REFRIGERANT

ON-VEHICLE INSPECTION

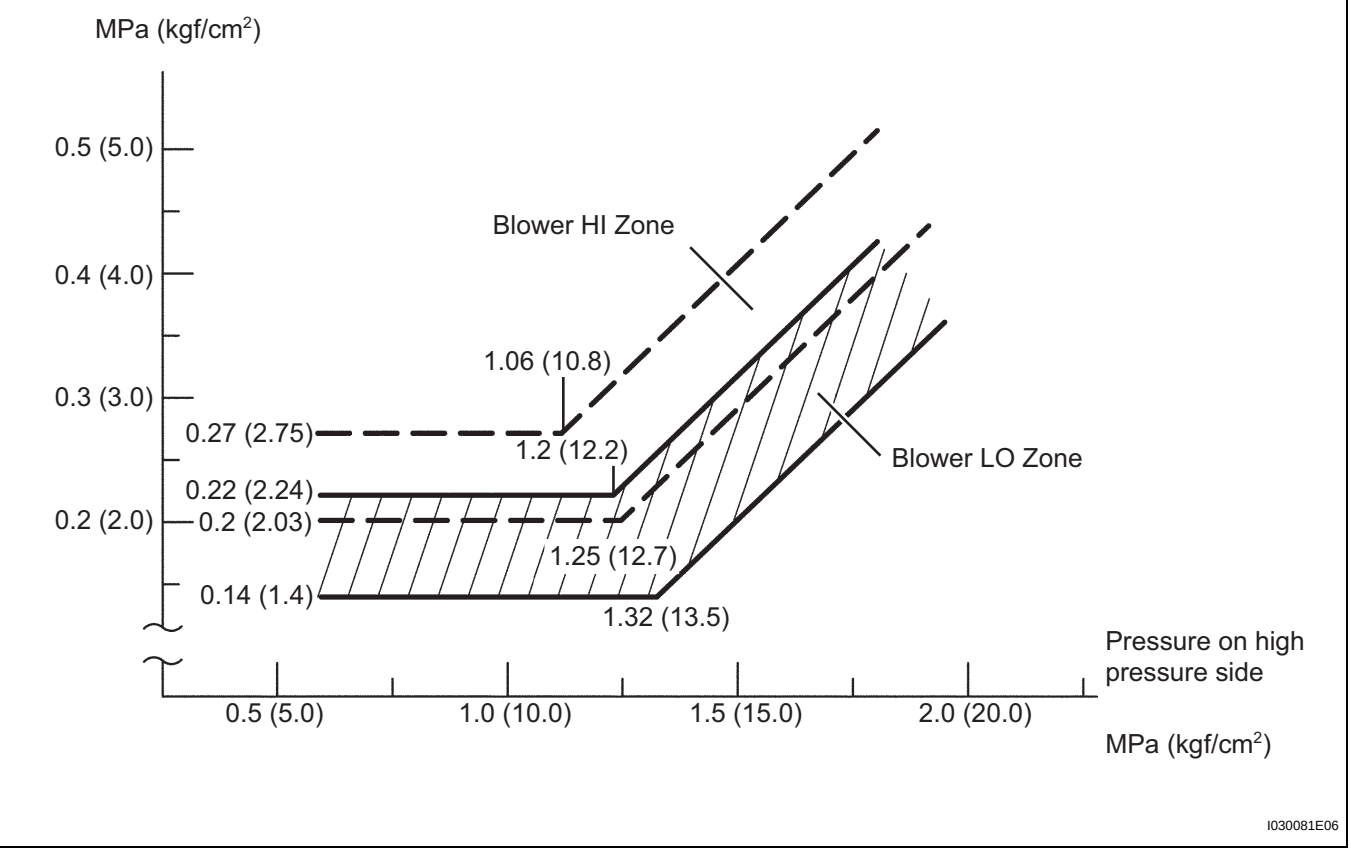
1. INSPECT REFRIGERANT PRESSURE WITH MANIFOLD GAUGE SET

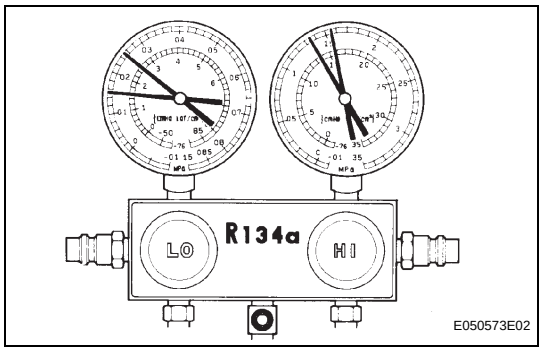
(a) This is a method to specify trouble areas by using a manifold gauge set. Read the manifold gauge pressure when the following conditions are established.

Test conditions:

- Engine has been warmed up.
- All doors are fully open.
- A/C switch is ON.
- Engine is running at 1,500 rpm.
- Air inlet mode selector damper is set at recirculation.
- Temperature control switch is in MAX. COLD position.
- Blower speed control switch is in HI position.
- Air temperature at the air inlet is 30 to 35°C (86 to 95°F).

Gauge readings (Reference)

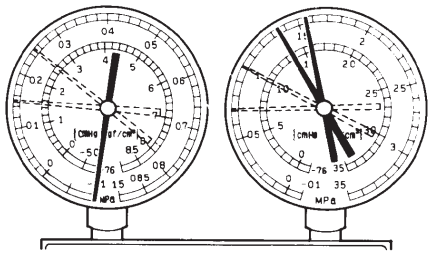




(1) When the refrigerant volume is proper:
Gauge reading:
Low pressure side:
0.15 to 0.25 MPa (1.5 to 2.5 kgf/cm^2)
High pressure side:
1.37 to 1.57 MPa (14 to 16 kgf/cm^2)

(2) When there is moisture in the refrigeration system:

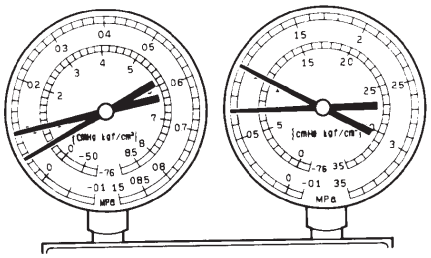
Condition: Air conditioning system periodically repeats proper and improper function.



Symptoms	Probable Cause	Diagnosis	Corrective Actions
During operation, pressure on low pressure side cycles between normal and vacuum	Moisture in refrigeration system freezes at expansion valve orifice, causing temporary stop of cycle. However, when melted, normal state restored	• Drier overly saturated • Moisture in refrigeration system freezes at expansion valve orifice and blocks refrigerant circulation	1. Replace cooler drier 2. Remove moisture from cycle by repeatedly evacuating air 3. Supply appropriate volume of new refrigerant

(3) When cooling is insufficient:

Condition: Air conditioning system does not function effectively.



Symptoms	Probable Cause	Diagnosis	Corrective Actions
• Pressure low on both low and high pressure sides • Cooling performance insufficient	Gas leakage from refrigeration system	• Insufficient refrigerant • Refrigerant leakage	1. Check for gas leakage and repair if necessary 2. Supply appropriate volume of new refrigerant 3. If indicated pressure value close to 0 when connected to gauge, create vacuum after inspecting and repairing the location of leakage

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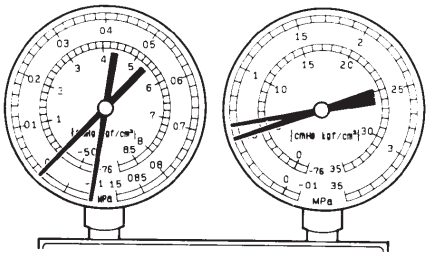
(4) When the circulation of the refrigerant is poor:

Condition: Air conditioning system does not function effectively.



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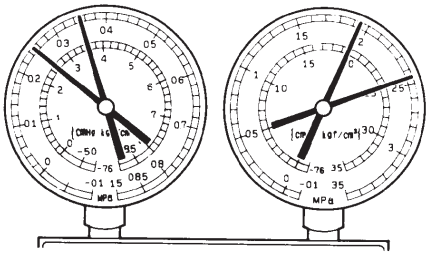
Symptoms	Probable Cause	Diagnosis	Corrective Action
• Pressure low on both low and high pressure sides • Frost exists on piping from condenser to A/C unit	Refrigerant flow obstructed by dirt in condenser	Condenser clogged	Replace condenser

(5) When the refrigerant does not circulate:

Condition: Air conditioning system does not function. (Sometimes it may function)



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Symptoms	Probable Causes	Diagnosis	Corrective Actions
• Vacuum indicated on low pressure side, and extremely low pressure indicated on high pressure side • Frost or condensation seen on piping on both sides of condenser or expansion valve	• Refrigerant flow obstructed by moisture or dirt in refrigeration system • Refrigerant flow obstructed by gas leakage from expansion valve	Refrigerant does not circulate	1. Check expansion valve 2. Clean expansion valve by blowing air 3. Replace condenser 4. Evacuate air and charge appropriate volume of new refrigerant 5. For gas leakage from expansion valve, replace expansion valve

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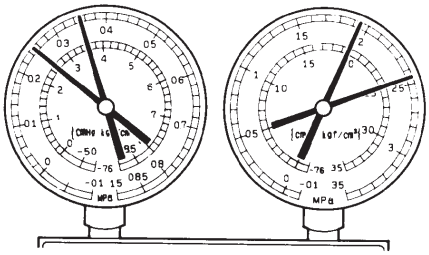
(6) When the refrigerant is overcharged or cooling of condenser is insufficient:

Condition: Air conditioning system does not function effectively.



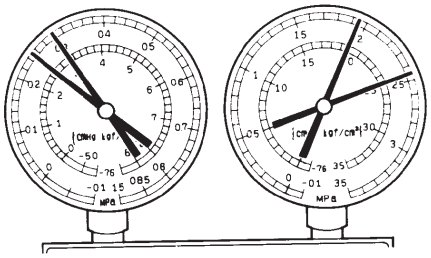
I022121E06

Symptoms	Probable Causes	Diagnosis	Corrective Actions
Pressure extremely high on both low and high pressure sides	• Excessive refrigerant • Cooling performance of condenser insufficient	• Excessive refrigerant • Cooling performance of condenser insufficient	1. Clean condenser 2. Check condenser fan motor operation 3. If 1 and 2 normal, check the amount of refrigerant and supply appropriate volume of refrigerant

(7) When there is air in the refrigeration system:

Condition: Air conditioning system does not function.

NOTE: These gauge indications occur when the refrigeration system opens and the refrigerant is charged without vacuum purging.



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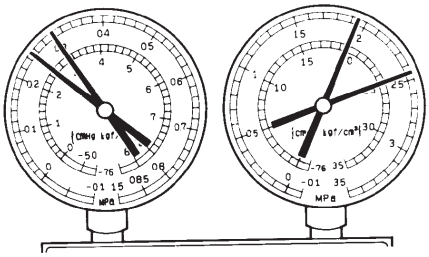
Symptoms	Probable Cause	Diagnosis	Corrective Actions
• Pressure extremely high on both low and high pressure sides • The low pressure piping too hot to touch	Air in refrigeration system	• Air in refrigeration system • Vacuum purging insufficient	1. Check whether compressor oil dirty or insufficient 2. Evacuate air and charge new refrigerant

(8) When the expansion valve malfunctions:

Condition: Air conditioning system does not function effectively.



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Symptoms	Probable Cause	Diagnosis	Corrective Action
• Pressure extremely high on both low and high pressure sides • Frost or condensation on piping on low pressure side	Trouble in expansion valve	• Excessive refrigerant in low pressure piping • Expansion valve too wide open	Replace expansion valve

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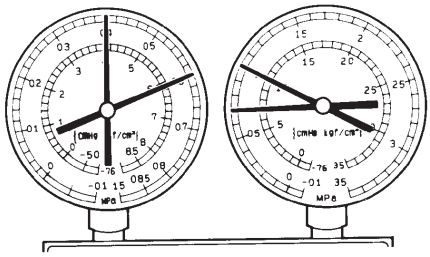
(9) When the compressor is defective:

Condition: Air conditioning system does not function.



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Symptoms	Probable Cause	Diagnosis	Corrective Action
• Pressure extremely high on both low and high pressure sides • Pressure extremely low on high pressure side	Internal leakage in compressor	• Compression failure • Leakage from damaged valve or broken sliding parts	Repair or replace compressor