



ON-VEHICLE INSPECTION

This is a method in which the trouble is located by using a gauge set. Read the gauge pressure when these conditions are established.

TEST CONDITIONS

- Temperature at the air inlet with the switch set at RECIRC is 30~35°C (86~95°F)
- Engine running at 1,500rpm
- Blower speed control knob on "4" position
- Temperature control knob on "COOL" position

NOTE

It should be noted that the gauge indications may vary slightly due to ambient temperature conditions

1. Normally functioning refrigeration system.

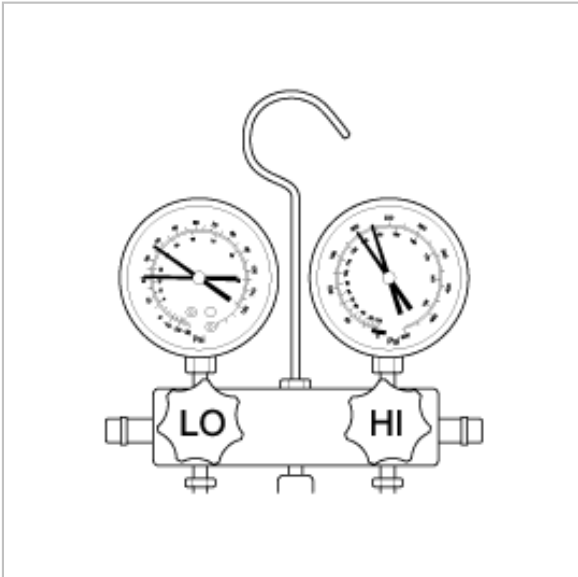
Gauge reading :

Low pressure side :

0.15~0.25 MPa (21.8~36.3 psi, 1.5~2.5 kgf/cm²)

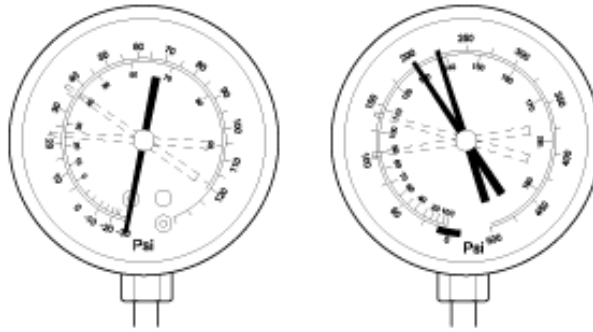
High pressure side :

1.37~1.57 MPa (199~228 psi, 14~16 kgf/cm²)



2. Moisture present in refrigeration system.

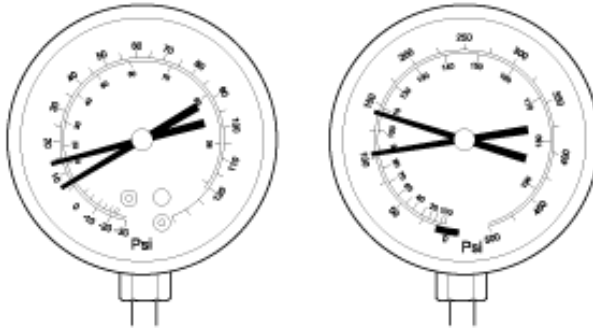
Condition : Periodically cools and then fails to cool



Symptom seen in refrigeration system	Probable cause	Diagnosis	Remedy
During operation, pressure on low pressure side sometimes become a vacuum and sometime normal	Moisture entered in refrigeration system freezes at expansion valve orifice and temporarily stops cycle, but normal state is restored after a time when the ice melts	<ul style="list-style-type: none"> •Drier in oversaturated state •Moisture in refrigeration system freezes at expansion valve orifice and block circulation of refrigerant 	<ul style="list-style-type: none"> -Raplace drier -Remove moisture in cycle through repeatedly evacuating air -Charge proper amount of new refrigerant

3. Insufficient cooling

Condition : Insufficient cooling

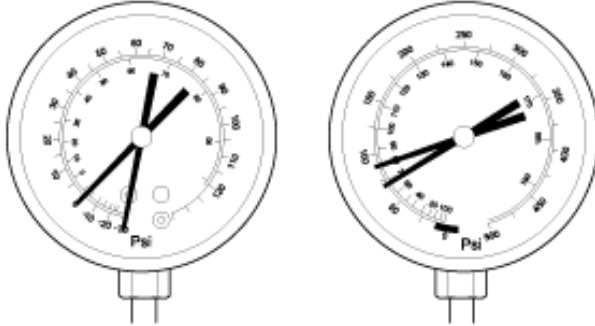


Symptom seen in refrigeration system	Probable cause	Diagnosis	Remedy

<ul style="list-style-type: none"> •Pressure low on both low and high pressure sides •Insufficient cooling performance 	<p>Gas leakage at some place in refrigeration system</p>	<ul style="list-style-type: none"> •Insufficient refrigerant in system •Refrigerant leaking 	<ul style="list-style-type: none"> -Check for gas leakage with gas leak detector and repair if necessary -Charge proper amount of refrigerant -If indicated pressure value is near 0 when connected to gauge, create the vacuum after inspecting and repairing the location of the leak
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4. Poor circulation of refrigerant

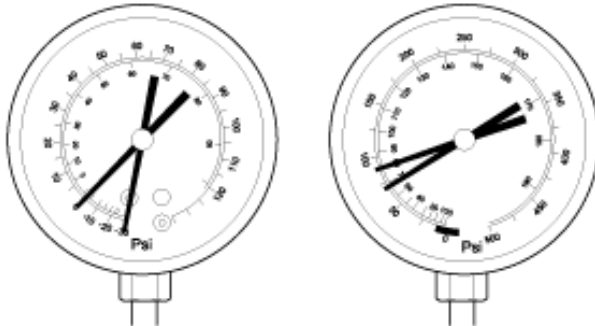
Condition : Insufficient cooling



Symptom seen in refrigeration system	Probable cause	Diagnosis	Remedy
<ul style="list-style-type: none"> •Pressure low in both low and high pressure sides •Frost on tube from receiver to unit 	<p>Refrigerant flow obstructed by dirt in drier</p>	<p>Condenser clogged</p>	<p>Replace drier</p>

5. Refrigerant does not circulate

Condition : Does not cool (Cools from time to time in some cases)



Symptom seen in refrigeration system	Probable cause	Diagnosis	Remedy
<ul style="list-style-type: none"> • Vacuum indicated on low pressure side, very low pressure indicated on high pressure side • Frost or dew seen on piping before and after receiver/drier or expansion valve 	<ul style="list-style-type: none"> • Refrigerant flow obstructed by moisture or dirt in refrigeration system • Refrigerant flow obstructed by gas leakage from expansion valve 	Refrigerant does not circulate	<ul style="list-style-type: none"> - Check expansion valve - Clean out dirt in expansion valve by blowing with air - Replace drier - Evacuate air and charge new refrigerant to proper amount - For gas leakage from expansion valve, replace expansion valve

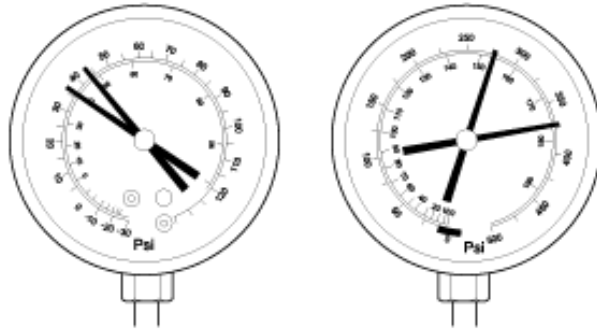
6. Refrigerant overcharged or insufficient cooling of condenser

Condition : Insufficient cooling

Symptom seen in refrigeration system	Probable cause	Diagnosis	Remedy
Pressure too high on both low and high pressure sides	<ul style="list-style-type: none"> • Unable to develop sufficient performance due to excessive • Insufficient cooling of condenser 	<ul style="list-style-type: none"> • Excessive refrigerant in cycle → refrigerant overcharged • Condenser cooling → condenser fins clogged or condenser fan faulty 	<ul style="list-style-type: none"> - (1) Clean condenser - (2) Check cooling fan with fluid coupling operation. - (3) If (1) and (2) are in normal state, check amount of refrigerant Charge proper amount of refrigerant

7. Air present in refrigeration system

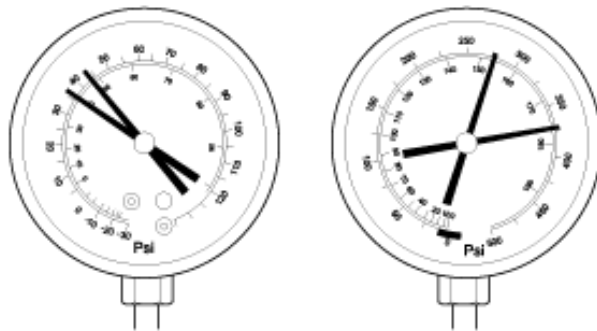
Condition : Insufficient cooling



Symptom seen in refrigeration system	Probable cause	Diagnosis	Remedy
<ul style="list-style-type: none"> •Pressure too high on both low and high pressure sides •The low pressure piping hot to the touch 	Air entered in refrigeration system	<ul style="list-style-type: none"> •Air present in refrigeration system •Insufficient vacuum purging 	<ul style="list-style-type: none"> -Check compressor oil to see if it is see if it is dirty or insufficient -Evacuate air and charge new refrigerant

8. Expansion valve improperly

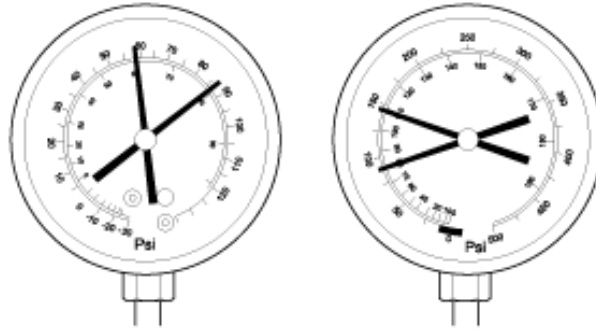
Condition : Insufficient cooling



Symptom seen in refrigeration system	Probable cause	Diagnosis	Remedy
<ul style="list-style-type: none"> •Pressure too high on both low and high pressure sides •Frost or large amount of dew on piping on low pressure side 	Trouble in expansion valve	<ul style="list-style-type: none"> •Excessive refrigerant in low pressure piping •Expansion valve opened too wide 	<ul style="list-style-type: none"> -Check expansion valve -Replace if defective

9. Defective compression compressor

Condition : Does not cool



Symptom seen in refrigeration system	Probable cause	Diagnosis	Remedy
<ul style="list-style-type: none"> •Pressure too high on low and high pressure sides •Pressure too low to on high pressure side 	Internal leak in compressor	<ul style="list-style-type: none"> •Compression defective •Valve leaking or broken sliding parts 	Repair or replace compressor

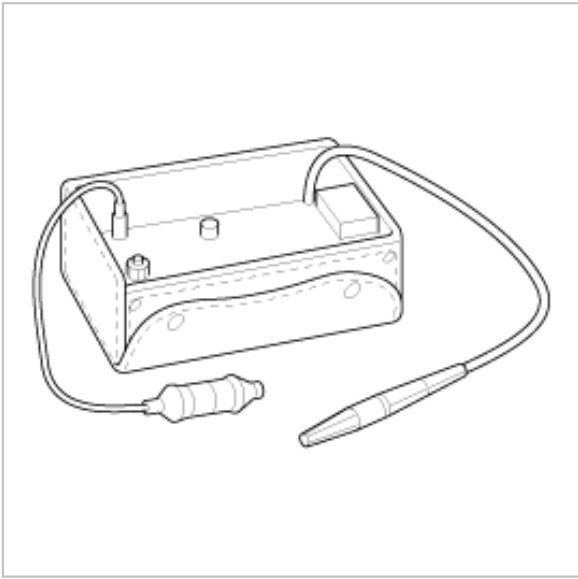
INSPECT FOR LEAKAGE OF REFRIGERANT

Always conduct a leak test with an electronic leak detector whenever leakage or refrigerant is suspected and when conducting service operations which are accompanied by disassembly or loosening or connection fittings.

NOTE

In order to use the leak detector properly, read the manual supplied by the manufacturer.

1. Check the torque on the connection fittings and, if too loose, tighten to the proper torque. Check for gas leakage with a leak detector.
2. If leakage continues even after the fitting has been tightened, discharge the refrigerant from the system, disconnect the fittings, and check their seating faces for damage. Always replace, even if the damage is slight.
3. Check the compressor oil and add oil if required.
4. Charge the system and recheck for gas leaks. If no leaks are found, evacuate and charge the system again.



A/C SYSTEM TESTS

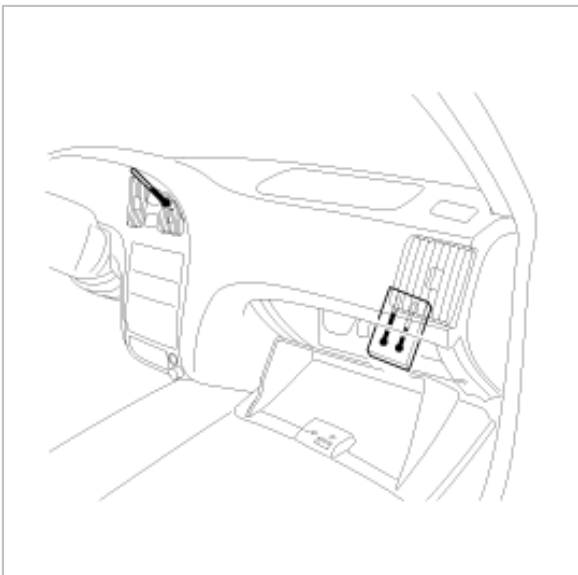
CAUTION

- Air conditioning refrigerant or lubricant vapor can irritate your eyes, nose, or throat.
- Be careful when connecting service equipment.
- Do not breathe refrigerant or vapor.

WARNING

- Compressed air mixed with R-134a forms a combustible vapor.
- The vapor can burn or explode causing serious injury.
- Never use compressed air to pressure test R-134a service equipment or vehicle air conditioning systems.

1. Connect a R-134a refrigerant recover/recycling/charging station to the high-pressure service port and the low-pressure service port, following the equipment manufacturer's instructions.
2. Insert a thermometer in the center vent.
Determine the relative humidity and air temperature.



3. Test conditions :

- A. Avoid direct sunlight.
- B. Open the hood.
- C. Open the front doors.
- D. Set the temperature control dial on MAX COOL, the mode control switch on VENT and the recirculation control switch on RECIRCULATE.
- E. Turn the A/C switch on and the fan switch on MAX.
- F. Run the engine at 1,500 rpm.
- G. No driver or passengers in vehicle.

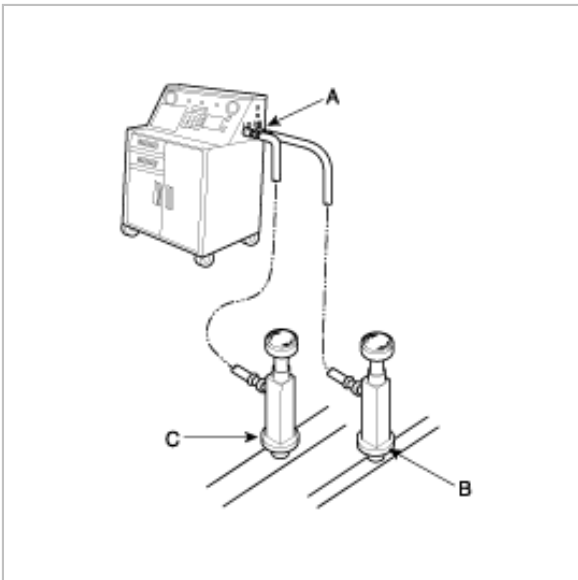
4. After running the air conditioning for 10 minutes under the above test conditions, read the delivery temperature from the thermometer in the dash vent, the intake temperature near the blower unit behind the glove box and the high and low system pressure from the A/C gauges.

REFRIGERANT RECOVERY

CAUTION

- Air conditioning refrigerant or lubricant vapor can irritate your eyes, nose, or throat.
- Be careful when connecting service equipment.
- Do not breathe refrigerant or vapor.

1. Connect a R-134a refrigerant recovery/recycling/charging station (A) to the high-pressure service port (B) and the low-pressure service port (C), as shown, following the equipment manufacturer's instruction.



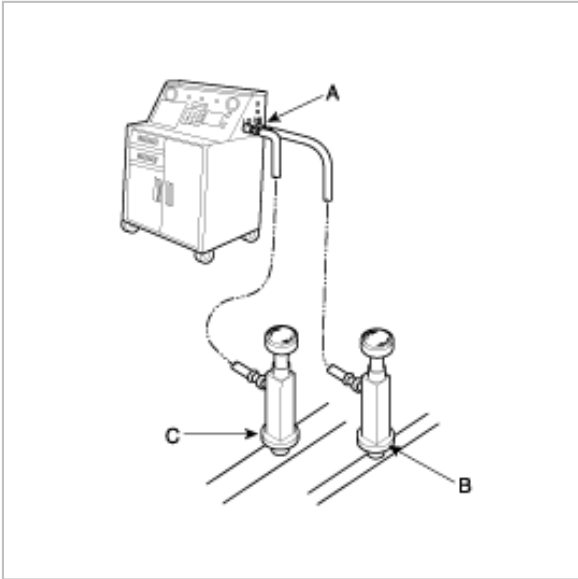
2. Measure the amount of refrigerant oil removed from the A/C system after the recovery process is completed. Be sure to put the same amount of new refrigerant oil back into the A/C system before charging.

SYSTEM EVACUATION

CAUTION

- Air conditioning refrigerant or lubricant vapor can irritate your eyes, nose, or throat.
- Be careful when connecting service equipment.
- Do not breathe refrigerant or vapor.

1. When an A/C System has been opened to the atmosphere, such as during installation or repair, it must be evacuated using a R-134a refrigerant recover/recycling/charging station (If the system has been open for several days, the receiver/dryer should be replaced, and the system should be evacuated for several hours.)
2. Connect a R-134a refrigerant recovery/recycling/charging station(A) to the high-pressure service port(B) and the low-pressure service port(C), as shown, following the equipment manufacturer's instruction. Evacuate the system.



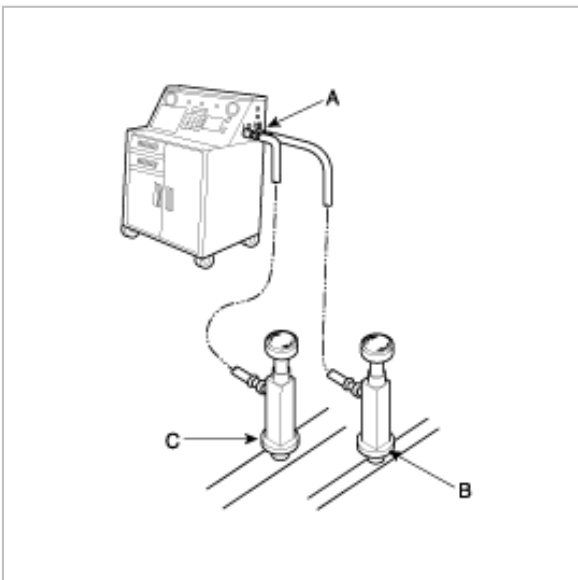
3. If the low-pressure does not reach more than 93.3 kPa (700 mmHg, 27.6 in.Hg) in 15 minutes, there is probably a leak in the system. Partially charge the system (see page HA-28), and check for leaks (see page HA-26).

SYSTEM CHARGING

CAUTION

- Air conditioning refrigerant or lubricant vapor can irritate your eyes, nose, or throat.
- Be careful when connecting service equipment.
- Do not breathe refrigerant or vapor.

1. Connect a R-134a refrigerant recover/recycling/charging station (A) to the high-pressure service port (B) and the low-pressure service port (C), as shown, following the equipment manufacture's instructions.



2. Add the same amount of new refrigerant oil to the system that was removed during recovery. Use only FD46XG (PAG) refrigerant oil.

3. Charge the system with the specified amount of R-134a refrigerant. Do not overcharge the system; the compressor will be damaged.

Refrigerant capacity :

Select the appropriate units of measure for your charging station : $680 \pm 25\text{g}$