach 345 kPa (3.52 kg/cm², 50 psi).
4. Perform the leak test from the high-pressure side (compressor discharge a to evaporator inlet j) to the low-pressure side (evaporator drain hose k to shaft seal p). Perform a leak check for the following areas carefully. Clean the component to be checked and move the leak detected probe completely around the connection/component.



- | | | |
|--------------------------------------|---|--|
| 1. Heater sealing | 2. Expansion valve | 3. Low pressure pipe 1 and high pressure pipe 2 assembly |
| 4. Evaporator | 5. O-ring | 6. Connector pipe fixing bolt |
| 7. High pressure pipe 1 | 8. Condenser assembly | 9. Fixing bolt |
| 10. Compressor | 11. Heater & cooling unit assembly | 12. Heater & blower unit assembly |
| 13. Refrigerant pressure sensor | 14. Liquid tank | 15. Liquid tank fixing screw |
| 16. Low pressure flexible hose | 17. Fixing bolt | 18. Pipes fixing clip |
| 19. Low & high pressure pipe bracket | 20. Liquid tank fixing bracket | 21. High pressure flexible hose |
| 22. Low pressure pipe 2 | 23. Low pressure pipe fixing clamp assembly | 24. Pipe mantening clip |

Compressor

Check the fitting of high- and low-pressure flexible hoses, relief valve and shaft seal.

Condenser

Check the fitting of condenser pipe assembly, high-pressure flexible hose and pipe.

Liquid tank

Check the fitting of radiator & condenser assembly and refrigerant pressure sensor.

Service valves

Check all around the service valves. Ensure service valve caps are secured on the service valves (to prevent leaks).

NOTE:

ELECTRICAL LEAK DETECTOR

< ON-VEHICLE MAINTENANCE >

[AUTOMATIC AIR CONDITIONER (K9K)]

After removing A/C manifold gauge set from service valves, wipe any residue from valves to prevent any false readings by leak detector.

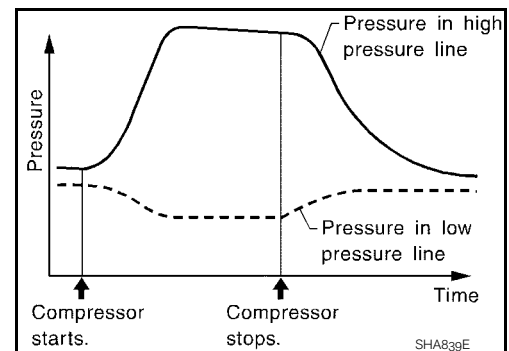
Cooling unit (Evaporator)

With engine OFF, turn blower fan on "High" for at least 15 seconds to dissipate any refrigerant trace in the cooling unit. Wait a minimum of 10 minutes accumulation time (refer to the manufacturer's recommended procedure for actual wait time) before inserting the leak detector probe into the drain hose.

Keep the probe inserted for at least 10 seconds. Use caution not to contaminate the probe tip with water or dirt that may be in the drain hose.

5. If a leak detector detects a leak, verify at least once by blowing compressed air into area of suspected leak, then repeat check as outlined above.
6. Do not stop when one leak is found. Continue to check for additional leaks at all system components. If no leaks are found, perform steps 7 - 10.
7. Start the engine.
8. Set the A/C control as follows;
 - a. A/C switch: ON
 - b. MODE door position: VENT (Ventilation)
 - c. Intake door position: Recirculation
 - d. Temperature setting: Max. cold
 - e. Fan speed: High
9. Run engine at 1,500 rpm for at least 2 minutes.
10. Stop the engine and perform leak check again following steps 4 through 6 above.

Refrigerant leaks should be checked immediately after stopping the engine. Begin with the leak detector at the compressor. The pressure on the high-pressure side will gradually drop after refrigerant circulation stops and pressure on the low-pressure side will gradually rise, as shown in the graph. Some leaks are more easily detected when pressure is high.



11. Before connecting recovery/recycling recharging equipment to vehicle, check recovery/recycling recharging equipment gauges. No refrigerant pressure should be displayed. If pressure is displayed, recover refrigerant from equipment lines and then check refrigerant purity.
12. Confirm refrigerant purity in supply tank using recovery/recycling recharging equipment and refrigerant identifier.
13. Confirm refrigerant purity in vehicle A/C system using recovery/recycling recharging equipment and refrigerant identifier.
14. Discharge A/C system using approved refrigerant recovery equipment. Repair the leaking fitting or component if necessary.
15. Evacuate and recharge A/C system and perform the leak test to confirm no refrigerant leaks.
16. Perform A/C performance test to ensure system works properly.

REFRIGERATION SYSTEM

< ON-VEHICLE REPAIR >

[AUTOMATIC AIR CONDITIONER (K9K)]

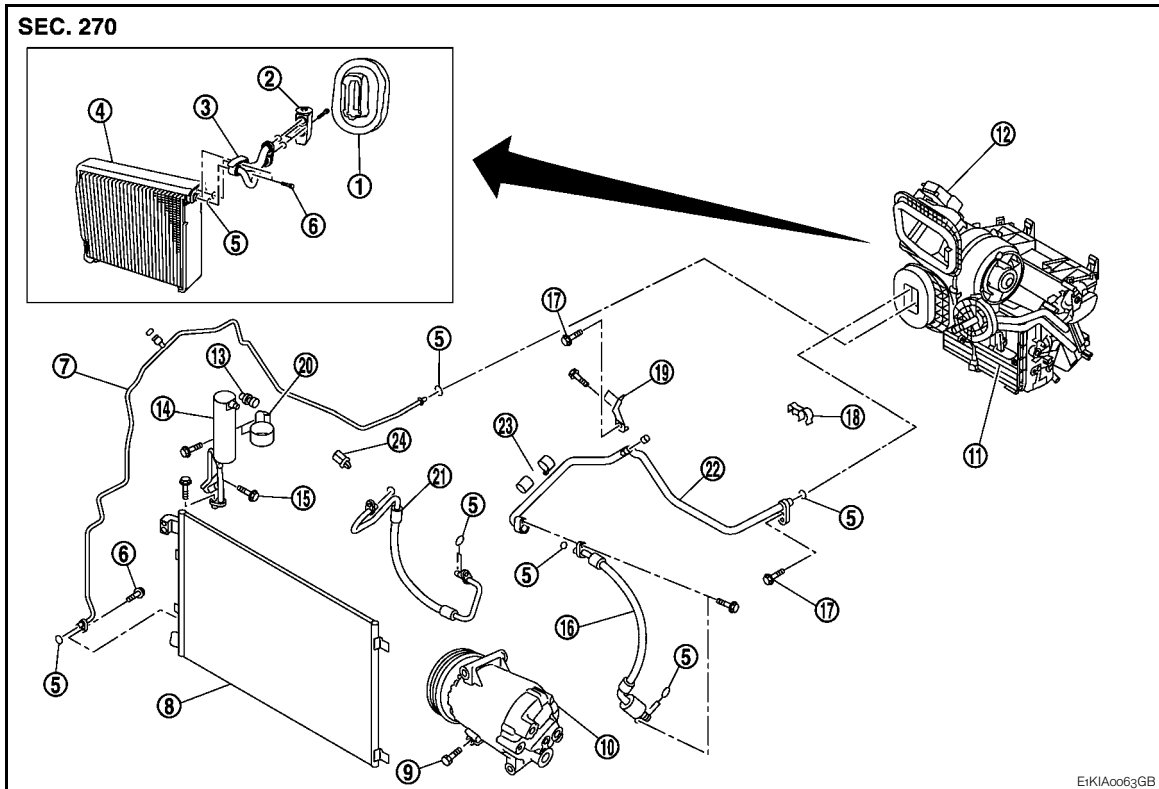
ON-VEHICLE REPAIR

REFRIGERATION SYSTEM

Exploded View

INFOID:000000001093909

Refer to [HA-69, "Refrigerant Connection"](#).



- | | | |
|--------------------------------------|---|--|
| 1. Heater sealing | 2. Expansion valve | 3. Low pressure pipe 1 and high pressure pipe 2 assembly |
| 4. Evaporator | 5. O-ring | 6. Connector pipe fixing bolt |
| 7. High pressure pipe 1 | 8. Condenser assembly | 9. Fixing bolt |
| 10. Compressor | 11. Heater & cooling unit assembly | 12. Heater & blower unit assembly |
| 13. Refrigerant pressure sensor | 14. Liquid tank | 15. Liquid tank fixing screw |
| 16. Low pressure flexible hose | 17. Fixing bolt | 18. Pipes fixing clip |
| 19. Low & high pressure pipe bracket | 20. Liquid tank fixing bracket | 21. High pressure flexible hose |
| 22. Low pressure pipe 2 | 23. Low pressure pipe fixing clamp assembly | 24. Pipe mantening clip |

Inspection After Installation

INFOID:000000001093910

SETTING OF SERVICE TOOLS AND EQUIPMENT

Discharging Refrigerant

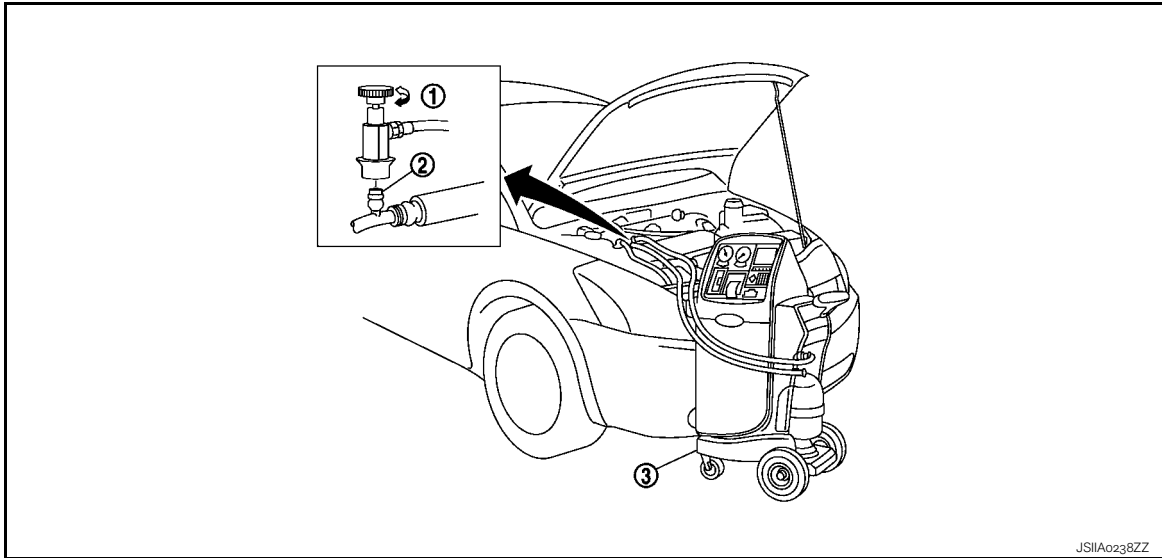
WARNING:

Avoid breathing A/C refrigerant and lubricant vapor or mist. Exposure may irritate eyes, nose and throat. Remove HFC-134a (R-134a) from 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]. If accidental system discharge occurs, ventilate work area before resuming service. Additional health and safety information may be obtained from refrigerant and lubricant manufacturers.

REFRIGERATION SYSTEM

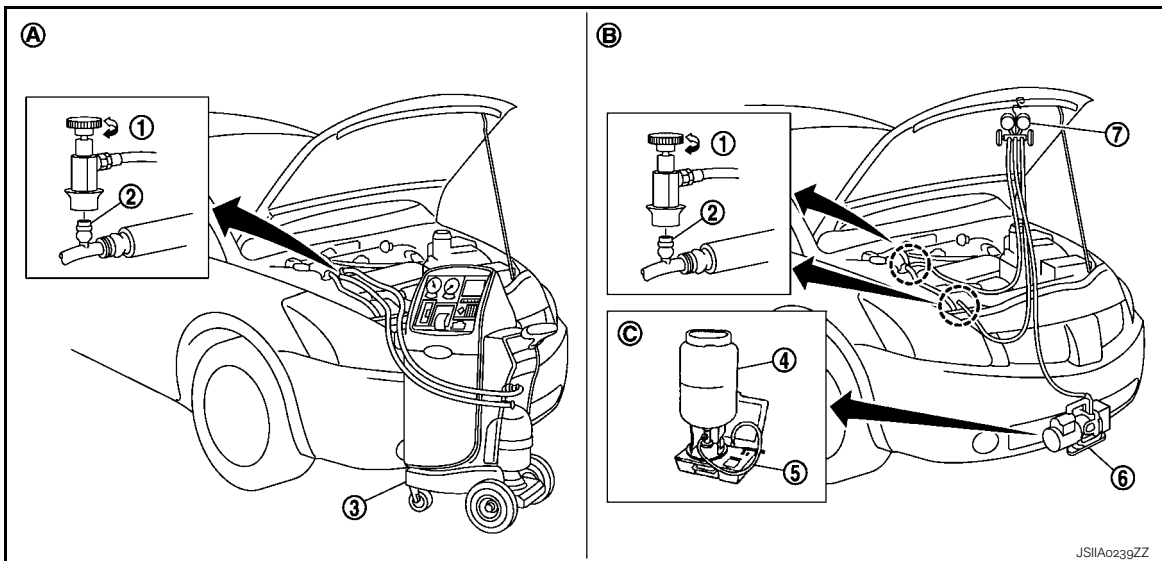
< ON-VEHICLE REPAIR >

[AUTOMATIC AIR CONDITIONER (K9K)]



- 1. Shut-off valve
- 2. A/C service valve
- 3. Recovery/Recycling/Recharging equipment

Evacuating System and Charging Refrigerant

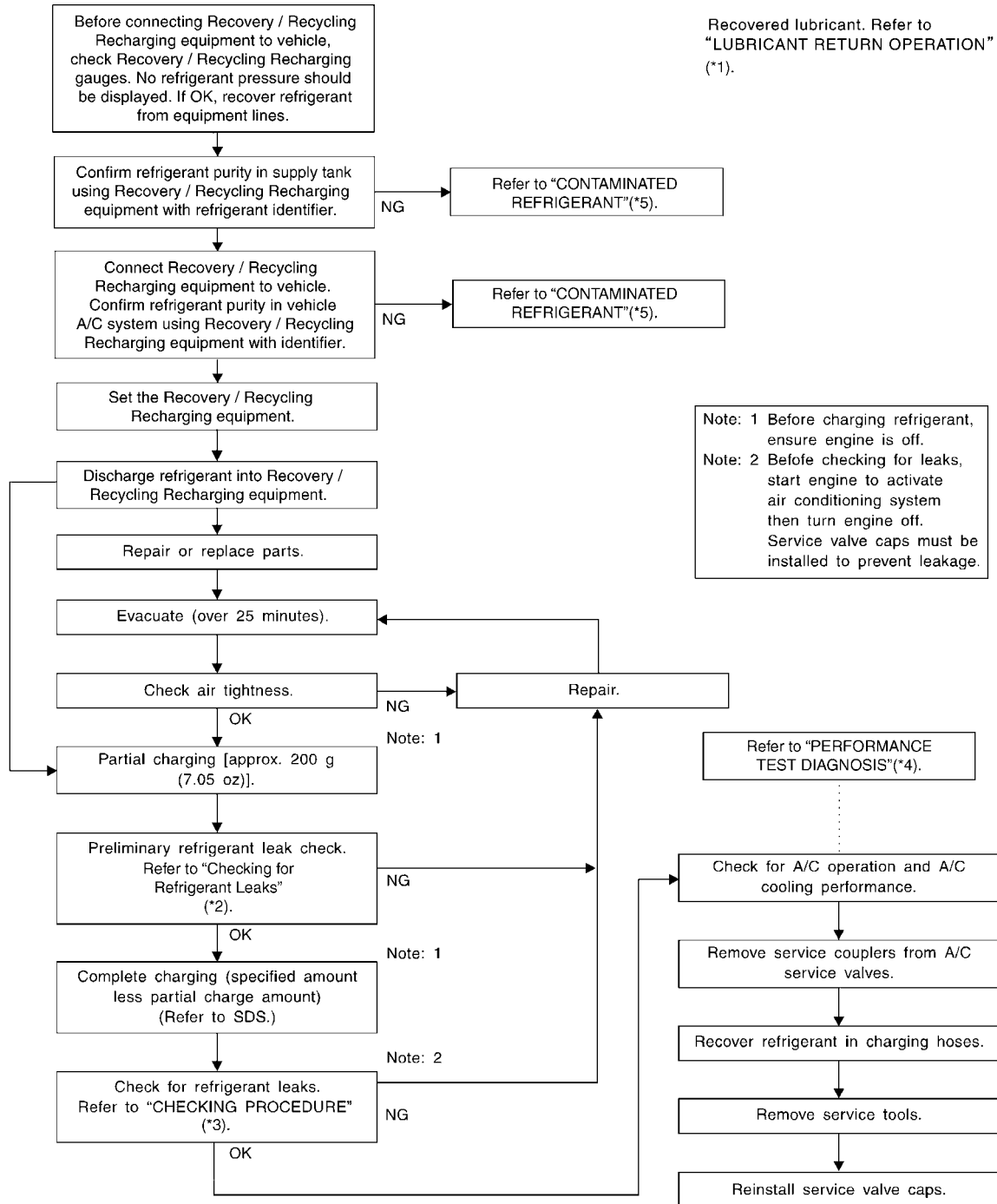


- 1. Shut-off valve
- 2. A/C service valve
- 3. Recovery/Recycling/Recharging equipment
- 4. Refrigerant container (HFC-134a)
- 5. Weight scale (J-39650)
- 6. Vacuum pump (J-39649)
- 7. Manifold gauge set (J-39183)
- A. Preferred (best) method
- B. Alternative method
- C. For charging

REFRIGERATION SYSTEM

< ON-VEHICLE REPAIR >

[AUTOMATIC AIR CONDITIONER (K9K)]



*1 [HA-78, "Adjustment"](#)

*2 "REFRIGERANT LEAKS" in [HA-81, "Refrigerant Leaks"](#).

*3 "CHECKING PROCEDURE" in [HA-80, "Inspection"](#).

*4 "PERFORMANCE TEST DIAGNOSIS" in [HA-80, "Inspection"](#).

*5 "CONTAMINATED REFRIGERANT" in [HAC-118, "Working with HFC-134a \(R-134a\)"](#).

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COMPRESSOR

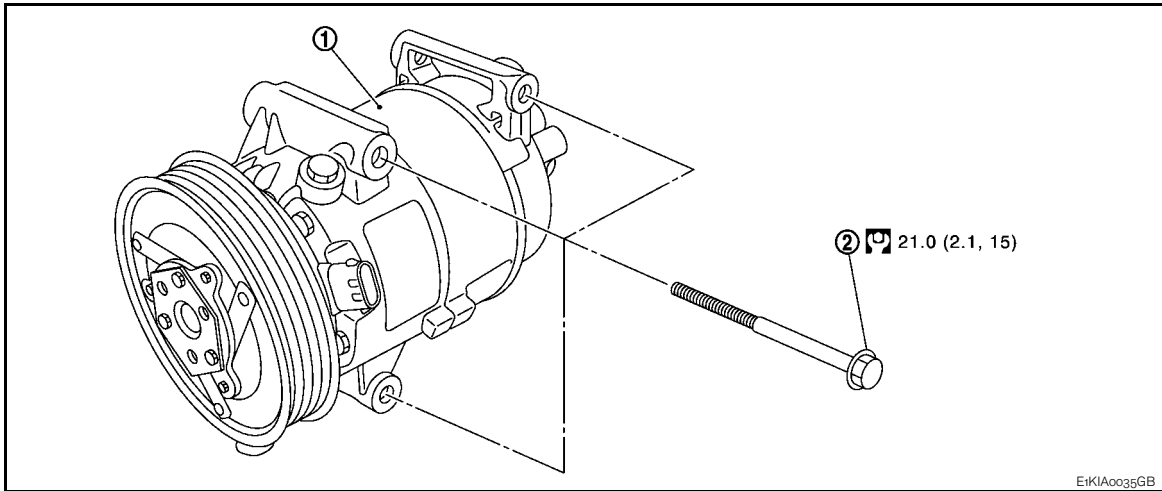
< ON-VEHICLE REPAIR >

[AUTOMATIC AIR CONDITIONER (K9K)]

COMPRESSOR

Exploded View

INFOID:000000001093911



1. Compressor
2. Compressor fixing bolt

Refer to [GI-4, "Components"](#) for symbols in the figure.

Removal and Installation

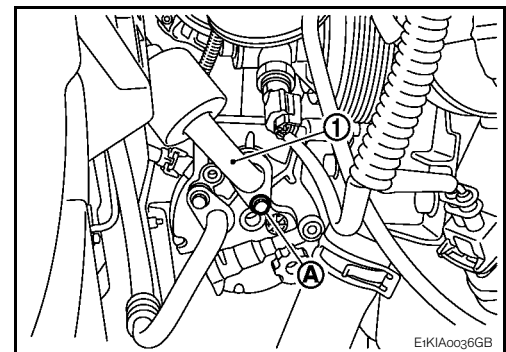
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REMOVAL

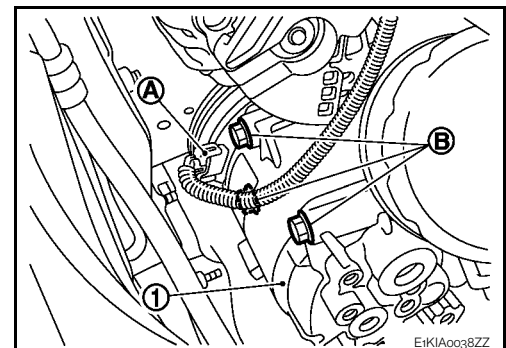
1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
2. Remove engine cover ornament.
3. Remove air intake hoses (RH) and air duct (LH). Refer to [EM-265, "Exploded View"](#).
4. Remove engine undercover, using power tools.
5. Drain engine coolant from radiator. Refer to [CO-52, "Draining"](#).
6. Remove drive belt. Refer to [EM-259, "Removal and Installation"](#).
7. Remove lower radiator hose from engine. Refer to [CO-56, "Exploded View"](#).
8. Remove compressor fixing bolt (B) from low-pressure flexible hose (1) and compressor fixing bolt (A) from high-pressure flexible hose (2).
9. Remove low-pressure flexible hose, and, high-pressure flexible hose from compressor.

CAUTION:

Cap or wrap the joint of compressor, low-pressure flexible hose and high-pressure flexible hose with suitable material such as vinyl tape to avoid the entry of air.



10. Remove compressor harness connector (A), then remove mounting bolts (B) from compressor (1), using power tools.



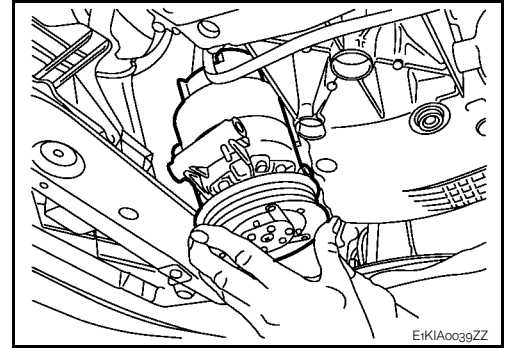
COMPRESSOR

< ON-VEHICLE REPAIR >

[AUTOMATIC AIR CONDITIONER (K9K)]

11. Remove the compressor from the vehicle.

**Compressor fixing bolt : 21 N·m (2.2 kg-m, 15.5 ft-lb)
to engine**



INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

- Replace O-rings of low-pressure flexible hose and high-pressure flexible hose with new ones, and then apply compressor oil to it when installing it.
- When recharging refrigerant, check for leaks.

LOW-PRESSURE FLEXIBLE HOSE AND PIPE 2

< ON-VEHICLE REPAIR >

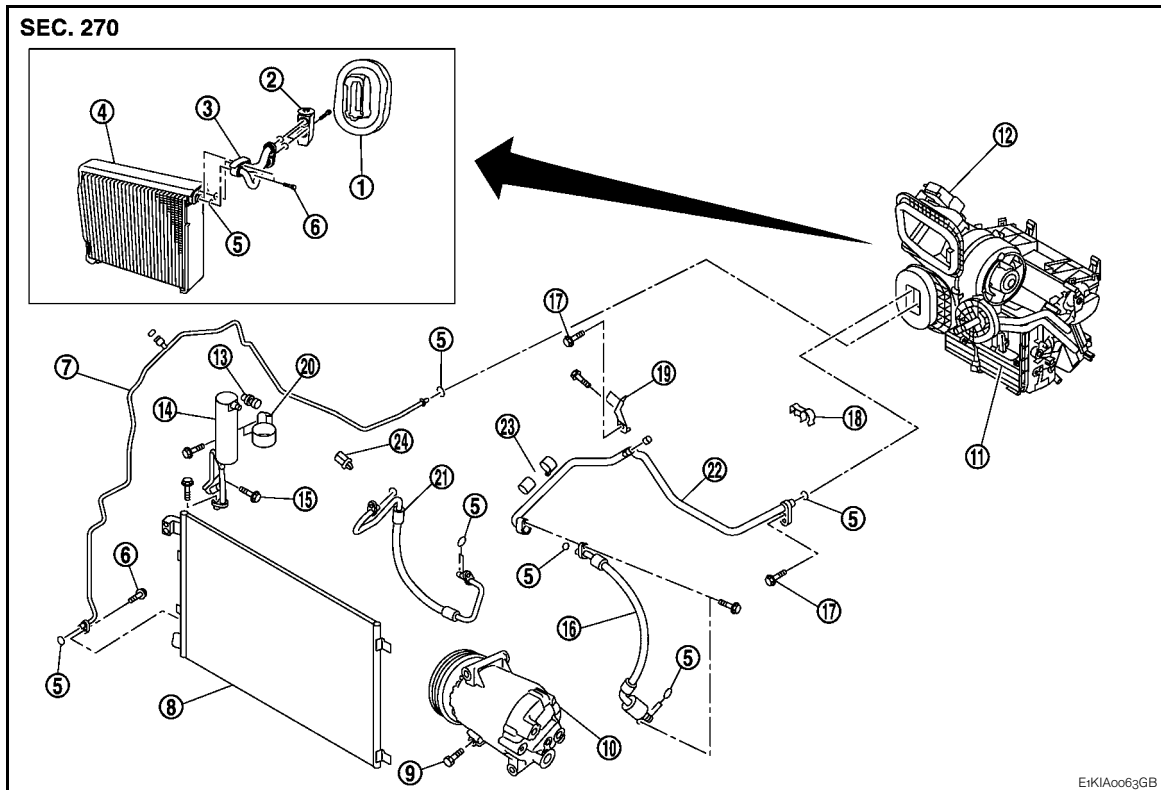
[AUTOMATIC AIR CONDITIONER (K9K)]

LOW-PRESSURE FLEXIBLE HOSE AND PIPE 2

Exploded View

INFOID:000000001093914

Refer to [HA-69. "Refrigerant Connection"](#).



- | | | |
|--------------------------------------|---|--|
| 1. Heater sealing | 2. Expansion valve | 3. Low pressure pipe 1 and high pressure pipe 2 assembly |
| 4. Evaporator | 5. O-ring | 6. Connector pipe fixing bolt |
| 7. High pressure pipe 1 | 8. Condenser assembly | 9. Fixing bolt |
| 10. Compressor | 11. Heater & cooling unit assembly | 12. Heater & blower unit assembly |
| 13. Refrigerant pressure sensor | 14. Liquid tank | 15. Liquid tank fixing screw |
| 16. Low pressure flexible hose | 17. Fixing bolt | 18. Pipes fixing clip |
| 19. Low & high pressure pipe bracket | 20. Liquid tank fixing bracket | 21. High pressure flexible hose |
| 22. Low pressure pipe 2 | 23. Low pressure pipe fixing clamp assembly | 24. Pipe mantening clip |

Removal and Installation

INFOID:000000001093915

REMOVAL

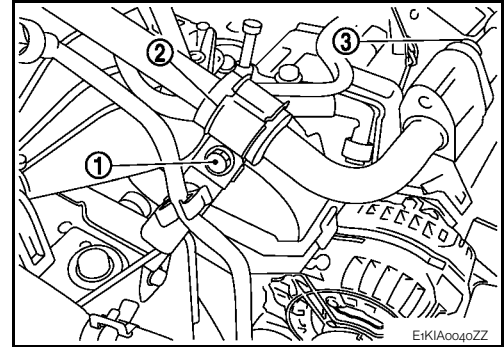
1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
2. Remove upper engine cover ornament. Refer to [EM-266. "Removal and Installation"](#).
3. Remove air intake hose (RH side), and air duct (LH). Refer to [EM-265. "Removal and Installation"](#).

LOW-PRESSURE FLEXIBLE HOSE AND PIPE 2

< ON-VEHICLE REPAIR >

[AUTOMATIC AIR CONDITIONER (K9K)]

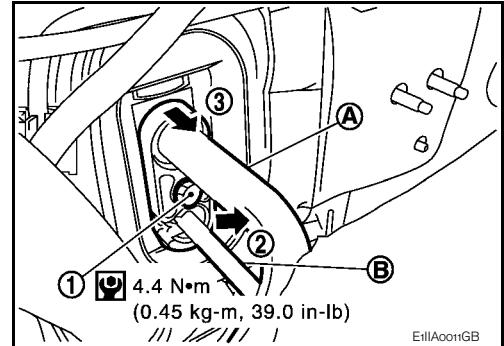
4. Remove mounting bolt (1) and clamp (2), from low pressure pipe bracket support.
5. Remove low and high-pressure maintaining clip, from both pipes, then remove fixing bolt (3) from low-pressure flexible hose and low-pressure pipe 2.
6. Remove engine room insulator fixing clip from cowl top.



7. Pull engine room insulator, then remove pipes bracket fixing bolt (1), from expansion valve, and release pipes fixing bracket, as shown in order (1) to (3), from high pressure pipe 1 (B), to remove low pressure pipe 2 (A) from expansion valve.

CAUTION:

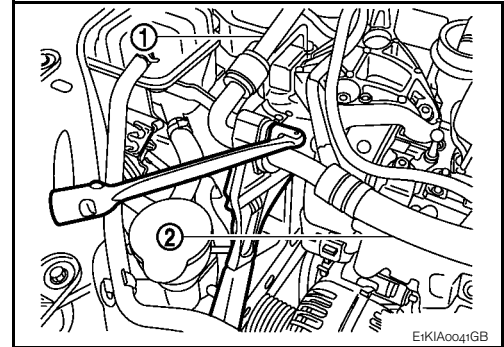
Cap or wrap the joint of the low-pressure flexible hose and pipe 2, and expansion valve exit with suitable material such as vinyl tape to avoid the entry of air.



8. Remove low pressure pipe 2 (1) connector fixing bolt, with suitable tools, then remove low pressure pipe 2 from low pressure flexible hose.

CAUTION:

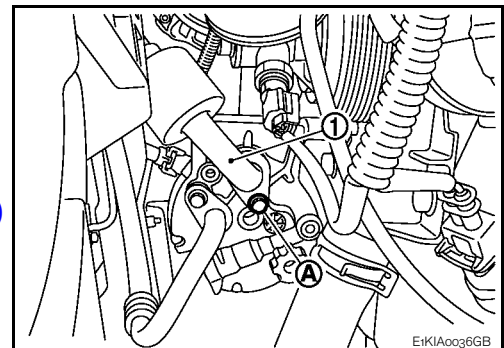
Cap or wrap the joint of the low pressure pipe 2 connector, and low pressure flexible hose, with suitable material such as vinyl tape to avoid the entry of air.



9. Remove low pressure flexible hose fixing bolt (A), from air conditioner compressor, and remove low pressure flexible hose (1).

CAUTION:

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



Pipe bracket fixing bolt to : 4.4 N·m (0.45 kg-m, 39.0 in-lb)
expansion valve

Low pressure flexible : 8.0 N·m (0.9 kg-m, 70.8 in-lb)
pipe fixing bolt to com-
pressor

INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

- Replace O-rings of low-pressure flexible hose and low-pressure pipe 2 with new ones, and then apply compressor oil to it when installing it.
- 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 make sure that connection does not come loose.
- When recharging refrigerant, check for leaks.

HIGH-PRESSURE FLEXIBLE HOSE

< ON-VEHICLE REPAIR >

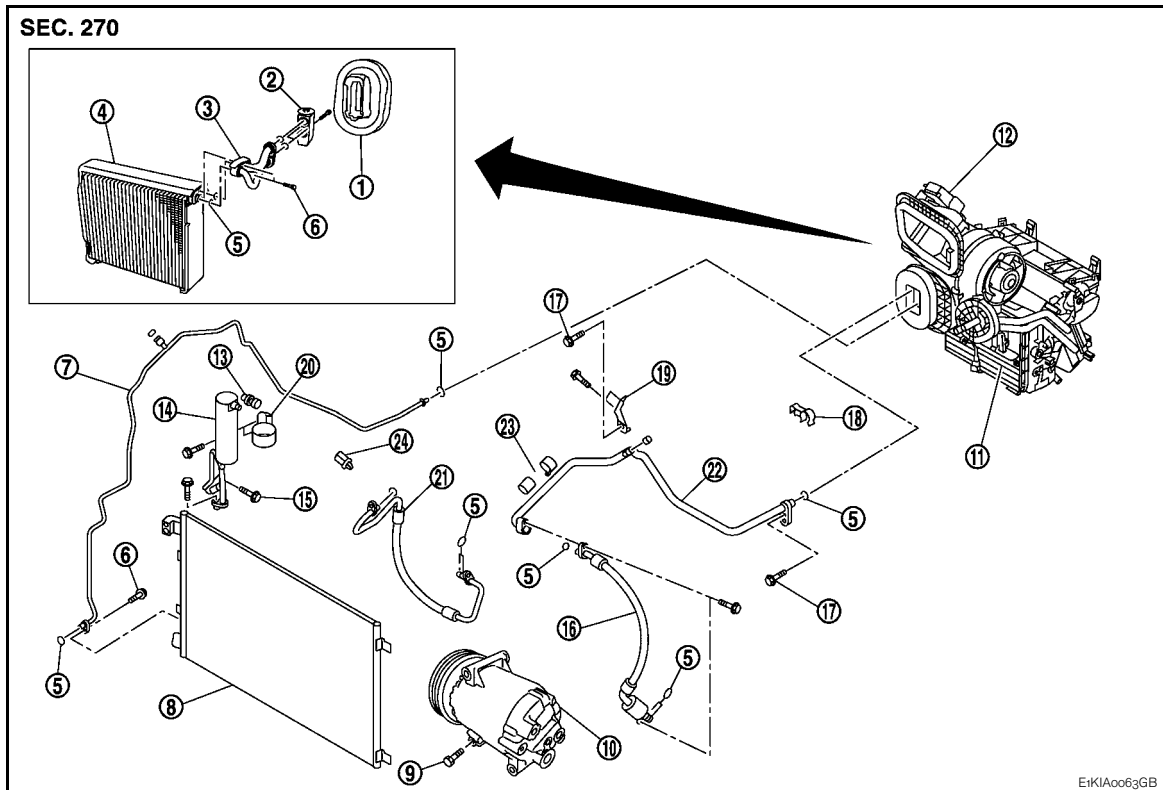
[AUTOMATIC AIR CONDITIONER (K9K)]

HIGH-PRESSURE FLEXIBLE HOSE

Exploded View

INFOID:000000001093916

Refer to [HA-69. "Refrigerant Connection"](#).



- | | | |
|--------------------------------------|---|--|
| 1. Heater sealing | 2. Expansion valve | 3. Low pressure pipe 1 and high pressure pipe 2 assembly |
| 4. Evaporator | 5. O-ring | 6. Connector pipe fixing bolt |
| 7. High pressure pipe 1 | 8. Condenser assembly | 9. Fixing bolt |
| 10. Compressor | 11. Heater & cooling unit assembly | 12. Heater & blower unit assembly |
| 13. Refrigerant pressure sensor | 14. Liquid tank | 15. Liquid tank fixing screw |
| 16. Low pressure flexible hose | 17. Fixing bolt | 18. Pipes fixing clip |
| 19. Low & high pressure pipe bracket | 20. Liquid tank fixing bracket | 21. High pressure flexible hose |
| 22. Low pressure pipe 2 | 23. Low pressure pipe fixing clamp assembly | 24. Pipe mantening clip |

Removal and Installation

INFOID:000000001093917

REMOVAL

1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
2. Remove engine cover ornament. Refer to [EM-266. "Removal and Installation"](#).
3. Remove air intake hose (RH) and air duct (LH). Refer to [EM-265. "Exploded View"](#).
4. Remove front grille. Refer to [EXT-17. "Removal and Installation"](#).
5. Remove radiator air guide (RH). Refer to [CO-56. "Removal and Installation"](#).

HIGH-PRESSURE FLEXIBLE HOSE

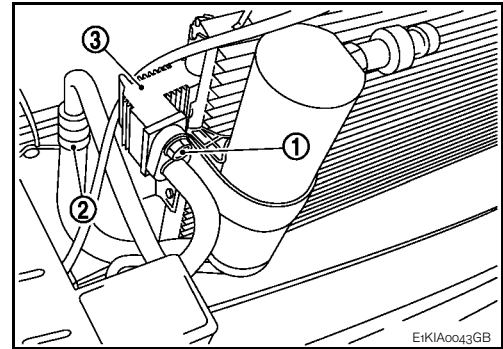
< ON-VEHICLE REPAIR >

[AUTOMATIC AIR CONDITIONER (K9K)]

6. Remove high pressure flexible hose fixing bolt (1) from condenser (3), then pull high pressure flexible hose (2) to remove it from condenser.

CAUTION:

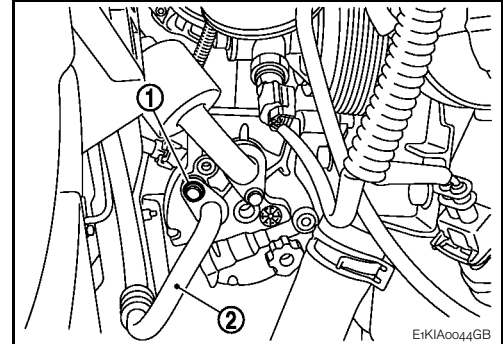
Cap or wrap the joint of high-pressure flexible hose and condenser assembly with suitable material such as vinyl tape to avoid the entry of air.



7. Remove high pressure flexible hose fixing bolt (1) from compressor, then pull high pressure flexible hose (2) to remove it from compressor. Remove high pressure flexible hose.

CAUTION:

Cap or wrap the joint of compressor and high-pressure flexible hose with suitable material such as vinyl tape to avoid the entry of air.



High pressure fixing bolt to condenser

: 4.4 N·m (0.45 kg-m, 39 in-lb)

High pressure fixing bolt to compressor

: 8 N·m (0.8 kg-m, 71 in-lb)

INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

- Replace O-rings of high-pressure flexible hose with new ones, and then apply compressor oil to it when installing it.
- 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 make sure that connection does not come loose.
- When recharging refrigerant, check for leaks.

HIGH-PRESSURE PIPE 1 (ENGINE COMPARTMENT)

< ON-VEHICLE REPAIR >

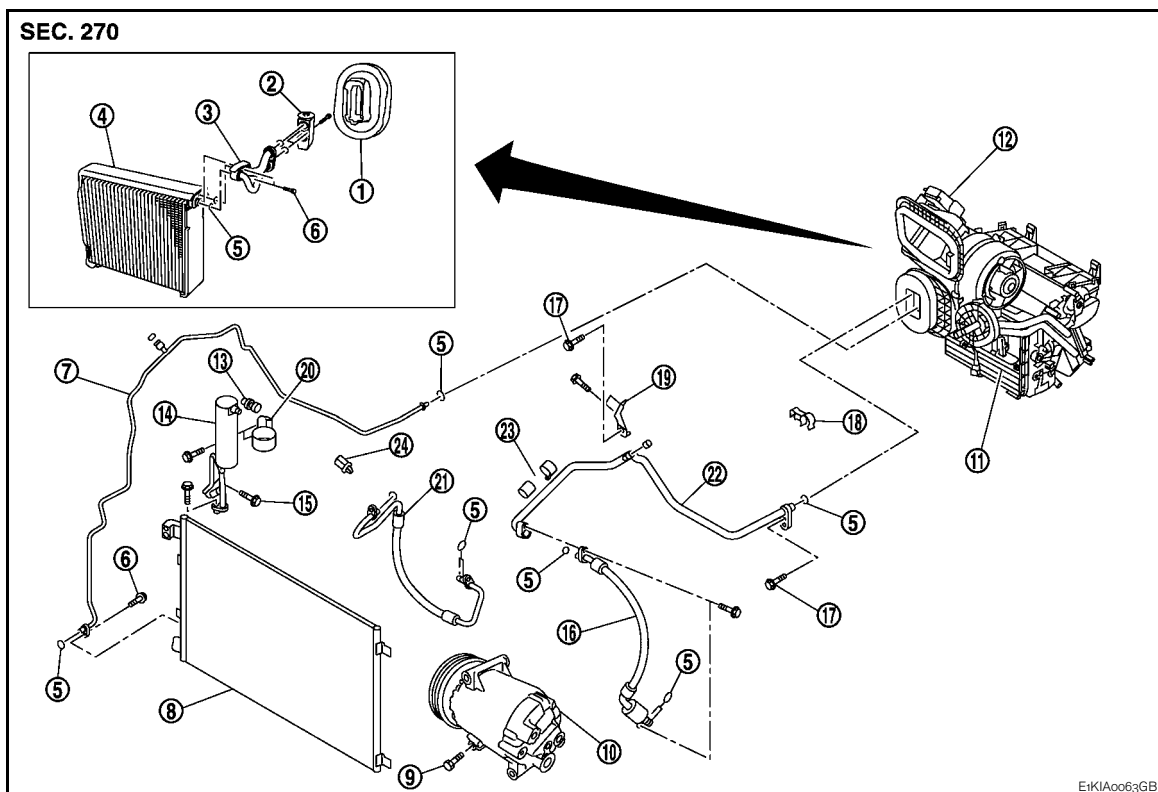
[AUTOMATIC AIR CONDITIONER (K9K)]

HIGH-PRESSURE PIPE 1 (ENGINE COMPARTMENT)

Exploded View

INFOID:000000001093918

Refer to [HA-69. "Refrigerant Connection"](#).



- | | | |
|--------------------------------------|---|--|
| 1. Heater sealing | 2. Expansion valve | 3. Low pressure pipe 1 and high pressure pipe 2 assembly |
| 4. Evaporator | 5. O-ring | 6. Connector pipe fixing bolt |
| 7. High pressure pipe 1 | 8. Condenser assembly | 9. Fixing bolt |
| 10. Compressor | 11. Heater & cooling unit assembly | 12. Heater & blower unit assembly |
| 13. Refrigerant pressure sensor | 14. Liquid tank | 15. Liquid tank fixing screw |
| 16. Low pressure flexible hose | 17. Fixing bolt | 18. Pipes fixing clip |
| 19. Low & high pressure pipe bracket | 20. Liquid tank fixing bracket | 21. High pressure flexible hose |
| 22. Low pressure pipe 2 | 23. Low pressure pipe fixing clamp assembly | 24. Pipe mantening clip |

Removal and Installation

INFOID:000000001093919

REMOVAL

1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
2. Remove engine cover ornament. Refer to [EM-266. "Removal and Installation"](#).
3. Remove intake hose (RH) and air duct (LH). Refer to [EM-265. "Removal and Installation"](#).

HIGH-PRESSURE PIPE 1 (ENGINE COMPARTMENT)

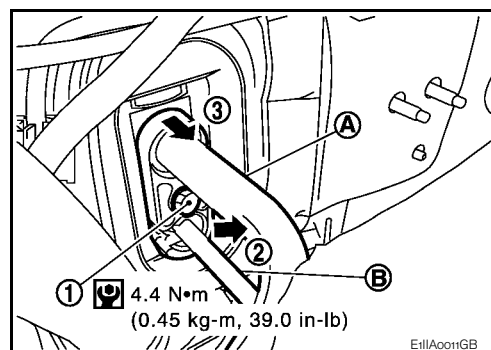
< ON-VEHICLE REPAIR >

[AUTOMATIC AIR CONDITIONER (K9K)]

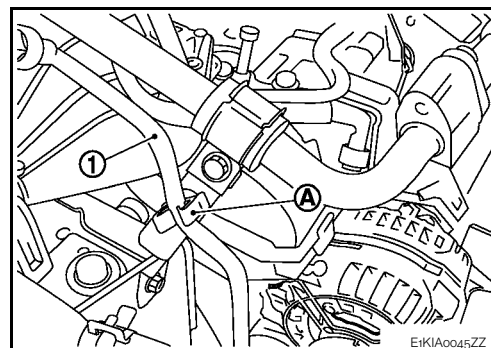
4. Pull engine room insulator, then remove pipes bracket fixing bolt (1), from expansion valve, then release pipe fixing bracket from high pressure pipe 1 (B), as shown in order (1) to (3), to disconnect it from expansion valve.

CAUTION:

Cap or wrap the joint of the high pressure pipe 1, and expansion valve in, with suitable material such as vinyl tape to avoid the entry of air.



5. Remove high pressure pipe 1 (1) from clip (A).

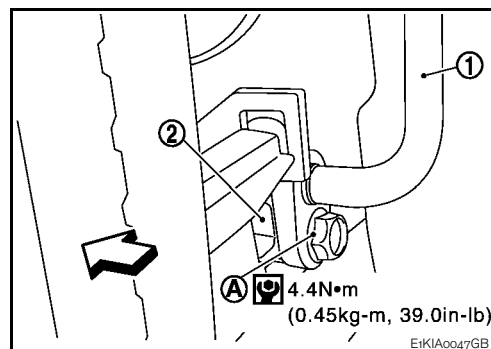


Remove high-pressure pipe 1 mounting bolt (A) from condenser (2).

CAUTION:

Cap or wrap the joint of the high pressure pipe 1, and condenser, with suitable material such as vinyl tape to avoid the entry of air.

Remove high pressure pipe 1 (1).



INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

- Replace O-rings of high-pressure pipe 1 with new ones, and then apply compressor oil to it when installing it.
- 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 make sure that connection does not come loose.
- When recharging refrigerant, check for leaks.

LOW-PRESSURE PIPE 1 AND HIGH-PRESSURE PIPE 2

< ON-VEHICLE REPAIR >

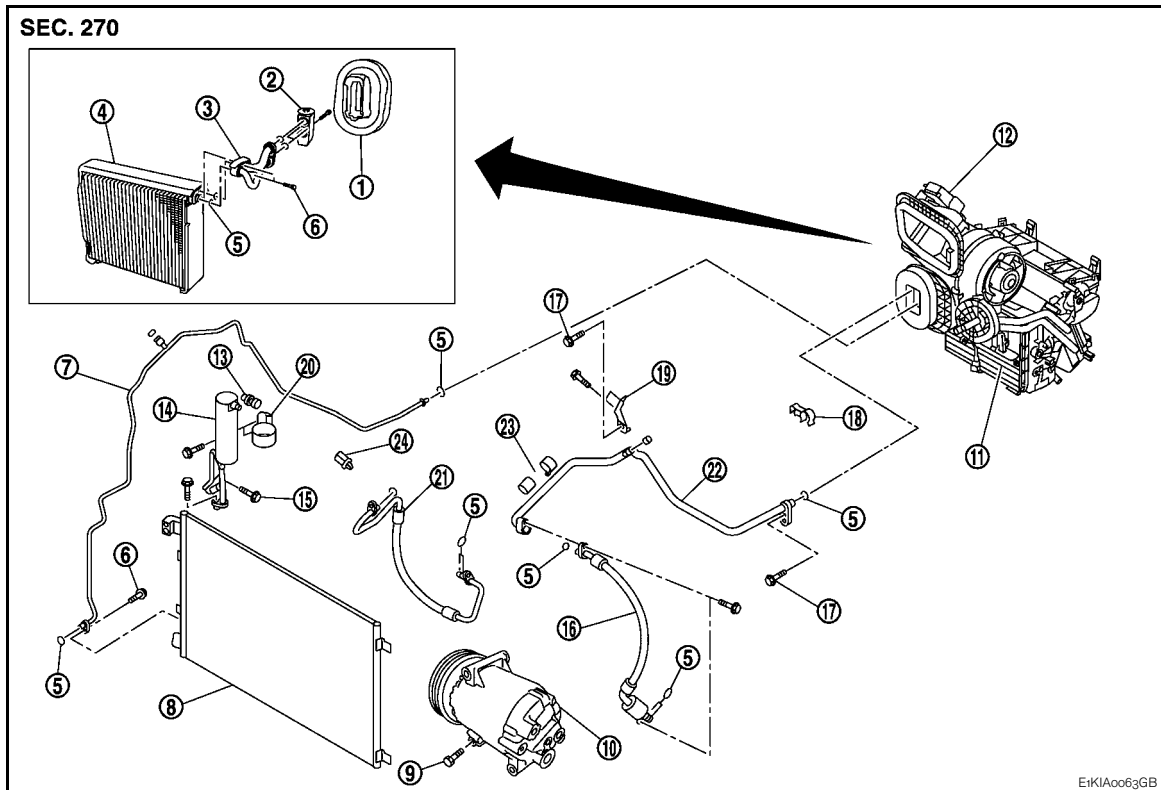
[AUTOMATIC AIR CONDITIONER (K9K)]

LOW-PRESSURE PIPE 1 AND HIGH-PRESSURE PIPE 2

Exploded View

INFOID:000000001093920

Refer to [HA-69. "Refrigerant Connection"](#).



- | | | |
|--------------------------------------|---|--|
| 1. Heater sealing | 2. Expansion valve | 3. Low pressure pipe 1 and high pressure pipe 2 assembly |
| 4. Evaporator | 5. O-ring | 6. Connector pipe fixing bolt |
| 7. High pressure pipe 1 | 8. Condenser assembly | 9. Fixing bolt |
| 10. Compressor | 11. Heater & cooling unit assembly | 12. Heater & blower unit assembly |
| 13. Refrigerant pressure sensor | 14. Liquid tank | 15. Liquid tank fixing screw |
| 16. Low pressure flexible hose | 17. Fixing bolt | 18. Pipes fixing clip |
| 19. Low & high pressure pipe bracket | 20. Liquid tank fixing bracket | 21. High pressure flexible hose |
| 22. Low pressure pipe 2 | 23. Low pressure pipe fixing clamp assembly | 24. Pipe maintaining clip |

Removal and Installation

INFOID:000000001093921

REMOVAL

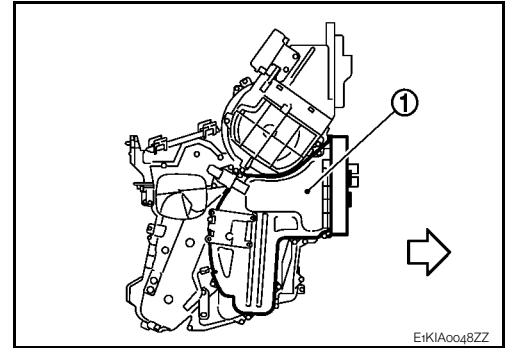
1. Set the temperature at 18°C (60°F), and then disconnect the battery cable from the negative terminal.
2. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
3. Remove engine cover ornament. Refer to [EM-266. "Removal and Installation"](#).
4. Remove high-pressure pipe 1 and low pressure pipe 2 from expansion valve. Refer to [HA-92. "Removal and Installation"](#) and [HA-96. "Removal and Installation"](#).
CAUTION:
Cap or wrap the joint of the, high-pressure pipe 1, low-pressure pipe 2, and the expansion valve with suitable material such as vinyl tape to avoid the entry of air.
5. Remove instrument panel. Refer to [IP-12. "Removal and Installation"](#).
6. Remove foot duct (RH / LH). Refer to [VTL-48. "FOOT DUCTS : Removal and Installation"](#).
7. Remove steering column. Refer to [ST-10. "Removal and Installation"](#).

LOW-PRESSURE PIPE 1 AND HIGH-PRESSURE PIPE 2

< ON-VEHICLE REPAIR >

[AUTOMATIC AIR CONDITIONER (K9K)]

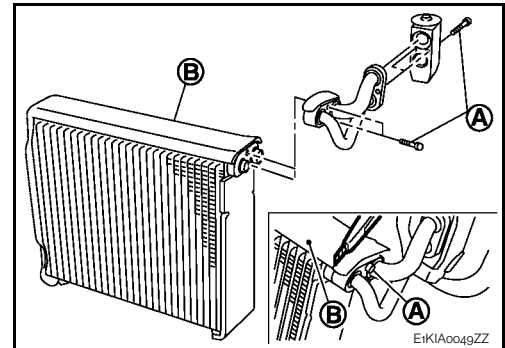
8. Remove steering member. Refer to [ST-15. "Removal and Installation"](#).
9. Remove heater and cooling assembly. Refer to [VTL-32. "Removal and Installation"](#).
10. Remove mounting screws, and then remove evaporator cover (1).



11. Using a thin cutter, cut the evaporator insulator (B), and remove fixing bolt (A) then remove low-pressure pipe 1 and high-pressure pipe 2 assembly.

CAUTION:

Cap or wrap the joint of expansion valve, high-pressure pipe 2 and low-pressure pipe 1 with suitable material such as vinyl tape to avoid the entry of air.



INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

- Replace O-rings of high-pressure pipe 1, 2 and low-pressure pipe 1, 2 with new ones, and then apply compressor oil to it when installing it.
- 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 make sure that connection does not come loose.
- When recharging refrigerant, check for leaks.

CONDENSER

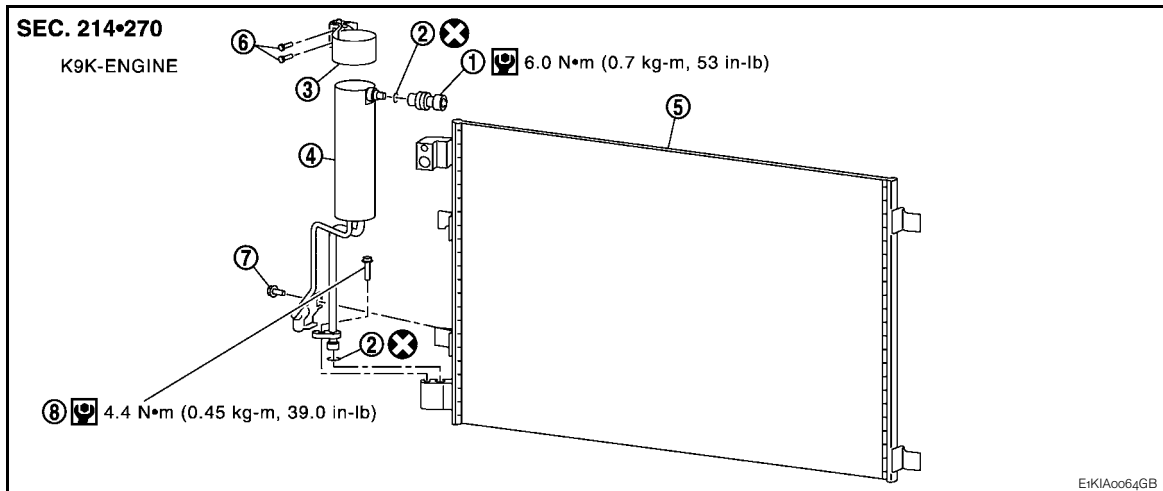
< ON-VEHICLE REPAIR >

[AUTOMATIC AIR CONDITIONER (K9K)]

CONDENSER

Exploded View

INFOID:000000001093922



- | | | |
|----------------------------------|---------------------------------|-----------------------------|
| 1. Refrigerant pressure sensor | 2. O-ring | 3. Liquid tank bracket |
| 4. Liquid tank | 5. Condensor | 6. Liquid tank fixing screw |
| 7. Liquid tank pipe fixing screw | 8. Liquid tank pipe fixing bolt | |

Removal and Installation

INFOID:000000001093923

REMOVAL

1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
2. Remove engine cover ornament. Refer to [EM-266, "Removal and Installation"](#).
3. Remove front grille. Refer to [EXT-17, "Removal and Installation"](#).
4. Remove radiator hose, and drain coolant. Refer to [CO-56, "Removal and Installation"](#).
5. Remove upper radiator fixing bracket. Refer to [CO-56, "Removal and Installation"](#).
6. Remove radiator air-guide duct (RH). Refer to [CO-56, "Removal and Installation"](#).
7. Remove high-pressure pipe 1 from condenser. Refer to [HA-96, "Removal and Installation"](#).
8. Remove high-pressure flexible pipe 1 from condenser. Refer to [HA-94, "Removal and Installation"](#).

CAUTION:

Cap or wrap the joint of low and high-pressure pipe 1 and condenser with suitable material such as vinyl tape to avoid the entry of air.

9. Remove harness connector from refrigerant pressure sensor.
10. Remove liquid tank pipes and liquid tank from condenser and radiator. Refer to [HA-102, "Removal and Installation"](#), Refer to [CO-56, "Removal and Installation"](#).

CAUTION:

Cap or wrap the joint of liquid tank pipes and condenser with suitable material such as vinyl tape to avoid the entry of air.

11. Remove radiator fixing brackets. Refer to [CO-56, "Removal and Installation"](#).
12. Release radiator maintaining pawls, then pull-up the condenser assembly to release it from radiator. Refer to [CO-56, "Removal and Installation"](#).
13. Maintain radiator pushing back.
14. Pull upward to remove condenser.

CAUTION:

Take care do not damaged condenser or radiator.

INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

CONDENSER

< ON-VEHICLE REPAIR >

[AUTOMATIC AIR CONDITIONER (K9K)]

- Replace O-rings of high-pressure flexible hose and high-pressure pipe 1 with new ones, and then apply compressor oil to it when installing it.
- 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 make sure that connection does not come loose.
- When recharging refrigerant, check for leaks.

A

B

C

D

E

F

G

H

HA

J

K

L

M

N

O

P

LIQUID TANK

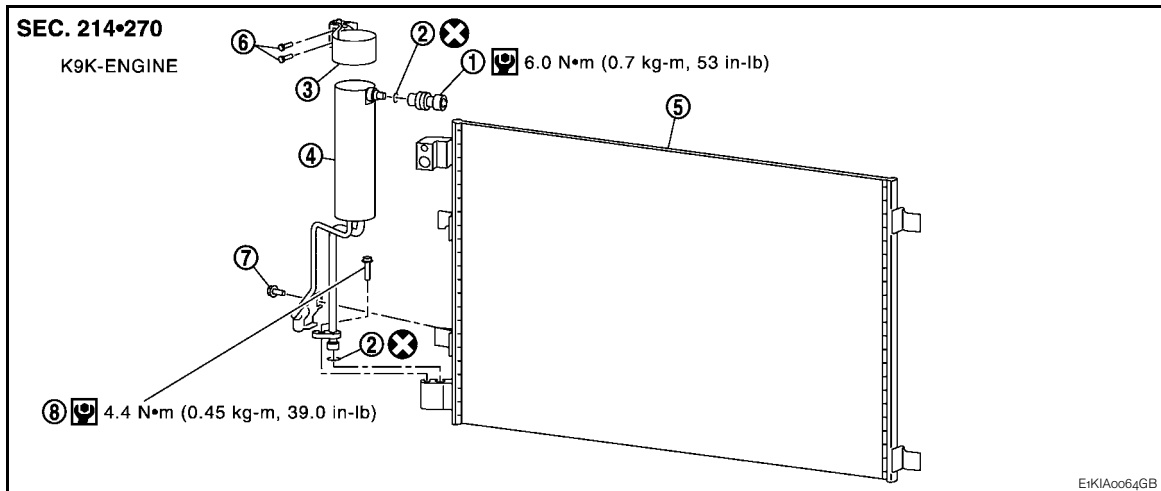
< ON-VEHICLE REPAIR >

[AUTOMATIC AIR CONDITIONER (K9K)]

LIQUID TANK

Exploded View

INFOID:000000001093926



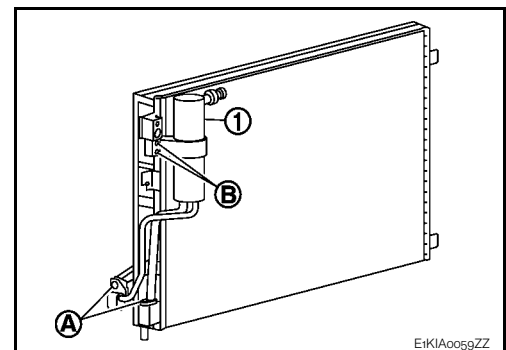
- | | | |
|----------------------------------|---------------------------------|-----------------------------|
| 1. Refrigerant pressure sensor | 2. O-ring | 3. Liquid tank bracket |
| 4. Liquid tank | 5. Condenser | 6. Liquid tank fixing screw |
| 7. Liquid tank pipe fixing screw | 8. Liquid tank pipe fixing bolt | |

Removal and Installation

INFOID:000000001093927

REMOVAL

1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
2. Remove engine cover ornament. Refer to [EM-266, "Removal and Installation"](#).
3. Remove front grille. Refer to [EXT-17, "Removal and Installation"](#).
4. Clean liquid tank and its surrounding area, and remove dust and rust from liquid tank.
CAUTION:
Be sure to clean carefully.
5. Disconnect refrigerant sensor harness connector. Refer to [HA-103, "Removal and Installation"](#).
6. Remove air inlet tube and hose from change air cooler. Refer to [EM-266, "Removal and Installation"](#).
7. Remove radiator air-guide duct (RH) fixing clip to move air-guide duct. Refer to [CO-56, "Removal and Installation"](#).
8. Remove liquid tank bracket support mounting screws (B).
9. Remove high pressure pipe 1 mounting bolt (A). Refer to [HA-96, "Removal and Installation"](#).
10. Remove liquid tank high pressure pipe mounting bolt (A).
11. Remove liquid tank pipe bracket fixing screw (B).
CAUTION:
Cap or wrap the joint of high pressure pipe, liquid tank pipes and condenser with suitable material such as vinyl tape to avoid the entry of air.
12. Remove liquid tank assembly (1).



INSTALLATION

Install liquid tank, and then install liquid tank bracket on condenser.

CAUTION:

- Make sure liquid tank bracket is securely installed at protrusion of condenser. (Make sure liquid tank bracket does not move to a position below center of liquid tank.)
- Replace O-rings of A/C piping with new ones, and then apply compressor oil to it when installing it.
- When recharging refrigerant, check for leaks.

REFRIGERANT PRESSURE SENSOR

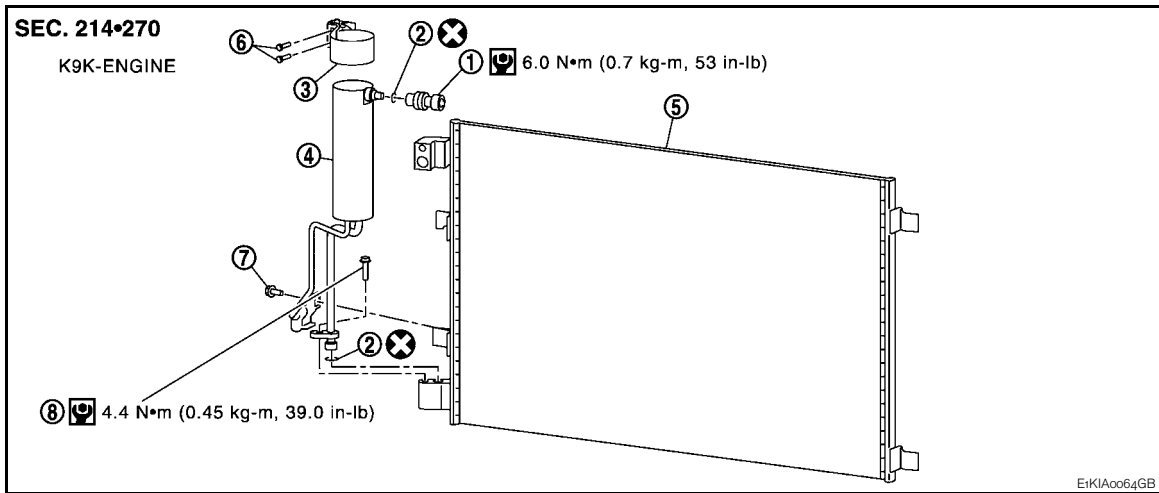
< ON-VEHICLE REPAIR >

[AUTOMATIC AIR CONDITIONER (K9K)]

REFRIGERANT PRESSURE SENSOR

Exploded View

INFOID:000000001093928



- | | | |
|----------------------------------|---------------------------------|-----------------------------|
| 1. Refrigerant pressure sensor | 2. O-ring | 3. Liquid tank bracket |
| 4. Liquid tank | 5. Condensor | 6. Liquid tank fixing screw |
| 7. Liquid tank pipe fixing screw | 8. Liquid tank pipe fixing bolt | |

Removal and Installation

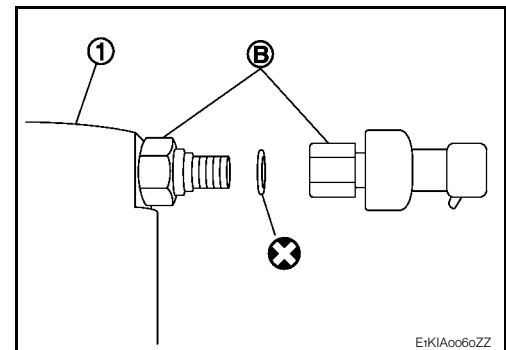
INFOID:000000001093929

REMOVAL

1. Remove liquid tank. Refer to [HA-204, "Exploded View"](#).
2. Fix the liquid tank (1) with a vise. Remove the refrigerant pressure sensor from liquid tank adaptor (B) with a wrench.

CAUTION:

Be careful not to damage liquid tank.



INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

- Apply compressor oil to O-ring of refrigerant pressure sensor when installing it.
- When recharging refrigerant, check for leaks.

EVAPORATOR

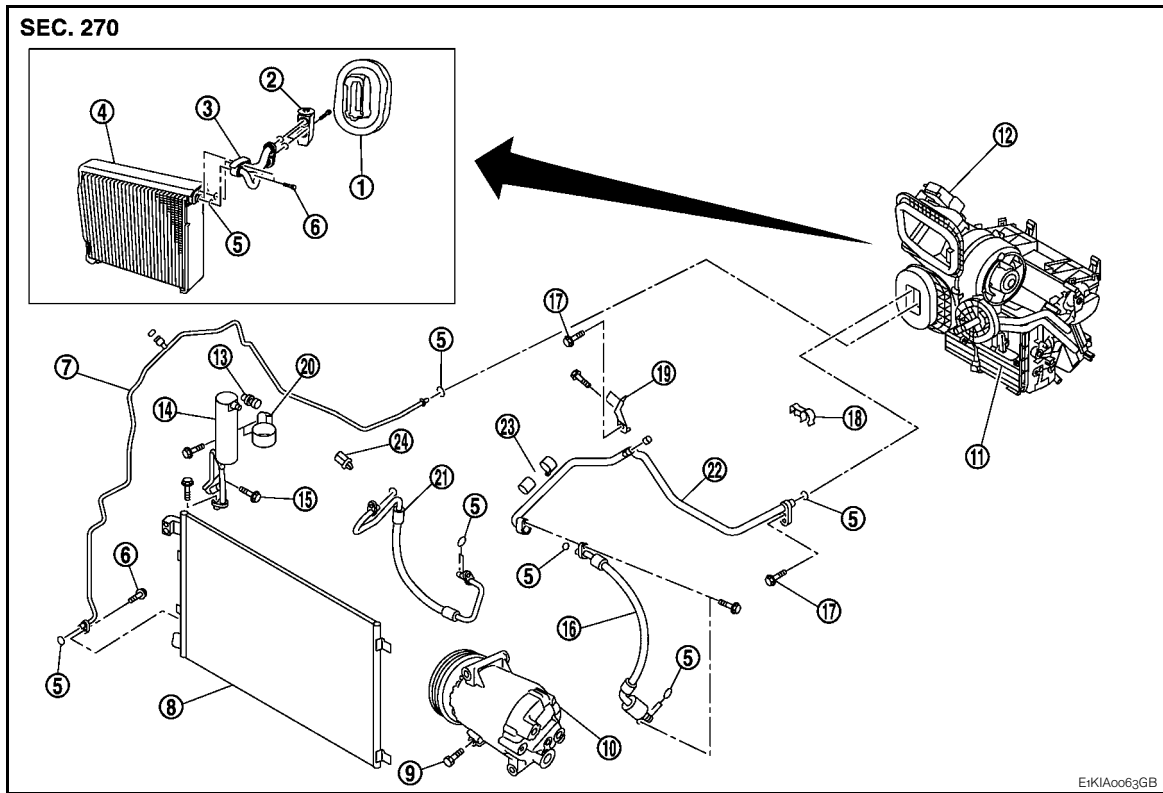
< ON-VEHICLE REPAIR >

[AUTOMATIC AIR CONDITIONER (K9K)]

EVAPORATOR

Exploded View

INFOID:000000001093930



- | | | |
|--------------------------------------|---|--|
| 1. Heater sealing | 2. Expansion valve | 3. Low pressure pipe 1 and high pressure pipe 2 assembly |
| 4. Evaporator | 5. O-ring | 6. Connector pipe fixing bolt |
| 7. High pressure pipe 1 | 8. Condenser assembly | 9. Fixing bolt |
| 10. Compressor | 11. Heater & cooling unit assembly | 12. Heater & blower unit assembly |
| 13. Refrigerant pressure sensor | 14. Liquid tank | 15. Liquid tank fixing screw |
| 16. Low pressure flexible hose | 17. Fixing bolt | 18. Pipes fixing clip |
| 19. Low & high pressure pipe bracket | 20. Liquid tank fixing bracket | 21. High pressure flexible hose |
| 22. Low pressure pipe 2 | 23. Low pressure pipe fixing clamp assembly | 24. Pipe mantening clip |

Removal and Installation

INFOID:000000001093931

REMOVAL

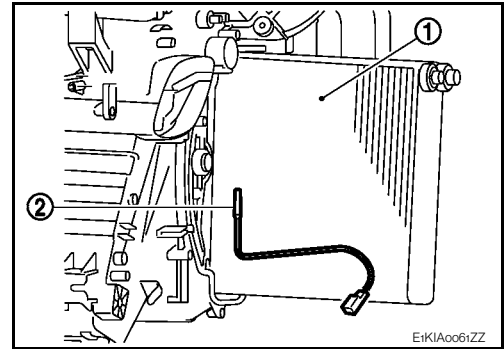
1. Remove low-pressure pipe 2 and high-pressure pipe 1 from expansion valve. Refer to [HA-92, "Removal and Installation"](#), Refer to [HA-96, "Removal and Installation"](#).
CAUTION:
Cap or wrap the joint of expansion valve, low-pressure pipe 2 and high-pressure pipe 1 with suitable material such as vinyl tape to avoid the entry of air.
2. Remove heater and cooling unit assembly.
3. Remove evaporator cover fixing screws and cover.

EVAPORATOR

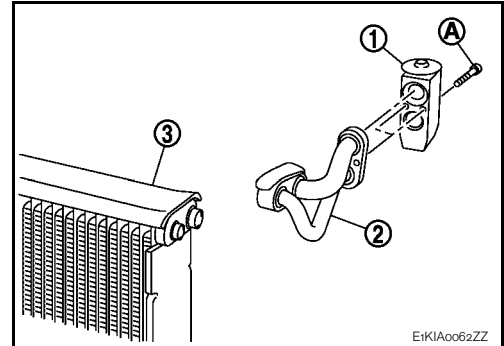
< ON-VEHICLE REPAIR >

[AUTOMATIC AIR CONDITIONER (K9K)]

4. Slide evaporator (1), and intake sensor (2) from heater and cooling unit assembly.



5. Cut upper insulator (3) and remove mounting bolt (A) and pressure pipe assembly (2) and expansion valve (1), from evaporator.
6. Remove evaporator.



INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

- Replace O-rings of low-pressure pipe 1 and high-pressure pipe 2 with new ones, and then apply compressor oil to it when installing it.
- 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 make sure that connection does not come loose.
- O-rings are different from low-pressure flexible hose (high-pressure pipe 1) and low-pressure pipe 1 (high-pressure pipe 2).
- Mark the mounting position of intake sensor bracket prior to removal so that the reinstalled sensor can be located in the same position.
- When recharging refrigerant, check for leaks.

EXPANSION VALVE

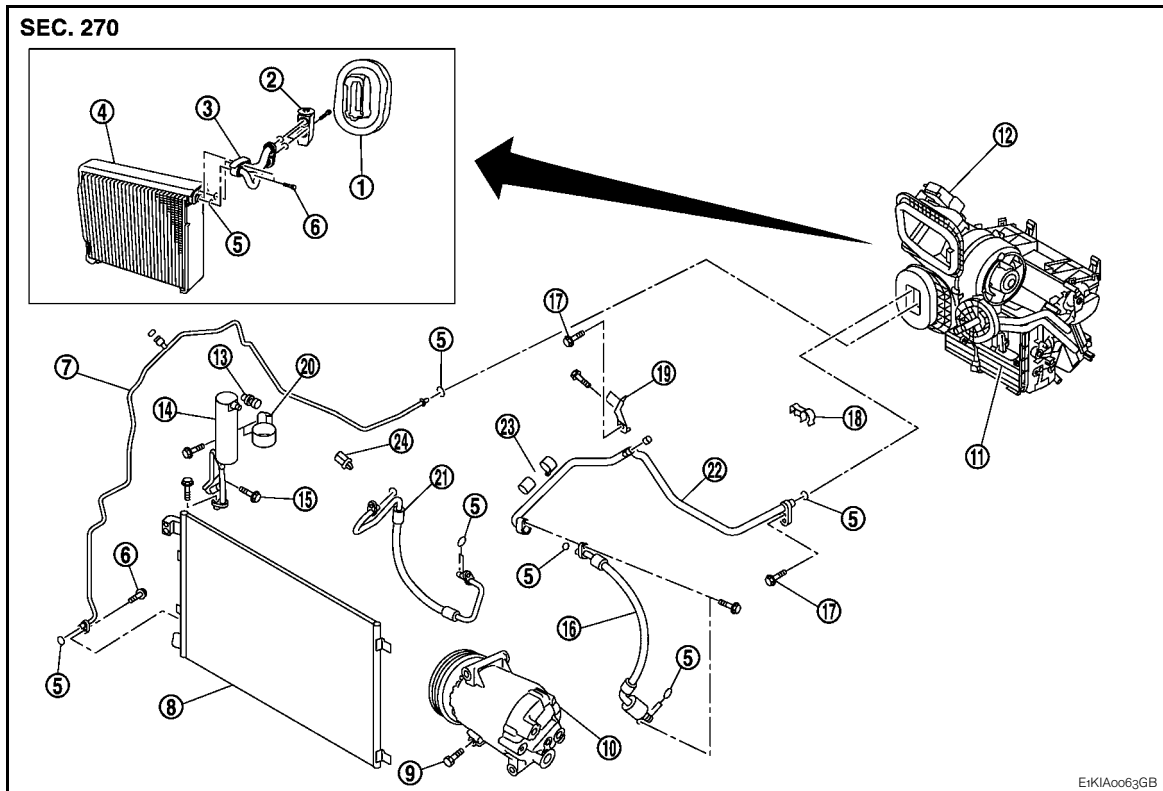
< ON-VEHICLE REPAIR >

[AUTOMATIC AIR CONDITIONER (K9K)]

EXPANSION VALVE

Exploded View

INFOID:000000001093932



E1KIA0063GB

- | | | |
|--------------------------------------|---|--|
| 1. Heater sealing | 2. Expansion valve | 3. Low pressure pipe 1 and high pressure pipe 2 assembly |
| 4. Evaporator | 5. O-ring | 6. Connector pipe fixing bolt |
| 7. High pressure pipe 1 | 8. Condenser assembly | 9. Fixing bolt |
| 10. Compressor | 11. Heater & cooling unit assembly | 12. Heater & blower unit assembly |
| 13. Refrigerant pressure sensor | 14. Liquid tank | 15. Liquid tank fixing screw |
| 16. Low pressure flexible hose | 17. Fixing bolt | 18. Pipes fixing clip |
| 19. Low & high pressure pipe bracket | 20. Liquid tank fixing bracket | 21. High pressure flexible hose |
| 22. Low pressure pipe 2 | 23. Low pressure pipe fixing clamp assembly | 24. Pipe mantening clip |

Removal and Installation

INFOID:000000001093933

REMOVAL

1. Remove evaporator (3). Refer to [HA-98, "Removal and Installation"](#).
2. Remove low pressure pipe 1 and high pressure pipe 2 assembly (2). Refer to [HA-98, "Removal and Installation"](#).

EXPANSION VALVE

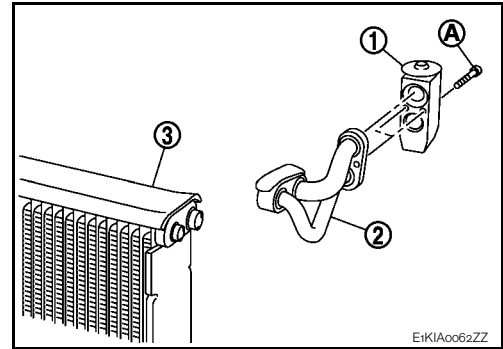
< ON-VEHICLE REPAIR >

[AUTOMATIC AIR CONDITIONER (K9K)]

3. Remove mounting bolts (A), and then remove expansion valve (1) from low and high pressure pipe assembly (2).

CAUTION:

Cap or wrap the joint of expansion valve, low and high pressure pipe assembly, evaporator and expansion valve with suitable material such as vinyl tape to avoid the entry of air.



INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

- Replace O-rings of evaporator with new ones, and then apply compressor oil to it when installing it.
- O-rings are different from low-pressure pipe 1 (high-pressure pipe 1) and low-pressure pipe 2 (high-pressure pipe 2).
- When recharging refrigerant, check for leaks.

SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE DATA AND SPECIFICATIONS (SDS)

[AUTOMATIC AIR CONDITIONER (K9K)]

SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

Compressor

INFOID:0000000001093934

Model		DELPHI THERMAL HUNGARY make 5CVC
Type		Variable displacement swash plate
Displacement cm ³ (cu in)/rev	Max.	120 (7.32)
Cylinder bore × stroke (Max.) mm (in.)		—
Direction of rotation		Clockwise (viewed from clutch)
Drive belt		Poly V
Disc to pulley clearance	Standard	—

Lubricant

INFOID:0000000001093935

Model		DELPHI THERMAL HUNGARY make 5 CVC
Name		Nissan A/C System Oil Type S (DH-PS)
Capacity mℓ (US fl oz, Imp fl oz)	Total in system	150 (5.03, 5.3)
	Compressor (Service part) charging amount	150 (5.03, 5.3)

Refrigerant

INFOID:0000000001093936

Type	HFC-134a (R-134a)
Capacity kg (lb)	—

Engine Idling Speed

INFOID:0000000001093937

Refer to [EC-1483. "Idle Speed"](#).

Belt Tension

INFOID:0000000001093938

Refer to [EM-259. "Inspection and Adjustment"](#).

BASIC INSPECTION

DIAGNOSIS AND REPAIR WORKFLOW

Work Flow

INFOID:000000001098128

DETAILED FLOW

1. LISTEN TO CUSTOMER COMPLAINT

Listen to customer complaint. (Get detailed information about the conditions and environment when the symptom occurs.)

>> GO TO 2.

2. VERIFY THE SYMPTOM WITH OPERATIONAL CHECK

Verify the symptom with operational check. Refer to [HAC-126, "Description & Inspection"](#).

>> GO TO 3.

3. GO TO APPROPRIATE TROUBLE DIAGNOSIS

Go to appropriate trouble diagnosis (Refer to [HAC-187, "Diagnosis Chart By Symptom"](#) below).

>> GO TO 4.

4. REPAIR OR REPLACE

Repair or replace the specific parts

>> GO TO 5.

5. FINAL CHECK

Final check.

Is the inspection result normal?

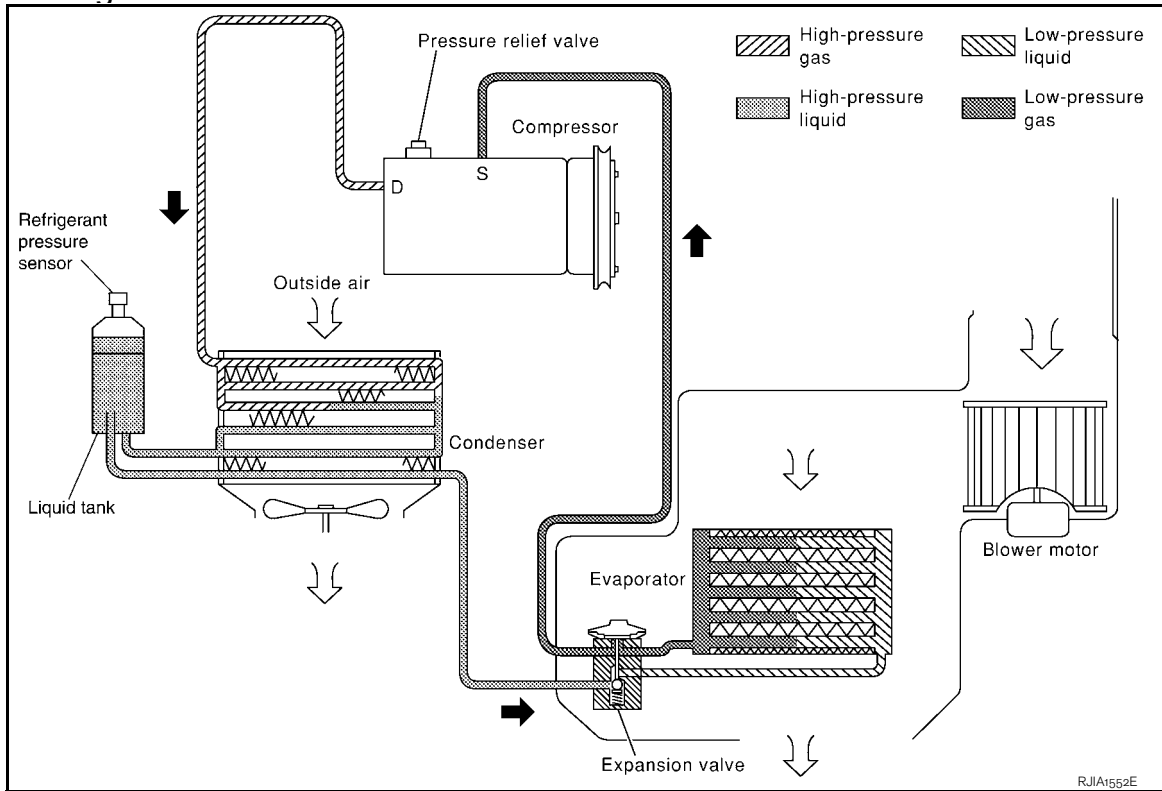
YES >> CHECK OUT

NO >> GO TO 3.

FUNCTION DIAGNOSIS

REFRIGERATION SYSTEM

System Diagram



System Description

INFOID:000000001098130

REFRIGERANT CYCLE

Refrigerant Flow

The refrigerant flows from the compressor, through the condenser with liquid tank, through the evaporator, and back to the compressor. The refrigerant evaporation in the evaporator is controlled by an externally equalized expansion valve, located inside the evaporator case.

Freeze Protection

To prevent evaporator frozen up, the evaporator air temperature is monitored, and the voltage signal to the display and A/C auto amp. will make 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 condenser. If the system pressure rises above, or falls below the specifications, the refrigerant pressure sensor detects the pressure inside the refrigerant line and sends the voltage signal to the ECM. ECM makes the A/C relay go OFF and stops the compressor when pressure on the high-pressure side detected by refrigerant pressure sensor is over about 3,119 kPa (31.8 kg/cm², 452 psi), or below about 118 kPa (1.2 kg/cm², 17 psi).

Pressure Relief Valve

The refrigerant system is also protected by a pressure relief valve, located in the rear head of the compressor. When the pressure of refrigerant in the system increases to an unusual level [more than 3,628 kPa (37 kg/cm², 526 psi)], the release port on the pressure relief valve automatically opens and releases refrigerant into the atmosphere.

LUBRICANT

REFRIGERATION SYSTEM

< FUNCTION DIAGNOSIS >

[MANUAL AIR CONDITIONER (HR/MR)]

Maintenance of Lubricant Quantity in Compressor

The lubricant in the compressor circulates through the system with the refrigerant. Add lubricant to compressor when replacing any component or after a large refrigerant leakage occurred. It is important to maintain the specified amount.

If lubricant quantity is not maintained properly, the following malfunctions may result:

- Lack of lubricant: May lead to a seized compressor.
- Excessive lubricant: Inadequate cooling (thermal exchange interference)

Lubricant

Name

: Nissan A/C System Oil Type S

Component Parts Location

INFOID:000000001098131

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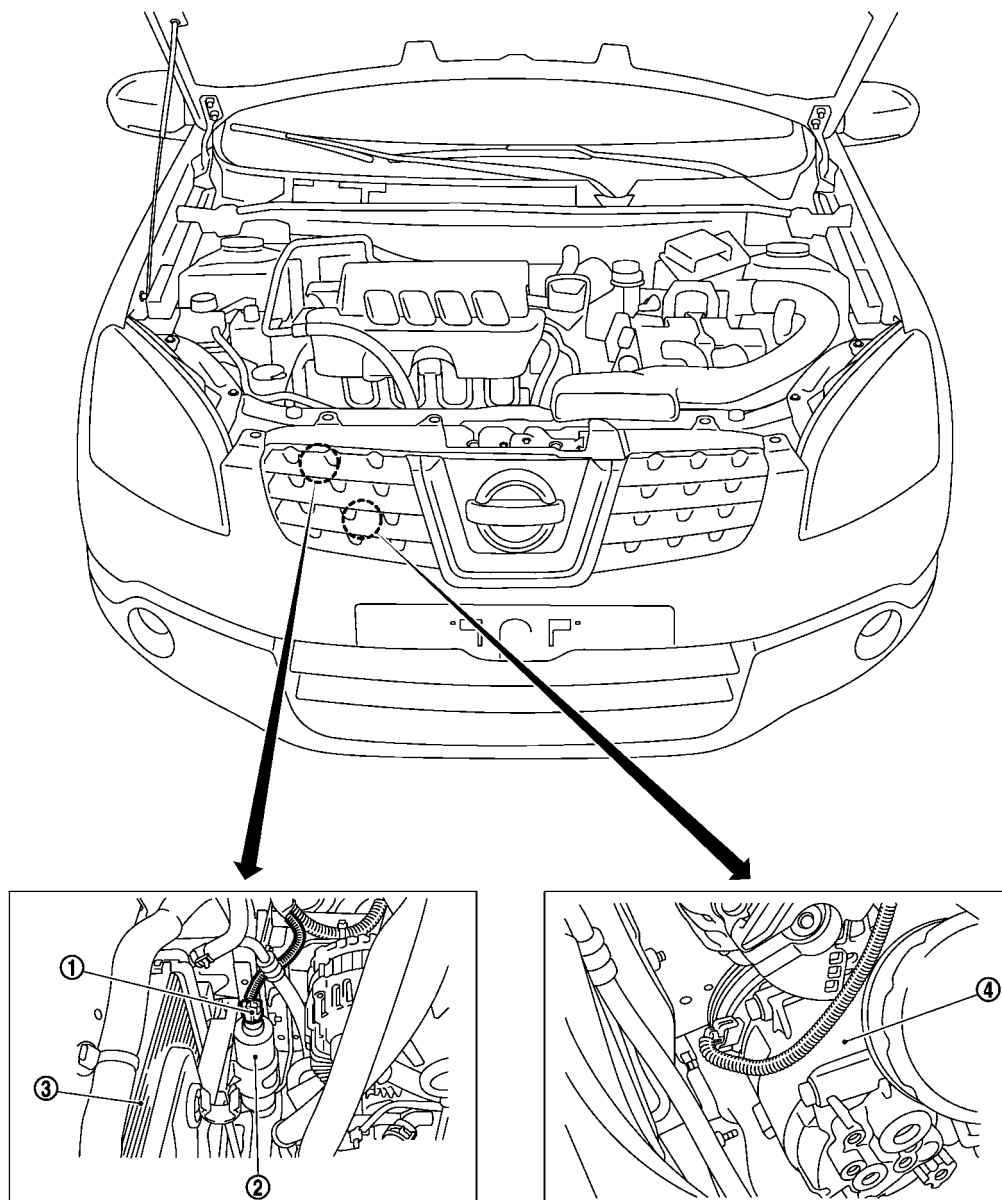
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REFRIGERATION SYSTEM

< FUNCTION DIAGNOSIS >

[MANUAL AIR CONDITIONER (HR/MR)]

SEC. 214•270•271•274•276



- 1. Refrigerant pressure sensor
- 2. Liquid tank
- 3. Radiator
- 4. Compressor

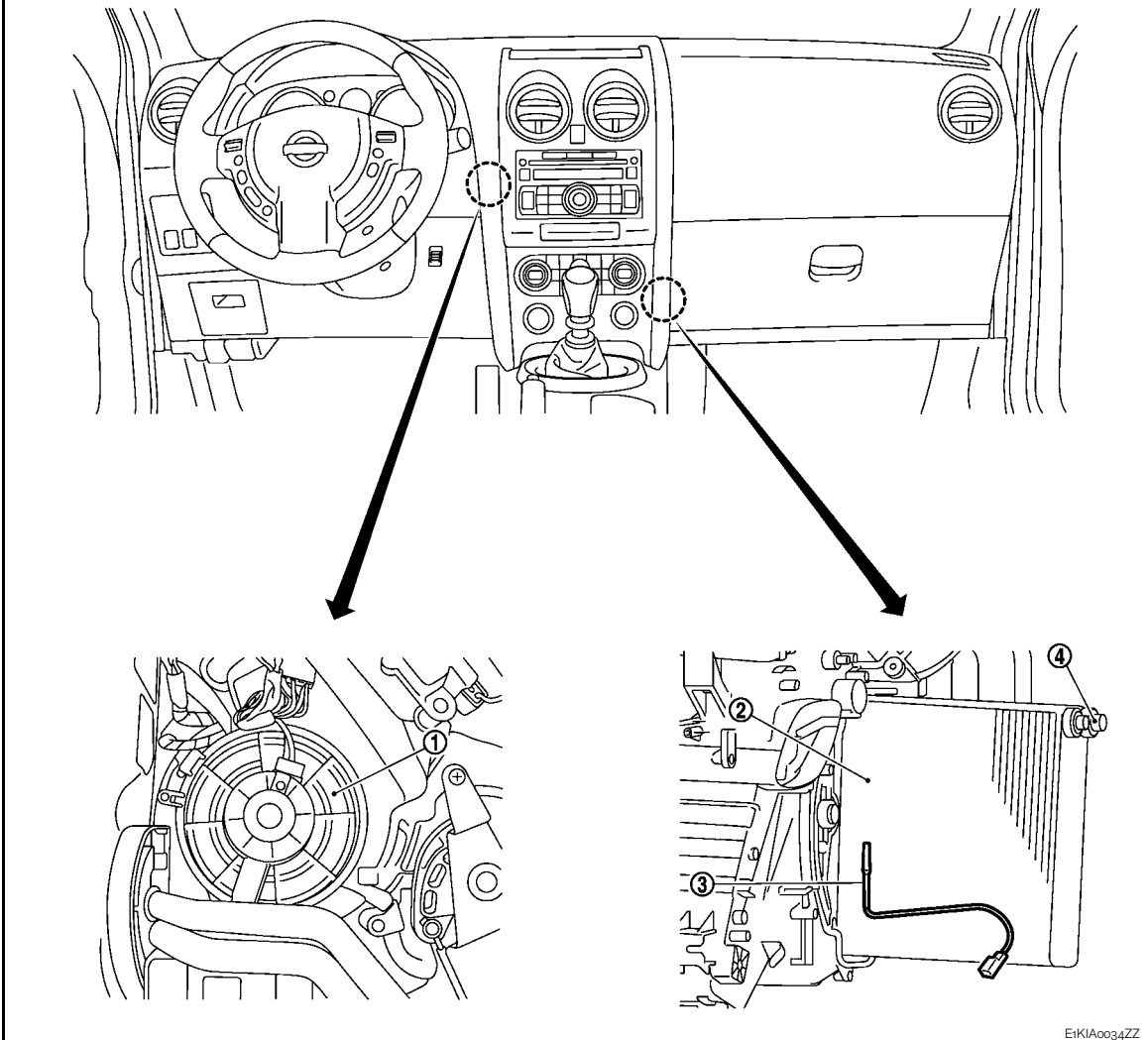
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REFRIGERATION SYSTEM

< FUNCTION DIAGNOSIS >

[MANUAL AIR CONDITIONER (HR/MR)]

SEC. 214•270•271•274•276



1. Blower motor assembly
2. Evaporator
3. Intake sensor (AT only)
4. Expansion valve

Component Description

INFOID:0000000001098132

Component	Description
Compressor	Intakes, compresses, and discharges refrigerant, then conveys it to condenser.
Condenser	Condenses refrigerant, and then conveys it to liquid tank.
Liquid tank	Drives moisture out of refrigerant, eliminates foreign matter, then conveys refrigerant to expansion valve.
Refrigerant pressure sensor	Refer to HAC-161, "Component Inspection" .
Expansion valve	Vaporizes refrigerant, controls the amount of flow, then conveys refrigerant to evaporator.
Evaporator	Cools passing air, and then conveys it to compressor.
Blower motor	Takes in air in the vehicle or fresh outside air, and then adjusts room temperature by air conditioning.

REFRIGERATION SYSTEM SYMPTOMS

< SYMPTOM DIAGNOSIS >

[MANUAL AIR CONDITIONER (HR/MR)]

SYMPTOM DIAGNOSIS

REFRIGERATION SYSTEM SYMPTOMS

SYMPTOM DIAGNOSIS PROCEDURE

SYMPTOM DIAGNOSIS PROCEDURE : Trouble Diagnosis For Unusual Pressure

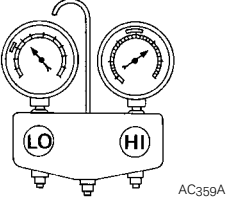
INFOID:0000000001098135

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

BOTH HIGH- AND LOW-PRESSURE SIDES ARE TOO HIGH

BOTH HIGH- AND LOW-PRESSURE SIDES ARE TOO HIGH : Symptom Table

INFOID:0000000001098136

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
Both high- and low-pressure sides are too high.  AC359A	The pressure returns to normal is reduced soon after water is splashed on condenser.	Excessive refrigerant charge in refrigeration cycle.	Reduce refrigerant until specified pressure is obtained.
	Air suction by cooling fan is insufficient.	Insufficient condenser cooling performance. ↓ 1. Condenser fins are clogged. 2. Improper fan rotation of cooling fan.	- Clean condenser. - Check and repair cooling fan as necessary.
	- Low-pressure pipe is not cold. - When compressor is stopped high-pressure value quickly drops by approximately 196 kPa (2 kg/cm², 28 psi). It then decreases gradually thereafter.	Poor heat exchange in condenser (After compressor operation stops, high-pressure decreases too slowly.). ↓ Air in refrigeration cycle.	Evacuate repeatedly and re-charge system.
	Engine tends to overheat.	Engine cooling systems malfunction.	Check and repair each engine cooling system.
	- An area of the low-pressure pipe is colder than areas near the evaporator outlet. - Low-pressure pipe is sometimes covered with frost.	- Excessive liquid refrigerant on low-pressure side. - Excessive refrigerant discharge flow. - Expansion valve is open a little compared with the specification. ↓ Improper expansion valve adjustment.	Replace expansion valve.

HIGH-PRESSURE SIDE IS TOO HIGH AND LOW-PRESSURE SIDE IS TOO LOW

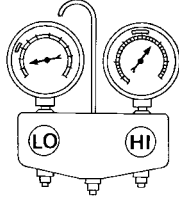
HIGH-PRESSURE SIDE IS TOO HIGH AND LOW-PRESSURE SIDE IS TOO LOW : Symptom Table

INFOID:0000000001098137

REFRIGERATION SYSTEM SYMPTOMS

< SYMPTOM DIAGNOSIS >

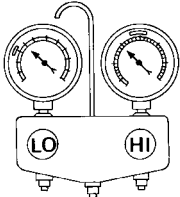
[MANUAL AIR CONDITIONER (HR/MR)]

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
High-pressure side is too high and low-pressure side is too low.  AC360A	Upper side of condenser and high-pressure side are hot, however, liquid tank is not so hot.	High-pressure tube or parts located between compressor and condenser are clogged or crushed.	• Check and repair or replace malfunctioning parts. • Check lubricant for contamination.

HIGH-PRESSURE SIDE IS TOO LOW AND LOW-PRESSURE SIDE IS TOO HIGH

HIGH-PRESSURE SIDE IS TOO LOW AND LOW-PRESSURE SIDE IS TOO HIGH : Symptom Table

INFOID:000000001098138

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
High-pressure side is too low and low-pressure side is too high.  AC366A	High- and low-pressure sides become equal soon after compressor operation stops.	Compressor pressure operation is improper. ↓ Damaged inside compressor packings.	Replace compressor.
	No temperature difference between high- and low-pressure sides.	Compressor pressure operation is improper. ↓ Damaged inside compressor packings.	Replace compressor.

BOTH HIGH- AND LOW-PRESSURE SIDES ARE TOO LOW

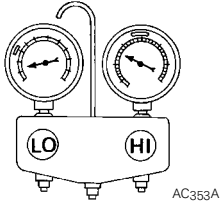
BOTH HIGH- AND LOW-PRESSURE SIDES ARE TOO LOW : Symptom Table

INFOID:000000001098139

REFRIGERATION SYSTEM SYMPTOMS

< SYMPTOM DIAGNOSIS >

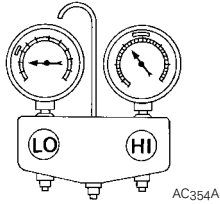
[MANUAL AIR CONDITIONER (HR/MR)]

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
Both high- and low-pressure sides are too low.  AC353A	- There is a big temperature difference between liquid tank outlet and inlet. Outlet temperature is extremely low. - Liquid tank inlet and expansion valve are frosted.	Liquid tank inside is slightly clogged.	- Replace liquid tank. - Check lubricant for contamination.
	- Temperature of expansion valve inlet is extremely low as compared with areas near liquid tank. - Expansion valve inlet is frosted. - Temperature difference occurs somewhere in high-pressure side.	High-pressure pipe located between liquid tank and expansion valve is clogged.	- Check and repair malfunctioning parts. - Check lubricant for contamination.
	Expansion valve and liquid tank are warm or slightly cool when touched.	Low refrigerant charge. ↓ Leaking fittings or components.	Check refrigerant for leaks. Refer to HA-132, "Refrigerant Leaks" (HR/MR), HA-183, "Refrigerant Leaks" (K9K).
	There is a big temperature difference between expansion valve inlet and outlet while the valve itself is frosted.	Expansion valve closes a little compared with the specification. ↓ 1. Improper expansion valve adjustment. 2. Malfunctioning expansion valve. 3. Outlet and inlet may be clogged.	- Remove foreign particles by using compressed air. - Replace expansion valve. - Check lubricant for contamination.
	An area of the low-pressure pipe is colder than areas near the evaporator outlet.	Low-pressure pipe is clogged or crushed.	- Check and repair malfunctioning parts. - Check lubricant for contamination.
	Air flow volume is not enough or is too low.	Evaporator is frozen.	- Replace compressor. - Repair evaporator fins. - Replace evaporator. - Refer to HAC-153, "Diagnosis Procedure".

LOW-PRESSURE SIDE SOMETIMES BECOMES NEGATIVE

LOW-PRESSURE SIDE SOMETIMES BECOMES NEGATIVE : Symptom Table

INFOID:000000001098140

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
Low-pressure side sometimes becomes negative.  AC354A	- Air conditioning system does not function and does not cyclically cool the compartment air. - The system constantly functions for a certain period of time after compressor is stopped and restarted.	Refrigerant does not discharge cyclically. ↓ Moisture is frozen at expansion valve outlet and inlet. ↓ Water is mixed with refrigerant.	- Drain water from refrigerant or replace refrigerant. - Replace liquid tank.

LOW-PRESSURE SIDE BECOMES NEGATIVE

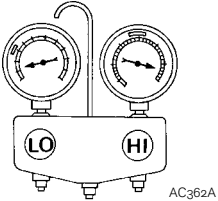
LOW-PRESSURE SIDE BECOMES NEGATIVE : Symptom Table

INFOID:000000001098141

REFRIGERATION SYSTEM SYMPTOMS

< SYMPTOM DIAGNOSIS >

[MANUAL AIR CONDITIONER (HR/MR)]

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
Low-pressure side becomes negative. 	Liquid tank or front/rear side of expansion valve's pipe is frosted or wet with dew.	High-pressure side is closed and refrigerant does not flow. ↓ Expansion valve or liquid tank is frosted.	Leave the system at rest until no frost is present. Start it again to check whether or not the malfunction is caused by water or foreign particles. • If water is the cause, initially cooling is okay. Then the water freezes causing a blockage. Drain water from refrigerant or replace refrigerant. • If due to foreign particles, remove expansion valve and remove the particles with dry and compressed air (not shop air). • If either of the above methods cannot correct the malfunction, replace expansion valve. • Replace liquid tank. • Check lubricant for contamination.

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PRECAUTION

PRECAUTIONS

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

INFOID:0000000001115388

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 SRC and SB section of this Service Manual.

WARNING:

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

Precaution Necessary for Steering Wheel Rotation After Battery Disconnect

INFOID:0000000001115392

NOTE:

- This Procedure is applied only to models with Intelligent Key system and NATS (NISSAN ANTI-THEFT SYSTEM).
- Remove and install all control units after disconnecting both battery cables with the ignition knob in the "LOCK" position.
- Always use CONSULT-III to perform self-diagnosis as a part of each function inspection after finishing work. If DTC is detected, perform trouble diagnosis according to self-diagnostic results.

For models equipped with the Intelligent Key system and NATS, an electrically controlled steering lock mechanism is adopted on the key cylinder.

For this reason, if the battery is disconnected or if the battery is discharged, the steering wheel will lock and steering wheel rotation will become impossible.

If steering wheel rotation is required when battery power is interrupted, follow the 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. Use the Intelligent Key or mechanical key to turn the ignition switch to the "ACC" position. At this time, the steering lock will be released.
3. Disconnect both battery cables. The steering lock will remain released and the steering wheel can be rotated.
4. Perform the necessary repair operation.
5. When the repair work is completed, return the ignition switch to the "LOCK" position before connecting the battery cables. (At this time, the steering lock mechanism will engage.)
6. Perform a self-diagnosis check of all control units using CONSULT-III.

Precaution for Procedure without Cowl Top Cover

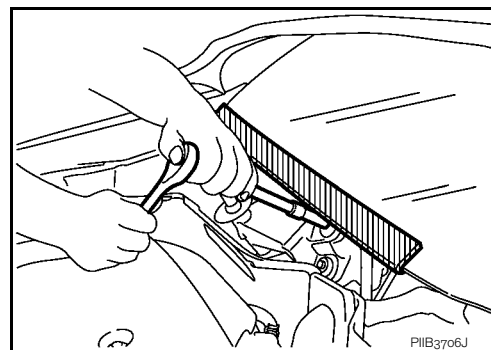
INFOID:0000000001115396

PRECAUTIONS

< PRECAUTION >

[MANUAL AIR CONDITIONER (HR/MR)]

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



Precautions For Xenon Headlamp Service

INFOID:000000001115400

WARNING:

Comply with the following warnings to prevent any serious accident.

- Disconnect the battery cable (negative terminal) or the power supply fuse before installing, removing, or touching the xenon headlamp (bulb included). The xenon headlamp contains high-voltage generated parts.
- Never work with wet hands.
- Check the xenon headlamp ON-OFF status after assembling it to the vehicle. Never turn the xenon headlamp ON in other conditions. Connect the power supply to the vehicle-side connector. (Turning it ON outside the lamp case may cause fire or visual impairments.)
- Never touch the bulb glass immediately after turning it OFF. It is extremely hot.

CAUTION:

Comply with the following cautions to prevent any error and malfunction.

- Install the xenon bulb securely. (Insufficient bulb socket installation may melt the bulb, the connector, the housing, etc. by high-voltage leakage or corona discharge.)
- Never perform HID circuit inspection with a tester.
- Never touch the xenon bulb glass with hands. Never put oil and grease on it.
- Dispose of the used xenon bulb after packing it in thick vinyl without breaking it.
- Never wipe out dirt and contamination with organic solvent (thinner, gasoline, etc.).

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

INFOID:000000001098146

CAUTION:

- CFC-12 (R-12) refrigerant and HFC-134a (R-134a) refrigerant are not compatible. These refrigerants must never be mixed, even in the smallest amounts. If the refrigerants are mixed and compressor malfunction is likely occur.
- Use only specified lubricant for the HFC-134a (R-134a) A/C system and HFC-134a (R-134a) components. If lubricant other than that specified is used, compressor malfunction is likely to occur.
- The specified HFC-134a (R-134a) lubricant 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, never remove the caps (unseal) until just before connecting the components. Connect all refrigerant loop components as quickly as possible to minimize the entry of moisture into system.
 - Only use the specified lubricant from a sealed container. Immediately reseal containers of lubricant. Without proper sealing, lubricant will become moisture saturated and should not be used.
 - Never allow lubricant (Nissan A/C System Oil Type S) to come in contact with styrene foam parts. Damage may result.

General Refrigerant Precaution

INFOID:000000001098147

WARNING:

- Avoid breathing A/C refrigerant and lubricant vapor or mist. Exposure may irritate eyes, nose and throat. Use only approved recovery/recycling equipment to discharge HFC-134a (R-134a) refrigerant. If accidental system discharge occurs, ventilate work area before resuming service. Additional health and safety information may be obtained from refrigerant and lubricant manufacturers.

PRECAUTIONS

< PRECAUTION >

[MANUAL AIR CONDITIONER (HR/MR)]

- Never 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.
- Never store or heat refrigerant containers above 52°C (126°F).
- Never 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.
- Never 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.
- Never pressure test or leak test HFC-134a (R-134a) service equipment and/or vehicle air conditioning systems with compressed air during repair. Some mixtures of air and HFC-134a (R-134a) have been shown to be combustible at elevated pressures. These mixtures, if ignited, may cause injury or property damage. Additional health and safety information may be obtained from refrigerant manufacturers.

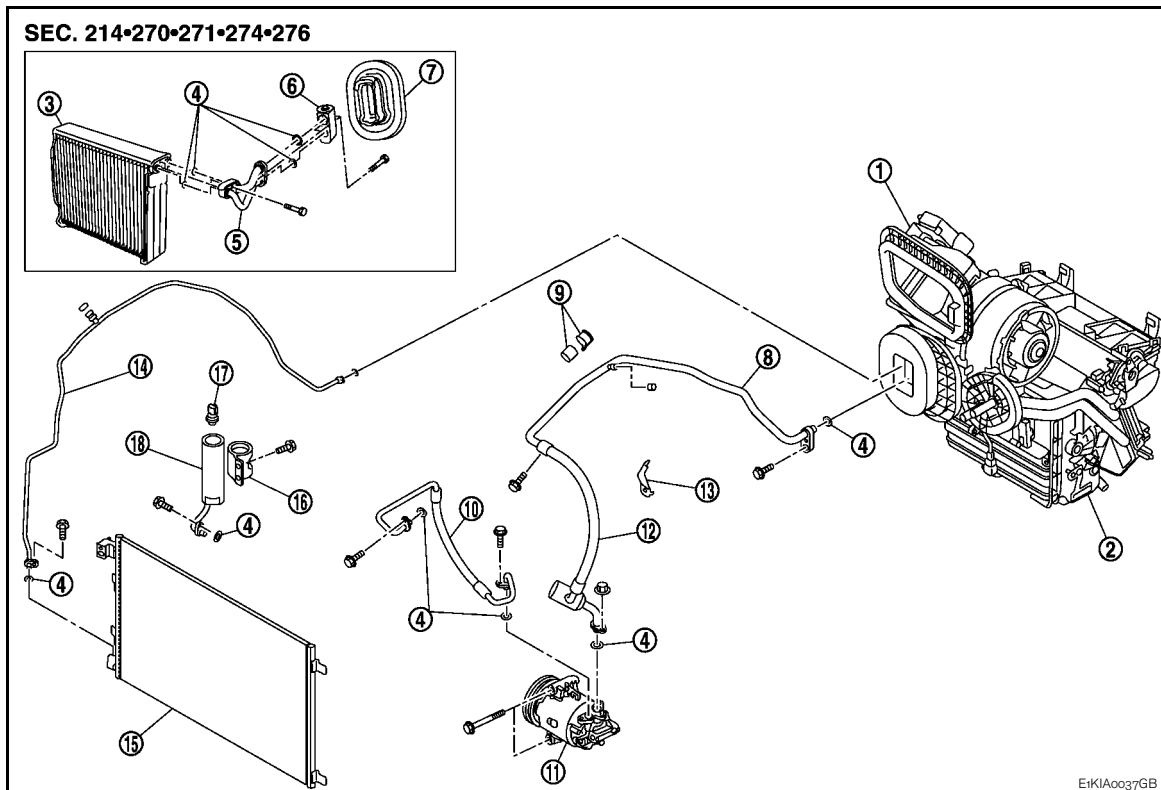
Refrigerant Connection

INFOID:000000001098148

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

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

O-RING AND REFRIGERANT CONNECTION



- | | | |
|-------------------------------------|--|--|
| 1. Heater & blower unit assembly | 2. Heater & cooling unit assembly | 3. Evaporator |
| 4. O-ring | 5. Low pressure pipe 1 and high pressure pipe 2 assembly | 6. Expansion valve |
| 7. Heater sealing | 8. Low pressure flexible hose and pipe 2 | 9. Low pressure pipe 2 fixing clamp assembly |
| 10. High pressure flexible hose | 11. Compressor | 12. Low pressure flexible hose |
| 13. Low & high pipe bracket support | 14. High pressure pipe 1 | 15. Condenser assembly |
| 16. Liquid tank fixing bracket | 17. Refrigerant pressure sensor | 18. Liquid tank |

CAUTION:

PRECAUTIONS

< PRECAUTION >

[MANUAL AIR CONDITIONER (HR/MR)]

The new and former refrigerant connections use different O-ring configurations. Never confuse O-rings since they are not interchangeable. If a wrong O-ring is installed, refrigerant may leak at the connection.

O-Ring Part Numbers and Specifications

Connection type	Piping connection point		Part number	QTY	O-ring size
New	Low pressure pipe 2 to expansion valve		92473 N8210	1	16
	High pressure flexible pipe 1 to condenser		92472 N8210	1	12
	High pressure pipe 1 to expansion valve		92471 N8210	1	8
	Low pressure pipe 1 and high pressure	Inlet	92475 71L00	1	12
	pipe 2 assembly to expansion valve	Outlet	92475 72L00	1	16
	Low pressure pipe 1 and high pressure	Inlet	92475 71L00	1	12
	pipe 2 assembly to evaporator	Outlet	92475 72L00	1	16
	High pressure pipe 1 to liquid tank		92471 N8210	1	8
	Compressor to low pressure flexible hose		92474 N8210	2	19
	Compressor to high pressure flexible hose		92474 N8210	2	12
	Liquid tank to condenser		92473 N8210	1	16

WARNING:

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

CAUTION:

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

- When the compressor is removed, store it in the same way as it is when mounted on the car. Failure to do so will cause lubricant to enter the low-pressure chamber.
- When connecting tubes, always use a torque wrench and a back-up wrench.
- After disconnecting tubes, immediately plug all openings to prevent entry of dust and moisture.
- When installing an air conditioner in the vehicle, connect the pipes at the final stage of the operation. 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.
- Thoroughly remove moisture from the refrigeration system before charging the refrigerant.
- Always replace used O-rings.
- When connecting tube, apply lubricant to circle of the O-rings shown in illustration. Be careful not to apply lubricant to threaded portion.

Name

: Nissan A/C System Oil
Type S

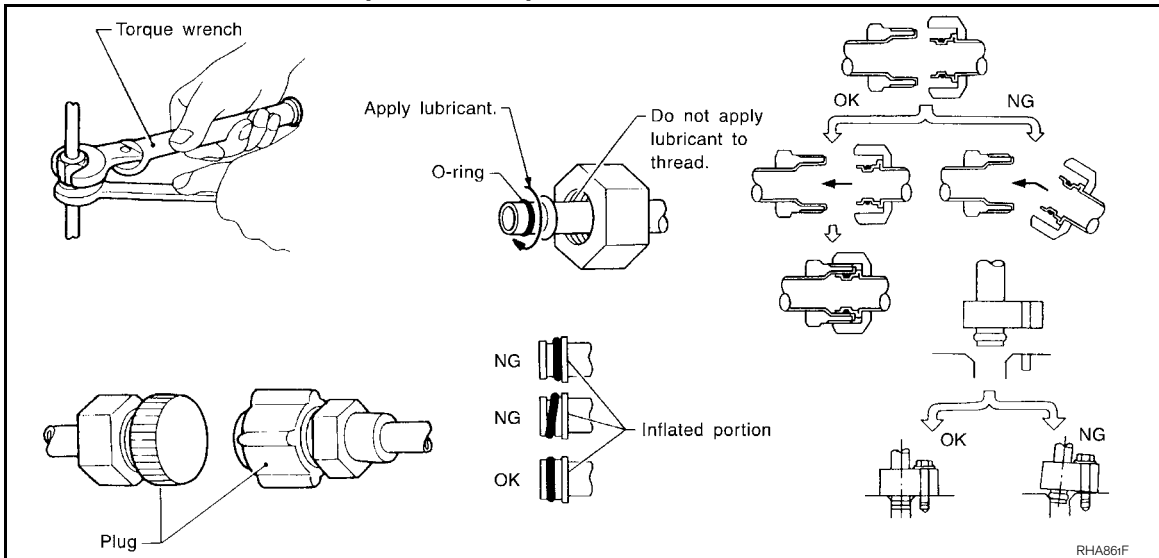
- O-ring must be closely attached to the groove portion of tube.
- When replacing the O-ring, be careful not to damage O-ring and tube.
- Connect tube until a click can be heard, then tighten the nut or bolt by hand. Make sure that the O-ring is installed to tube correctly.

PRECAUTIONS

< PRECAUTION >

[MANUAL AIR CONDITIONER (HR/MR)]

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



Service Equipment

INFOID:000000001098149

RECOVERY/RECYCLING 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

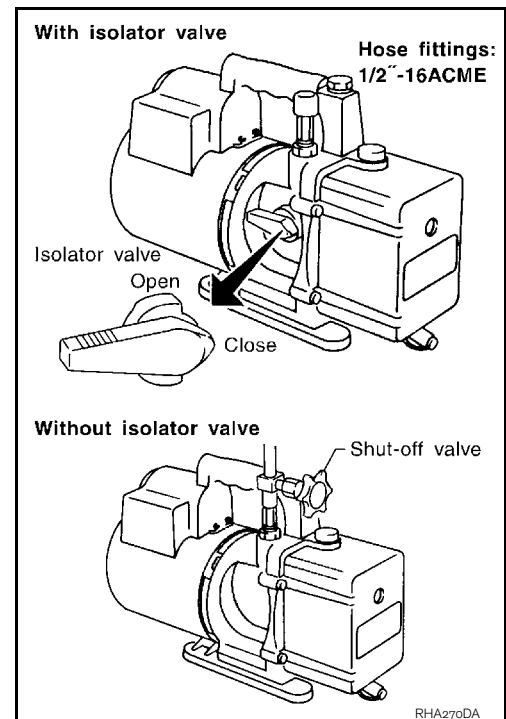
Be certain to follow the manufacturer's instructions for tester operation and tester maintenance.

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 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 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.



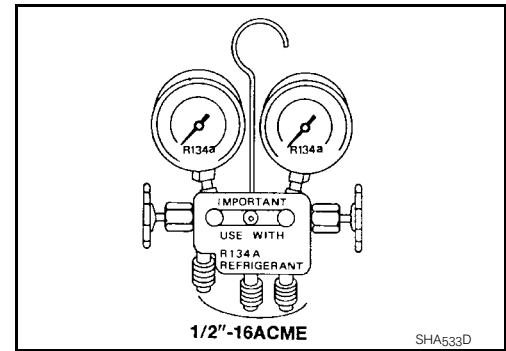
MANIFOLD GAUGE SET

PRECAUTIONS

< PRECAUTION >

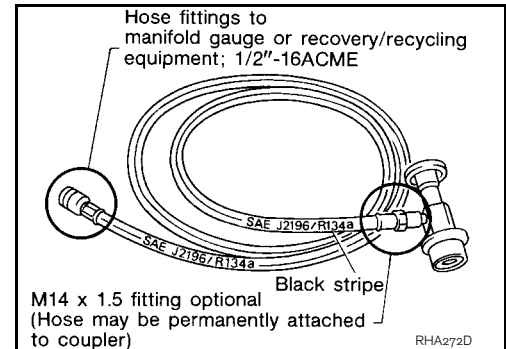
[MANUAL AIR CONDITIONER (HR/MR)]

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

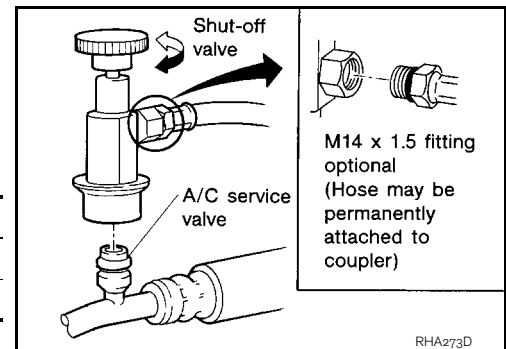
Be certain that the service hoses display the markings described (colored hose with black stripe). All hoses must include positive shut-off devices (either manual or automatic) near the end of the hoses opposite to the manifold gauge.



SERVICE COUPLERS

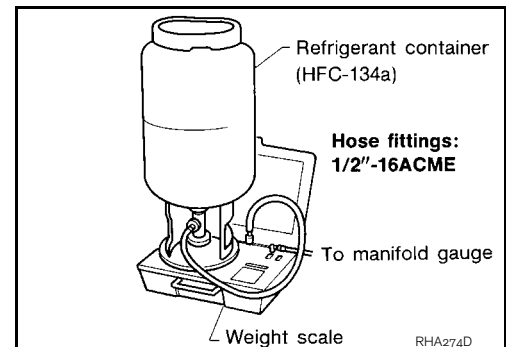
Never attempt to connect HFC-134a (R-134a) service couplers to a CFC-12 (R-12) A/C system. The HFC-134a (R-134a) couplers will not properly connect to the CFC-12 (R-12) system. However, if an improper connection is attempted, discharging and contamination may occur.

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



REFRIGERANT WEIGHT SCALE

Verify that no refrigerant other than HFC-134a (R-134a) and specified lubricants 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.

COMPRESSOR

General Precautions

INFOID:0000000001098150

CAUTION:

- Plug all openings to prevent moisture and foreign matter from entering.
- When the compressor is removed, store it in the same way as it is when mounted on the car.
- When replacing or repairing compressor, follow "Maintenance of Lubricant Quantity in Compressor" exactly. Refer to [HA-180, "Adjustment"](#).
- Keep friction surfaces between clutch and pulley clean. If the surface is contaminated with lubricant, wipe it off by using a clean waste cloth moistened with thinner.
- After compressor service operation, turn the compressor shaft by hand more than five turns in both directions. This will equally distribute lubricant inside the compressor. After the compressor is installed, let the engine idle and operate the compressor for one hour.
- After replacing the compressor magnet clutch, apply voltage to the new one and check for normal operation.

LEAK DETECTION DYE

General Precautions

INFOID:000000001098151

CAUTION:

- The A/C system contains a fluorescent leak detection dye used for locating refrigerant leaks. An ultraviolet (UV) lamp is required to illuminate the dye when inspecting for leaks.
- Always wear fluorescence enhancing UV safety goggles to protect your eyes and enhance the visibility of the fluorescent dye.
- The fluorescent dye leak detector is not a replacement for an electrical leak detector (SST: J-41995). The fluorescent dye leak detector should be used in conjunction with an electrical leak detector (SST: J-41995) to pin-point refrigerant leaks.
- For the purpose of safety and customer's satisfaction, read and follow all manufacture's operating instructions and precautions prior to performing the work.
- A compressor shaft seal should not necessarily be repaired because of dye seepage. The compressor shaft seal should only be repaired after confirming the leak with an electrical leak detector (SST: J-41995).
- Always remove any remaining dye from the leak area after repairs are completed to avoid a misdiagnosis during a future service.
- Never allow dye to come into contact with painted body panels or interior components. If dye is spilled, clean immediately with the approved dye cleaner. Fluorescent dye left on a surface for an extended period of time cannot be removed.
- 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 will remain for three years or a little over unless a compressor malfunction occurs.

IDENTIFICATION

NOTE:

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

IDENTIFICATION LABEL FOR VEHICLE

Vehicles with factory installed fluorescent dye have the identification label on the front side of hood.

PREPARATION

PREPARATION

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

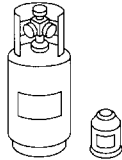
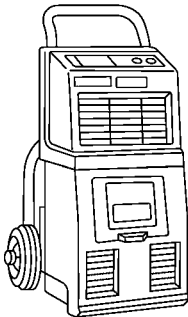
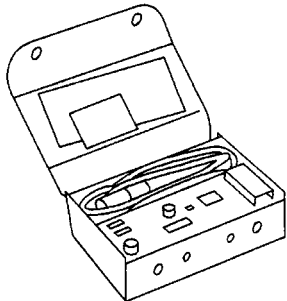
INFOID:000000001098152

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.

Adapters that convert one size fitting to another must never be used: refrigerant/lubricant contamination will occur and compressor malfunction will result.

Tool number 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
KLH00-PAGS0 Nissan A/C System Oil Type S (DH-PS)  S-NT197	Type: Polyalkylene glycol oil (PAG), type S (DH-PS) Application: HFC-134a (R-134a) wobble (swash) plate compressors (Nissan only) Lubricity: 40 m ℓ (1.4 Imp fl oz.)
Recovery/Recycling/ Recharging equipment (ACR4)  RJI/A0195E	Function: Refrigerant recovery and recycling and recharging
Electrical leak detector  A/C leak detector SHA705EB	Power supply: DC 12V (Cigarette lighter)

PREPARATION

< PREPARATION >

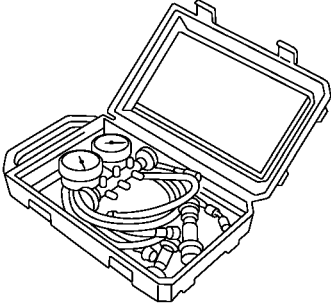
[MANUAL AIR CONDITIONER (HR/MR)]

Tool number Tool name		Description
(J-43926) Refrigerant dye leak detection kit Kit includes: (J-42220) UV lamp and UV safety goggles (J-41459) HFC-134a (R-134a) dye injector Use with J-41447, 1/4 ounce bottle (J-41447) HFC-134a (R-134a) fluorescent leak detection dye (Box of 24, 1/4 ounce bottles) (J-43872) Refrigerant dye cleaner		Power supply: DC 12 V (Battery terminal)
(J-42220) UV lamp and UV safety goggles		Power supply: DC 12 V (Battery terminal) For checking refrigerant leak when fluorescent dye is installed in A/C system Includes: UV lamp and UV safety goggles
(J-41447) HFC-134a (R-134a) fluorescent leak detection dye (Box of 24, 1/4 ounce bottles)		Application: For HFC-134a (R-134a) PAG oil Container: 1/4 ounce (7.4 cc) bottle (Includes self-adhesive dye identification labels for affixing to vehicle after charging system with dye.)
(J-41459) HFC-134a (R-134a) dye injector Use with J-41447, 1/4 ounce bottle		For injecting 1/4 ounce of fluorescent leak detection dye into A/C system

PREPARATION

< PREPARATION >

[MANUAL AIR CONDITIONER (HR/MR)]

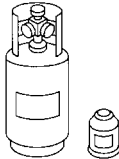
Tool number Tool name	Description
(J-43872) Refrigerant dye cleaner  SHA441F	For cleaning dye spills
(J-39183) Manifold gauge set (with hoses and couplers)  RJIA096E	Identification: - The gauge face indicates HFC-134a (R-134a). Fitting size: Thread size 1/2"-16 ACME

Sealant or/and Lubricant

INFOID:0000000001098154

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
Nissan A/C System Oil Type S (DH-PS)  S-NT197	Type: Polyalkylene glycol oil (PAG), type S (DH-PS) Application: HFC-134a (R-134a) swash plate compressors (Nissan only) Capacity: 40 mℓ (1.4 US fl oz., 1.4 Imp fl oz.)

ON-VEHICLE MAINTENANCE

LUBRICANT

Adjustment

INFOID:000000001098155

LUBRICANT RETURN OPERATION

Adjust the lubricant quantity according to the test group shown below.

1.CHECK LUBRICANT RETURN OPERATION

Can lubricant return operation be performed?

- A/C system works properly.
- There is no evidence of a large amount of lubricant leakage.

CAUTION:

If excessive lubricant leakage is noted, never perform the lubricant return operation.

Is it successful?

YES >> GO TO 2.

NO >> GO TO 3.

2.PERFORM LUBRICANT RETURN OPERATION, PROCEEDING AS FOLLOWS

1. Start the engine, and set to the following conditions:
 - Engine speed: Idling to 1,200 rpm
 - A/C switch: ON
 - Blower speed: Max. position
 - Temp. control: Optional [Set so that intake air temperature is 25 to 30°C (77 to 86°F).]
 - Intake position: Recirculation (REC)
2. Perform lubricant return operation for about 10 minutes.
3. Stop the engine.

>> GO TO 3.

3.CHECK REPLACEMENT PART

Should the compressor be replaced?

YES >> Refer to "LUBRICANT ADJUSTING PROCEDURE FOR COMPRESSOR REPLACEMENT".

NO >> Refer to "LUBRICANT ADJUSTING PROCEDURE FOR COMPONENTS REPLACEMENT EXCEPT COMPRESSOR".

LUBRICANT ADJUSTING PROCEDURE FOR COMPONENTS REPLACEMENT EXCEPT COMPRESSOR

After replacing any of the following major components, add the correct amount of lubricant to the system.

Amount of lubricant to be added:

Part replaced	Lubricant to be added to system	Remarks
	Amount of lubricant m ℓ (US fl oz., Imp fl oz.)	
Evaporator	75 (2.5, 2.6)	—
Condenser	35 (1.2, 1.2)	—
Liquid tank	10 (0.3, 0.4)	—
In case of refrigerant leak	30 (1.0, 1.1)	Large leak
	—	Small leak *1

*1: If the refrigerant leak is small, no addition of lubricant is needed.

LUBRICANT ADJUSTING PROCEDURE FOR COMPRESSOR REPLACEMENT

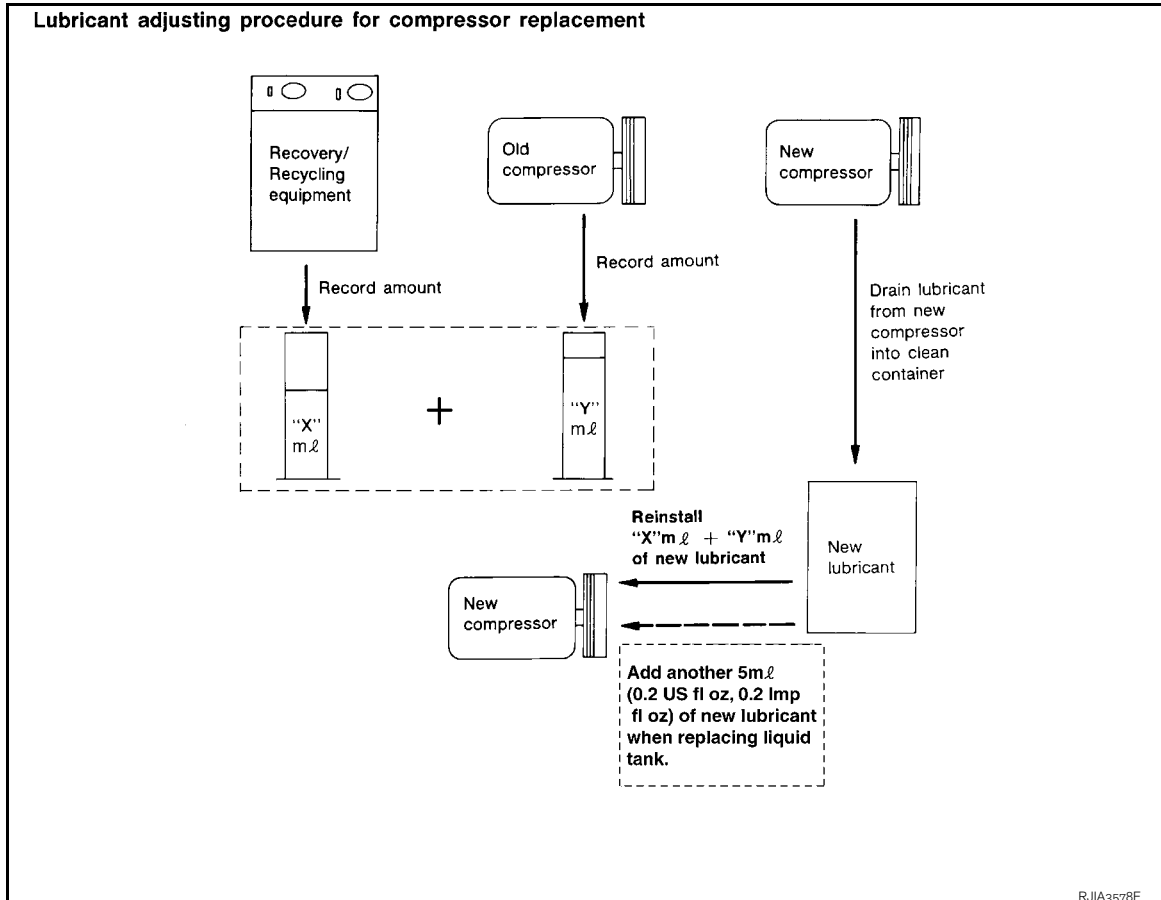
LUBRICANT

< ON-VEHICLE MAINTENANCE >

[MANUAL AIR CONDITIONER (HR/MR)]

1. Before connecting recovery/recycling recharging equipment to vehicle, check recovery/recycling recharging equipment gauges. No refrigerant pressure should be displayed. If NG, recover refrigerant from equipment lines.
2. Connect recovery/recycling recharging equipment to vehicle. Confirm refrigerant purity in supply tank using recovery/recycling recharging equipment and refrigerant identifier. If NG, refer to [HA-170, "Working with HFC-134a \(R-134a\)"](#).
3. Confirm refrigerant purity in vehicle A/C system using recovery/recycling recharging equipment and refrigerant identifier. If NG, refer to [HA-170, "Working with HFC-134a \(R-134a\)"](#).
4. Discharge refrigerant into the refrigerant recovery/recycling equipment. Measure lubricant discharged into the recovery/recycling equipment.
5. Drain the lubricant from the old (removed) compressor into a graduated container and recover the amount of lubricant drained.
6. Drain the lubricant from the new compressor into a separate, clean container.
7. Measure an amount of new lubricant installed equal to amount drained from old compressor. Add this lubricant to new compressor through the suction port opening.
8. Measure an amount of new lubricant equal to the amount recovered during discharging. Add this lubricant to new compressor through the suction port opening.
9. If the liquid tank also needs to be replaced, add another 5 mℓ (0.2 US fl oz., 0.2 Imp fl oz.) of lubricant at this time.

Do not add this 5 mℓ (0.2 US fl oz., 0.2 Imp fl oz.) of lubricant when replaces the compressor only.



[MANUAL AIR CONDITIONER (HR/MR)]

INFOID:0000000001098156

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graph TD
    Start([START]) --> Step1[INSUFFICIENT COOLING.]
    Step1 --> Step2[CHECK AIR FLOW.]
    Step2 -- NG --> Step2_1[CHECK BLOWER MOTOR OPERATION  
BY ADJUSTING BLOWER SPEED UP  
AND DOWN.]
    Step2 -- OK --> Step3[TURN A/C SWITCH ON AND  
CHECK COMPRESSOR OPERATION.]
    Step3 -- NG --> Step3_1((B))
    Step3_1 --> EndB((Go to  
next page.))
    Step3 -- OK --> Step4[CHECK HIGH- AND LOW-PRESSURE SIDE. USE  
PERFORMANCE CHART. (*1)]
    Step4 -- NG --> Step5[RECOVER REFRIGERANT USING RECOVERY  
RECYCLING EQUIPMENT AND CHARGE  
SPECIFIED AMOUNT OF REFRIGERANT.]
    Step5 --> Step6[CHECK HIGH- AND LOW-PRESSURE SIDE. USE  
PERFORMANCE CHART. (*1)]
    Step6 -- NG --> Step6_1[
        BOTH HIGH- AND LOW-PRESSURE SIDES ARE TOO HIGH. (*3)  

        HIGH-PRESSURE SIDE IS TOO HIGH AND LOW-PRESSURE SIDE IS TOO LOW. (*4)  

        HIGH-PRESSURE SIDE IS TOO LOW AND LOW-PRESSURE SIDE IS TOO HIGH. (*5)  

        BOTH HIGH- AND LOW-PRESSURE SIDES ARE TOO LOW. (*6)  

        LOW-PRESSURE SIDE SOMETIMES BECOMES NEGATIVE. (*7)  

        LOW-PRESSURE SIDE BECOMES NEGATIVE. (*8)
    ]
    Step6 -- OK --> Step7[CHECK DISCHARGE AIR TEMPERATURE. USE  
PERFORMANCE CHART. (*1)]
    Step7 -- NG --> Step8[Malfunctioning temperature control operation (air mix  
door position improperly adjusted) [Refer to (*2).]]
    Step8 --> Step7
    Step7 -- OK --> End([END])

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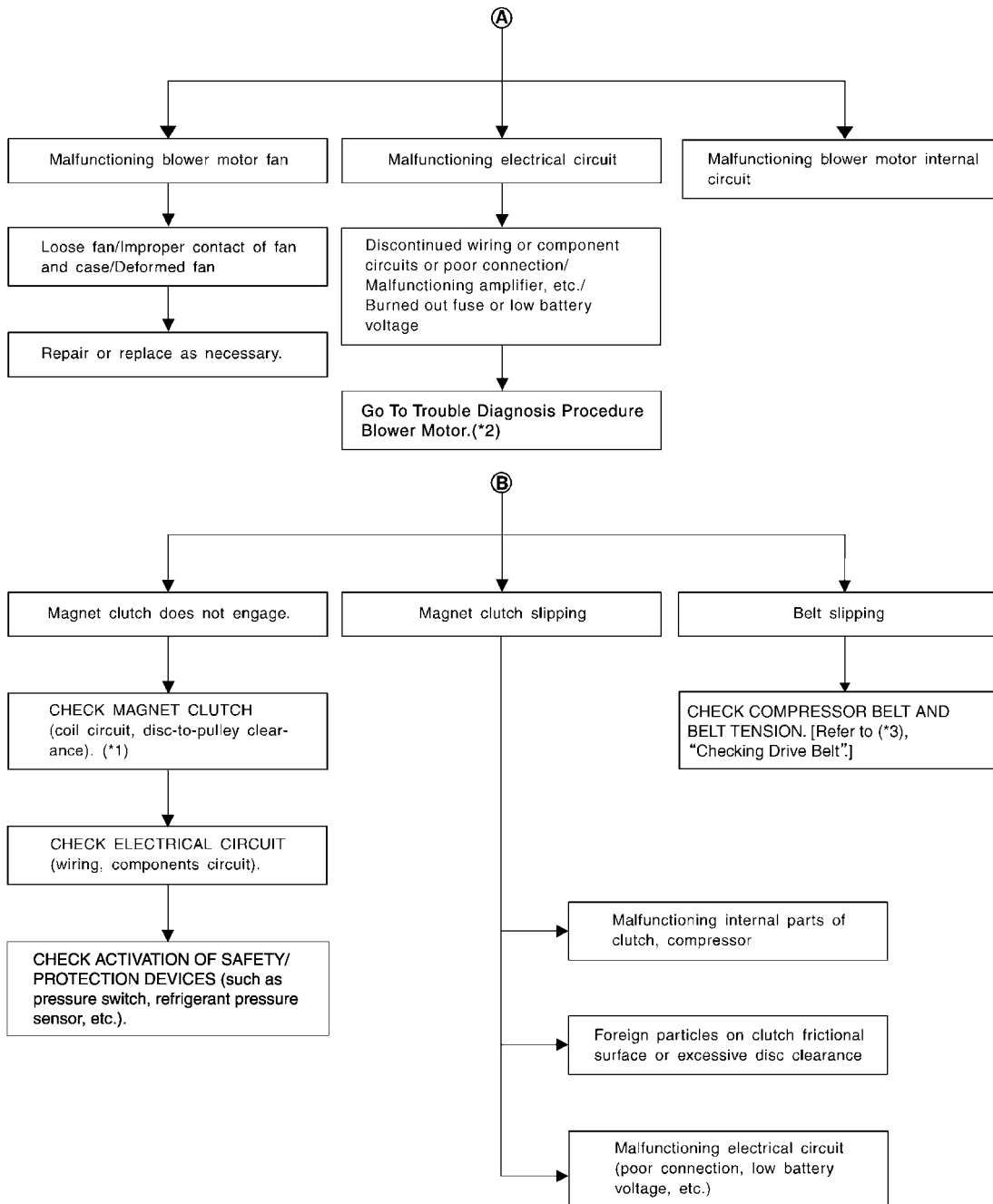
JSIIA0130GB

- # HA-131

REFRIGERATION SYSTEM

< ON-VEHICLE MAINTENANCE >

[MANUAL AIR CONDITIONER (HR/MR)]



SJIA1642E

*2 [HAC-187. "Diagnosis Chart By Symptom"](#)

*3 [EM-15. "Checking" \(HR\)](#), [EM-134. "Checking" \(MR\)](#)

Refrigerant Leaks

INFOID:0000000001098158

Perform a visual inspection of all refrigeration parts, fittings, hoses and components for signs of A/C lubricant leakage, damage and corrosion. A/C lubricant leakage may indicate an area of refrigerant leakage. Allow extra inspection time in these areas when using either an electrical leak detector or fluorescent dye leak detector (SST: J-42220).

If dye is observed, confirm the leak with an electrical leak detector. It is possible a prior leak was repaired and not properly cleaned.

REFRIGERATION SYSTEM

< ON-VEHICLE MAINTENANCE >

[MANUAL AIR CONDITIONER (HR/MR)]

When searching for leaks, do not stop when one leak is found but continue to check for additional leaks at all system components and connections.

When searching for refrigerant leaks using an electrical leak detector, move the probe along the suspected leak area at 1 to 2 inches per second and no further than 1/4 inch from the component.

CAUTION:

Moving the electrical leak detector probe slower and closer to the suspected leak area will improve the chances of finding a leak.

A

B

C

D

E

F

G

H

HA

J

K

L

M

N

O

P

FLUORESCENT LEAK DETECTOR

Inspection

INFOID:000000001098159

CHECKING SYSTEM FOR LEAKS USING THE FLUORESCENT LEAK DETECTOR

1. Check A/C system for leaks using the UV lamp and safety goggles (SST: J-42220) in a low sunlight area (area without windows preferable). Illuminate all components, fittings and lines. The dye will appear as a bright green/yellow area at the point of leakage. Fluorescent dye observed at the evaporator drain opening indicates an evaporator core assembly (tubes, core or expansion valve) leak.
2. If the suspected area is difficult to see, use an adjustable mirror or wipe the area with a clean shop rag or cloth, with the UV lamp for dye residue.
3. After the leak is repaired, remove any residual dye using dye cleaner (SST: J-43872) to prevent future misdiagnosis.
4. Perform a system performance check and verify the leak repair with an approved electrical leak detector.

NOTE:

Other gases in the work area or substances on the A/C components, for example, anti-freeze, windshield washer fluid, solvents and lubricants, may falsely trigger the leak detector. Make sure the surfaces to be checked are clean.

Clean with a dry cloth or blow off with shop air.

Do not allow the sensor tip of the detector to contact with any substance. This can also cause false readings and may damage the detector.

DYE INJECTION

(This procedure is only necessary when recharging the system or when the compressor has seized and was replaced.)

1. Check A/C system static (at rest) pressure. Pressure must be at least 345 kPa (3.52 kg/cm², 50 psi).
2. Pour one bottle (1/4 ounce / 7.4 cc) of the A/C refrigerant dye into the injector tool (SST: J-41459).
3. Connect the injector tool to the A/C low-pressure side service valve.
4. Start the engine and switch A/C ON.
5. When the A/C operating (compressor running), inject one bottle (1/4 ounce / 7.4 cc) of fluorescent dye through the low-pressure service valve using dye injector tool (SST: J-41459) (refer to the manufacture's operating instructions).
6. With the engine still running, disconnect the injector tool from the service valve.

CAUTION:

Be careful the A/C system or replacing a component, pour the dye directly into the open system connection and proceed with the service procedures.

7. Operate the A/C system for a minimum of 20 minutes to mix the dye with the system oil. Depending on the leak size, operating conditions and location of the leak, it may take from minutes to days for the dye to penetrate a leak and become visible.
8. Attach a blue label as necessary.

ELECTRICAL LEAK DETECTOR

< ON-VEHICLE MAINTENANCE >

[MANUAL AIR CONDITIONER (HR/MR)]

ELECTRICAL LEAK DETECTOR

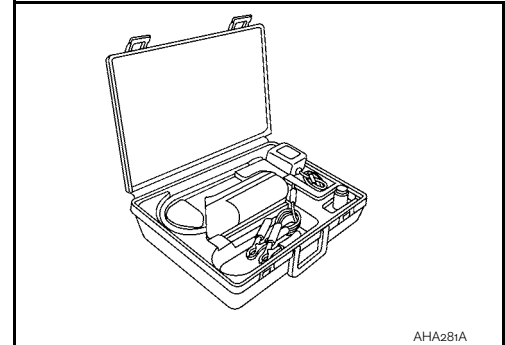
Inspection

INFOID:000000001098160

PRECAUTIONS FOR HANDLING LEAK DETECTOR

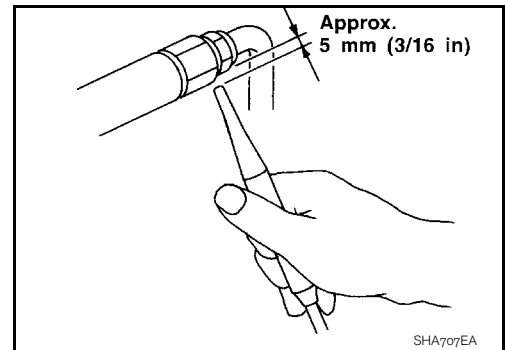
When performing a refrigerant leak check, use an electrical leak detector (SST: J-41995) or equivalent. Ensure that the instrument is calibrated and set properly per the operating instructions.

The leak detector is a delicate device. In order to use the leak detector properly, read the operating instructions and perform any specified maintenance.



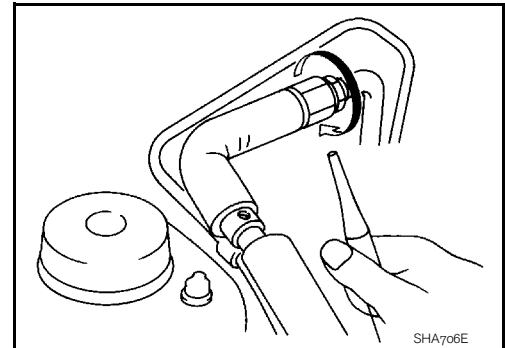
AHA281A

1. Position probe approximately 5 mm (3/16 in) away from point to be checked.



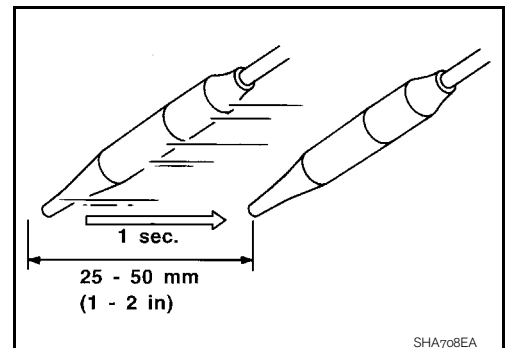
SHA707EA

2. When testing, circle each fitting completely with probe.



SHA706E

3. Move probe along component approximately 25 to 50 mm (1 to 2 in)/sec.



SHA708EA

CHECKING PROCEDURE

To prevent inaccurate or false readings, make sure there is no refrigerant vapor, shop chemicals, or cigarette smoke in the vicinity of the vehicle. Perform the leak test in calm area (low air/wind movement) so that the leaking refrigerant is not dispersed.

1. Stop the engine.

ELECTRICAL LEAK DETECTOR

< ON-VEHICLE MAINTENANCE >

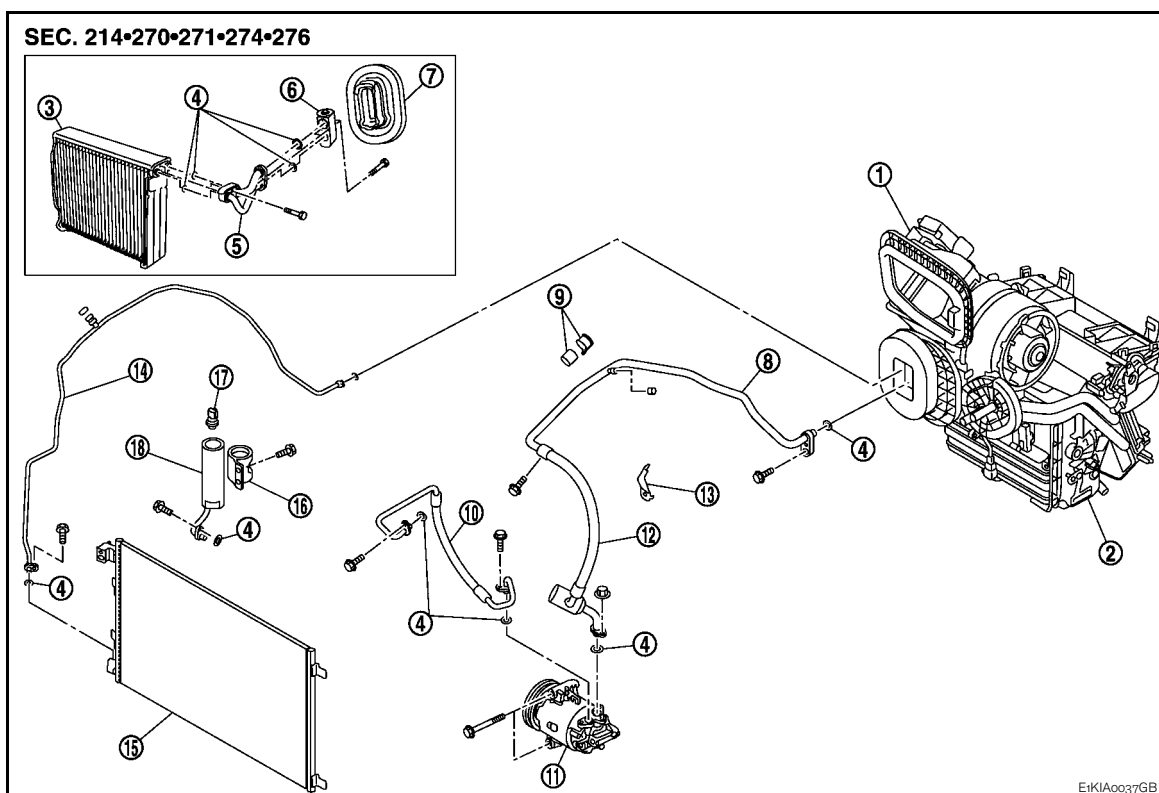
[MANUAL AIR CONDITIONER (HR/MR)]

2. Connect a suitable A/C manifold gauge set (SST: J-39183) to the A/C service valves.
3. Check if the A/C refrigerant pressure is at least 345 kPa (3.52 kg/cm², 50 psi) above 16°C (61°F). If less than specification, recover/evacuate and recharge the system with the specified amount of refrigerant.

NOTE:

At temperatures below 16°C (61°F), leaks may not be detected since the system may not reach 345 kPa (3.52 kg/cm², 50 psi).

4. Perform the leak test from the high-pressure side (compressor discharge a to evaporator inlet j) to the low-pressure side (evaporator drain hose k to shaft seal p). Perform a leak check for the following areas carefully. Clean the component to be checked and move the leak detected probe completely around the connection/component.



- | | | |
|-------------------------------------|--|--|
| 1. Heater & blower unit assembly | 2. Heater & cooling unit assembly | 3. Evaporator |
| 4. O-ring | 5. Low pressure pipe 1 and high pressure pipe 2 assembly | 6. Expansion valve |
| 7. Heater sealing | 8. Low pressure flexible hose and pipe 2 | 9. Low pressure pipe 2 fixing clamp assembly |
| 10. High pressure flexible hose | 11. Compressor | 12. Low pressure flexible hose |
| 13. Low & high pipe bracket support | 14. High pressure pipe 1 | 15. Condenser assembly |
| 16. Liquid tank fixing bracket | 17. Refrigerant pressure sensor | 18. Liquid tank |

Compressor

Check the fitting of high- and low-pressure flexible hoses, relief valve and shaft seal.

Condenser

Check the fitting of condenser pipe assembly, high-pressure flexible hose and pipe.

Liquid tank

Check the fitting of radiator & condenser assembly and refrigerant pressure sensor.

Service valves

Check all around the service valves. Ensure service valve caps are secured on the service valves (to prevent leaks).

NOTE:

After removing A/C manifold gauge set from service valves, wipe any residue from valves to prevent any false readings by leak detector.

Cooling unit (Evaporator)

ELECTRICAL LEAK DETECTOR

< ON-VEHICLE MAINTENANCE >

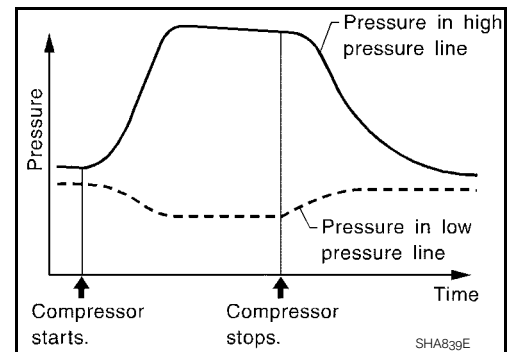
[MANUAL AIR CONDITIONER (HR/MR)]

With engine OFF, turn blower fan on "High" for at least 15 seconds to dissipate any refrigerant trace in the cooling unit. Wait a minimum of 10 minutes accumulation time (refer to the manufacturer's recommended procedure for actual wait time) before inserting the leak detector probe into the drain hose. Keep the probe inserted for at least 10 seconds. Use caution not to contaminate the probe tip with water or dirt that may be in the drain hose.

5. If a leak detector detects a leak, verify at least once by blowing compressed air into area of suspected leak, then repeat check as outlined above.
6. Do not stop when one leak is found. Continue to check for additional leaks at all system components. If no leaks are found, perform steps 7 - 10.
7. Start the engine.
8. Set the A/C control as follows;
 - a. A/C switch: ON
 - b. MODE door position: VENT (Ventilation)
 - c. Intake door position: Recirculation
 - d. Temperature setting: Max. cold
 - e. Fan speed: High
9. Run engine at 1,500 rpm for at least 2 minutes.

10. Stop the engine and perform leak check again following steps 4 through 6 above.

Refrigerant leaks should be checked immediately after stopping the engine. Begin with the leak detector at the compressor. The pressure on the high-pressure side will gradually drop after refrigerant circulation stops and pressure on the low-pressure side will gradually rise, as shown in the graph. Some leaks are more easily detected when pressure is high.



11. Before connecting recovery/recycling recharging equipment to vehicle, check recovery/recycling recharging equipment gauges. No refrigerant pressure should be displayed. If pressure is displayed, recover refrigerant from equipment lines and then check refrigerant purity.
12. Confirm refrigerant purity in supply tank using recovery/recycling recharging equipment and refrigerant identifier.
13. Confirm refrigerant purity in vehicle A/C system using recovery/recycling recharging equipment and refrigerant identifier.
14. Discharge A/C system using approved refrigerant recovery equipment. Repair the leaking fitting or component if necessary.
15. Evacuate and recharge A/C system and perform the leak test to confirm no refrigerant leaks.
16. Perform A/C performance test to ensure system works properly.

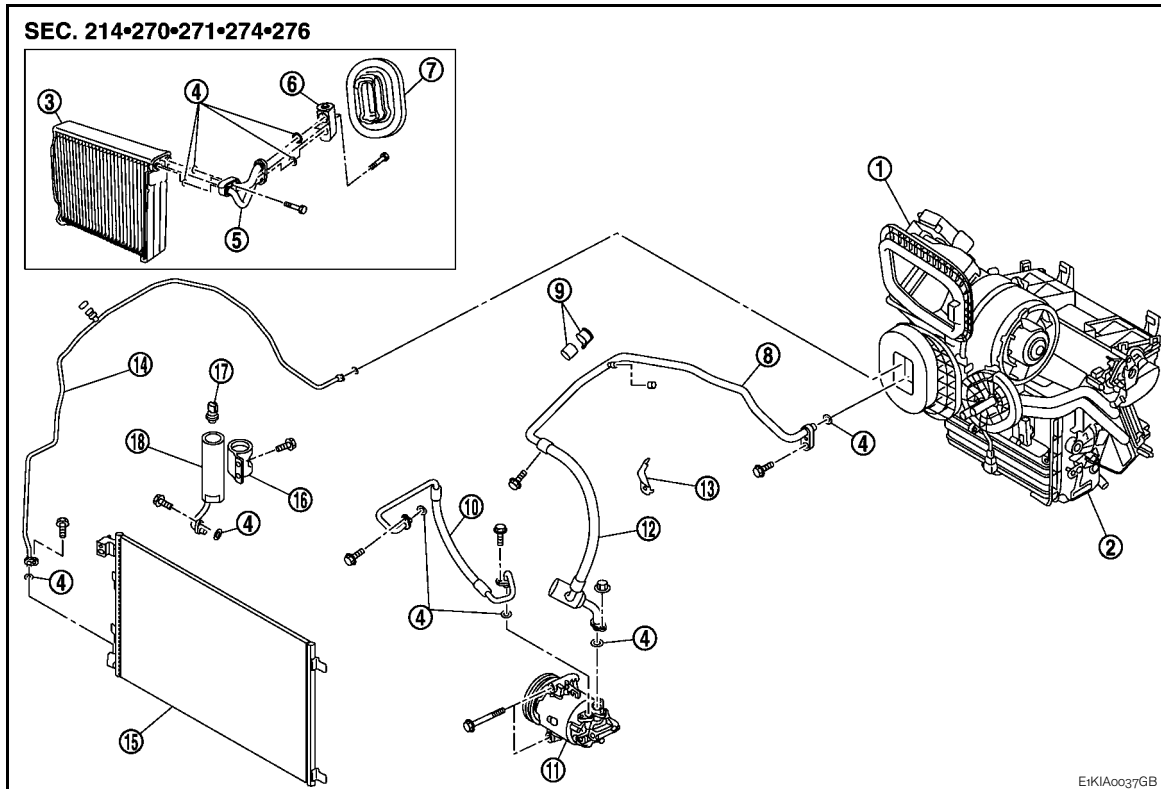
ON-VEHICLE REPAIR

REFRIGERATION SYSTEM

Exploded View

INFOID:000000001098161

Refer to [HA-171, "Refrigerant Connection"](#).



- | | | |
|-------------------------------------|--|--|
| 1. Heater & blower unit assembly | 2. Heater & cooling unit assembly | 3. Evaporator |
| 4. O-ring | 5. Low pressure pipe 1 and high pressure pipe 2 assembly | 6. Expansion valve |
| 7. Heater sealing | 8. Low pressure flexible hose and pipe 2 | 9. Low pressure pipe 2 fixing clamp assembly |
| 10. High pressure flexible hose | 11. Compressor | 12. Low pressure flexible hose |
| 13. Low & high pipe bracket support | 14. High pressure pipe 1 | 15. Condenser assembly |
| 16. Liquid tank fixing bracket | 17. Refrigerant pressure sensor | 18. Liquid tank |

Inspection After Installation

INFOID:000000001098162

SETTING OF SERVICE TOOLS AND EQUIPMENT

Discharging Refrigerant

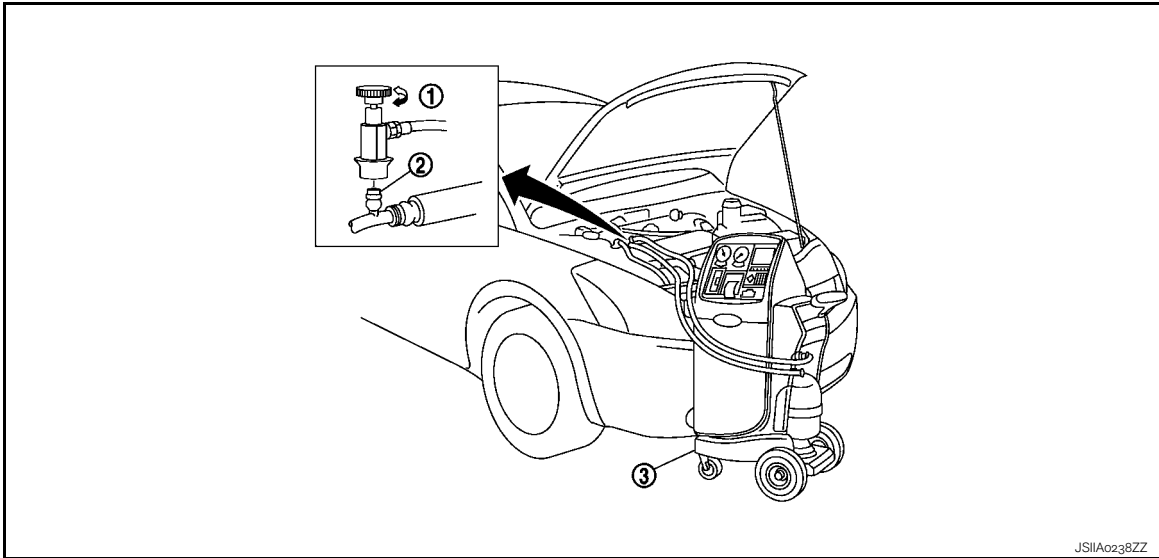
WARNING:

Avoid breathing A/C refrigerant and lubricant vapor or mist. Exposure may irritate eyes, nose and throat. Remove HFC-134a (R-134a) from 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]. If accidental system discharge occurs, ventilate work area before resuming service. Additional health and safety information may be obtained from refrigerant and lubricant manufacturers.

REFRIGERATION SYSTEM

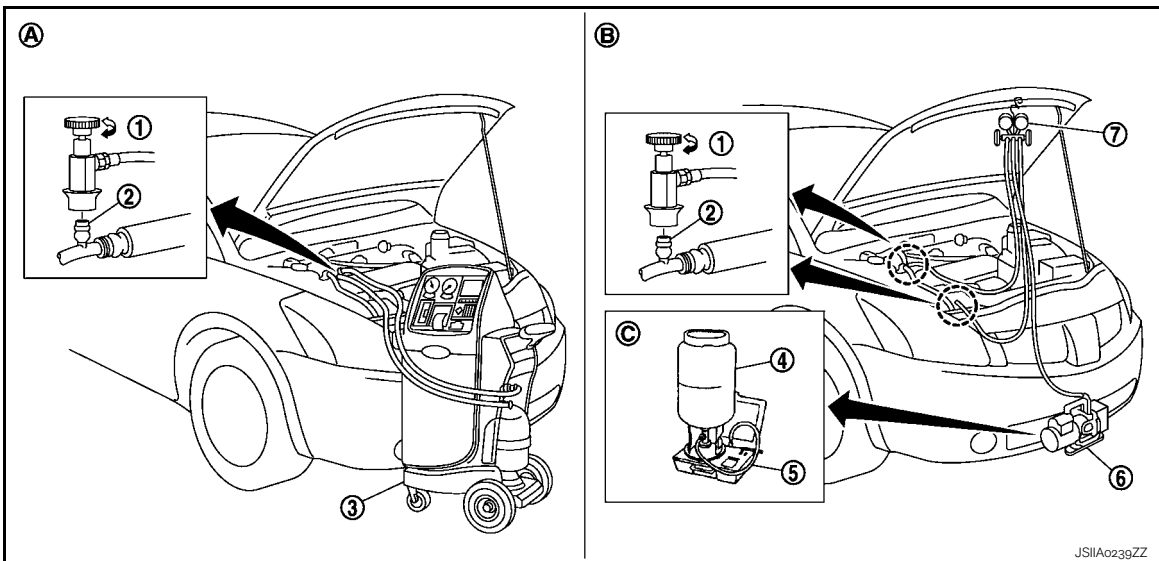
< ON-VEHICLE REPAIR >

[MANUAL AIR CONDITIONER (HR/MR)]



- 1. Shut-off valve
- 2. A/C service valve
- 3. Recovery/Recycling/Recharging equipment

Evacuating System and Charging Refrigerant

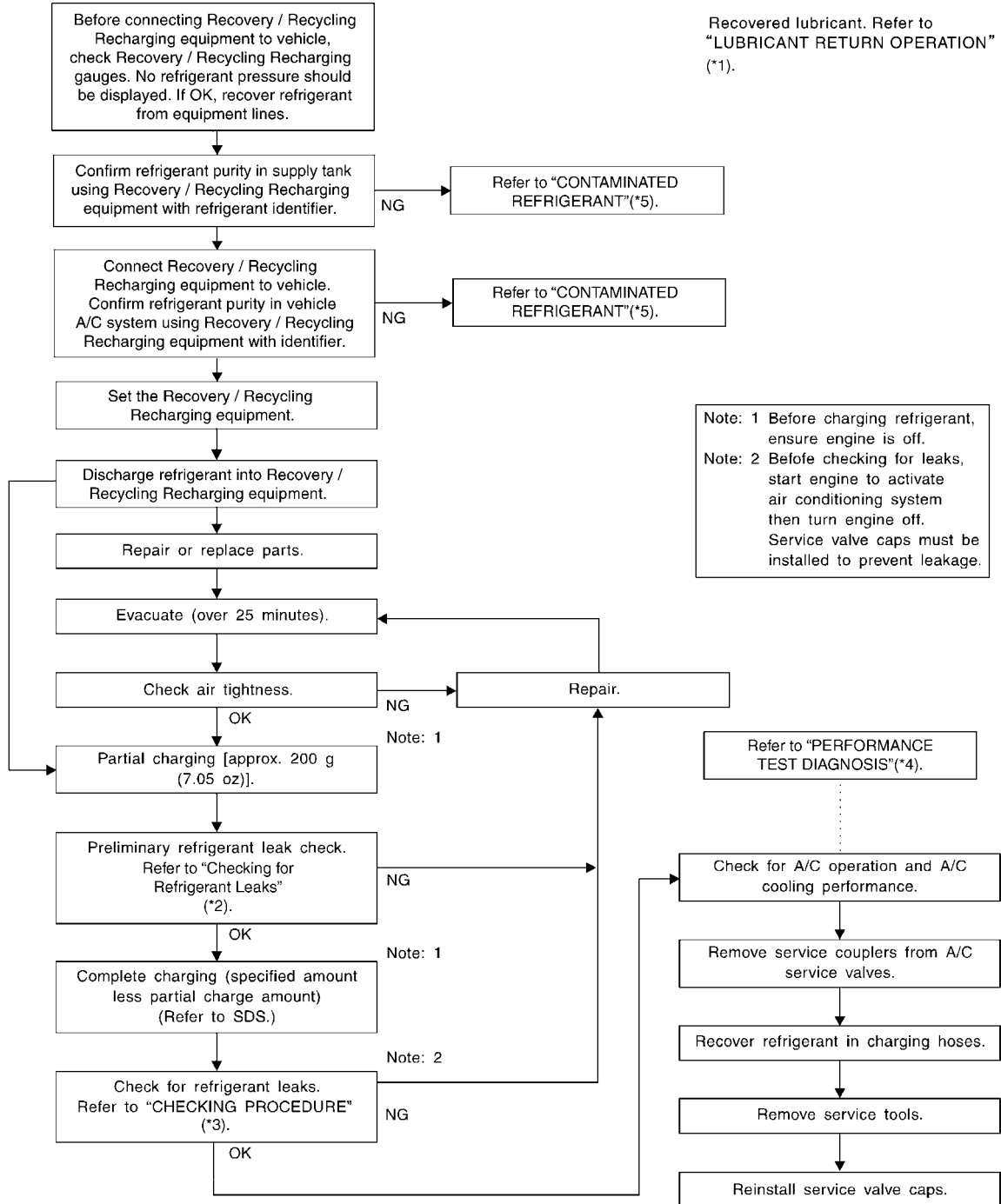


- 1. Shut-off valve
 - 2. A/C service valve
 - 3. Recovery/Recycling/Recharging equipment
 - 4. Refrigerant container (HFC-134a)
 - 5. Weight scale (J-39650)
 - 6. Vacuum pump (J-39649)
 - 7. Manifold gauge set (J-39183)
- A. Preferred (best) method B. Alternative method C. For charging

REFRIGERATION SYSTEM

< ON-VEHICLE REPAIR >

[MANUAL AIR CONDITIONER (HR/MR)]



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*1 [HA-180, "Adjustment"](#)

*2 "REFRIGERANT LEAKS" in [HA-132, "Refrigerant Leaks"](#) (HR/MR), [HA-183, "Refrigerant Leaks"](#) (K9K).

*3 "CHECKING PROCEDURE" in [HA-182, "Inspection"](#).

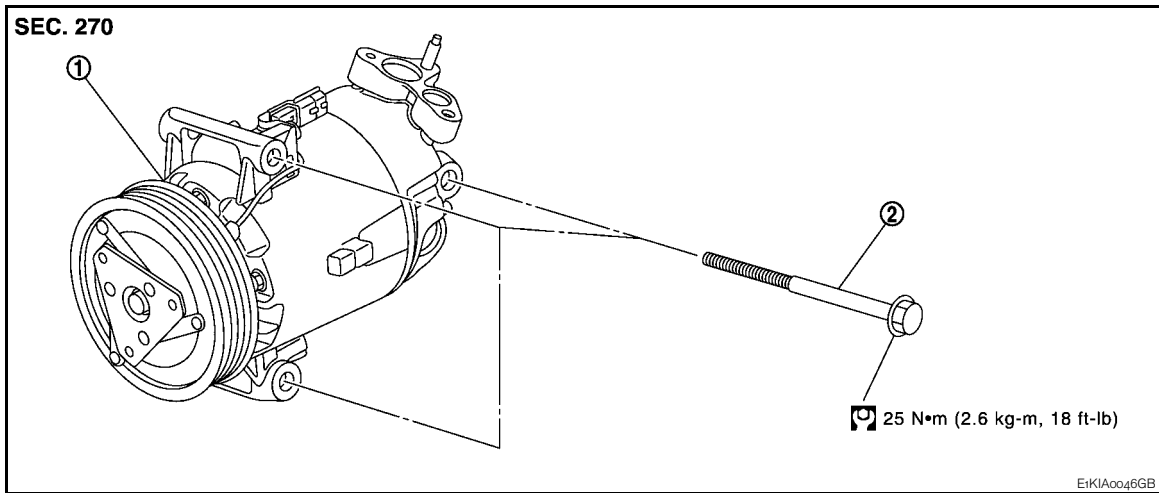
*4 "PERFORMANCE TEST DIAGNOSIS" in [HA-182, "Inspection"](#).

*5 "CONTAMINATED REFRIGERANT" in [HA-170, "Working with HFC-134a \(R-134a\)"](#).

COMPRESSOR

Exploded View

INFOID:000000001098163



1. Compressor

2. Bolt

Refer to [GI-4, "Components"](#) for symbols in the figure.

Removal and Installation

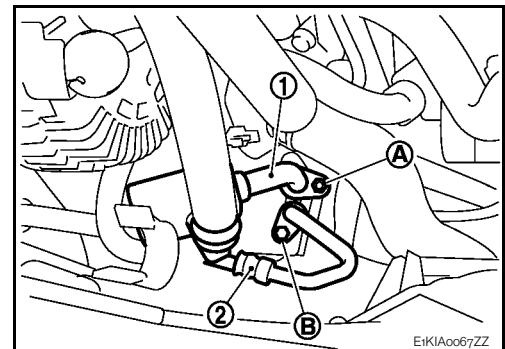
INFOID:000000001098164

REMOVAL

1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
2. Remove engine cover ornament.
3. Remove air intake hoses (RH) and air duct (LH). Refer to [EM-27, "Exploded View"](#) (HR), [EM-144, "Removal and Installation"](#) (MR).
4. Remove engine undercover, using power tools.
5. Drain engine coolant from radiator. Refer to [CO-9, "Draining"](#) (HR), [CO-30, "Draining"](#) (MR).
6. Remove drive belt. Refer to [EM-16, "Removal and Installation"](#) (HR), [EM-134, "Removal and Installation"](#) (MR).
7. Remove lower radiator hose from engine. Refer to [CO-13, "Exploded View"](#) (HR), [CO-34, "Exploded View"](#) (MR).
8. Remove mounting nuts (A) from low-pressure flexible hose (1) and mounting bolt (B) from high-pressure flexible hose (2).
9. Remove low-pressure flexible hose and high-pressure flexible hose from compressor.

CAUTION:

Cap or wrap the joint of compressor, low-pressure flexible hose and high-pressure flexible hose with suitable material such as vinyl tape to avoid the entry of air.



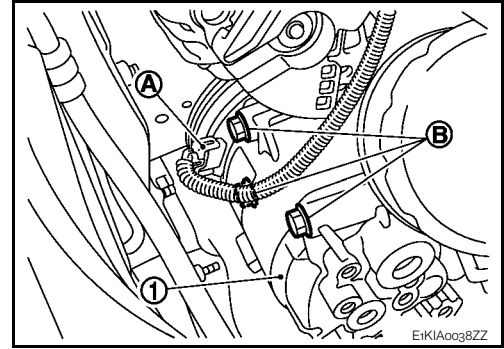
10. Disconnect harness connector from compressor.

COMPRESSOR

< ON-VEHICLE REPAIR >

[MANUAL AIR CONDITIONER (HR/MR)]

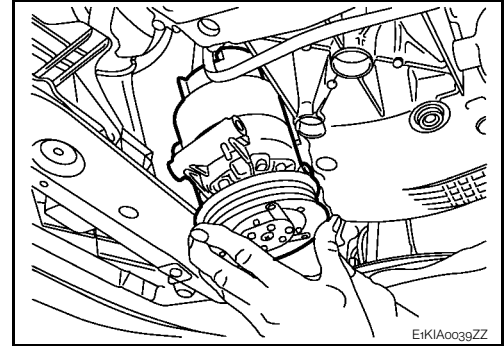
11. Remove compressor harness connector (A), then remove mounting bolts (B) from compressor (1), using power tools.



12. Remove the compressor from the vehicle.

Compressor fixing bolt to engine

: 25 N·m (2.6 kg-m, 18.5 ft-lb)



INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

- Replace O-rings of low-pressure flexible hose and high-pressure flexible hose with new ones, and then apply compressor oil to it when installing it.
- When recharging refrigerant, check for leaks.

LOW-PRESSURE FLEXIBLE HOSE AND PIPE 2

< ON-VEHICLE REPAIR >

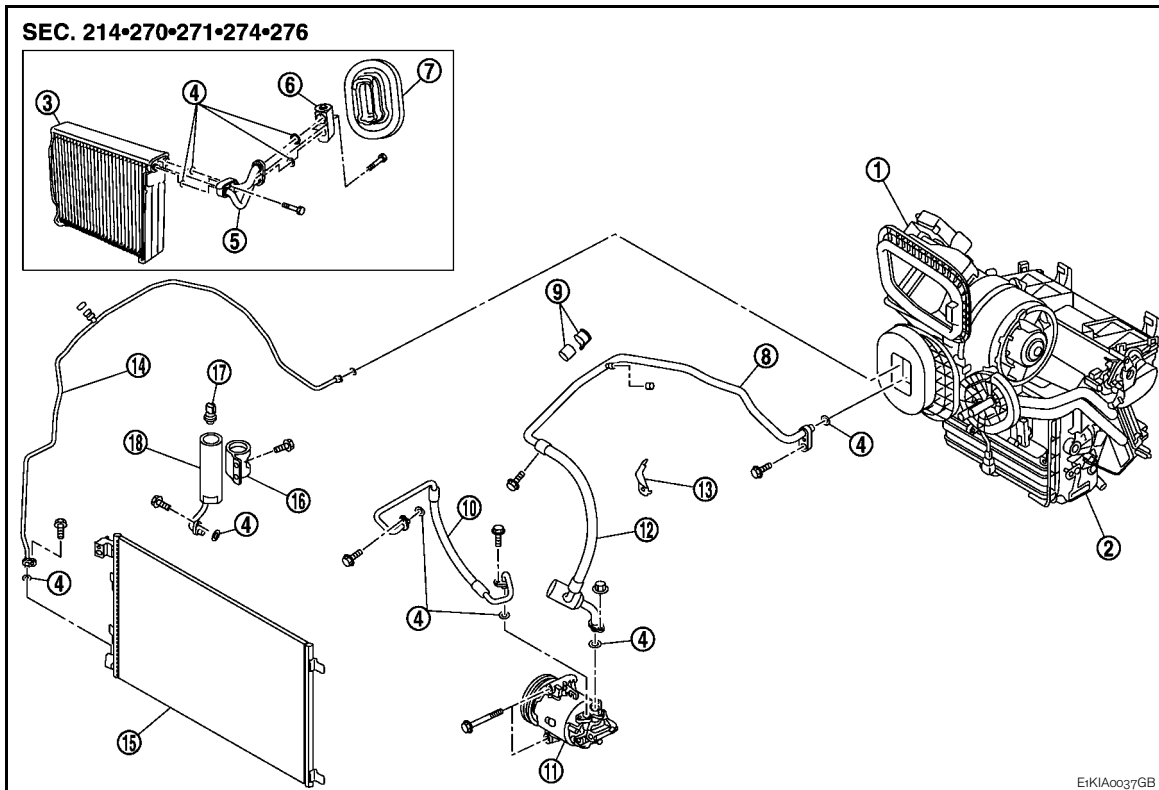
[MANUAL AIR CONDITIONER (HR/MR)]

LOW-PRESSURE FLEXIBLE HOSE AND PIPE 2

Exploded View

INFOID:000000001098166

Refer to [HA-171. "Refrigerant Connection"](#).



- | | | |
|-------------------------------------|--|--|
| 1. Heater & blower unit assembly | 2. Heater & cooling unit assembly | 3. Evaporator |
| 4. O-ring | 5. Low pressure pipe 1 and high pressure pipe 2 assembly | 6. Expansion valve |
| 7. Heater sealing | 8. Low pressure flexible hose and pipe 2 | 9. Low pressure pipe 2 fixing clamp assembly |
| 10. High pressure flexible hose | 11. Compressor | 12. Low pressure flexible hose |
| 13. Low & high pipe bracket support | 14. High pressure pipe 1 | 15. Condenser assembly |
| 16. Liquid tank fixing bracket | 17. Refrigerant pressure sensor | 18. Liquid tank |

Removal and Installation

INFOID:000000001098167

REMOVAL

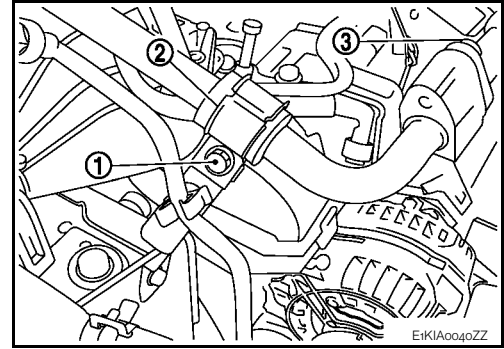
1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
2. Remove upper engine cover ornament. Refer to [EM-146. "Exploded View"](#) (MR).
3. Remove air intake hose (RH side), and air duct (LH). Refer to [EM-27. "Exploded View"](#) (HR), [EM-144. "Exploded View"](#) (MR).

LOW-PRESSURE FLEXIBLE HOSE AND PIPE 2

< ON-VEHICLE REPAIR >

[MANUAL AIR CONDITIONER (HR/MR)]

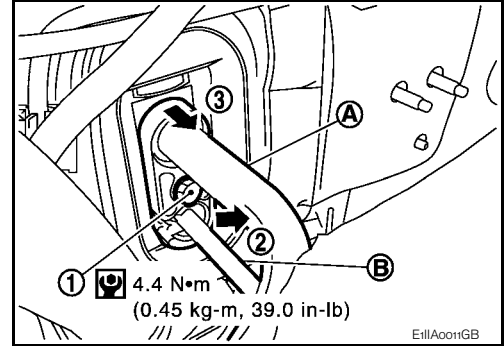
4. Remove mounting bolt (1) and clamp (2), from low pressure pipe bracket support.
5. Remove low and high-pressure maintaining clip, from both pipes then remove fixing bolt (3).
6. Remove engine room insulator fixing clip from cowl top.



7. Pull engine room insulator, then remove pipes bracket fixing bolt (1), from expansion valve, and release pipes fixing bracket as shown in order (1) to (3) from high pressure pipe 1 (B), to remove low pressure flexible hose and pipe 2 (A) from expansion valve.

CAUTION:

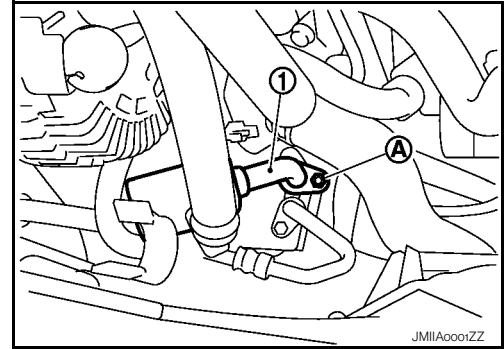
Cap or wrap the joint of the low pressure then remove fixing bolt (3) pipe 2, and expansion valve exit with suitable material such as vinyl tape to avoid the entry of air.



8. Remove low pressure flexible hose fixing nut (A), from air conditioner compressor, and remove low pressure flexible hose (1).

CAUTION:

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



INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

- Replace O-rings of low-pressure flexible hose and low-pressure pipe 2 with new ones, and then apply compressor oil to it when installing it.
- 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 make sure that connection does not come loose.
- When recharging refrigerant, check for leaks.

[MANUAL AIR CONDITIONER (HR/MR)]

INFOID:0000000001098168

- | | | |
|-------------------------------------|--|--|
| 1. Heater & blower unit assembly | 2. Heater & cooling unit assembly | 3. Evaporator |
| 4. O-ring | 5. Low pressure pipe 1 and high pressure pipe 2 assembly | 6. Expansion valve |
| 7. Heater sealing | 8. Low pressure flexible hose and pipe 2 | 9. Low pressure pipe 2 fixing clamp assembly |
| 10. High pressure flexible hose | 11. Compressor | 12. Low pressure flexible hose |
| 13. Low & high pipe bracket support | 14. High pressure pipe 1 | 15. Condenser assembly |
| 16. Liquid tank fixing bracket | 17. Refrigerant pressure sensor | 18. Liquid tank |

INFOID:0000000001098169

1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
2. Remove engine cover ornament. Refer to [EM-146, "Exploded View"](#) (MR).
3. Remove air intake hose (RH) and air duct (LH). Refer to [EM-27, "Exploded View"](#) (HR), [EM-144, "Exploded View"](#) (MR).
4. Remove front grille. Refer to [EXT-17, "Exploded View"](#).
5. Remove radiator air guide (RH). Refer to [CO-13, "Exploded View"](#) (HR), [CO-34, "Exploded View"](#) (MR).

HIGH-PRESSURE FLEXIBLE HOSE

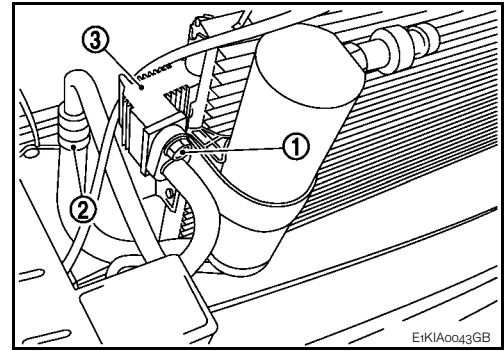
< ON-VEHICLE REPAIR >

[MANUAL AIR CONDITIONER (HR/MR)]

6. Remove high pressure flexible hose fixing bolt (1) from condenser (3), then pull high pressure flexible hose (2) to remove it from condenser.

CAUTION:

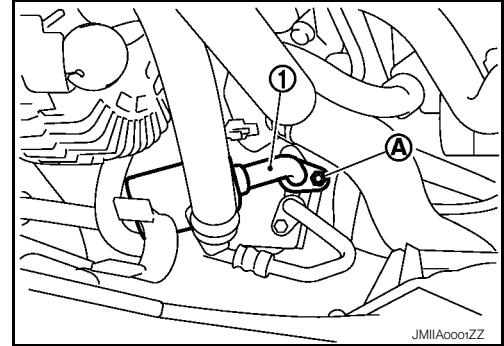
Cap or wrap the joint of high-pressure flexible hose and condenser assembly with suitable material such as vinyl tape to avoid the entry of air.



7. Remove high pressure flexible hose fixing nut (A) from compressor, then pull high pressure flexible hose (1) to remove it from compressor. Remove high pressure flexible hose.

CAUTION:

Cap or wrap the joint of compressor and high-pressure flexible hose with suitable material such as vinyl tape to avoid the entry of air.



High pressure fixing bolt to condenser

: 4.4 N·m (0.45 kg-m, 39 in-lb)

High pressure fixing bolt to compressor

: 4.4 N·m (0.45 kg-m, 39 in-lb)

INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

- Replace O-rings of high-pressure flexible hose with new ones, and then apply compressor oil to it when installing it.
- 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 make sure that connection does not come loose.
- When recharging refrigerant, check for leaks.

[MANUAL AIR CONDITIONER (HR/MR)]

INFOID:0000000001098170

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- | | | |
|-------------------------------------|--|--|
| 1. Heater & blower unit assembly | 2. Heater & cooling unit assembly | 3. Evaporator |
| 4. O-ring | 5. Low pressure pipe 1 and high pressure pipe 2 assembly | 6. Expansion valve |
| 7. Heater sealing | 8. Low pressure flexible hose and pipe 2 | 9. Low pressure pipe 2 fixing clamp assembly |
| 10. High pressure flexible hose | 11. Compressor | 12. Low pressure flexible hose |
| 13. Low & high pipe bracket support | 14. High pressure pipe 1 | 15. Condenser assembly |
| 16. Liquid tank fixing bracket | 17. Refrigerant pressure sensor | 18. Liquid tank |

INFOID:0000000001098171

1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
2. Remove engine cover ornament.
3. Remove intake hose (RH) and air duct (LH). Refer to [EM-27, "Removal and Installation"](#), [EM-144, "Removal and Installation"](#), [EM-265, "Removal and Installation"](#).

HIGH-PRESSURE PIPE 1 (ENGINE COMPARTMENT)

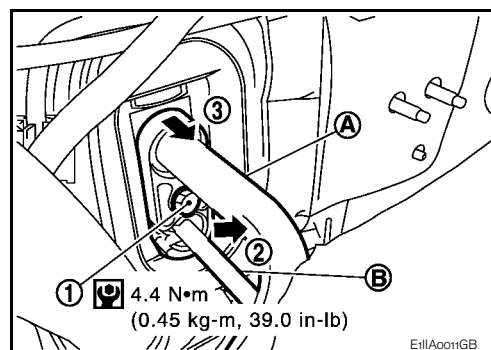
< ON-VEHICLE REPAIR >

[MANUAL AIR CONDITIONER (HR/MR)]

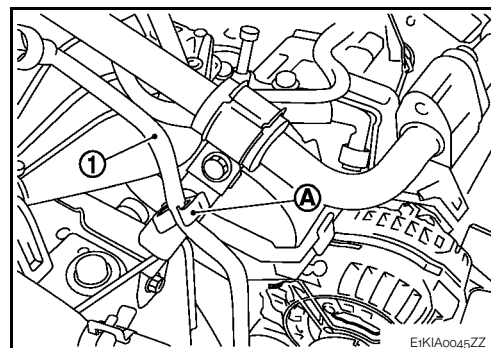
4. Pull engine room insulator, then remove pipes bracket fixing bolt (1), from expansion valve, then release pipe fixing bracket as shown from (1) to (3) from high pressure pipe 1 (B), to disconnect it from expansion valve.

CAUTION:

Cap or wrap the joint of the high pressure pipe 1, and expansion valve in, with suitable material such as vinyl tape to avoid the entry of air.



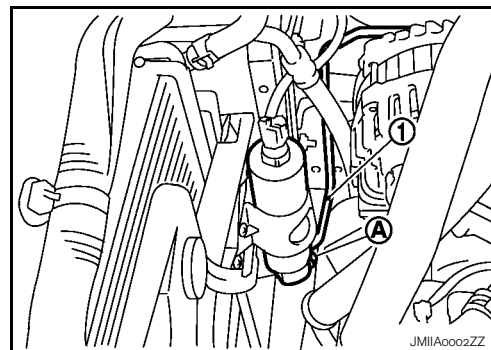
5. Remove high pressure pipe 1 (1) from clip (A).



Remove high-pressure pipe 1 mounting bolt (A) from liquid tank, then remove high-pressure pipe 1 (1).

CAUTION:

Cap or wrap the joint of the high pressure pipe 1, and liquid tank, with suitable material such as vinyl tape to avoid the entry of air.



INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

- Replace O-rings of high-pressure pipe 1 with new ones, and then apply compressor oil to it when installing it.
- 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 make sure that connection does not come loose.
- When recharging refrigerant, check for leaks.

LOW-PRESSURE PIPE 1 AND HIGH-PRESSURE PIPE 2

< ON-VEHICLE REPAIR >

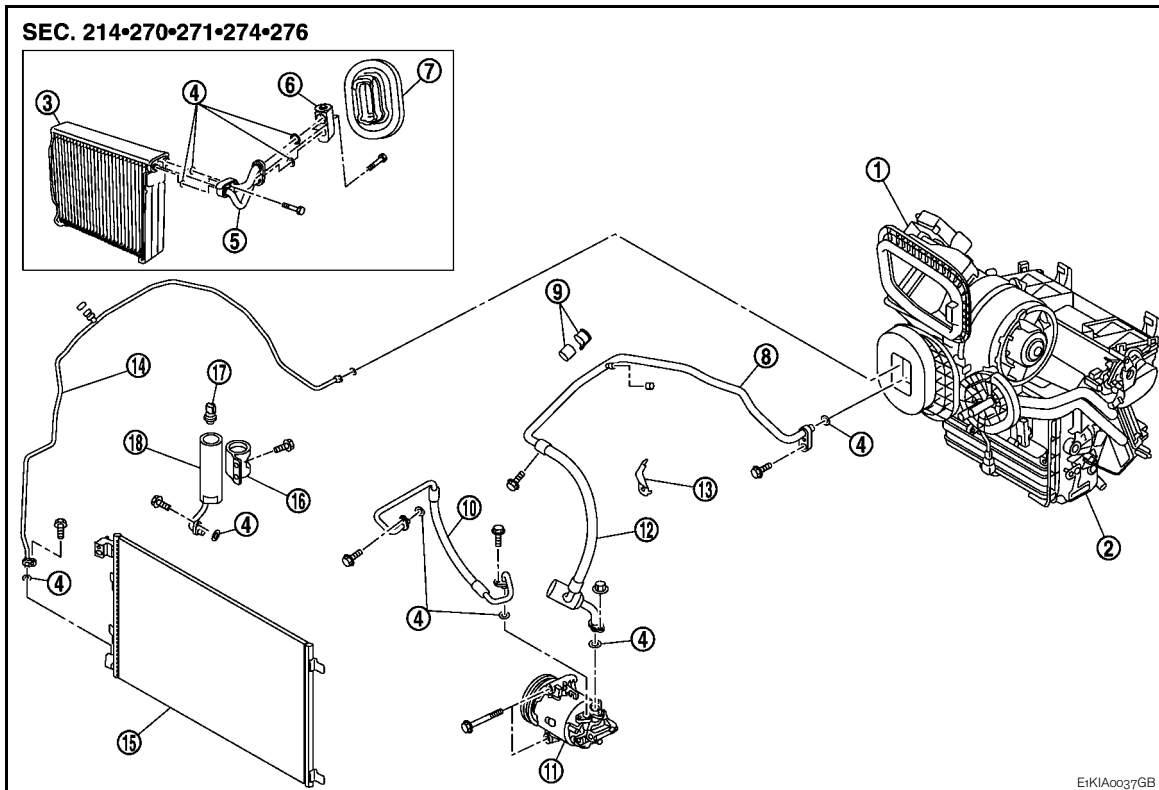
[MANUAL AIR CONDITIONER (HR/MR)]

LOW-PRESSURE PIPE 1 AND HIGH-PRESSURE PIPE 2

Exploded View

INFOID:000000001098172

Refer to [HA-171. "Refrigerant Connection"](#).



- | | | |
|-------------------------------------|--|--|
| 1. Heater & blower unit assembly | 2. Heater & cooling unit assembly | 3. Evaporator |
| 4. O-ring | 5. Low pressure pipe 1 and high pressure pipe 2 assembly | 6. Expansion valve |
| 7. Heater sealing | 8. Low pressure flexible hose and pipe 2 | 9. Low pressure pipe 2 fixing clamp assembly |
| 10. High pressure flexible hose | 11. Compressor | 12. Low pressure flexible hose |
| 13. Low & high pipe bracket support | 14. High pressure pipe 1 | 15. Condenser assembly |
| 16. Liquid tank fixing bracket | 17. Refrigerant pressure sensor | 18. Liquid tank |

Removal and Installation

INFOID:000000001098173

REMOVAL

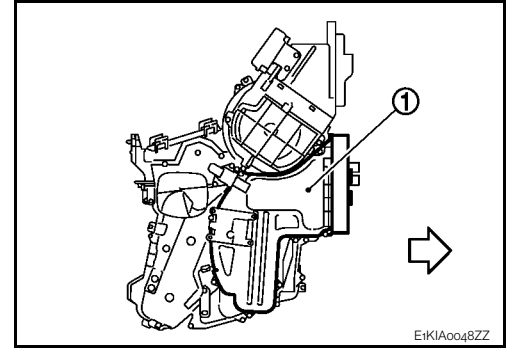
1. Set the temperature at 18°C (60°F), and then disconnect the battery cable from the negative terminal.
 2. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
 3. Remove engine cover ornament. Refer to [EM-27. "Removal and Installation"](#).
 4. Remove high-pressure pipe 1 and low pressure pipe 2 from expansion valve. Refer to [HA-147. "Removal and Installation"](#), [HA-143. "Removal and Installation"](#).
- CAUTION:**
Cap or wrap the joint of the, high-pressure pipe 1, low-pressure pipe 2, and the expansion valve with suitable material such as vinyl tape to avoid the entry of air.
5. Remove heater cooling fixing clamp, and heater hoses. Refer to [CO-21. "Removal and Installation"](#), [CO-44. "Removal and Installation"](#).
 6. Remove instrument panel. Refer to [IP-12. "Removal and Installation"](#).
 7. Remove foot duct (RH / LH). Refer to [VTL-46. "SIDE DEFROSTER DUCTS : Removal and Installation"](#).
 8. Remove steering column. Refer to [ST-10. "Removal and Installation"](#).

LOW-PRESSURE PIPE 1 AND HIGH-PRESSURE PIPE 2

< ON-VEHICLE REPAIR >

[MANUAL AIR CONDITIONER (HR/MR)]

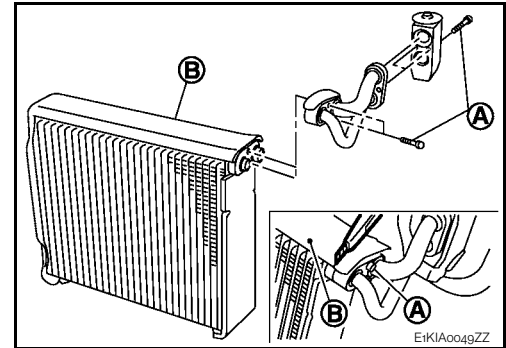
9. Disconnect Heater and cooling unit harness connectors from steering member main harness.
10. Remove steering member.
11. Remove heater and cooling assembly. Refer to [VTL-32. "Removal and Installation"](#).
12. Remove mounting screws, and then remove evaporator cover (1).



13. Using a thin cutter, cut the evaporator insulator (B), and then remove fixing bolt (A) and low-pressure pipe 1 and high-pressure pipe 2 assembly.

CAUTION:

Cap or wrap the joint of expansion valve, high-pressure pipe 2 and low-pressure pipe 1 with suitable material such as vinyl tape to avoid the entry of air.



INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

- Replace O-rings of high-pressure pipe 1, 2 and low-pressure pipe 1, 2 with new ones, and then apply compressor oil to it when installing it.
- 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 make sure that connection does not come loose.
- When recharging refrigerant, check for leaks.

CONDENSER

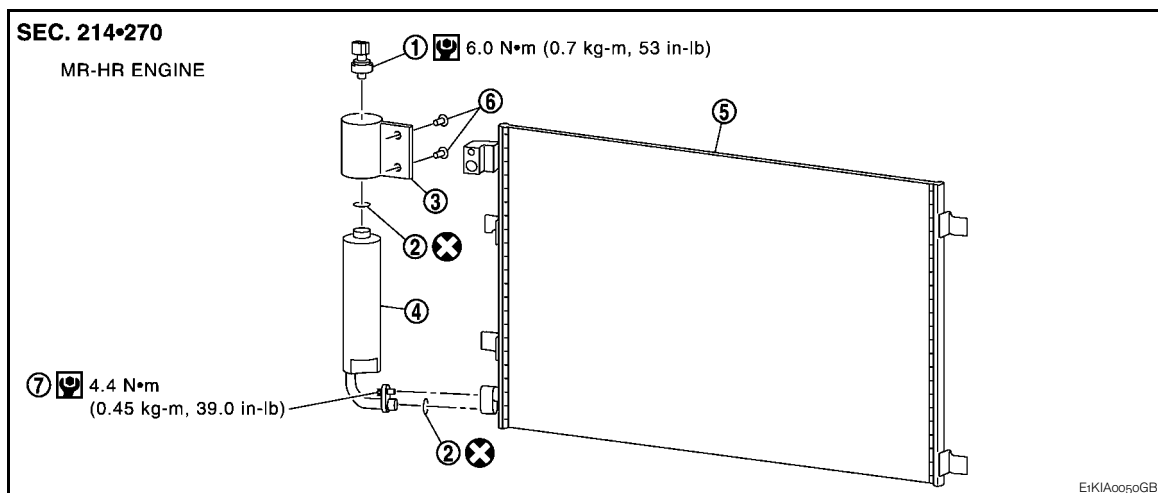
< ON-VEHICLE REPAIR >

[MANUAL AIR CONDITIONER (HR/MR)]

CONDENSER

Exploded View

INFOID:000000001098174



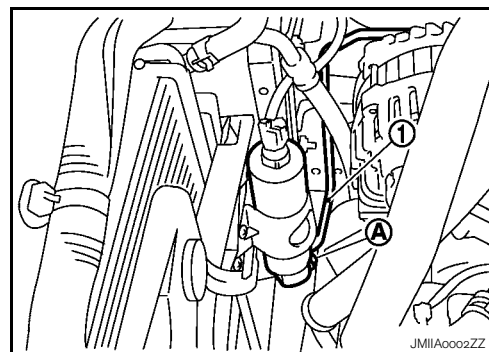
- | | | |
|---------------------------------|--------------|-----------------------------|
| 1. Refrigerant pressure sensor | 2. O-ring | 3. Liquid tank bracket |
| 4. Liquid tank | 5. Condenser | 6. Liquid tank fixing screw |
| 7. Liquid tank pipe fixing bolt | | |

Removal and Installation

INFOID:000000001098175

REMOVAL

- Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
- Remove engine cover ornament. Refer to [EM-27, "Removal and Installation"](#), [EM-144, "Removal and Installation"](#).
- Remove front grille. Refer to [EXT-17, "Removal and Installation"](#).
- Remove radiator hose, and drain coolant. Refer to [CO-13, "Exploded View"](#) (HR), [CO-34, "Exploded View"](#) (MR).
- Remove upper radiator fixing bracket. Refer to [CO-13, "Exploded View"](#) (HR), [CO-34, "Exploded View"](#) (MR).
- Remove radiator air-guide duct (RH). Refer to [CO-13, "Exploded View"](#) (HR), [CO-34, "Exploded View"](#) (MR).
- Remove high-pressure pipe 1 fixing bolt (A) and high pressure pipe (1) from liquid tank. Refer to [HA-147, "Removal and Installation"](#).
- Remove high-pressure flexible pipe 1 from condenser. Refer to [HA-145, "Removal and Installation"](#).
CAUTION:
Cap or wrap the joint of low and high-pressure pipe 1 and condenser with suitable material such as vinyl tape to avoid the entry of air.
- Remove harness connector from refrigerant pressure sensor.
- Remove liquid tank pipes and liquid tank from condenser and radiator. Refer to [HA-153, "Removal and Installation"](#).
CAUTION:
Cap or wrap the joint of liquid tank pipes and condenser with suitable material such as vinyl tape to avoid the entry of air.
- Remove radiator fixing brackets. Refer to [CO-13, "Exploded View"](#) (HR), [CO-34, "Exploded View"](#) (MR).
- Release radiator maintaining pawls, then pull-up the condenser assembly to release it from radiator. Refer to [CO-13, "Removal and Installation"](#) (HR), [CO-35, "Removal and Installation"](#) (MR).



CONDENSER

< ON-VEHICLE REPAIR >

[MANUAL AIR CONDITIONER (HR/MR)]

13. Maintain radiator pushing back.
14. Pull upward to remove condenser.

CAUTION:

Take care do not damaged condenser or radiator.

INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

- Replace O-rings of high-pressure flexible hose and high-pressure pipe 1 with new ones, and then apply compressor oil to it when installing it.
- 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 make sure that connection does not come loose.
- When recharging refrigerant, check for leaks.

LIQUID TANK

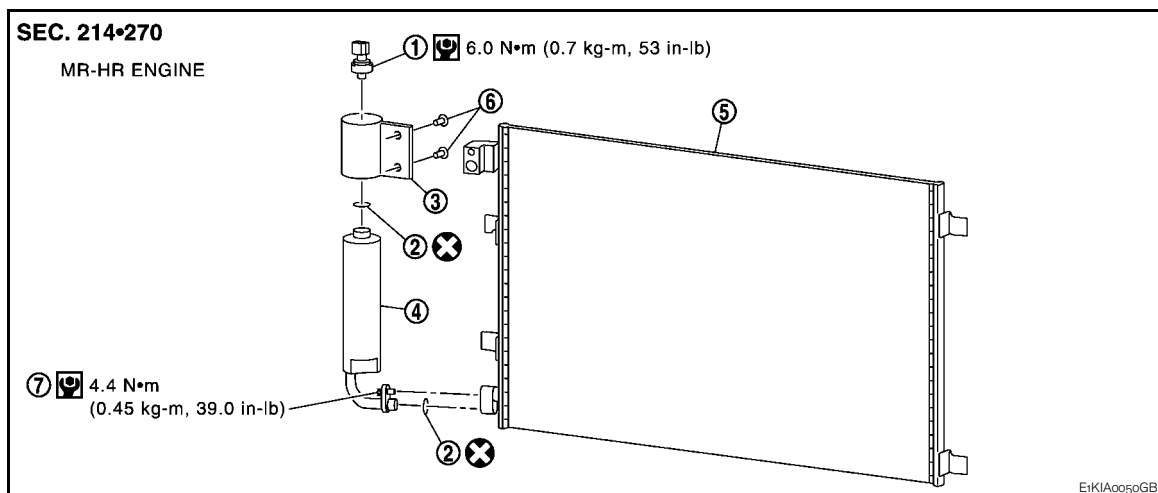
< ON-VEHICLE REPAIR >

[MANUAL AIR CONDITIONER (HR/MR)]

LIQUID TANK

Exploded View

INFOID:000000001098178



- | | | |
|---------------------------------|--------------|-----------------------------|
| 1. Refrigerant pressure sensor | 2. O-ring | 3. Liquid tank bracket |
| 4. Liquid tank | 5. Condenser | 6. Liquid tank fixing screw |
| 7. Liquid tank pipe fixing bolt | | |

Removal and Installation

INFOID:000000001098179

REMOVAL

1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
2. Remove engine cover ornament. Refer to [EM-146, "Exploded View"](#) (MR).
3. Clean liquid tank and its surrounding area, and remove dust and rust from liquid tank.

CAUTION:

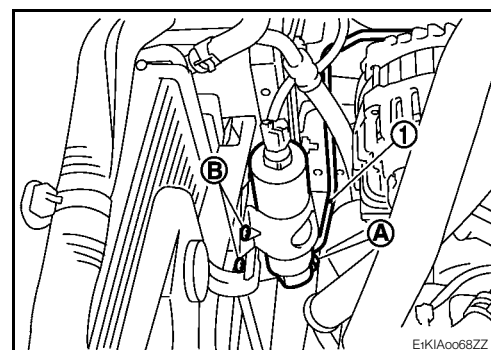
Be sure to clean carefully.

4. Disconnect refrigerant sensor harness connector. Refer to [HA-154, "Removal and Installation"](#).
5. Remove liquid tank bracket support mounting screws (B).
6. Remove high pressure pipe 1 (1) mounting bolt (A) from liquid tank. Refer to [HA-147, "Removal and Installation"](#).
7. Remove liquid tank high pressure pipe mounting bolt (A) from condenser.
8. Remove liquid tank pipe bracket fixing screw.

CAUTION:

Cap or wrap the joint of high pressure pipe, liquid tank pipes and condenser with suitable material such as vinyl tape to avoid the entry of air.

9. Remove liquid tank assembly.



INSTALLATION

Install liquid tank, and then install liquid tank bracket on condenser.

CAUTION:

- Make sure liquid tank bracket is securely installed at protrusion of condenser. (Make sure liquid tank bracket does not move to a position below center of liquid tank.)
- Replace O-rings of A/C piping with new ones, and then apply compressor oil to it when installing it.
- When recharging refrigerant, check for leaks.

REFRIGERANT PRESSURE SENSOR

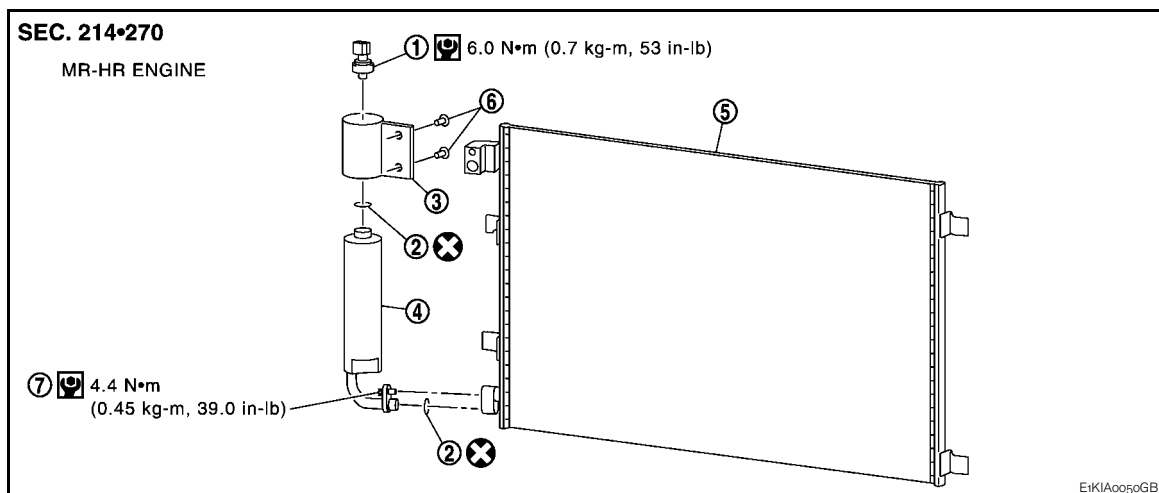
< ON-VEHICLE REPAIR >

[MANUAL AIR CONDITIONER (HR/MR)]

REFRIGERANT PRESSURE SENSOR

Exploded View

INFOID:000000001098180



- | | | |
|---------------------------------|--------------|-----------------------------|
| 1. Refrigerant pressure sensor | 2. O-ring | 3. Liquid tank bracket |
| 4. Liquid tank | 5. Condenser | 6. Liquid tank fixing screw |
| 7. Liquid tank pipe fixing bolt | | |

Removal and Installation

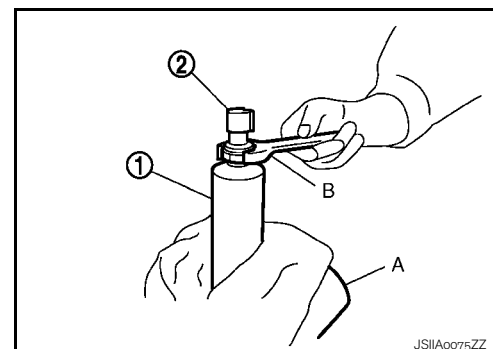
INFOID:000000001098181

REMOVAL

1. Remove liquid tank. Refer to [HA-153, "Exploded View"](#).
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.



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INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

- Apply compressor oil to O-ring of refrigerant pressure sensor when installing it.
- When recharging refrigerant, check for leaks.

EVAPORATOR

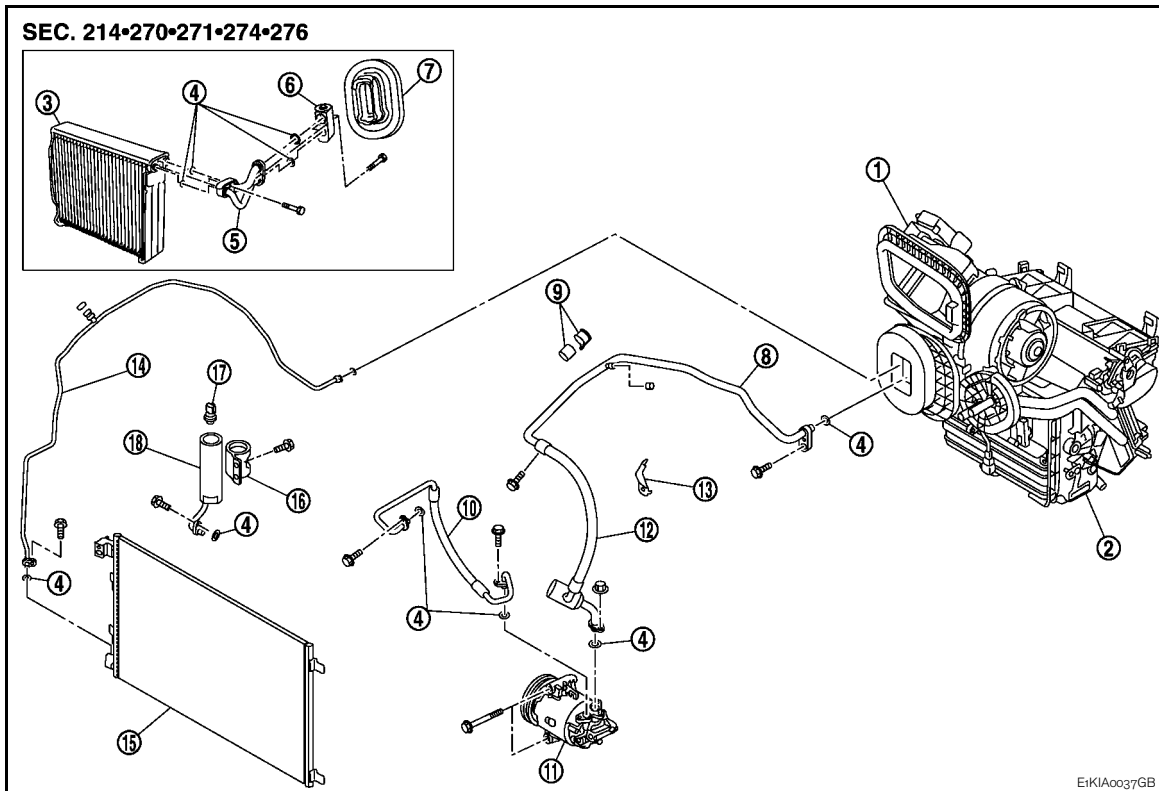
< ON-VEHICLE REPAIR >

[MANUAL AIR CONDITIONER (HR/MR)]

EVAPORATOR

Exploded View

INFOID:000000001098182



Removal and Installation

INFOID:000000001098183

REMOVAL

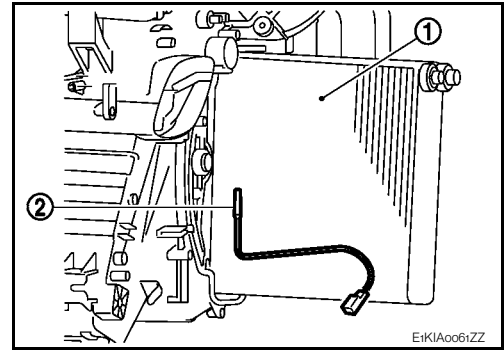
1. Remove low-pressure pipe 2 and high-pressure pipe 1 from expansion valve. Refer to [HA-143, "Removal and Installation"](#), [HA-147, "Removal and Installation"](#).
CAUTION:
Cap or wrap the joint of expansion valve, low-pressure pipe 2 and high-pressure pipe 1 with suitable material such as vinyl tape to avoid the entry of air.
2. Remove heater and cooling fixing clamp and hoses. Refer to [VTL-82, "Removal and Installation"](#).
3. Remove heater and cooling unit assembly. Refer to [VTL-82, "Removal and Installation"](#).
4. Remove evaporator cover fixing screws and cover. Refer to [HA-155, "Exploded View"](#).

EVAPORATOR

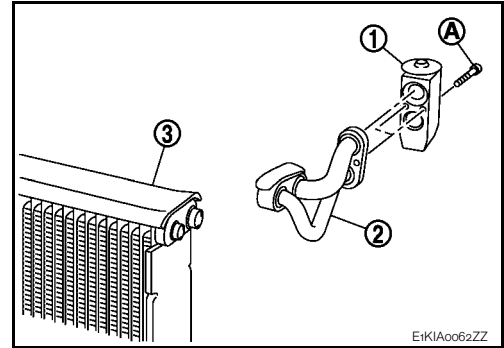
< ON-VEHICLE REPAIR >

[MANUAL AIR CONDITIONER (HR/MR)]

5. Slide evaporator (1) and intake sensor (2) from heater and cooling unit assembly.
6. Remove evaporator assembly.



7. Cut upper insulator (3) and remove mounting bolt (A), expansion valve and pressure pipe assembly(2), from evaporator.



INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

- Replace O-rings of low-pressure pipe 1 and high-pressure pipe 2 with new ones, and then apply compressor oil to it when installing it.
- 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 make sure that connection does not come loose.
- O-rings are different from low-pressure flexible hose (high-pressure pipe 1) and low-pressure pipe 1 (high-pressure pipe 2).
- Mark the mounting position of intake sensor bracket prior to removal so that the reinstalled sensor can be located in the same position.
- When recharging refrigerant, check for leaks.

EXPANSION VALVE

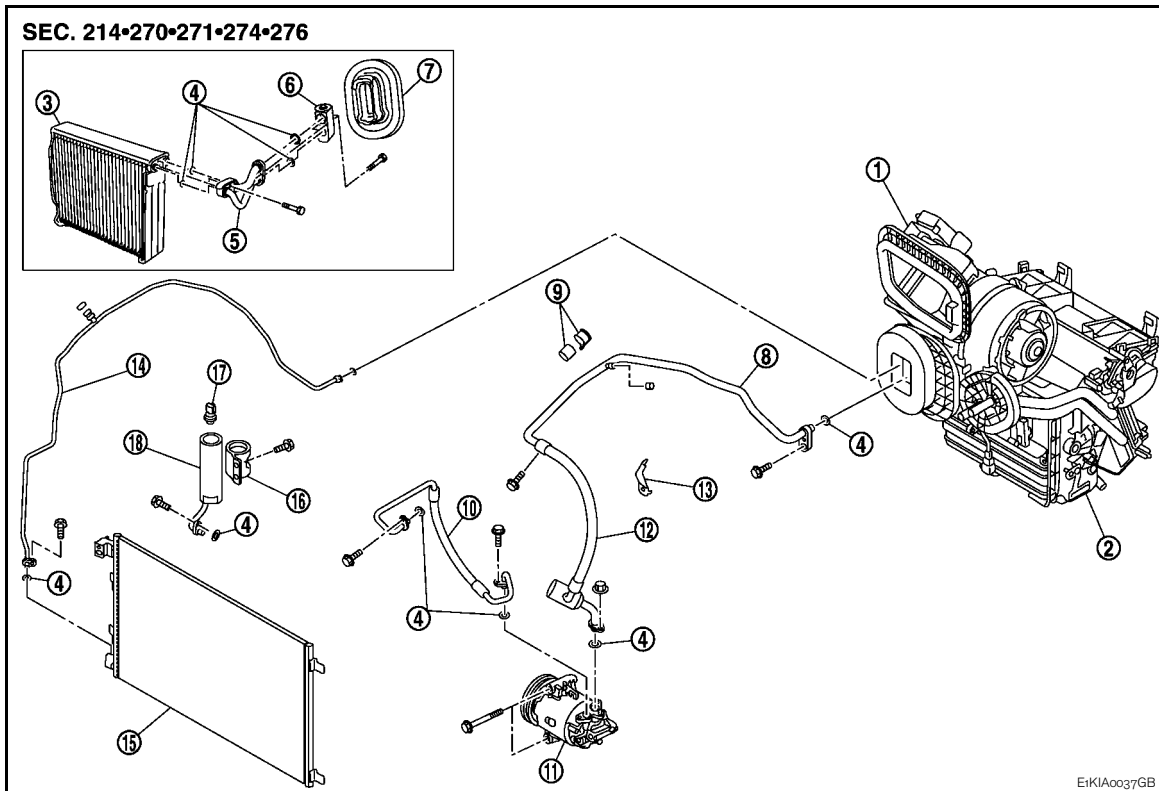
< ON-VEHICLE REPAIR >

[MANUAL AIR CONDITIONER (HR/MR)]

EXPANSION VALVE

Exploded View

INFOID:000000001098184



- | | | |
|-------------------------------------|--|--|
| 1. Heater & blower unit assembly | 2. Heater & cooling unit assembly | 3. Evaporator |
| 4. O-ring | 5. Low pressure pipe 1 and high pressure pipe 2 assembly | 6. Expansion valve |
| 7. Heater sealing | 8. Low pressure flexible hose and pipe 2 | 9. Low pressure pipe 2 fixing clamp assembly |
| 10. High pressure flexible hose | 11. Compressor | 12. Low pressure flexible hose |
| 13. Low & high pipe bracket support | 14. High pressure pipe 1 | 15. Condenser assembly |
| 16. Liquid tank fixing bracket | 17. Refrigerant pressure sensor | 18. Liquid tank |

Removal and Installation

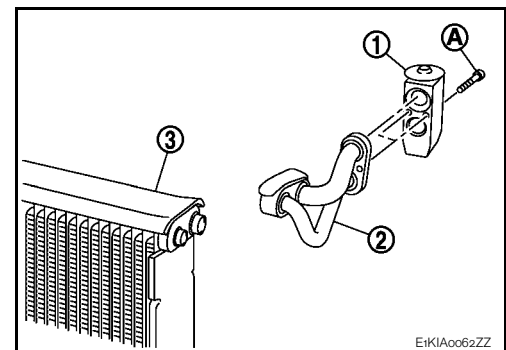
INFOID:000000001098185

REMOVAL

1. Remove evaporator (3). Refer to [HA-155, "Exploded View"](#).
2. Remove low pressure pipe 1 and high pressure pipe 2 assembly (2). Refer to [HA-149, "Removal and Installation"](#).
3. Remove mounting bolts (A), and then remove expansion valve (1) from low and high pressure pipe assembly (2).

CAUTION:

Cap or wrap the joint of expansion valve, low and high pressure pipe assembly, evaporator and expansion valve with suitable material such as vinyl tape to avoid the entry of air.



INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

- Replace O-rings of evaporator with new ones, and then apply compressor oil to it when installing it.

EXPANSION VALVE

< ON-VEHICLE REPAIR >

[MANUAL AIR CONDITIONER (HR/MR)]

- O-rings are different from low-pressure pipe 1 (high-pressure pipe 1) and low-pressure pipe 2 (high-pressure pipe 2).
- When recharging refrigerant, check for leaks.

SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE DATA AND SPECIFICATIONS (SDS)

[MANUAL AIR CONDITIONER (HR/MR)]

SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

Compressor

INFOID:0000000001098186

Model		CALSONICKANSEI
Type		Variable displacement swash plate
Displacement cm ³ (cu in)/rev	Max.	120 (7.32)
	Min.	6 (0.37)
Cylinder bore × stroke (Max.) mm (in.)		32 × 29 (1.26 × 1.14)
Direction of rotation		Clockwise (viewed from clutch)
Drive belt		Poly V 7 groove (HR engine), Poly V 6 groove (MR engine)

Lubricant

INFOID:0000000001098187

Model		CALSONICKANSEI
Name		Nissan A/C System Oil Type S (DH-PS)
Capacity mℓ (US fl oz, Imp fl oz)	Total in system	150 (5.03, 5.3)
	Compressor (Service part) charging amount	150 (5.03, 5.3)

Refrigerant

INFOID:0000000001098188

Type	HFC-134a (R-134a)
Capacity kg (lb)	—

Engine Idling Speed

INFOID:0000000001098189

Refer to [EC-29, "IDLE SPEED : Description"](#) (HR with EURO-OBD), [EC-368, "IDLE SPEED : Description"](#) (HR without EURO-OBD), [EC-646, "IDLE SPEED : Description"](#) (MR with OBD), [EC-990, "IDLE SPEED : Description"](#) (MR without EURO-OBD).

Belt Tension

INFOID:0000000001098190

Refer to [EM-15, "Tension Adjustment"](#) (HR), [EM-134, "Tension Adjustment"](#) (MR).

BASIC INSPECTION

DIAGNOSIS AND REPAIR WORKFLOW

Work Flow

INFOID:000000001098254

DETAILED FLOW

1. LISTEN TO CUSTOMER COMPLAINT

Listen to customer complaint. (Get detailed information about the conditions and environment when the symptom occurs.)

>> GO TO 2.

2. VERIFY THE SYMPTOM WITH OPERATIONAL CHECK

Verify the symptom with operational check. Refer to [HAC-126, "Description & Inspection"](#).

>> GO TO 3.

3. GO TO APPROPRIATE TROUBLE DIAGNOSIS

Go to appropriate trouble diagnosis (Refer to [HAC-187, "Diagnosis Chart By Symptom"](#)).

>> GO TO 4.

4. REPAIR OR REPLACE

Repair or replace the specific parts

>> GO TO 5.

5. FINAL CHECK

Final check.

Is the inspection result normal?

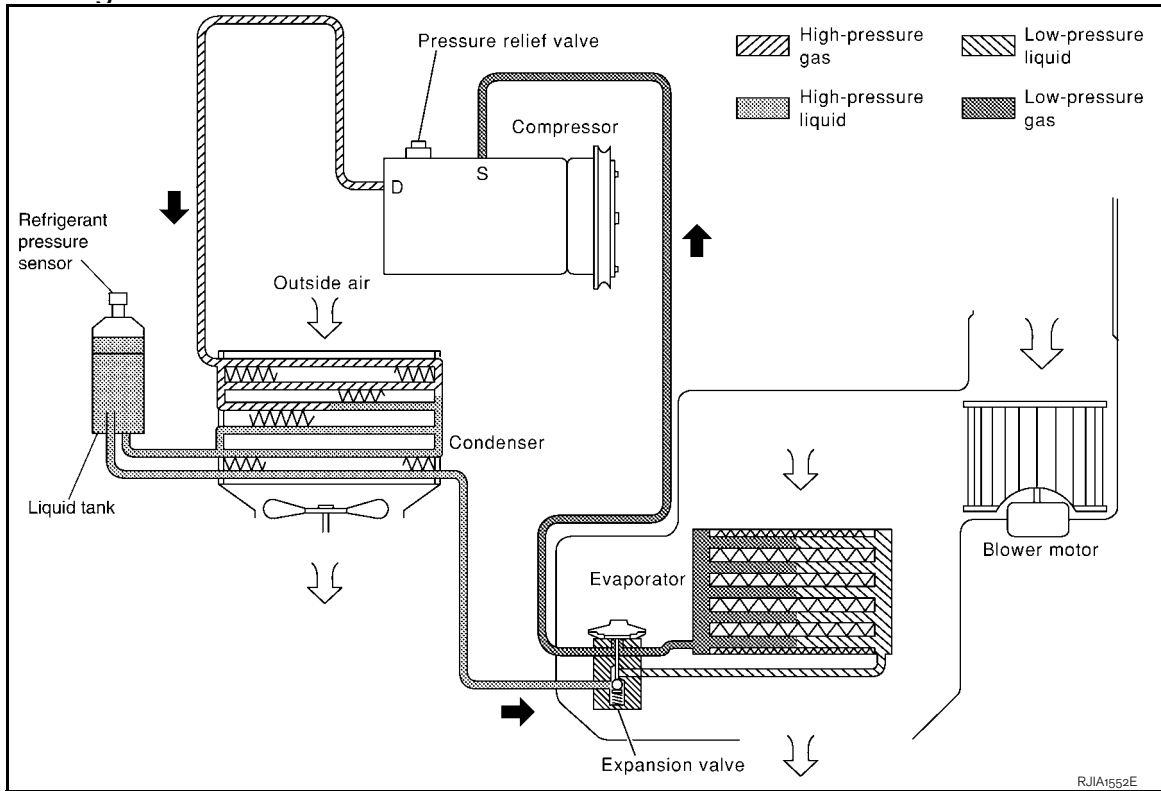
YES >> CHECK OUT

NO >> GO TO 3.

FUNCTION DIAGNOSIS

REFRIGERATION SYSTEM

System Diagram



System Description

INFOID:000000001098256

REFRIGERANT CYCLE

Refrigerant Flow

The refrigerant flows from the compressor, through the condenser with liquid tank, through the evaporator, and back to the compressor. The refrigerant evaporation in the evaporator is controlled by an externally equalized expansion valve, located inside the evaporator case.

Freeze Protection

To prevent evaporator frozen up, the evaporator air temperature is monitored, and the voltage signal to the display and A/C auto amp. will make 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 condenser. If the system pressure rises above, or falls below the specifications, the refrigerant pressure sensor detects the pressure inside the refrigerant line and sends the voltage signal to the ECM. ECM makes the A/C relay go OFF and stops the compressor when pressure on the high-pressure side detected by refrigerant pressure sensor is over about 3,119 kPa (31.8 kg/cm², 452 psi), or below about 118 kPa (1.2 kg/cm², 17 psi).

Pressure Relief Valve

The refrigerant system is also protected by a pressure relief valve, located in the rear head of the compressor. When the pressure of refrigerant in the system increases to an unusual level [more than 3,628 kPa (37 kg/cm², 526 psi)], the release port on the pressure relief valve automatically opens and releases refrigerant into the atmosphere.

LUBRICANT

REFRIGERATION SYSTEM

< FUNCTION DIAGNOSIS >

[MANUAL AIR CONDITIONER (K9K)]

Maintenance of Lubricant Quantity in Compressor

The lubricant in the compressor circulates through the system with the refrigerant. Add lubricant to compressor when replacing any component or after a large refrigerant leakage occurred. It is important to maintain the specified amount.

If lubricant quantity is not maintained properly, the following malfunctions may result:

- Lack of lubricant: May lead to a seized compressor.
- Excessive lubricant: Inadequate cooling (thermal exchange interference)

Lubricant

Name : Nissan A/C System Oil Type S

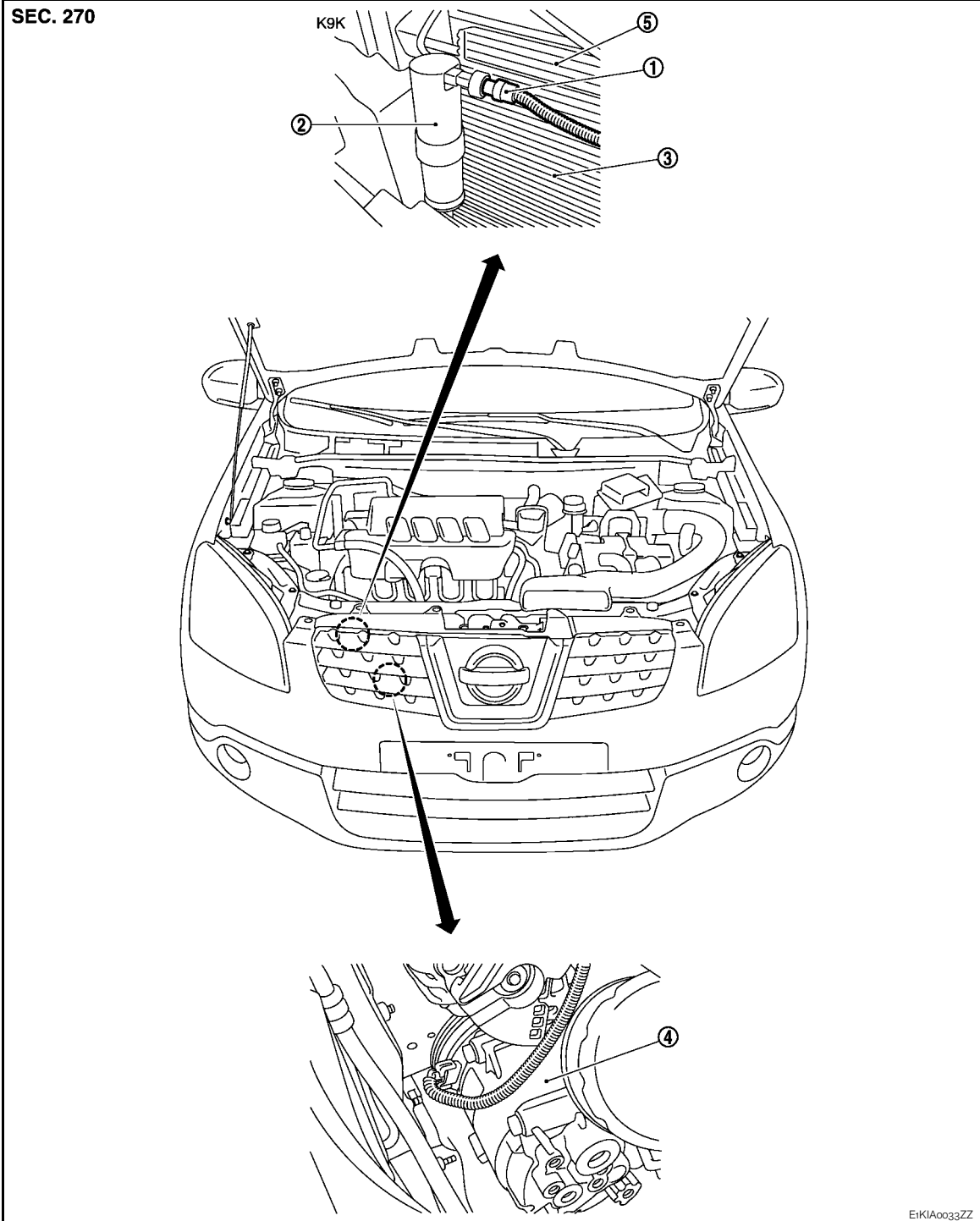
Component Parts Location

INFOID:000000001098257

REFRIGERATION SYSTEM

< FUNCTION DIAGNOSIS >

[MANUAL AIR CONDITIONER (K9K)]

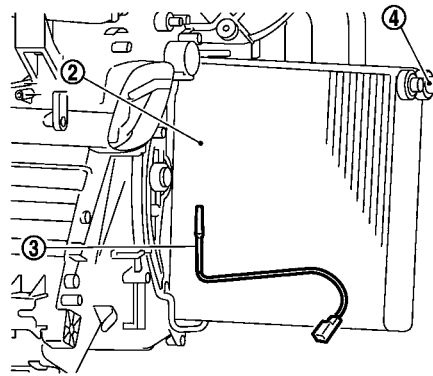
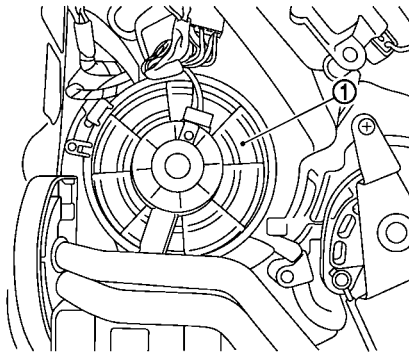
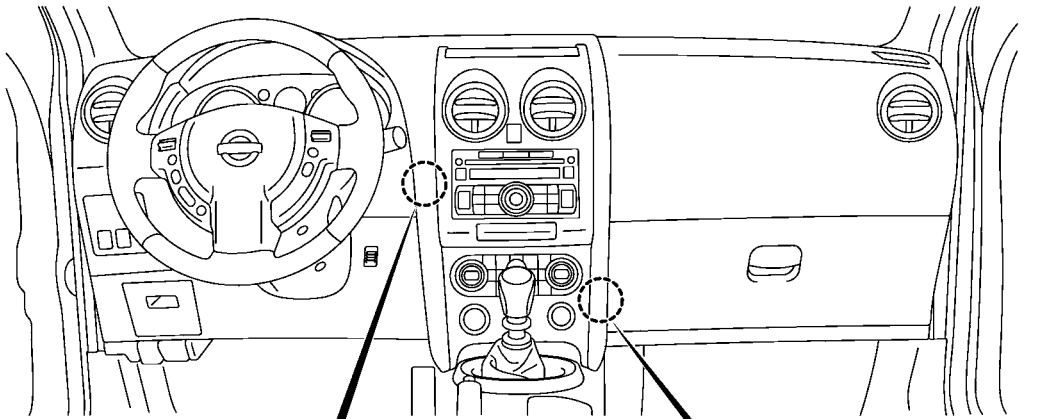


REFRIGERATION SYSTEM

< FUNCTION DIAGNOSIS >

[MANUAL AIR CONDITIONER (K9K)]

SEC. 214•270•271•274•276



EtKIA0034ZZ

1. Blower motor assembly
2. Evaporator
3. Intake sensor (AT only)
4. Expansion valve

Component Description

INFOID:000000001098258

Component	Description
Compressor	Intakes, compresses, and discharges refrigerant, then conveys it to condenser.
Condenser	Condenses refrigerant, and then conveys it to liquid tank.
Liquid tank	Drives moisture out of refrigerant, eliminates foreign matter, then conveys refrigerant to expansion valve.
Refrigerant pressure sensor	Refer to HAC-161, "Component Inspection" .
Expansion valve	Vaporizes refrigerant, controls the amount of flow, then conveys refrigerant to evaporator.
Evaporator	Cools passing air, and then conveys it to compressor.
Blower motor	Takes in air in the vehicle or fresh outside air, and then adjusts room temperature by air conditioning.

REFRIGERATION SYSTEM SYMPTOMS

< SYMPTOM DIAGNOSIS >

[MANUAL AIR CONDITIONER (K9K)]

SYMPTOM DIAGNOSIS

REFRIGERATION SYSTEM SYMPTOMS

SYMPTOM DIAGNOSIS PROCEDURE

SYMPTOM DIAGNOSIS PROCEDURE : Trouble Diagnosis For Unusual Pressure

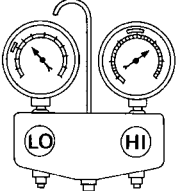
INFOID:000000001098261

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

BOTH HIGH- AND LOW-PRESSURE SIDES ARE TOO HIGH

BOTH HIGH- AND LOW-PRESSURE SIDES ARE TOO HIGH : Symptom Table

INFOID:000000001098262

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
Both high- and low-pressure sides are too high.  AC359A	The pressure returns to normal is reduced soon after water is splashed on condenser.	Excessive refrigerant charge in refrigeration cycle.	Reduce refrigerant until specified pressure is obtained.
	Air suction by cooling fan is insufficient.	Insufficient condenser cooling performance. ↓ 1. Condenser fins are clogged. 2. Improper fan rotation of cooling fan.	- Clean condenser. - Check and repair cooling fan as necessary.
	- Low-pressure pipe is not cold. - When compressor is stopped high-pressure value quickly drops by approximately 196 kPa (2 kg/cm², 28 psi). It then decreases gradually thereafter.	Poor heat exchange in condenser (After compressor operation stops, high-pressure decreases too slowly). ↓ Air in refrigeration cycle.	Evacuate repeatedly and re-charge system.
	Engine tends to overheat.	Engine cooling systems malfunction.	Check and repair each engine cooling system.
	- An area of the low-pressure pipe is colder than areas near the evaporator outlet. - Low-pressure pipe is sometimes covered with frost.	- Excessive liquid refrigerant on low-pressure side. - Excessive refrigerant discharge flow. - Expansion valve is open a little compared with the specification. ↓ Improper expansion valve adjustment.	Replace expansion valve.

HIGH-PRESSURE SIDE IS TOO HIGH AND LOW-PRESSURE SIDE IS TOO LOW

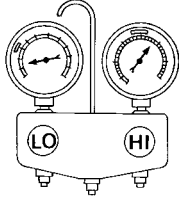
HIGH-PRESSURE SIDE IS TOO HIGH AND LOW-PRESSURE SIDE IS TOO LOW : Symptom Table

INFOID:000000001098263

REFRIGERATION SYSTEM SYMPTOMS

< SYMPTOM DIAGNOSIS >

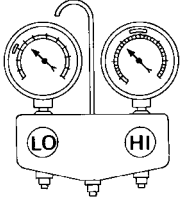
[MANUAL AIR CONDITIONER (K9K)]

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
High-pressure side is too high and low-pressure side is too low.  AC360A	Upper side of condenser and high-pressure side are hot, however, liquid tank is not so hot.	High-pressure tube or parts located between compressor and condenser are clogged or crushed.	• Check and repair or replace malfunctioning parts. • Check lubricant for contamination.

HIGH-PRESSURE SIDE IS TOO LOW AND LOW-PRESSURE SIDE IS TOO HIGH

HIGH-PRESSURE SIDE IS TOO LOW AND LOW-PRESSURE SIDE IS TOO HIGH : Symptom Table

INFOID:000000001098264

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
High-pressure side is too low and low-pressure side is too high.  AC356A	High- and low-pressure sides become equal soon after compressor operation stops.	Compressor pressure operation is improper. ↓ Damaged inside compressor packings.	Replace compressor.
	No temperature difference between high- and low-pressure sides.	Compressor pressure operation is improper. ↓ Damaged inside compressor packings.	Replace compressor.

BOTH HIGH- AND LOW-PRESSURE SIDES ARE TOO LOW

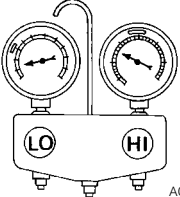
BOTH HIGH- AND LOW-PRESSURE SIDES ARE TOO LOW : Symptom Table

INFOID:000000001098265

REFRIGERATION SYSTEM SYMPTOMS

< SYMPTOM DIAGNOSIS >

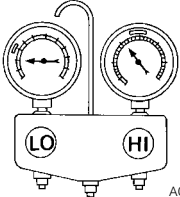
[MANUAL AIR CONDITIONER (K9K)]

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
Both high- and low-pressure sides are too low.  AC353A	- There is a big temperature difference between liquid tank outlet and inlet. Outlet temperature is extremely low. - Liquid tank inlet and expansion valve are frosted.	Liquid tank inside is slightly clogged.	- Replace liquid tank. - Check lubricant for contamination.
	- Temperature of expansion valve inlet is extremely low as compared with areas near liquid tank. - Expansion valve inlet is frosted. - Temperature difference occurs somewhere in high-pressure side.	High-pressure pipe located between liquid tank and expansion valve is clogged.	- Check and repair malfunctioning parts. - Check lubricant for contamination.
	Expansion valve and liquid tank are warm or slightly cool when touched.	Low refrigerant charge. ↓ Leaking fittings or components.	Check refrigerant for leaks. Refer to HA-183, "Refrigerant Leaks" .
	There is a big temperature difference between expansion valve inlet and outlet while the valve itself is frosted.	Expansion valve closes a little compared with the specification. ↓ - Improper expansion valve adjustment. - Malfunctioning expansion valve. - Outlet and inlet may be clogged.	- Remove foreign particles by using compressed air. - Replace expansion valve. - Check lubricant for contamination.
	An area of the low-pressure pipe is colder than areas near the evaporator outlet.	Low-pressure pipe is clogged or crushed.	- Check and repair malfunctioning parts. - Check lubricant for contamination.
	Air flow volume is not enough or is too low.	Evaporator is frozen.	- Replace compressor. - Repair evaporator fins. - Replace evaporator. - Refer to HAC-153, "Diagnosis Procedure".

LOW-PRESSURE SIDE SOMETIMES BECOMES NEGATIVE

LOW-PRESSURE SIDE SOMETIMES BECOMES NEGATIVE : Symptom Table

INFOID:000000001098266

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
Low-pressure side sometimes becomes negative.  AC354A	- Air conditioning system does not function and does not cyclically cool the compartment air. - The system constantly functions for a certain period of time after compressor is stopped and restarted.	Refrigerant does not discharge cyclically. ↓ Moisture is frozen at expansion valve outlet and inlet. ↓ Water is mixed with refrigerant.	- Drain water from refrigerant or replace refrigerant. - Replace liquid tank.

LOW-PRESSURE SIDE BECOMES NEGATIVE

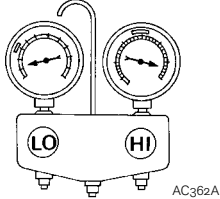
LOW-PRESSURE SIDE BECOMES NEGATIVE : Symptom Table

INFOID:000000001098267

REFRIGERATION SYSTEM SYMPTOMS

< SYMPTOM DIAGNOSIS >

[MANUAL AIR CONDITIONER (K9K)]

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
Low-pressure side becomes negative. 	Liquid tank or front/rear side of expansion valve's pipe is frosted or wet with dew.	High-pressure side is closed and refrigerant does not flow. ↓ Expansion valve or liquid tank is frosted.	Leave the system at rest until no frost is present. Start it again to check whether or not the malfunction is caused by water or foreign particles. • If water is the cause, initially cooling is okay. Then the water freezes causing a blockage. Drain water from refrigerant or replace refrigerant. • If due to foreign particles, remove expansion valve and remove the particles with dry and compressed air (not shop air). • If either of the above methods cannot correct the malfunction, replace expansion valve. • Replace liquid tank. • Check lubricant for contamination.

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PRECAUTION

PRECAUTIONS

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

INFOID:0000000001115389

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 SRC and SB section of this Service Manual.

WARNING:

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

Precaution Necessary for Steering Wheel Rotation After Battery Disconnect

INFOID:0000000001115393

NOTE:

- This Procedure is applied only to models with Intelligent Key system and NATS (NISSAN ANTI-THEFT SYSTEM).
- Remove and install all control units after disconnecting both battery cables with the ignition knob in the "LOCK" position.
- Always use CONSULT-III to perform self-diagnosis as a part of each function inspection after finishing work. If DTC is detected, perform trouble diagnosis according to self-diagnostic results.

For models equipped with the Intelligent Key system and NATS, an electrically controlled steering lock mechanism is adopted on the key cylinder.

For this reason, if the battery is disconnected or if the battery is discharged, the steering wheel will lock and steering wheel rotation will become impossible.

If steering wheel rotation is required when battery power is interrupted, follow the 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. Use the Intelligent Key or mechanical key to turn the ignition switch to the "ACC" position. At this time, the steering lock will be released.
3. Disconnect both battery cables. The steering lock will remain released and the steering wheel can be rotated.
4. Perform the necessary repair operation.
5. When the repair work is completed, return the ignition switch to the "LOCK" position before connecting the battery cables. (At this time, the steering lock mechanism will engage.)
6. Perform a self-diagnosis check of all control units using CONSULT-III.

Precaution for Procedure without Cowl Top Cover

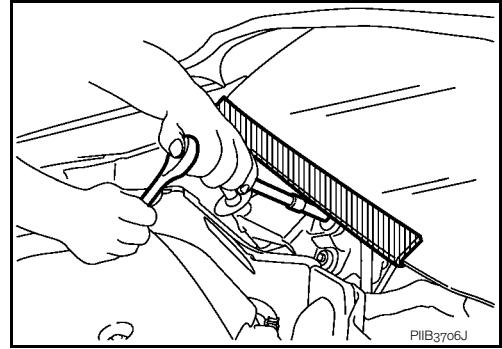
INFOID:0000000001115397

PRECAUTIONS

< PRECAUTION >

[MANUAL AIR CONDITIONER (K9K)]

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



Precautions For Xenon Headlamp Service

INFOID:000000001115401

WARNING:

Comply with the following warnings to prevent any serious accident.

- Disconnect the battery cable (negative terminal) or the power supply fuse before installing, removing, or touching the xenon headlamp (bulb included). The xenon headlamp contains high-voltage generated parts.
- Never work with wet hands.
- Check the xenon headlamp ON-OFF status after assembling it to the vehicle. Never turn the xenon headlamp ON in other conditions. Connect the power supply to the vehicle-side connector. (Turning it ON outside the lamp case may cause fire or visual impairments.)
- Never touch the bulb glass immediately after turning it OFF. It is extremely hot.

CAUTION:

Comply with the following cautions to prevent any error and malfunction.

- Install the xenon bulb securely. (Insufficient bulb socket installation may melt the bulb, the connector, the housing, etc. by high-voltage leakage or corona discharge.)
- Never perform HID circuit inspection with a tester.
- Never touch the xenon bulb glass with hands. Never put oil and grease on it.
- Dispose of the used xenon bulb after packing it in thick vinyl without breaking it.
- Never wipe out dirt and contamination with organic solvent (thinner, gasoline, etc.).

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

INFOID:000000001098272

CAUTION:

- CFC-12 (R-12) refrigerant and HFC-134a (R-134a) refrigerant are not compatible. These refrigerants must never be mixed, even in the smallest amounts. If the refrigerants are mixed and compressor malfunction is likely occur.
- Use only specified lubricant for the HFC-134a (R-134a) A/C system and HFC-134a (R-134a) components. If lubricant other than that specified is used, compressor malfunction is likely to occur.
- The specified HFC-134a (R-134a) lubricant 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, never remove the caps (unseal) until just before connecting the components. Connect all refrigerant loop components as quickly as possible to minimize the entry of moisture into system.
 - Only use the specified lubricant from a sealed container. Immediately reseal containers of lubricant. Without proper sealing, lubricant will become moisture saturated and should not be used.
 - Never allow lubricant (Nissan A/C System Oil Type S) to come in contact with styrene foam parts. Damage may result.

General Refrigerant Precaution

INFOID:000000001098273

WARNING:

- Avoid breathing A/C refrigerant and lubricant vapor or mist. Exposure may irritate eyes, nose and throat. Use only approved recovery/recycling equipment to discharge HFC-134a (R-134a) refrigerant. If accidental system discharge occurs, ventilate work area before resuming service. Additional health and safety information may be obtained from refrigerant and lubricant manufacturers.

PRECAUTIONS

< PRECAUTION >

[MANUAL AIR CONDITIONER (K9K)]

- Never 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.
- Never store or heat refrigerant containers above 52°C (126°F).
- Never 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.
- Never 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.
- Never pressure test or leak test HFC-134a (R-134a) service equipment and/or vehicle air conditioning systems with compressed air during repair. Some mixtures of air and HFC-134a (R-134a) have been shown to be combustible at elevated pressures. These mixtures, if ignited, may cause injury or property damage. Additional health and safety information may be obtained from refrigerant manufacturers.

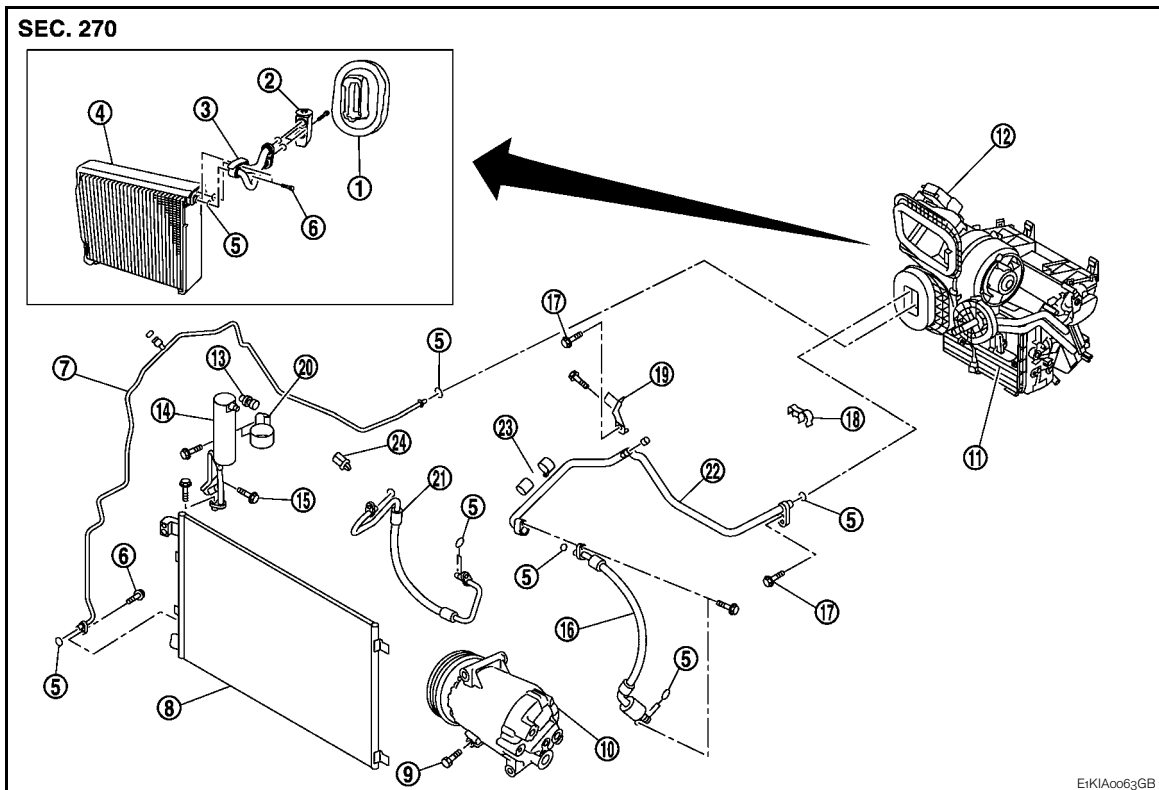
Refrigerant Connection

INFOID:000000001098274

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

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

O-RING AND REFRIGERANT CONNECTION



- | | | |
|---------------------------------|------------------------------------|--|
| 1. Heater sealing | 2. Expansion valve | 3. Low pressure pipe 1 and high pressure pipe 2 assembly |
| 4. Evaporator | 5. O-ring | 6. Connector pipe fixing bolt |
| 7. High pressure pipe 1 | 8. Condenser assembly | 9. Fixing bolt |
| 10. Compressor | 11. Heater & cooling unit assembly | 12. Heater & blower unit assembly |
| 13. Refrigerant pressure sensor | 14. Liquid tank | 15. Liquid tank fixing screw |
| 16. Low pressure flexible hose | 17. Fixing bolt | 18. Pipes fixing clip |

PRECAUTIONS

< PRECAUTION >

[MANUAL AIR CONDITIONER (K9K)]

- | | | |
|--------------------------------------|---|---------------------------------|
| 19. Low & high pressure pipe bracket | 20. Liquid tank fixing bracket | 21. High pressure flexible hose |
| 22. Low pressure pipe 2 | 23. Low pressure pipe fixing clamp assembly | 24. Pipe mantening clip |

CAUTION:

The new and former refrigerant connections use different O-ring configurations. Never confuse O-rings since they are not interchangeable. If a wrong O-ring is installed, refrigerant may leak at the connection.

O-Ring Part Numbers and Specifications

Connection type	Piping connection point		Part number	QTY	O-ring size
New	Low pressure flexible hose to Low pressure pipe 2		92473 N8210	1	16
	Low pressure pipe 2 to expansion valve		92473 N8210	1	16
	High pressure flexible pipe 1 to condenser		92472 N8210	1	12
	High pressure pipe 1 to expansion valve		92471 N8210	1	8
	Low pressure pipe 1 and high pressure	Inlet	92475 71L00	1	12
	pipe 2 assembly to expansion valve	Outlet	92475 72L00	1	16
	Low pressure pipe 1 and high pressure	Inlet	92475 71L00	1	12
	pipe 2 assembly to evaporator	Outlet	92475 72L00	1	16
	High pressure pipe 1 to liquid tank		92471 N8210	1	8
	Compressor to low pressure flexible hose		01-57-112	2	19
	Compressor to high pressure flexible hose		01-57-112	2	12
	Liquid tank to condenser		92473 N8210	2	16

WARNING:

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

CAUTION:

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

- When the compressor is removed, store it in the same way at it is when mounted on the car. Failure to do so will cause lubricant to enter the low-pressure chamber.
- When connecting tubes, always use a torque wrench and a back-up wrench.
- After disconnecting tubes, immediately plug all openings to prevent entry of dust and moisture.
- When installing an air conditioner in the vehicle, connect the pipes at the final stage of the operation. 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.
- Thoroughly remove moisture from the refrigeration system before charging the refrigerant.
- Always replace used O-rings.
- When connecting tube, apply lubricant to circle of the O-rings shown in illustration. Be careful not to apply lubricant to threaded portion.

Name : Nissan A/C System Oil
Type S

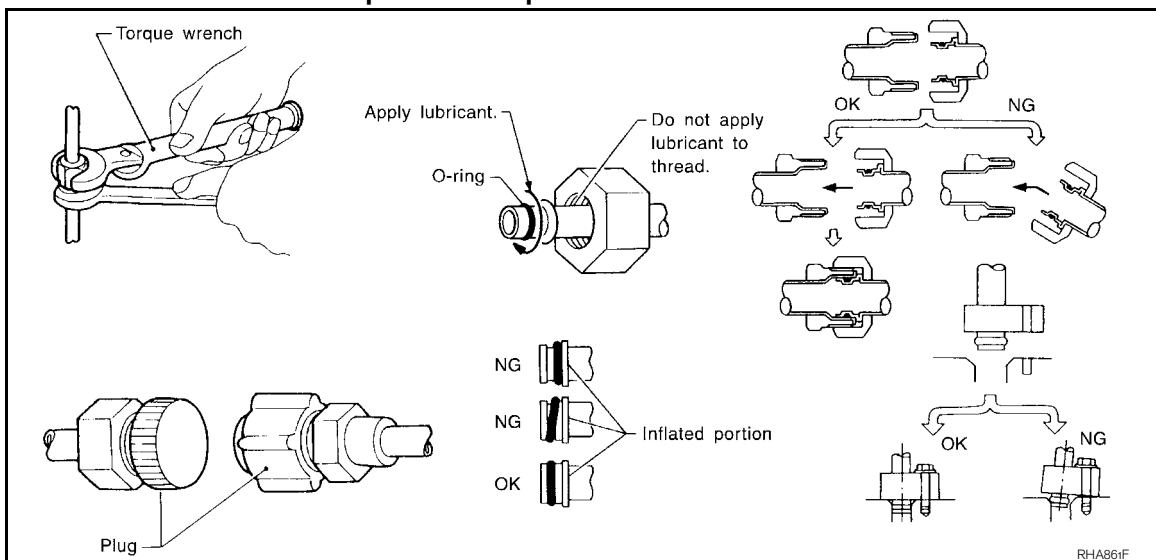
- O-ring must be closely attached to the groove portion of tube.
- When replacing the O-ring, be careful not to damage O-ring and tube.
- Connect tube until a click can be heard, then tighten the nut or bolt by hand. Make sure that the O-ring is installed to tube correctly.

PRECAUTIONS

< PRECAUTION >

[MANUAL AIR CONDITIONER (K9K)]

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



Service Equipment

INFOID:000000001098275

RECOVERY/RECYCLING 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.

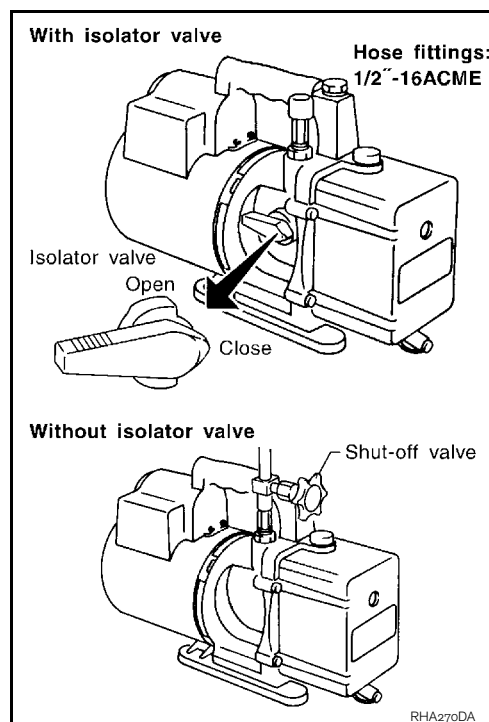
VACUUM PUMP

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 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 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.



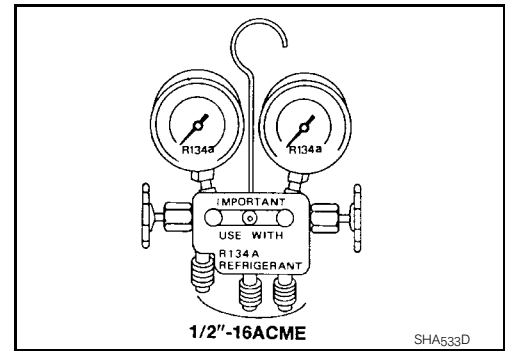
MANIFOLD GAUGE SET

PRECAUTIONS

< PRECAUTION >

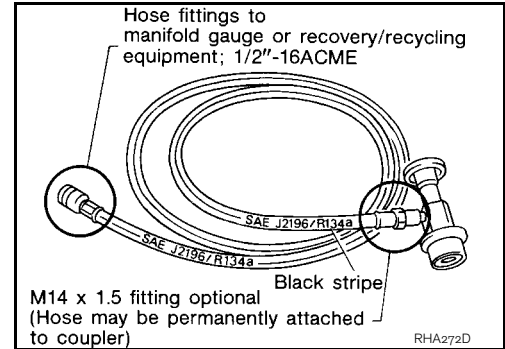
[MANUAL AIR CONDITIONER (K9K)]

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

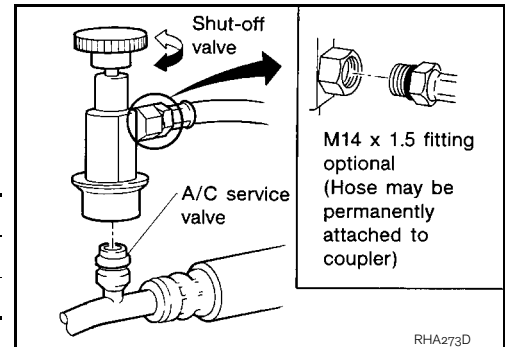
Be certain that the service hoses display the markings described (colored hose with black stripe). All hoses must include positive shut-off devices (either manual or automatic) near the end of the hoses opposite to the manifold gauge.



SERVICE COUPLERS

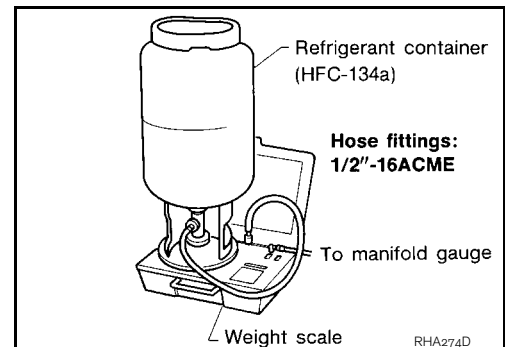
Never attempt to connect HFC-134a (R-134a) service couplers to a CFC-12 (R-12) A/C system. The HFC-134a (R-134a) couplers will not properly connect to the CFC-12 (R-12) system. However, if an improper connection is attempted, discharging and contamination may occur.

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



REFRIGERANT WEIGHT SCALE

Verify that no refrigerant other than HFC-134a (R-134a) and specified lubricants 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.

COMPRESSOR

General Precautions

INFOID:000000001098276

CAUTION:

- Plug all openings to prevent moisture and foreign matter from entering.
- When the compressor is removed, store it in the same way at it is when mounted on the car.
- When replacing or repairing compressor, follow "Maintenance of Lubricant Quantity in Compressor" exactly. Refer to [HA-180, "Adjustment"](#).
- Keep friction surfaces between clutch and pulley clean. If the surface is contaminated with lubricant, wipe it off by using a clean waste cloth moistened with thinner.
- After compressor service operation, turn the compressor shaft by hand more than five turns in both directions. This will equally distribute lubricant inside the compressor. After the compressor is installed, let the engine idle and operate the compressor for one hour.
- After replacing the compressor magnet clutch, apply voltage to the new one and check for normal operation.

A

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C

D

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HA

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LEAK DETECTION DYE

General Precautions

INFOID:000000001098277

CAUTION:

- The A/C system contains a fluorescent leak detection dye used for locating refrigerant leaks. An ultraviolet (UV) lamp is required to illuminate the dye when inspecting for leaks.
- Always wear fluorescence enhancing UV safety goggles to protect your eyes and enhance the visibility of the fluorescent dye.
- The fluorescent dye leak detector is not a replacement for an electrical leak detector (SST: J-41995). The fluorescent dye leak detector should be used in conjunction with an electrical leak detector (SST: J-41995) to pin-point refrigerant leaks.
- For the purpose of safety and customer's satisfaction, read and follow all manufacture's operating instructions and precautions prior to performing the work.
- A compressor shaft seal should not necessarily be repaired because of dye seepage. The compressor shaft seal should only be repaired after confirming the leak with an electrical leak detector (SST: J-41995).
- Always remove any remaining dye from the leak area after repairs are completed to avoid a misdiagnosis during a future service.
- Never allow dye to come into contact with painted body panels or interior components. If dye is spilled, clean immediately with the approved dye cleaner. Fluorescent dye left on a surface for an extended period of time cannot be removed.
- 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 will remain for three years or a little over unless a compressor malfunction occurs.

IDENTIFICATION

NOTE:

Vehicles with factory installed fluorescent dye have a green label.

Vehicles without factory installed fluorescent dye have a blue label.

IDENTIFICATION LABEL FOR VEHICLE

Vehicles with factory installed fluorescent dye have the identification label on the front side of hood.

PREPARATION

PREPARATION

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

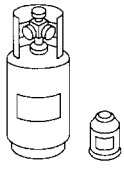
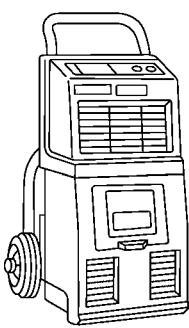
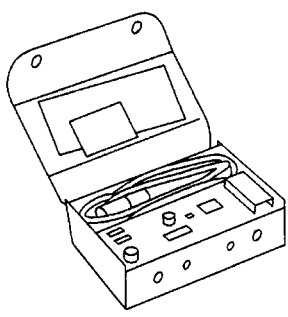
INFOID:000000001116273

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.

Adapters that convert one size fitting to another must never be used: refrigerant/lubricant contamination will occur and compressor malfunction will result.

Tool number 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
KLH00-PAGS0 Nissan A/C System Oil Type S (DH-PS)  S-NT197	Type: Polyalkylene glycol oil (PAG), type S (DH-PS) Application: HFC-134a (R-134a) wobble (swash) plate compressors (Nissan only) Lubricity: 40 m ℓ (1.4 Imp fl oz.)
Recovery/Recycling/ Recharging equipment (ACR4)  RJIA0195E	Function: Refrigerant recovery and recycling and recharging
Electrical leak detector  A/C leak detector SHA705EB	Power supply: DC 12V (Cigarette lighter)

PREPARATION

< PREPARATION >

[MANUAL AIR CONDITIONER (K9K)]

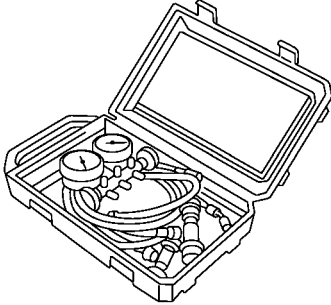
Tool number Tool name		Description
(J-43926) Refrigerant dye leak detection kit Kit includes: (J-42220) UV lamp and UV safety goggles (J-41459) HFC-134a (R-134a) dye injector Use with J-41447, 1/4 ounce bottle (J-41447) HFC-134a (R-134a) fluorescent leak detection dye (Box of 24, 1/4 ounce bottles) (J-43872) Refrigerant dye cleaner		Power supply: DC 12 V (Battery terminal)
(J-42220) UV lamp and UV safety goggles		Power supply: DC 12 V (Battery terminal) For checking refrigerant leak when fluorescent dye is installed in A/C system Includes: UV lamp and UV safety goggles
(J-41447) HFC-134a (R-134a) fluorescent leak detection dye (Box of 24, 1/4 ounce bottles)		Application: For HFC-134a (R-134a) PAG oil Container: 1/4 ounce (7.4 cc) bottle (Includes self-adhesive dye identification labels for affixing to vehicle after charging system with dye.)
(J-41459) HFC-134a (R-134a) dye injector Use with J-41447, 1/4 ounce bottle		For injecting 1/4 ounce of fluorescent leak detection dye into A/C system

cardiagn.com

PREPARATION

< PREPARATION >

[MANUAL AIR CONDITIONER (K9K)]

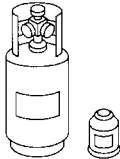
Tool number Tool name	Description
(J-43872) Refrigerant dye cleaner  SHA441F	For cleaning dye spills
(J-39183) Manifold gauge set (with hoses and couplers)  RJIA0196E	Identification: • The gauge face indicates HFC-134a (R-134a). Fitting size: Thread size • 1/2"-16 ACME

Sealant or/and Lubricant

INFOID:0000000001098280

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
Nissan A/C System Oil Type S (DH-PS)  S-NT197	Type: Polyalkylene glycol oil (PAG), type S (DH-PS) Application: HFC-134a (R-134a) swash plate compressors (Nissan only) Capacity: 40 mℓ (1.4 US fl oz., 1.4 Imp fl oz.)

ON-VEHICLE MAINTENANCE

LUBRICANT

Adjustment

INFOID:000000001098281

LUBRICANT RETURN OPERATION

Adjust the lubricant quantity according to the test group shown below.

1. CHECK LUBRICANT RETURN OPERATION

Can lubricant return operation be performed?

- A/C system works properly.
- There is no evidence of a large amount of lubricant leakage.

CAUTION:

If excessive lubricant leakage is noted, never perform the lubricant return operation.

Is it successful?

YES >> GO TO 2.

NO >> GO TO 3.

2. PERFORM LUBRICANT RETURN OPERATION, PROCEEDING AS FOLLOWS

1. Start the engine, and set to the following conditions:
 - Engine speed: Idling to 1,200 rpm
 - A/C switch: ON
 - Blower speed: Max. position
 - Temp. control: Optional [Set so that intake air temperature is 25 to 30°C (77 to 86°F).]
 - Intake position: Recirculation (REC)
2. Perform lubricant return operation for about 10 minutes.
3. Stop the engine.

>> GO TO 3.

3. CHECK REPLACEMENT PART

Should the compressor be replaced?

YES >> Refer to "LUBRICANT ADJUSTING PROCEDURE FOR COMPRESSOR REPLACEMENT".

NO >> Refer to "LUBRICANT ADJUSTING PROCEDURE FOR COMPONENTS REPLACEMENT EXCEPT COMPRESSOR".

LUBRICANT ADJUSTING PROCEDURE FOR COMPONENTS REPLACEMENT EXCEPT COMPRESSOR

After replacing any of the following major components, add the correct amount of lubricant to the system.

Amount of lubricant to be added:

Part replaced	Lubricant to be added to system	Remarks
	Amount of lubricant mℓ (US fl oz., Imp fl oz.)	
Evaporator	75 (2.5, 2.6)	—
Condenser	35 (1.2, 1.2)	—
Liquid tank	10 (0.3, 0.4)	—
In case of refrigerant leak	30 (1.0, 1.1)	Large leak
	—	Small leak ^{*1}

*1: If the refrigerant leak is small, no addition of lubricant is needed.

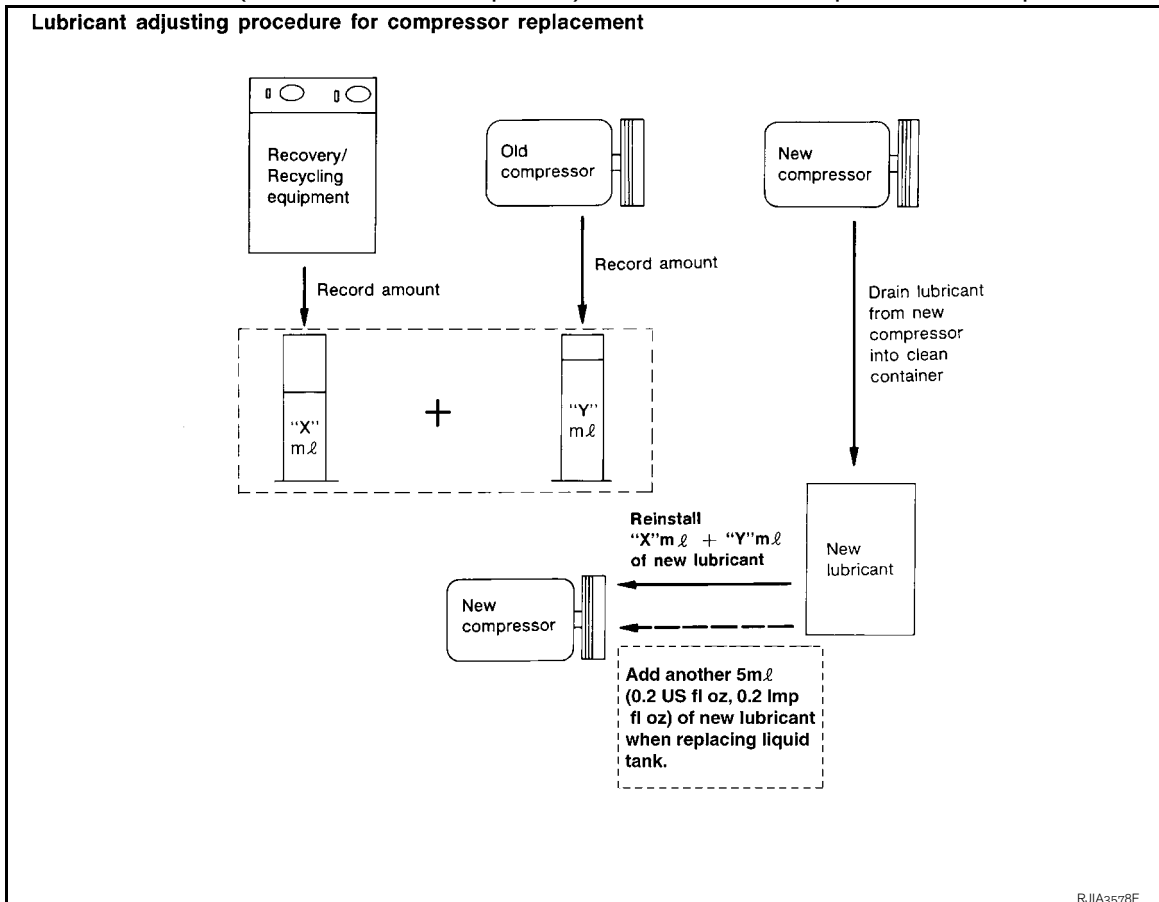
LUBRICANT ADJUSTING PROCEDURE FOR COMPRESSOR REPLACEMENT

LUBRICANT

< ON-VEHICLE MAINTENANCE >

[MANUAL AIR CONDITIONER (K9K)]

1. Before connecting recovery/recycling recharging equipment to vehicle, check recovery/recycling recharging equipment gauges. No refrigerant pressure should be displayed. If NG, recover refrigerant from equipment lines.
 2. Connect recovery/recycling recharging equipment to vehicle. Confirm refrigerant purity in supply tank using recovery/recycling recharging equipment and refrigerant identifier. If NG, refer to [HA-170, "Working with HFC-134a \(R-134a\)"](#).
 3. Confirm refrigerant purity in vehicle A/C system using recovery/recycling recharging equipment and refrigerant identifier. If NG, refer to [HA-170, "Working with HFC-134a \(R-134a\)"](#).
 4. Discharge refrigerant into the refrigerant recovery/recycling equipment. Measure lubricant discharged into the recovery/recycling equipment.
 5. Drain the lubricant from the old (removed) compressor into a graduated container and recover the amount of lubricant drained.
 6. Drain the lubricant from the new compressor into a separate, clean container.
 7. Measure an amount of new lubricant installed equal to amount drained from old compressor. Add this lubricant to new compressor through the suction port opening.
 8. Measure an amount of new lubricant equal to the amount recovered during discharging. Add this lubricant to new compressor through the suction port opening.
 9. If the liquid tank also needs to be replaced, add another 5 mℓ (0.2 US fl oz., 0.2 Imp fl oz.) of lubricant at this time.
- Do not add this 5 mℓ (0.2 US fl oz., 0.2 Imp fl oz.) of lubricant when replaces the compressor only.



REFRIGERATION SYSTEM

< ON-VEHICLE MAINTENANCE >

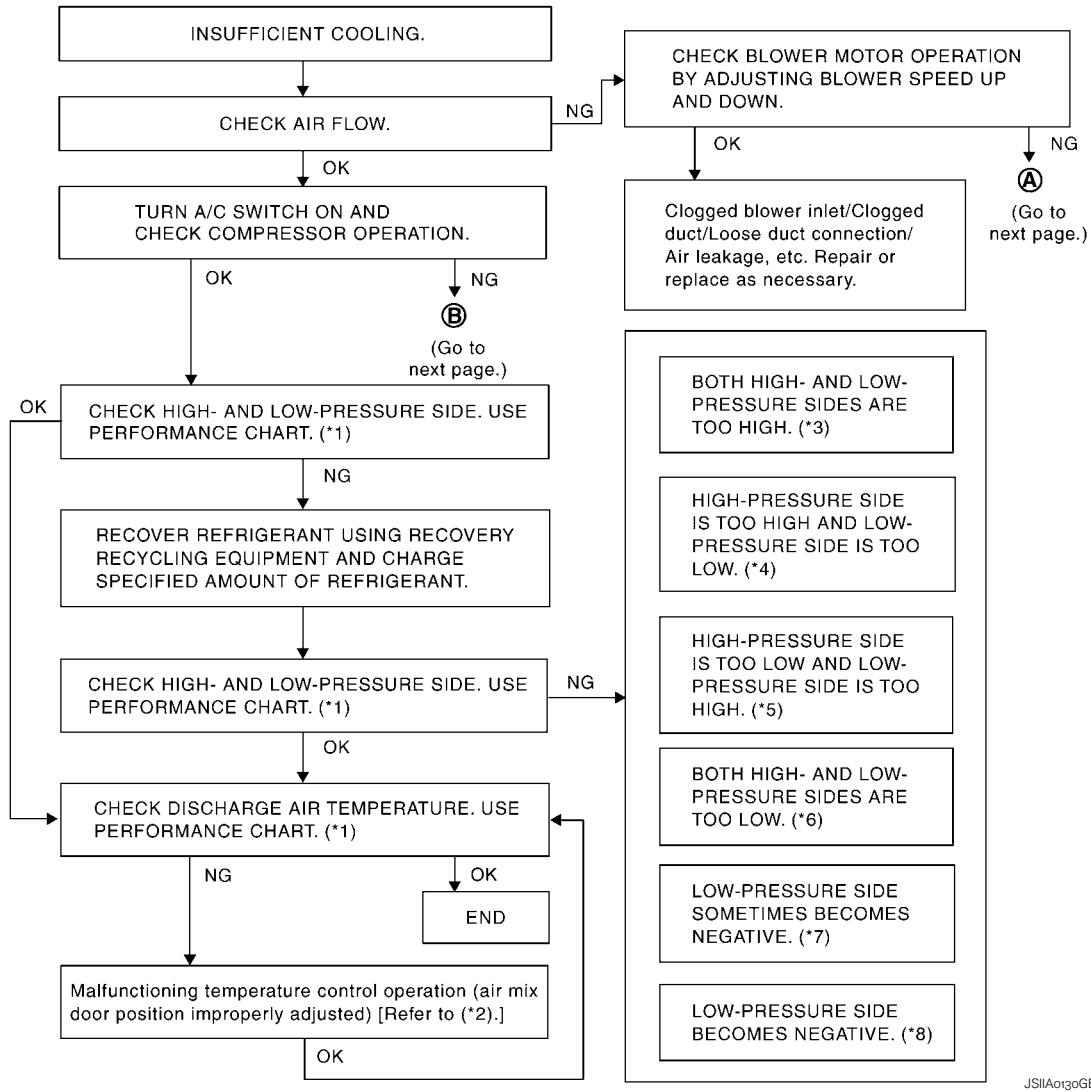
[MANUAL AIR CONDITIONER (K9K)]

REFRIGERATION SYSTEM

Inspection

INFOID:000000001098282

PERFORMANCE TEST DIAGNOSIS



JSIIA0130GB

*2 [HAC-187, "Diagnosis Chart By Symptom"](#)

*3 [HA-165, "BOTH HIGH- AND LOW-PRESSURE SIDES ARE TOO HIGH : Symptom Table"](#)

*4 [HA-165, "HIGH-PRESSURE SIDE IS TOO HIGH AND LOW-PRESSURE SIDE IS TOO LOW : Symptom Table"](#)

*5 [HA-166, "HIGH-PRESSURE SIDE IS TOO LOW AND LOW-PRESSURE SIDE IS TOO HIGH : Symptom Table"](#)

*6 [HA-166, "BOTH HIGH- AND LOW-PRESSURE SIDES ARE TOO LOW : Symptom Table"](#)

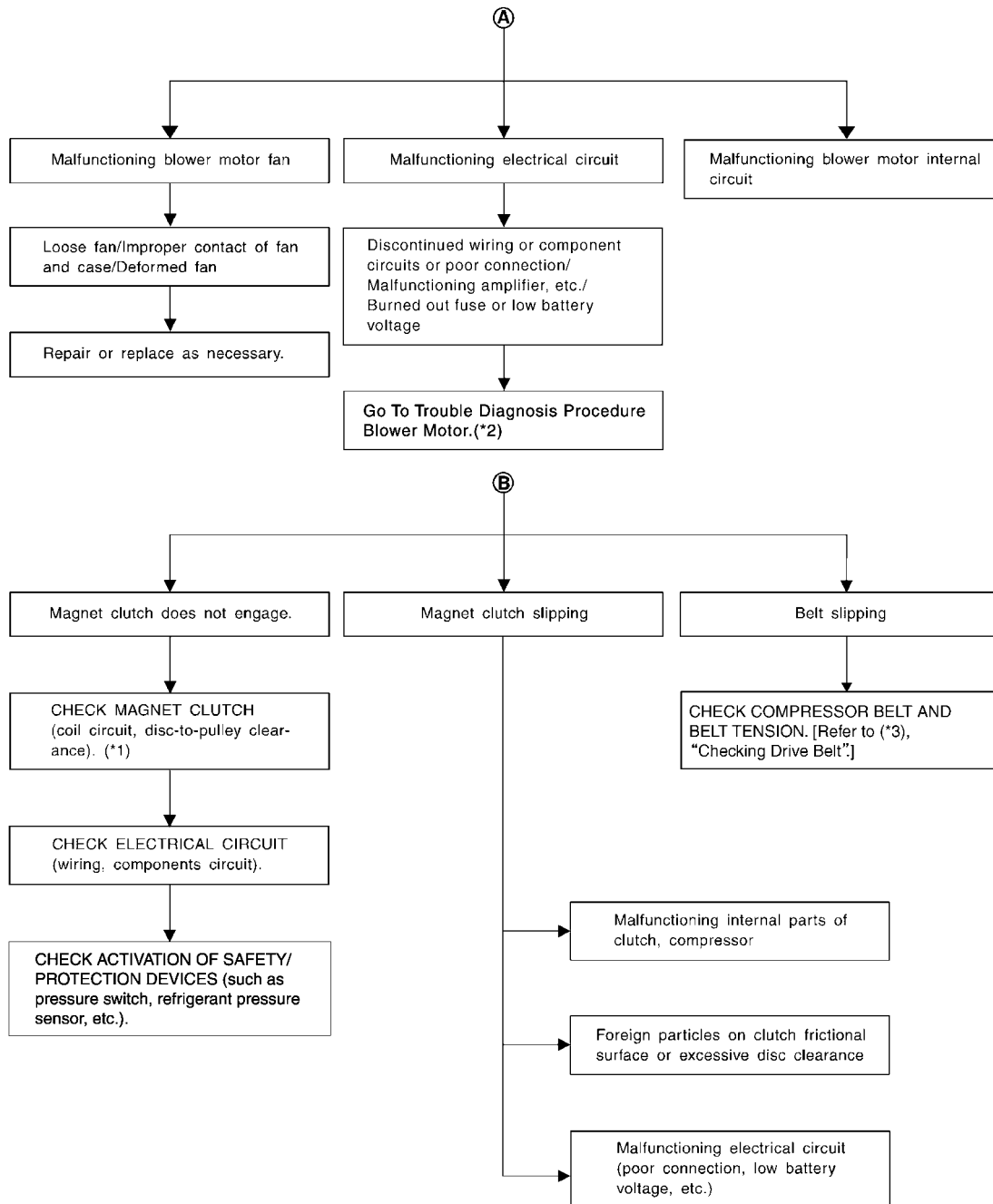
*7 [HA-167, "LOW-PRESSURE SIDE SOMETIMES BECOMES NEGATIVE : Symptom Table"](#)

*8 [HA-167, "LOW-PRESSURE SIDE BECOMES NEGATIVE : Symptom Table"](#)

REFRIGERATION SYSTEM

< ON-VEHICLE MAINTENANCE >

[MANUAL AIR CONDITIONER (K9K)]



SJIA1642E

*2 [HAC-153. "Diagnosis Procedure"](#)

*3 [EM-259. "Inspection and Adjustment"](#)

Refrigerant Leaks

INFOID:000000001098284

Perform a visual inspection of all refrigeration parts, fittings, hoses and components for signs of A/C lubricant leakage, damage and corrosion. A/C lubricant leakage may indicate an area of refrigerant leakage. Allow extra inspection time in these areas when using either an electrical leak detector or fluorescent dye leak detector (SST: J-42220).

If dye is observed, confirm the leak with an electrical leak detector. It is possible a prior leak was repaired and not properly cleaned.

REFRIGERATION SYSTEM

< ON-VEHICLE MAINTENANCE >

[MANUAL AIR CONDITIONER (K9K)]

When searching for leaks, do not stop when one leak is found but continue to check for additional leaks at all system components and connections.

When searching for refrigerant leaks using an electrical leak detector, move the probe along the suspected leak area at 1 to 2 inches per second and no further than 1/4 inch from the component.

CAUTION:

Moving the electrical leak detector probe slower and closer to the suspected leak area will improve the chances of finding a leak.

FLUORESCENT LEAK DETECTOR

< ON-VEHICLE MAINTENANCE >

[MANUAL AIR CONDITIONER (K9K)]

FLUORESCENT LEAK DETECTOR

Inspection

INFOID:000000001098285

CHECKING SYSTEM FOR LEAKS USING THE FLUORESCENT LEAK DETECTOR

1. Check A/C system for leaks using the UV lamp and safety goggles (SST: J-42220) in a low sunlight area (area without windows preferable). Illuminate all components, fittings and lines. The dye will appear as a bright green/yellow area at the point of leakage. Fluorescent dye observed at the evaporator drain opening indicates an evaporator core assembly (tubes, core or expansion valve) leak.
2. If the suspected area is difficult to see, use an adjustable mirror or wipe the area with a clean shop rag or cloth, with the UV lamp for dye residue.
3. After the leak is repaired, remove any residual dye using dye cleaner (SST: J-43872) to prevent future misdiagnosis.
4. Perform a system performance check and verify the leak repair with an approved electrical leak detector.

NOTE:

Other gases in the work area or substances on the A/C components, for example, anti-freeze, windshield washer fluid, solvents and lubricants, may falsely trigger the leak detector. Make sure the surfaces to be checked are clean.

Clean with a dry cloth or blow off with shop air.

Do not allow the sensor tip of the detector to contact with any substance. This can also cause false readings and may damage the detector.

DYE INJECTION

(This procedure is only necessary when recharging the system or when the compressor has seized and was replaced.)

1. Check A/C system static (at rest) pressure. Pressure must be at least 345 kPa (3.52 kg/cm², 50 psi).
2. Pour one bottle (1/4 ounce / 7.4 cc) of the A/C refrigerant dye into the injector tool (SST: J-41459).
3. Connect the injector tool to the A/C low-pressure side service valve.
4. Start the engine and switch A/C ON.
5. When the A/C operating (compressor running), inject one bottle (1/4 ounce / 7.4 cc) of fluorescent dye through the low-pressure service valve using dye injector tool (SST: J-41459) (refer to the manufacture's operating instructions).
6. With the engine still running, disconnect the injector tool from the service valve.

CAUTION:

Be careful the A/C system or replacing a component, pour the dye directly into the open system connection and proceed with the service procedures.

7. Operate the A/C system for a minimum of 20 minutes to mix the dye with the system oil. Depending on the leak size, operating conditions and location of the leak, it may take from minutes to days for the dye to penetrate a leak and become visible.
8. Attach a blue label as necessary.

ELECTRICAL LEAK DETECTOR

< ON-VEHICLE MAINTENANCE >

[MANUAL AIR CONDITIONER (K9K)]

ELECTRICAL LEAK DETECTOR

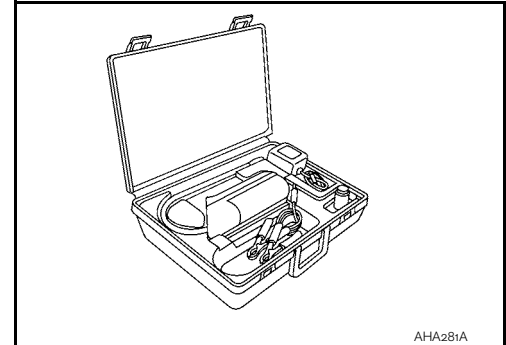
Inspection

INFOID:000000001098286

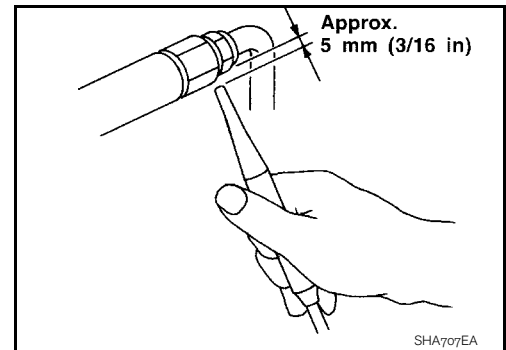
PRECAUTIONS FOR HANDLING LEAK DETECTOR

When performing a refrigerant leak check, use an electrical leak detector (SST: J-41995) or equivalent. Ensure that the instrument is calibrated and set properly per the operating instructions.

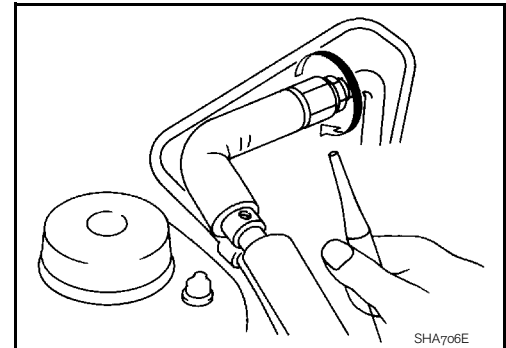
The leak detector is a delicate device. In order to use the leak detector properly, read the operating instructions and perform any specified maintenance.



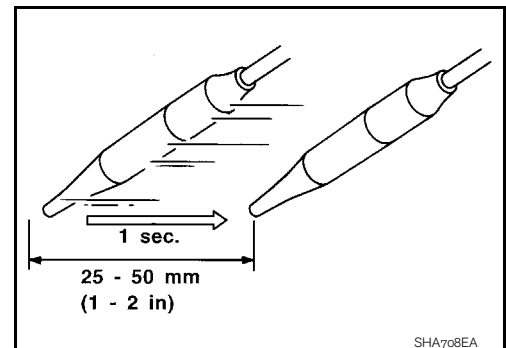
1. Position probe approximately 5 mm (3/16 in) away from point to be checked.



2. When testing, circle each fitting completely with probe.



3. Move probe along component approximately 25 to 50 mm (1 to 2 in)/sec.



CHECKING PROCEDURE

To prevent inaccurate or false readings, make sure there is no refrigerant vapor, shop chemicals, or cigarette smoke in the vicinity of the vehicle. Perform the leak test in calm area (low air/wind movement) so that the leaking refrigerant is not dispersed.

1. Stop the engine.

ELECTRICAL LEAK DETECTOR

< ON-VEHICLE MAINTENANCE >

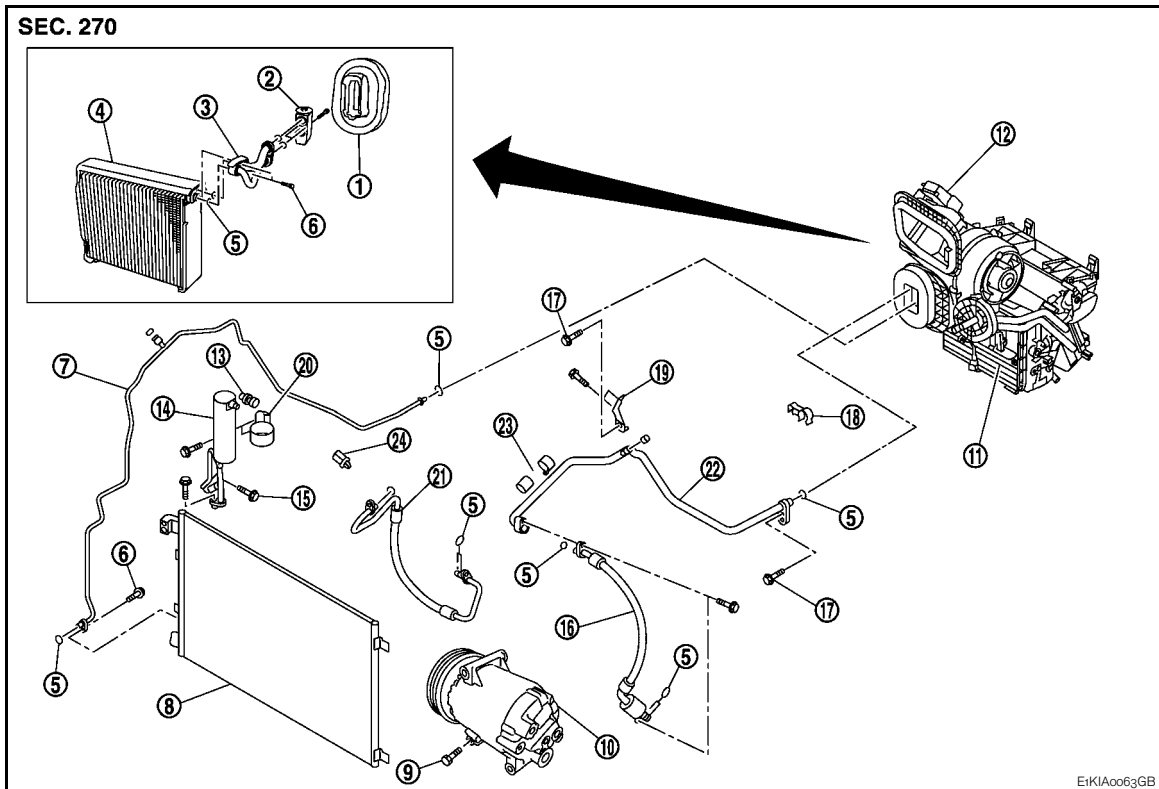
[MANUAL AIR CONDITIONER (K9K)]

2. Connect a suitable A/C manifold gauge set (SST: J-39183) to the A/C service valves.
3. Check if the A/C refrigerant pressure is at least 345 kPa (3.52 kg/cm², 50 psi) above 16°C (61°F). If less than specification, recover/evacuate and recharge the system with the specified amount of refrigerant.

NOTE:

At temperatures below 16°C (61°F), leaks may not be detected since the system may not reach 345 kPa (3.52 kg/cm², 50 psi).

4. Perform the leak test from the high-pressure side (compressor discharge a to evaporator inlet j) to the low-pressure side (evaporator drain hose k to shaft seal p). Perform a leak check for the following areas carefully. Clean the component to be checked and move the leak detected probe completely around the connection/component.



- | | | |
|--------------------------------------|---|--|
| 1. Heater sealing | 2. Expansion valve | 3. Low pressure pipe 1 and high pressure pipe 2 assembly |
| 4. Evaporator | 5. O-ring | 6. Connector pipe fixing bolt |
| 7. High pressure pipe 1 | 8. Condenser assembly | 9. Fixing bolt |
| 10. Compressor | 11. Heater & cooling unit assembly | 12. Heater & blower unit assembly |
| 13. Refrigerant pressure sensor | 14. Liquid tank | 15. Liquid tank fixing screw |
| 16. Low pressure flexible hose | 17. Fixing bolt | 18. Pipes fixing clip |
| 19. Low & high pressure pipe bracket | 20. Liquid tank fixing bracket | 21. High pressure flexible hose |
| 22. Low pressure pipe 2 | 23. Low pressure pipe fixing clamp assembly | 24. Pipe mantening clip |

Compressor

Check the fitting of high- and low-pressure flexible hoses, relief valve and shaft seal.

Condenser

Check the fitting of condenser pipe assembly, high-pressure flexible hose and pipe.

Liquid tank

Check the fitting of radiator & condenser assembly and refrigerant pressure sensor.

Service valves

Check all around the service valves. Ensure service valve caps are secured on the service valves (to prevent leaks).

NOTE:

ELECTRICAL LEAK DETECTOR

< ON-VEHICLE MAINTENANCE >

[MANUAL AIR CONDITIONER (K9K)]

After removing A/C manifold gauge set from service valves, wipe any residue from valves to prevent any false readings by leak detector.

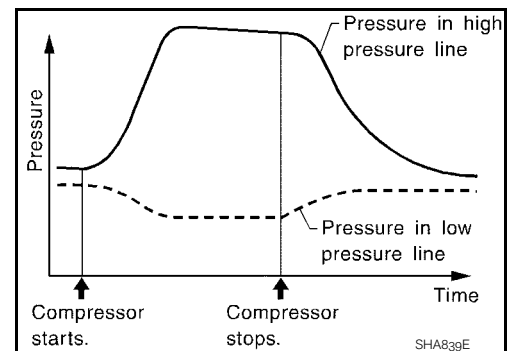
Cooling unit (Evaporator)

With engine OFF, turn blower fan on "High" for at least 15 seconds to dissipate any refrigerant trace in the cooling unit. Wait a minimum of 10 minutes accumulation time (refer to the manufacturer's recommended procedure for actual wait time) before inserting the leak detector probe into the drain hose.

Keep the probe inserted for at least 10 seconds. Use caution not to contaminate the probe tip with water or dirt that may be in the drain hose.

5. If a leak detector detects a leak, verify at least once by blowing compressed air into area of suspected leak, then repeat check as outlined above.
6. Do not stop when one leak is found. Continue to check for additional leaks at all system components. If no leaks are found, perform steps 7 - 10.
7. Start the engine.
8. Set the A/C control as follows;
 - a. A/C switch: ON
 - b. MODE door position: VENT (Ventilation)
 - c. Intake door position: Recirculation
 - d. Temperature setting: Max. cold
 - e. Fan speed: High
9. Run engine at 1,500 rpm for at least 2 minutes.
10. Stop the engine and perform leak check again following steps 4 through 6 above.

Refrigerant leaks should be checked immediately after stopping the engine. Begin with the leak detector at the compressor. The pressure on the high-pressure side will gradually drop after refrigerant circulation stops and pressure on the low-pressure side will gradually rise, as shown in the graph. Some leaks are more easily detected when pressure is high.



11. Before connecting recovery/recycling recharging equipment to vehicle, check recovery/recycling recharging equipment gauges. No refrigerant pressure should be displayed. If pressure is displayed, recover refrigerant from equipment lines and then check refrigerant purity.
12. Confirm refrigerant purity in supply tank using recovery/recycling recharging equipment and refrigerant identifier.
13. Confirm refrigerant purity in vehicle A/C system using recovery/recycling recharging equipment and refrigerant identifier.
14. Discharge A/C system using approved refrigerant recovery equipment. Repair the leaking fitting or component if necessary.
15. Evacuate and recharge A/C system and perform the leak test to confirm no refrigerant leaks.
16. Perform A/C performance test to ensure system works properly.

REFRIGERATION SYSTEM

< ON-VEHICLE REPAIR >

[MANUAL AIR CONDITIONER (K9K)]

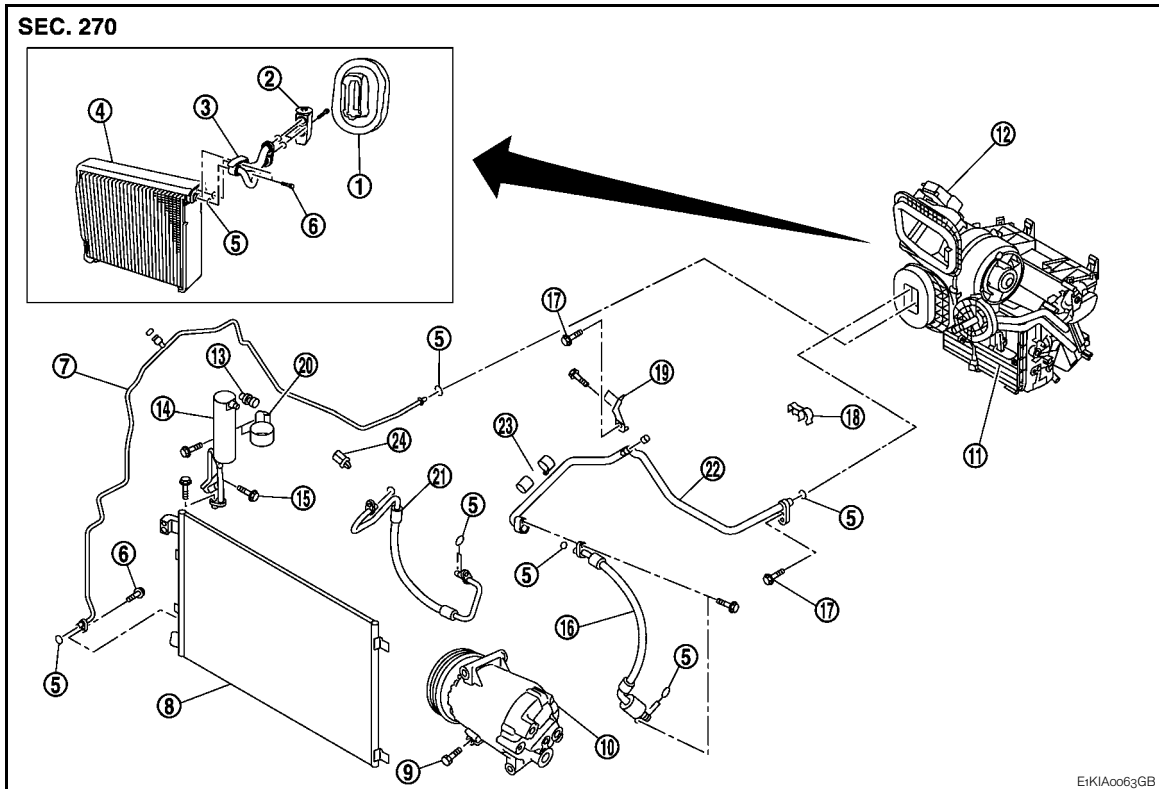
ON-VEHICLE REPAIR

REFRIGERATION SYSTEM

Exploded View

INFOID:000000001098287

Refer to [HA-171, "Refrigerant Connection"](#).



- | | | |
|--------------------------------------|---|--|
| 1. Heater sealing | 2. Expansion valve | 3. Low pressure pipe 1 and high pressure pipe 2 assembly |
| 4. Evaporator | 5. O-ring | 6. Connector pipe fixing bolt |
| 7. High pressure pipe 1 | 8. Condenser assembly | 9. Fixing bolt |
| 10. Compressor | 11. Heater & cooling unit assembly | 12. Heater & blower unit assembly |
| 13. Refrigerant pressure sensor | 14. Liquid tank | 15. Liquid tank fixing screw |
| 16. Low pressure flexible hose | 17. Fixing bolt | 18. Pipes fixing clip |
| 19. Low & high pressure pipe bracket | 20. Liquid tank fixing bracket | 21. High pressure flexible hose |
| 22. Low pressure pipe 2 | 23. Low pressure pipe fixing clamp assembly | 24. Pipe mantening clip |

Inspection After Installation

INFOID:000000001098288

SETTING OF SERVICE TOOLS AND EQUIPMENT

Discharging Refrigerant

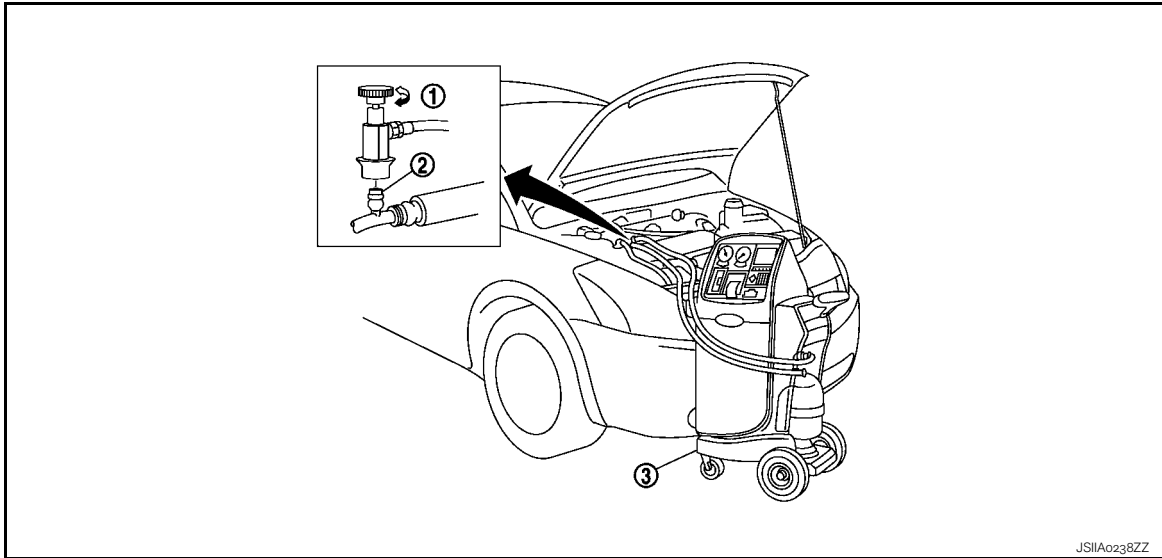
WARNING:

Avoid breathing A/C refrigerant and lubricant vapor or mist. Exposure may irritate eyes, nose and throat. Remove HFC-134a (R-134a) from 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]. If accidental system discharge occurs, ventilate work area before resuming service. Additional health and safety information may be obtained from refrigerant and lubricant manufacturers.

REFRIGERATION SYSTEM

< ON-VEHICLE REPAIR >

[MANUAL AIR CONDITIONER (K9K)]

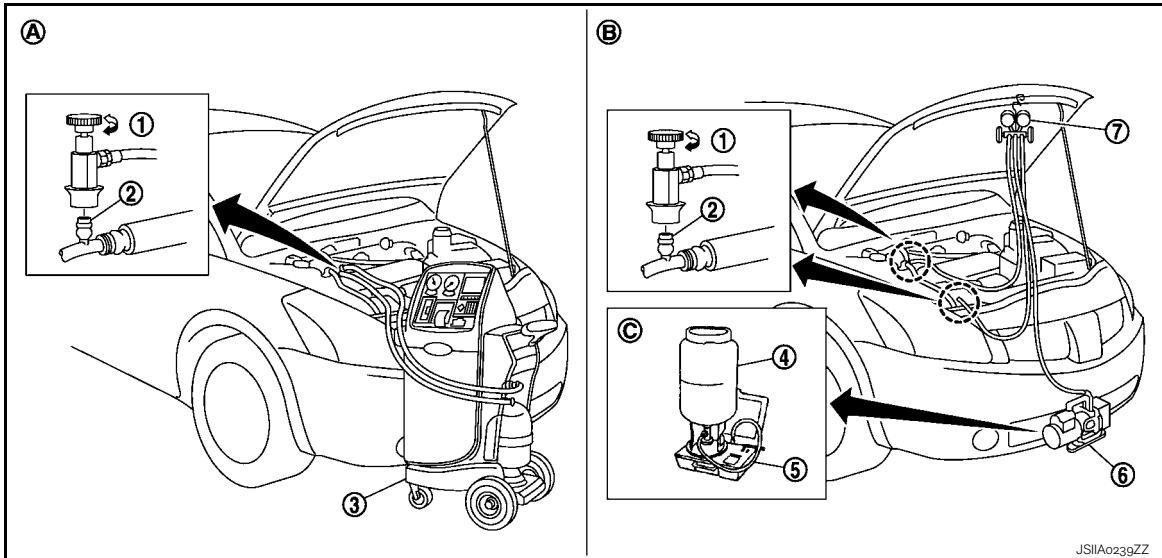


1. Shut-off valve

2. A/C service valve

3. Recovery/Recycling/Recharging equipment

Evacuating System and Charging Refrigerant



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

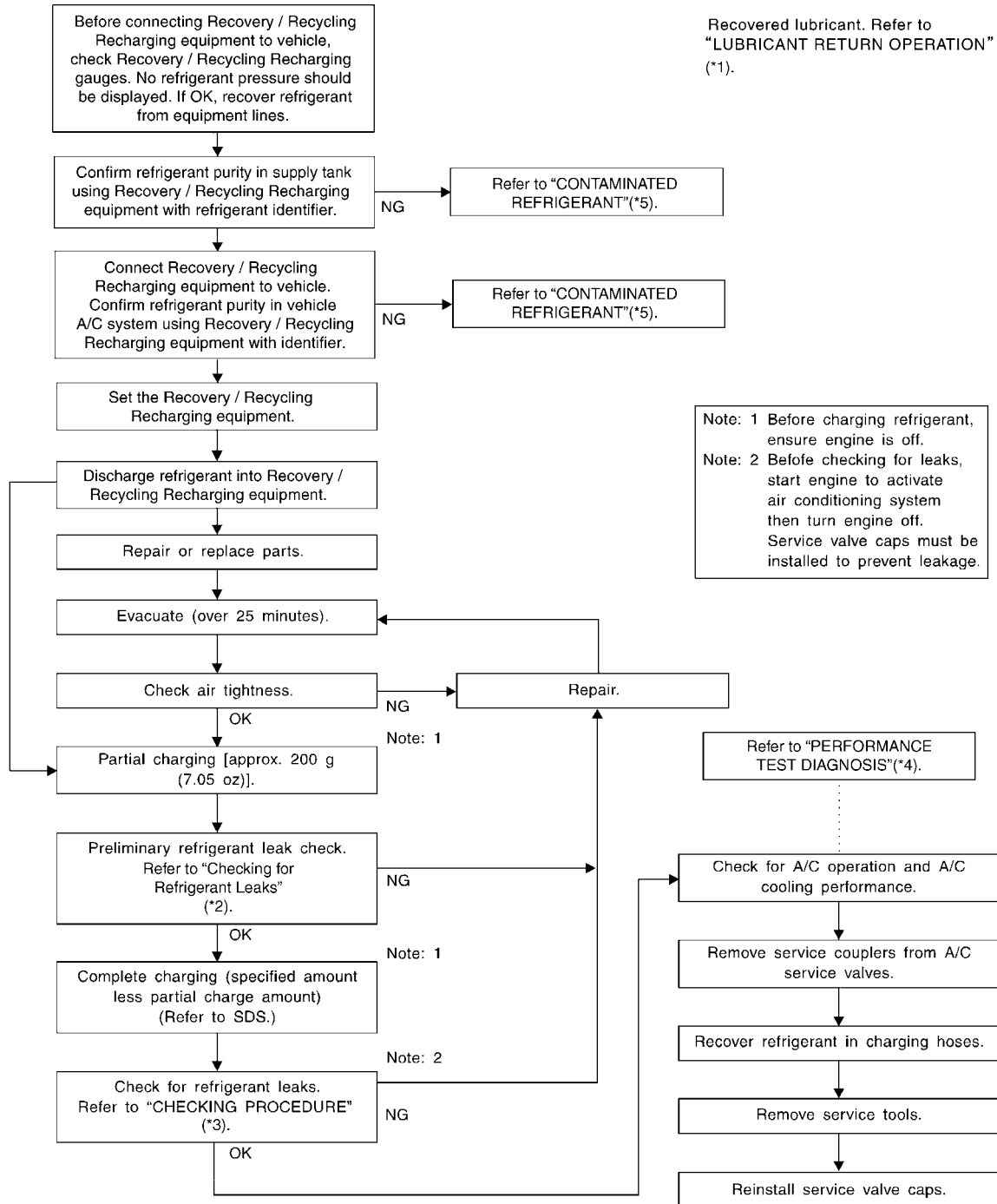
B. Alternative method

C. For charging

REFRIGERATION SYSTEM

< ON-VEHICLE REPAIR >

[MANUAL AIR CONDITIONER (K9K)]



*1 [HA-180. "Adjustment"](#)

*4 "PERFORMANCE TEST DIAGNOSIS" in [HA-182. "Inspection"](#).

*2 "REFRIGERANT LEAKS" in [HA-183. "Refrigerant Leaks"](#).

*5 "CONTAMINATED REFRIGERANT" in [HA-170. "Working with HFC-134a \(R-134a\)"](#).

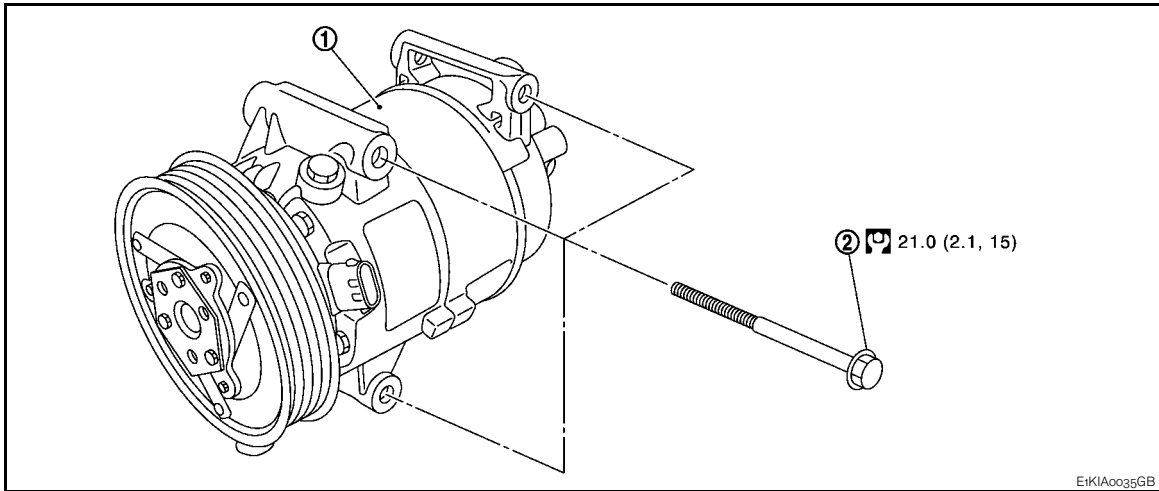
*3 "CHECKING PROCEDURE" in [HA-182. "Inspection"](#).

SJIA1275E

COMPRESSOR

Exploded View

INFOID:000000001098289



1. Compressor
2. Compressor fixing bolt

Refer to [GI-4, "Components"](#) for symbols in the figure.

Removal and Installation

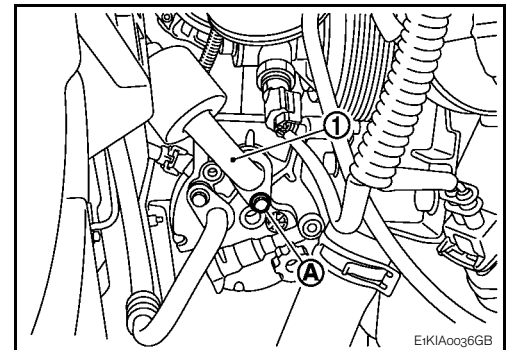
INFOID:000000001098290

REMOVAL

1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
2. Remove engine cover ornament.
3. Remove air intake hoses (RH) and air duct (LH). Refer to [EM-265, "Removal and Installation"](#).
4. Remove engine undercover, using power tools.
5. Drain engine coolant from radiator. Refer to [CO-52, "Draining"](#).
6. Remove drive belt. Refer to [EM-259, "Removal and Installation"](#).
7. Remove lower radiator hose from engine. Refer to [CO-56, "Removal and Installation"](#).
8. Remove fixing bolts (A) and (B) from low-pressure flexible hose (1) and high-pressure flexible hose (2).
9. Remove low-pressure flexible hose and high-pressure flexible hose from compressor.

CAUTION:

Cap or wrap the joint of compressor, low-pressure flexible hose and high-pressure flexible hose with suitable material such as vinyl tape to avoid the entry of air.



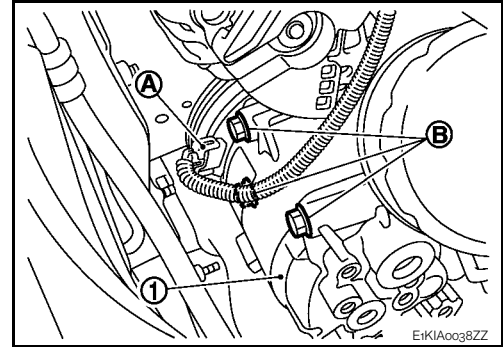
10. Disconnect harness connector from compressor.

COMPRESSOR

< ON-VEHICLE REPAIR >

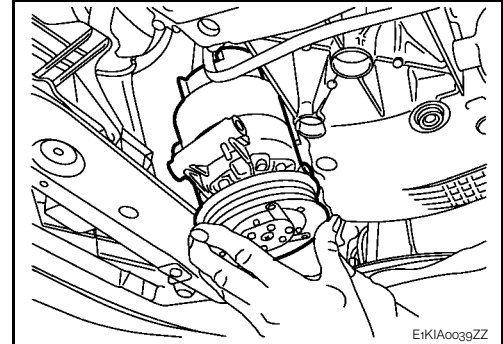
[MANUAL AIR CONDITIONER (K9K)]

11. Remove compressor harness connector (A), then remove mounting bolts (B) from compressor (1), using power tools.



12. Remove the compressor from the vehicle.

Compressor fixing bolt to engine
: 21 N·m (2.2 kg-m, 15.5 ft-lb)



INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

- Replace O-rings of low-pressure flexible hose and high-pressure flexible hose with new ones, and then apply compressor oil to it when installing it.
- When recharging refrigerant, check for leaks.

LOW-PRESSURE FLEXIBLE HOSE AND PIPE 2

< ON-VEHICLE REPAIR >

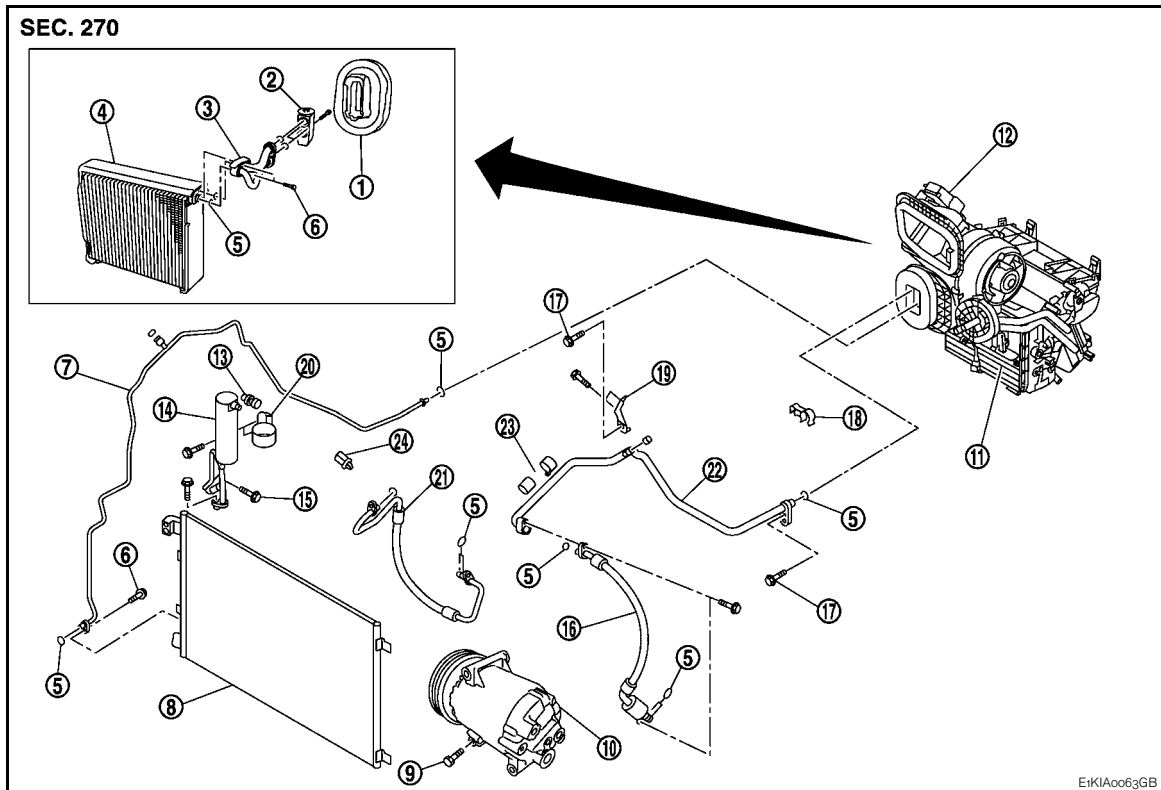
[MANUAL AIR CONDITIONER (K9K)]

LOW-PRESSURE FLEXIBLE HOSE AND PIPE 2

Exploded View

INFOID:000000001098292

Refer to [HA-171. "Refrigerant Connection"](#).



- | | | |
|--------------------------------------|---|--|
| 1. Heater sealing | 2. Expansion valve | 3. Low pressure pipe 1 and high pressure pipe 2 assembly |
| 4. Evaporator | 5. O-ring | 6. Connector pipe fixing bolt |
| 7. High pressure pipe 1 | 8. Condenser assembly | 9. Fixing bolt |
| 10. Compressor | 11. Heater & cooling unit assembly | 12. Heater & blower unit assembly |
| 13. Refrigerant pressure sensor | 14. Liquid tank | 15. Liquid tank fixing screw |
| 16. Low pressure flexible hose | 17. Fixing bolt | 18. Pipes fixing clip |
| 19. Low & high pressure pipe bracket | 20. Liquid tank fixing bracket | 21. High pressure flexible hose |
| 22. Low pressure pipe 2 | 23. Low pressure pipe fixing clamp assembly | 24. Pipe mantening clip |

Removal and Installation

INFOID:000000001098293

REMOVAL

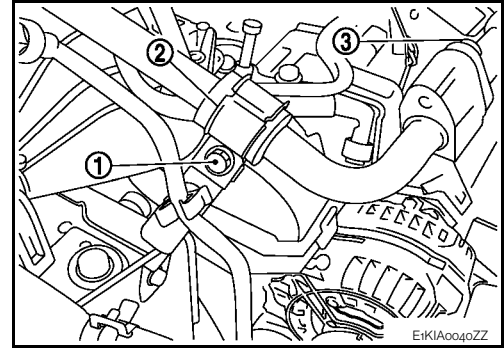
1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
2. Remove upper engine cover ornament. Refer to [EM-266. "Removal and Installation"](#).
3. Remove air intake hose (RH side), and air duct (LH). Refer to [EM-265. "Removal and Installation"](#).

LOW-PRESSURE FLEXIBLE HOSE AND PIPE 2

< ON-VEHICLE REPAIR >

[MANUAL AIR CONDITIONER (K9K)]

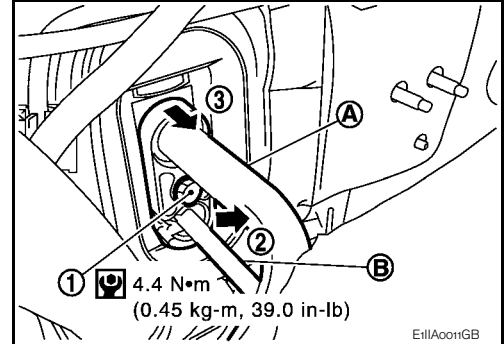
4. Remove mounting bolt (1) and clamp (2), from low pressure pipe bracket support.
5. Remove low and high-pressure maintaining clip, from both pipes, then remove fixing bolt (3) from low-pressure flexible hose and low-pressure pipe 2.
6. Remove engine room insulator fixing clip from cowl top.



7. Pull engine room insulator, then remove pipes bracket fixing bolt (1), from expansion valve, and release pipes fixing bracket, as shown in order (1) to (3), from high pressure pipe 1 (B), to remove low pressure flexible hose and pipe 2 (A) from expansion valve.

CAUTION:

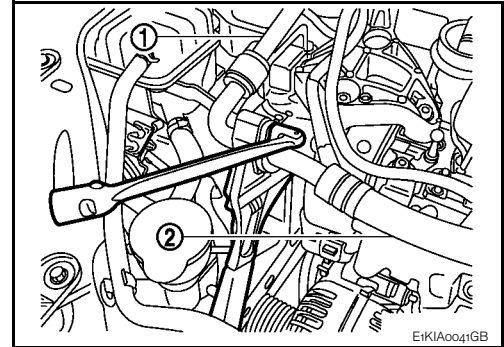
Cap or wrap the joint of the low pressure then remove fixing bolt (3) pipe 2, and expansion valve exit with suitable material such as vinyl tape to avoid the entry of air.



8. Remove low pressure pipe 2 connector fixing nut, with suitable tools, then remove low pressure pipe 2 (1) from low pressure flexible hose (2).

CAUTION:

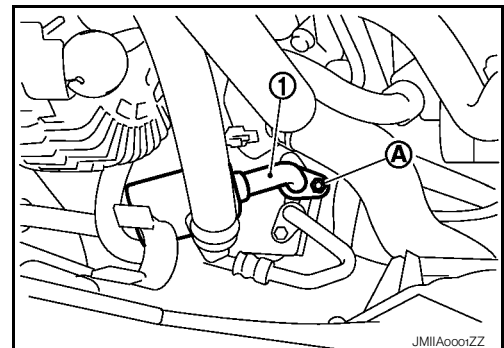
Cap or wrap the joint of the low pressure pipe 2 connector, and low pressure flexible hose, with suitable material such as vinyl tape to avoid the entry of air.



9. Remove low pressure flexible hose fixing bolt (A), from air conditioner compressor, and remove low pressure flexible hose (1).

CAUTION:

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



Pipe bracket fixing bolt to expansion valve

: 4.4 N·m (0.45 kg-m, 39 in-lb)

Low pressure flexible pipe fixing bolt to compressor

: 8.0 N·m (0.8 kg-m, 71 in-lb)

INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

- Replace O-rings of low-pressure flexible hose and low-pressure pipe 2 with new ones, and then apply compressor oil to it when installing it.
- 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 make sure that connection does not come loose.
- When recharging refrigerant, check for leaks.

HIGH-PRESSURE FLEXIBLE HOSE

< ON-VEHICLE REPAIR >

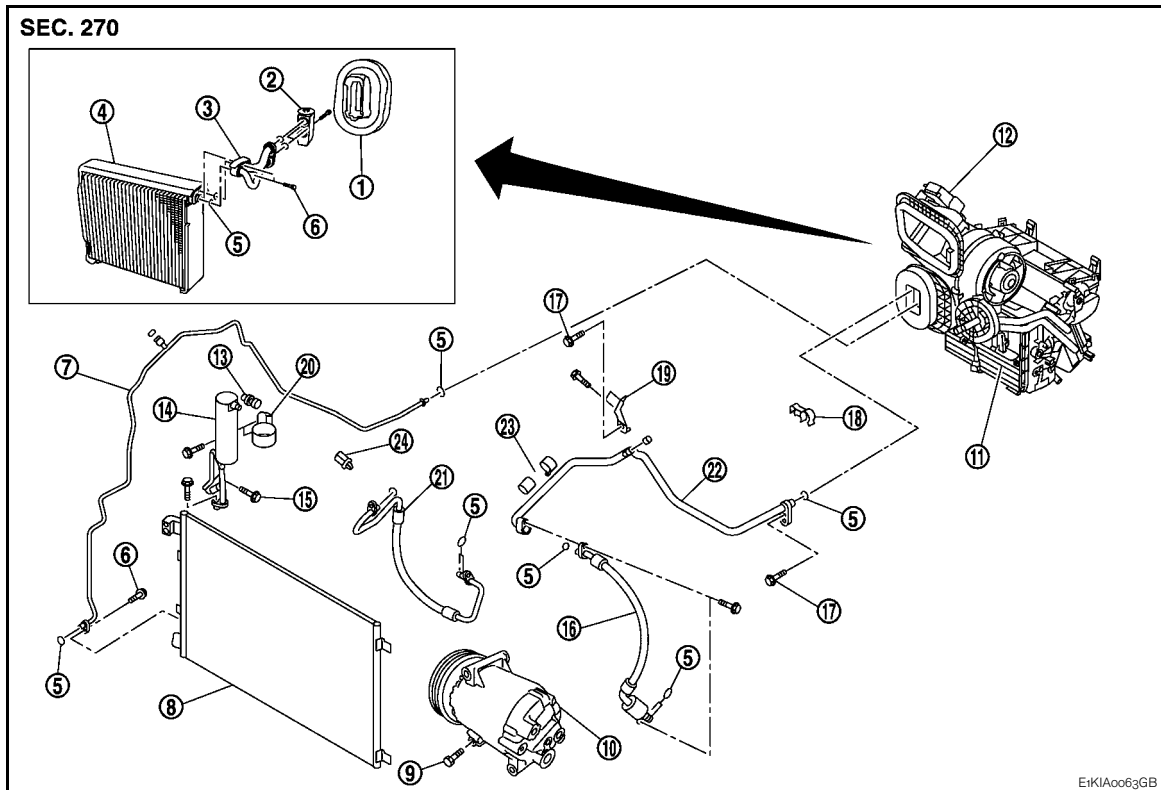
[MANUAL AIR CONDITIONER (K9K)]

HIGH-PRESSURE FLEXIBLE HOSE

Exploded View

INFOID:000000001098294

Refer to [HA-171. "Refrigerant Connection"](#).



- | | | |
|--------------------------------------|---|--|
| 1. Heater sealing | 2. Expansion valve | 3. Low pressure pipe 1 and high pressure pipe 2 assembly |
| 4. Evaporator | 5. O-ring | 6. Connector pipe fixing bolt |
| 7. High pressure pipe 1 | 8. Condenser assembly | 9. Fixing bolt |
| 10. Compressor | 11. Heater & cooling unit assembly | 12. Heater & blower unit assembly |
| 13. Refrigerant pressure sensor | 14. Liquid tank | 15. Liquid tank fixing screw |
| 16. Low pressure flexible hose | 17. Fixing bolt | 18. Pipes fixing clip |
| 19. Low & high pressure pipe bracket | 20. Liquid tank fixing bracket | 21. High pressure flexible hose |
| 22. Low pressure pipe 2 | 23. Low pressure pipe fixing clamp assembly | 24. Pipe mantening clip |

Removal and Installation

INFOID:000000001098295

REMOVAL

1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
2. Remove engine cover ornament. Refer to [EM-266. "Removal and Installation"](#).
3. Remove air intake hose (RH) and air duct (LH). Refer to [EM-265. "Removal and Installation"](#).
4. Remove front grille. Refer to [EXT-17. "Removal and Installation"](#).
5. Remove radiator air guide (RH). Refer to [CO-56. "Removal and Installation"](#).

HIGH-PRESSURE FLEXIBLE HOSE

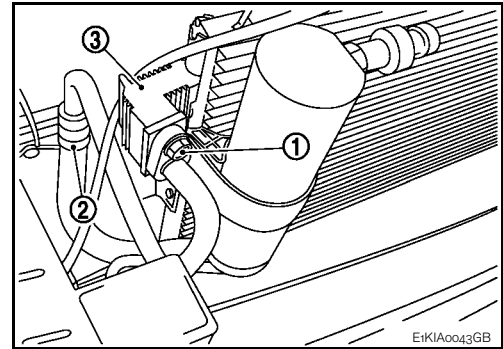
< ON-VEHICLE REPAIR >

[MANUAL AIR CONDITIONER (K9K)]

6. Remove high pressure flexible hose fixing bolt (1) from condenser (3), then pull high pressure flexible hose (2) to remove it from condenser.

CAUTION:

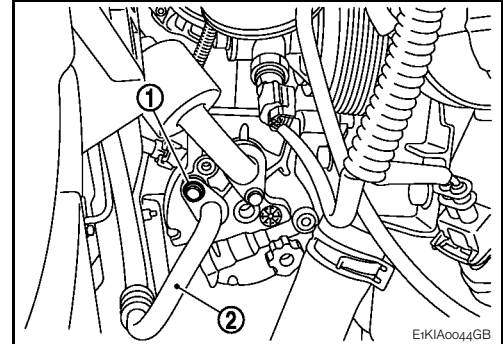
Cap or wrap the joint of high-pressure flexible hose and condenser assembly with suitable material such as vinyl tape to avoid the entry of air.



7. Remove high pressure flexible hose fixing bolt (1) from compressor, then pull high pressure flexible hose (2) to remove it from compressor. Remove high pressure flexible hose.

CAUTION:

Cap or wrap the joint of compressor and high-pressure flexible hose with suitable material such as vinyl tape to avoid the entry of air.



High pressure fixing bolt to condensor

: 4.4 N·m (0.45 kg-m, 39 in-lb)

High pressure fixing bolt to compressor

: 8 N·m (0.8 kg-m, 71 in-lb)

INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

- Replace O-rings of high-pressure flexible hose with new ones, and then apply compressor oil to it when installing it.
- 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 make sure that connection does not come loose.
- When recharging refrigerant, check for leaks.

HIGH-PRESSURE PIPE 1 (ENGINE COMPARTMENT)

< ON-VEHICLE REPAIR >

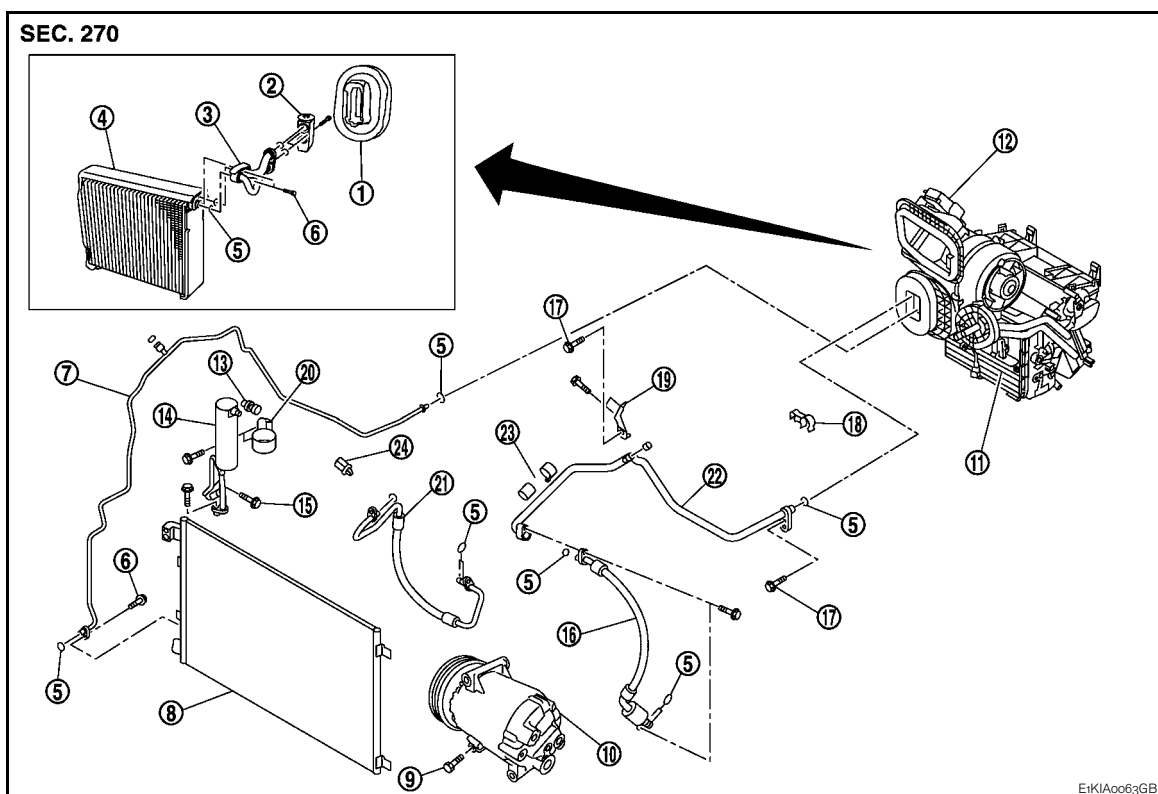
[MANUAL AIR CONDITIONER (K9K)]

HIGH-PRESSURE PIPE 1 (ENGINE COMPARTMENT)

Exploded View

INFOID:000000001098296

Refer to [HA-171. "Refrigerant Connection"](#).



- | | | |
|--------------------------------------|---|--|
| 1. Heater sealing | 2. Expansion valve | 3. Low pressure pipe 1 and high pressure pipe 2 assembly |
| 4. Evaporator | 5. O-ring | 6. Connector pipe fixing bolt |
| 7. High pressure pipe 1 | 8. Condenser assembly | 9. Fixing bolt |
| 10. Compressor | 11. Heater & cooling unit assembly | 12. Heater & blower unit assembly |
| 13. Refrigerant pressure sensor | 14. Liquid tank | 15. Liquid tank fixing screw |
| 16. Low pressure flexible hose | 17. Fixing bolt | 18. Pipes fixing clip |
| 19. Low & high pressure pipe bracket | 20. Liquid tank fixing bracket | 21. High pressure flexible hose |
| 22. Low pressure pipe 2 | 23. Low pressure pipe fixing clamp assembly | 24. Pipe mantening clip |

Removal and Installation

INFOID:000000001098297

REMOVAL

1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
2. Remove engine cover ornament. Refer to [EM-266. "Removal and Installation"](#).
3. Remove intake hose (RH) and air duct (LH). Refer to [EM-265. "Removal and Installation"](#).

HIGH-PRESSURE PIPE 1 (ENGINE COMPARTMENT)

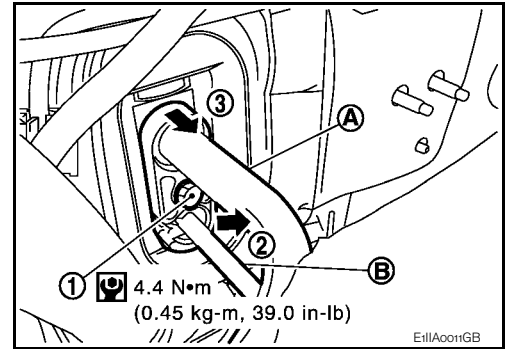
< ON-VEHICLE REPAIR >

[MANUAL AIR CONDITIONER (K9K)]

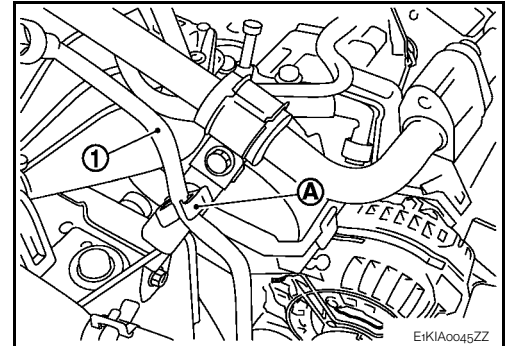
4. Pull engine room insulator, then remove pipes bracket fixing bolt, from expansion valve, then release pipe fixing bracket from high pressure pipe 1, to disconnect it from expansion valve.

CAUTION:

Cap or wrap the joint of the high pressure pipe 1, and expansion valve in, with suitable material such as vinyl tape to avoid the entry of air.



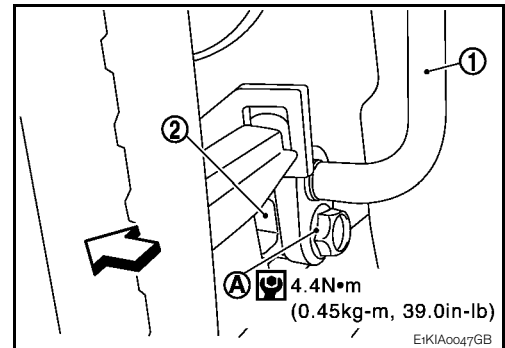
5. Remove high pressure pipe 1 (1) from clip (A).



- Remove high-pressure pipe 1 mounting bolt (A) from condenser (2).
- Remove high pressure pipe 1 (1).

CAUTION:

Cap or wrap the joint of the high pressure pipe 1, and condenser, with suitable material such as vinyl tape to avoid the entry of air.



INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

- Replace O-rings of high-pressure pipe 1 with new ones, and then apply compressor oil to it when installing it.
- 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 make sure that connection does not come loose.
- When recharging refrigerant, check for leaks.

LOW-PRESSURE PIPE 1 AND HIGH-PRESSURE PIPE 2

< ON-VEHICLE REPAIR >

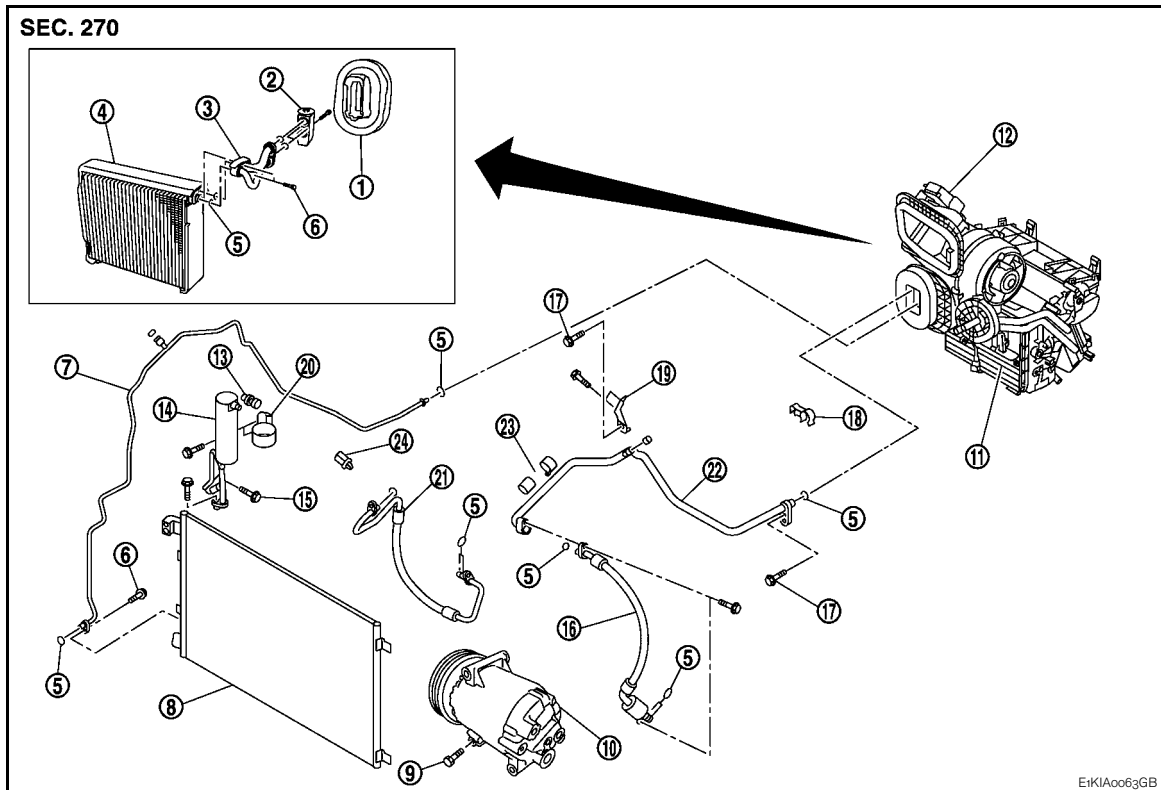
[MANUAL AIR CONDITIONER (K9K)]

LOW-PRESSURE PIPE 1 AND HIGH-PRESSURE PIPE 2

Exploded View

INFOID:000000001098298

Refer to [HA-171, "Refrigerant Connection"](#).



- | | | |
|--------------------------------------|---|--|
| 1. Heater sealing | 2. Expansion valve | 3. Low pressure pipe 1 and high pressure pipe 2 assembly |
| 4. Evaporator | 5. O-ring | 6. Connector pipe fixing bolt |
| 7. High pressure pipe 1 | 8. Condenser assembly | 9. Fixing bolt |
| 10. Compressor | 11. Heater & cooling unit assembly | 12. Heater & blower unit assembly |
| 13. Refrigerant pressure sensor | 14. Liquid tank | 15. Liquid tank fixing screw |
| 16. Low pressure flexible hose | 17. Fixing bolt | 18. Pipes fixing clip |
| 19. Low & high pressure pipe bracket | 20. Liquid tank fixing bracket | 21. High pressure flexible hose |
| 22. Low pressure pipe 2 | 23. Low pressure pipe fixing clamp assembly | 24. Pipe mantening clip |

Removal and Installation

INFOID:000000001098299

REMOVAL

1. Set the temperature at 18°C (60°F), and then disconnect the battery cable from the negative terminal.
2. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
3. Remove engine cover ornament. Refer to [EM-266, "Removal and Installation"](#).
4. Remove high-pressure pipe 1 and low pressure pipe 2 from expansion valve. Refer to [HA-194, "Removal and Installation"](#) and [HA-198, "Removal and Installation"](#).

CAUTION:

Cap or wrap the joint of the, high-pressure pipe 1, low-pressure pipe 2, and the expansion valve with suitable material such as vinyl tape to avoid the entry of air.

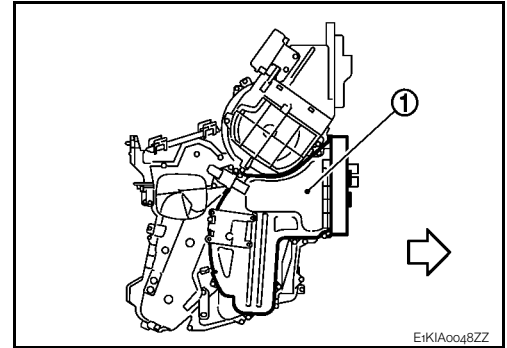
5. Remove instrument panel. Refer to [IP-12, "Removal and Installation"](#).
6. Remove foot duct (RH / LH). Refer to [VTL-95, "FLOOR DUCTS : Removal and Installation"](#).
7. Remove steering column. Refer to [ST-10, "Removal and Installation"](#).

LOW-PRESSURE PIPE 1 AND HIGH-PRESSURE PIPE 2

< ON-VEHICLE REPAIR >

[MANUAL AIR CONDITIONER (K9K)]

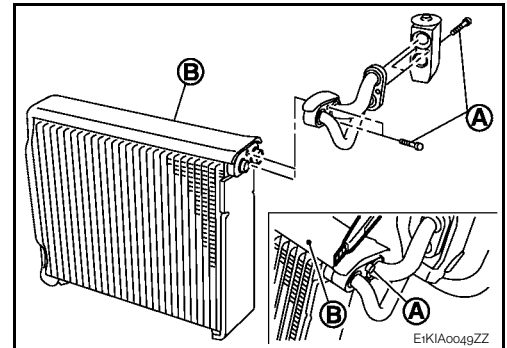
8. Remove steering member. Refer to [ST-15, "Removal and Installation"](#).
9. Remove heater and cooling assembly. Refer to [VTL-82, "Removal and Installation"](#).
10. Remove mounting screws, and then remove evaporator cover (1).



11. Using a thin cutter, cut the evaporator insulator (B), and remove fixing bolt (A) then remove low-pressure pipe 1 and high-pressure pipe 2 assembly.

CAUTION:

Cap or wrap the joint of expansion valve, high-pressure pipe 2 and low-pressure pipe 1 with suitable material such as vinyl tape to avoid the entry of air.



INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

- Replace O-rings of high-pressure pipe 1, 2 and low-pressure pipe 1, 2 with new ones, and then apply compressor oil to it when installing it.
- 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 make sure that connection does not come loose.
- When recharging refrigerant, check for leaks.

CONDENSER

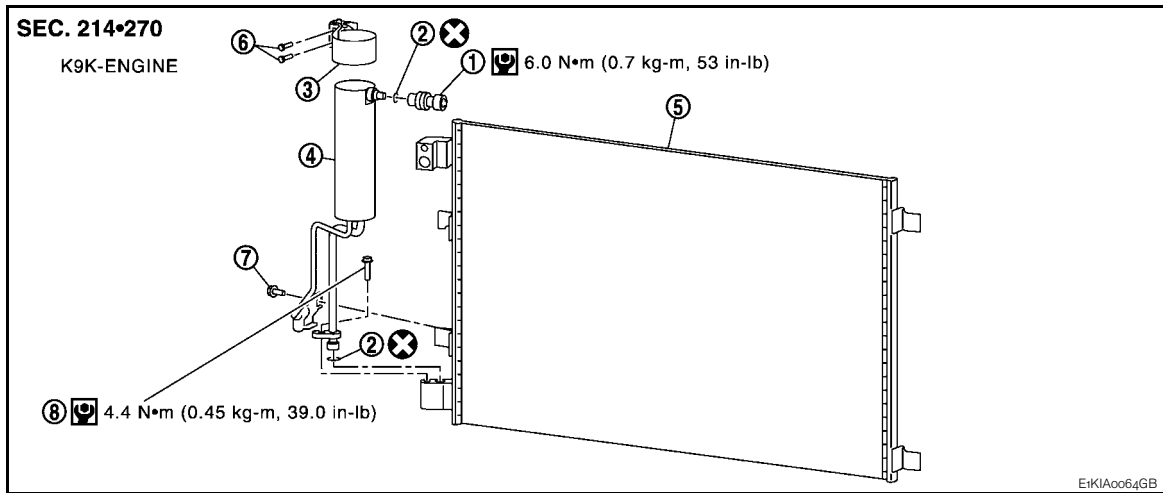
< ON-VEHICLE REPAIR >

[MANUAL AIR CONDITIONER (K9K)]

CONDENSER

Exploded View

INFOID:000000001098300



- | | | |
|----------------------------------|---------------------------------|-----------------------------|
| 1. Refrigerant pressure sensor | 2. O-ring | 3. Liquid tank bracket |
| 4. Liquid tank | 5. Condensor | 6. Liquid tank fixing screw |
| 7. Liquid tank pipe fixing screw | 8. Liquid tank pipe fixing bolt | |

Removal and Installation

INFOID:000000001098301

REMOVAL

1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
2. Remove engine cover ornament. Refer to [EM-266, "Removal and Installation"](#).
3. Remove front grille. Refer to [EXT-17, "Removal and Installation"](#).
4. Remove radiator hose, and drain coolant. Refer to [CO-56, "Removal and Installation"](#).
5. Remove upper radiator fixing bracket. Refer to [CO-56, "Removal and Installation"](#).
6. Remove radiator air-guide duct (RH). Refer to [CO-56, "Removal and Installation"](#).
7. Remove high-pressure pipe 1 from condenser. Refer to [HA-198, "Removal and Installation"](#).
8. Remove high-pressure flexible pipe 1 from condenser. Refer to [HA-196, "Removal and Installation"](#).

CAUTION:

Cap or wrap the joint of low and high-pressure pipe 1 and condenser with suitable material such as vinyl tape to avoid the entry of air.

9. Remove harness connector from refrigerant pressure sensor.
10. Remove liquid tank pipes and liquid tank from condenser and radiator. Refer to [HA-204, "Removal and Installation"](#), Refer to [CO-56, "Removal and Installation"](#).

CAUTION:

Cap or wrap the joint of liquid tank pipes and condenser with suitable material such as vinyl tape to avoid the entry of air.

11. Remove radiator fixing brackets. Refer to [CO-56, "Removal and Installation"](#).
12. Release radiator maintaining pawls, then pull-up the condenser assembly to release it from radiator. Refer to [CO-56, "Removal and Installation"](#).
13. Maintain radiator pushing back.
14. Pull upward to remove condenser.

CAUTION:

Take care do not damaged condenser or radiator.

INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

CONDENSER

< ON-VEHICLE REPAIR >

[MANUAL AIR CONDITIONER (K9K)]

- Replace O-rings of high-pressure flexible hose and high-pressure pipe 1 with new ones, and then apply compressor oil to it when installing it.
- 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 make sure that connection does not come loose.
- When recharging refrigerant, check for leaks.

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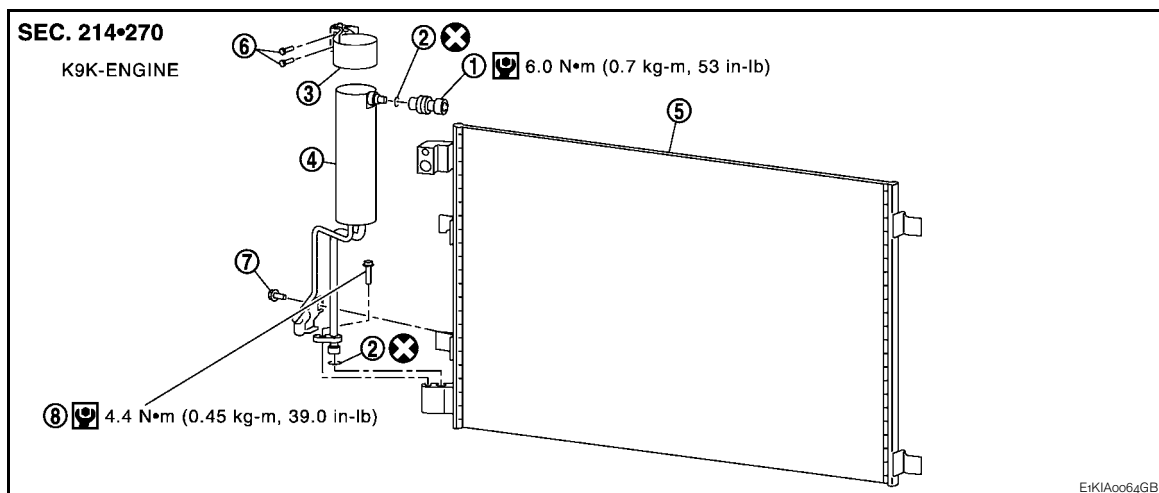
O

P

LIQUID TANK

Exploded View

INFOID:000000001098304



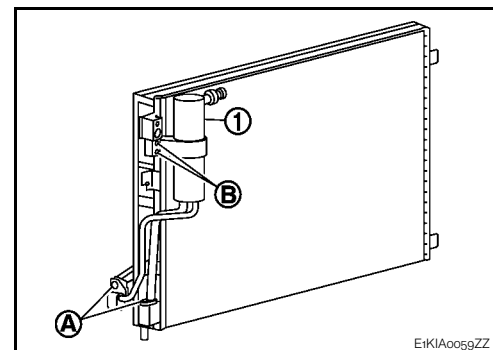
- | | | |
|----------------------------------|---------------------------------|-----------------------------|
| 1. Refrigerant pressure sensor | 2. O-ring | 3. Liquid tank bracket |
| 4. Liquid tank | 5. Condenser | 6. Liquid tank fixing screw |
| 7. Liquid tank pipe fixing screw | 8. Liquid tank pipe fixing bolt | |

Removal and Installation

INFOID:000000001098305

REMOVAL

1. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
2. Remove engine cover ornament. Refer to [EM-266, "Removal and Installation"](#).
3. Remove front grille. Refer to [EXT-17, "Removal and Installation"](#).
4. Clean liquid tank and its surrounding area, and remove dust and rust from liquid tank.
CAUTION:
Be sure to clean carefully.
5. Disconnect refrigerant sensor harness connector. Refer to [HA-205, "Removal and Installation"](#).
6. Remove air inlet tube and hose from change air cooler. Refer to [EM-266, "Removal and Installation"](#).
7. Remove radiator air-guide duct (RH) fixing clip to move air-guide duct. Refer to [CO-56, "Removal and Installation"](#).
8. Remove liquid tank bracket support mounting screws (B).
9. Remove high pressure pipe 1 mounting bolt (A). Refer to [HA-198, "Removal and Installation"](#).
10. Remove liquid tank high pressure pipe mounting bolt (A).
11. Remove liquid tank pipe bracket fixing screw (B).
CAUTION:
Cap or wrap the joint of high pressure pipe, liquid tank pipes and condenser with suitable material such as vinyl tape to avoid the entry of air.
12. Remove liquid tank assembly (1).



INSTALLATION

Install liquid tank, and then install liquid tank bracket on condenser.

CAUTION:

- Make sure liquid tank bracket is securely installed at protrusion of condenser. (Make sure liquid tank bracket does not move to a position below center of liquid tank.)
- Replace O-rings of A/C piping with new ones, and then apply compressor oil to it when installing it.
- When recharging refrigerant, check for leaks.

REFRIGERANT PRESSURE SENSOR

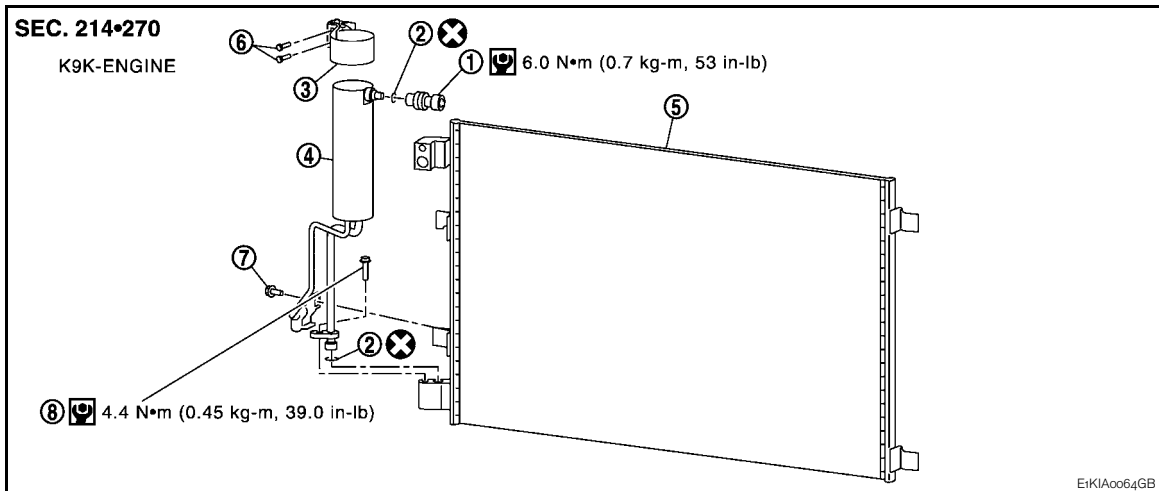
< ON-VEHICLE REPAIR >

[MANUAL AIR CONDITIONER (K9K)]

REFRIGERANT PRESSURE SENSOR

Exploded View

INFOID:000000001098306



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|----------------------------------|---------------------------------|-----------------------------|
| 1. Refrigerant pressure sensor | 2. O-ring | 3. Liquid tank bracket |
| 4. Liquid tank | 5. Condensor | 6. Liquid tank fixing screw |
| 7. Liquid tank pipe fixing screw | 8. Liquid tank pipe fixing bolt | |

Removal and Installation

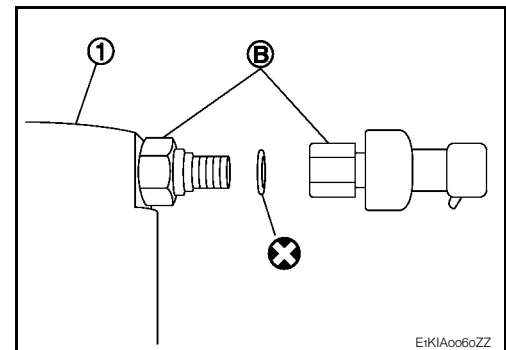
INFOID:000000001098307

REMOVAL

1. Remove liquid tank. Refer to [HA-204, "Exploded View"](#).
2. Fix the liquid tank (1) with a vise. Remove the refrigerant pressure sensor from liquid tank adaptor with a wrench (B).

CAUTION:

Be careful not to damage liquid tank.



INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

- Apply compressor oil to O-ring of refrigerant pressure sensor when installing it.
- When recharging refrigerant, check for leaks.

EVAPORATOR

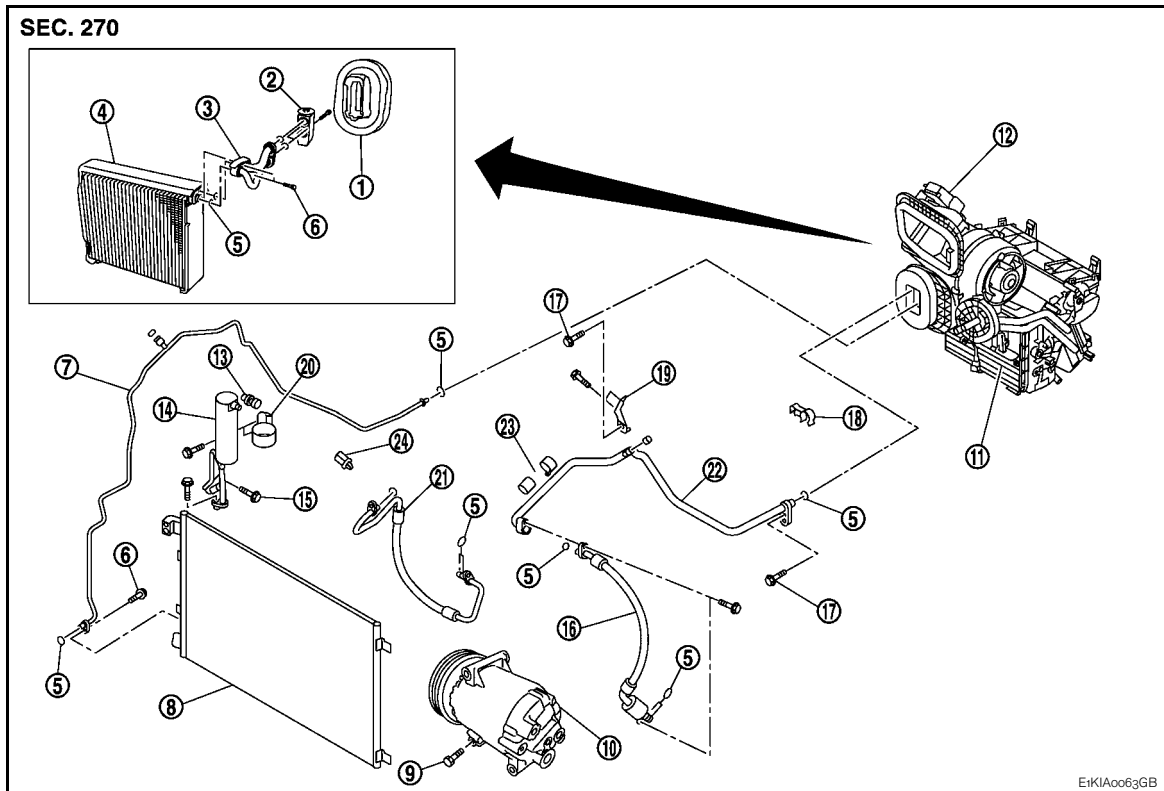
< ON-VEHICLE REPAIR >

[MANUAL AIR CONDITIONER (K9K)]

EVAPORATOR

Exploded View

INFOID:000000001098308



- | | | |
|--------------------------------------|---|--|
| 1. Heater sealing | 2. Expansion valve | 3. Low pressure pipe 1 and high pressure pipe 2 assembly |
| 4. Evaporator | 5. O-ring | 6. Connector pipe fixing bolt |
| 7. High pressure pipe 1 | 8. Condenser assembly | 9. Fixing bolt |
| 10. Compressor | 11. Heater & cooling unit assembly | 12. Heater & blower unit assembly |
| 13. Refrigerant pressure sensor | 14. Liquid tank | 15. Liquid tank fixing screw |
| 16. Low pressure flexible hose | 17. Fixing bolt | 18. Pipes fixing clip |
| 19. Low & high pressure pipe bracket | 20. Liquid tank fixing bracket | 21. High pressure flexible hose |
| 22. Low pressure pipe 2 | 23. Low pressure pipe fixing clamp assembly | 24. Pipe mantening clip |

Removal and Installation

INFOID:000000001098309

REMOVAL

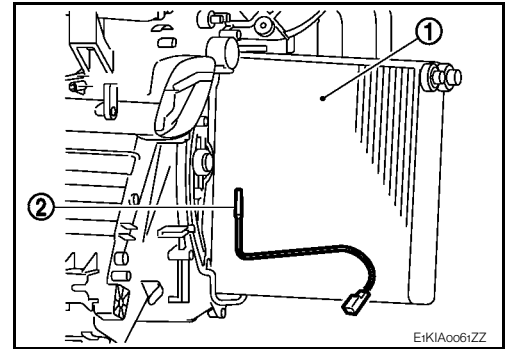
1. Remove low-pressure pipe 2 and high-pressure pipe 1 from expansion valve. Refer to [HA-194, "Removal and Installation"](#). Refer to [HA-198, "Removal and Installation"](#).
CAUTION:
Cap or wrap the joint of expansion valve, low-pressure pipe 2 and high-pressure pipe 1 with suitable material such as vinyl tape to avoid the entry of air.
2. Remove heater and cooling unit assembly. Refer to [VTL-82, "Removal and Installation"](#).
3. Remove evaporator cover fixing screws and cover. Refer to [HA-206, "Removal and Installation"](#).

EVAPORATOR

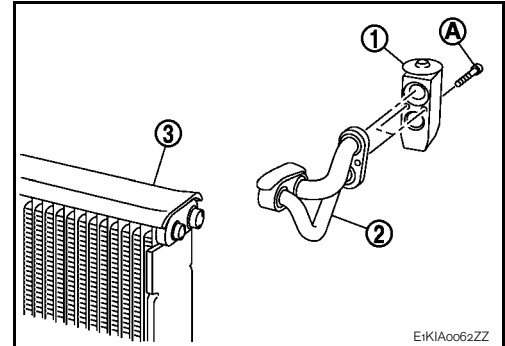
< ON-VEHICLE REPAIR >

[MANUAL AIR CONDITIONER (K9K)]

- Slide evaporator (1) from heater and cooling unit assembly.



- Cut upper insulator (3) and remove mounting bolt (A), (1) expansion valve and pressure pipe assembly (2), from evaporator.
- Remove evaporator.



INSTALLATION

Installation is basically the reverse order of removal.

CAUTION:

- Replace O-rings of low-pressure pipe 1 and high-pressure pipe 2 with new ones, and then apply compressor oil to it when installing it.
- 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 make sure that connection does not come loose.
- O-rings are different from low-pressure flexible hose (high-pressure pipe 1) and low-pressure pipe 1 (high-pressure pipe 2).
- Mark the mounting position of intake sensor bracket prior to removal so that the reinstalled sensor can be located in the same position.
- When recharging refrigerant, check for leaks.

EXPANSION VALVE

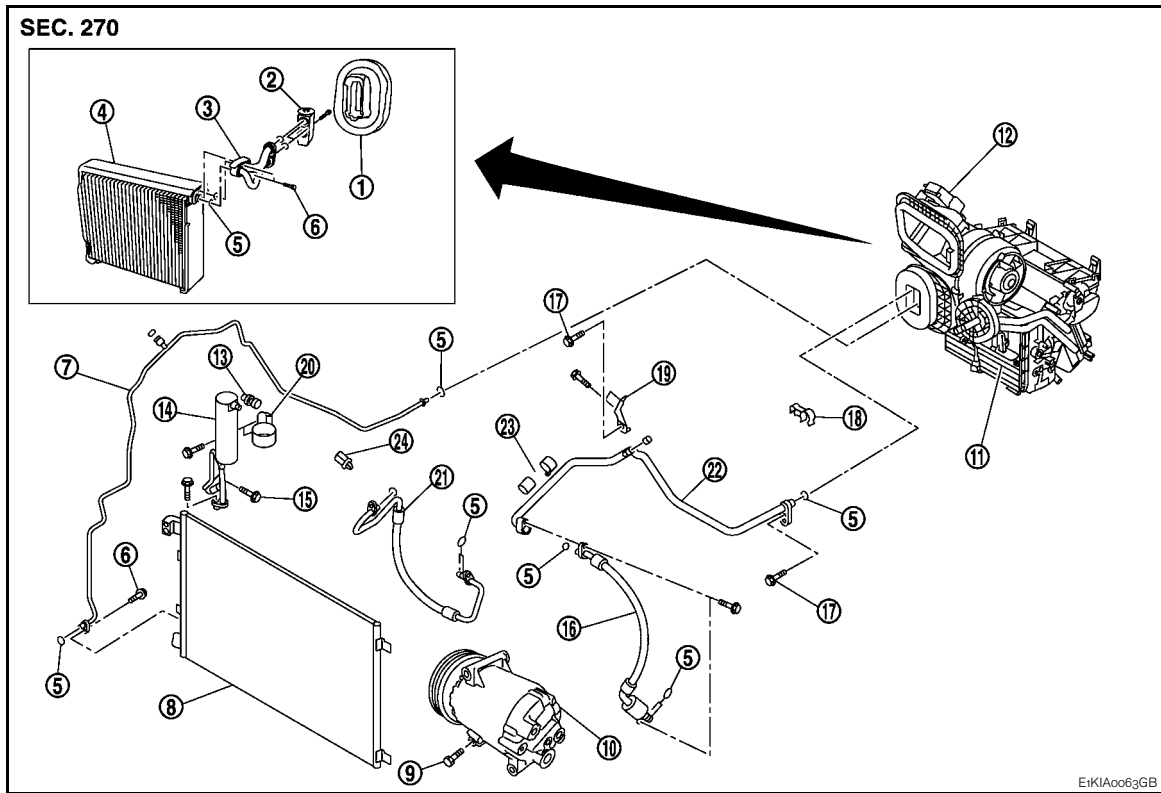
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[MANUAL AIR CONDITIONER (K9K)]

EXPANSION VALVE

Exploded View

INFOID:000000001098310



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|--------------------------------------|---|--|
| 1. Heater sealing | 2. Expansion valve | 3. Low pressure pipe 1 and high pressure pipe 2 assembly |
| 4. Evaporator | 5. O-ring | 6. Connector pipe fixing bolt |
| 7. High pressure pipe 1 | 8. Condenser assembly | 9. Fixing bolt |
| 10. Compressor | 11. Heater & cooling unit assembly | 12. Heater & blower unit assembly |
| 13. Refrigerant pressure sensor | 14. Liquid tank | 15. Liquid tank fixing screw |
| 16. Low pressure flexible hose | 17. Fixing bolt | 18. Pipes fixing clip |
| 19. Low & high pressure pipe bracket | 20. Liquid tank fixing bracket | 21. High pressure flexible hose |
| 22. Low pressure pipe 2 | 23. Low pressure pipe fixing clamp assembly | 24. Pipe mantening clip |

Removal and Installation

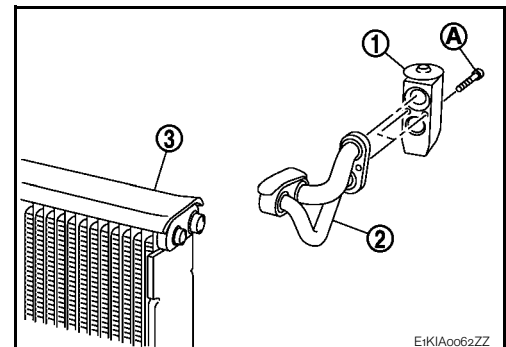
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REMOVAL

1. Remove evaporator (3). Refer to [HA-206, "Removal and Installation"](#).
2. Remove low pressure pipe 1 and high pressure pipe 2 assembly (2). Refer to [HA-200, "Removal and Installation"](#).
3. Remove mounting bolts (A), and then remove expansion valve (1) from low and high pressure pipe assembly (2).

CAUTION:

Cap or wrap the joint of expansion valve, low and high pressure pipe assembly, evaporator and expansion valve with suitable material such as vinyl tape to avoid the entry of air.



INSTALLATION

EXPANSION VALVE

< ON-VEHICLE REPAIR >

[MANUAL AIR CONDITIONER (K9K)]

Installation is basically the reverse order of removal.

CAUTION:

- Replace O-rings of evaporator with new ones, and then apply compressor oil to it when installing it.
- O-rings are different from low-pressure pipe 1 (high-pressure pipe 1) and low-pressure pipe 2 (high-pressure pipe 2).
- When recharging refrigerant, check for leaks.

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SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE DATA AND SPECIFICATIONS (SDS)

[MANUAL AIR CONDITIONER (K9K)]

SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

Compressor

INFOID:0000000001098312

Model		DELPHI THERMAL HUNGARY make 5 CVC
Type		Variable displacement swash plate
Displacement cm ³ (cu in)/rev	Max.	120 (7.32)
Cylinder bore × stroke (Max.) mm (in.)		-
Direction of rotation		Clockwise (viewed from clutch)
Drive belt		Poly V
Disc to pulley clearance	Standard	-

Lubricant

INFOID:0000000001098313

Model		DELPHI THERMAL HUNGARY make 5 CVC
Name		Nissan A/C System Oil Type S (DH-PS)
Capacity mℓ (US fl oz, Imp fl oz)	Total in system	150 (5.03, 5.3)
	Compressor (Service part) charging amount	150 (5.03, 5.3)

Refrigerant

INFOID:0000000001098314

Type	HFC-134a (R-134a)
Capacity kg (lb)	—

Engine Idling Speed

INFOID:0000000001098315

Refer to [EC-1483. "Idle Speed"](#).

Belt Tension

INFOID:0000000001098316

Refer to [EM-259. "Inspection and Adjustment"](#).