REFRIGERANT

ON-VEHICLE INSPECTION

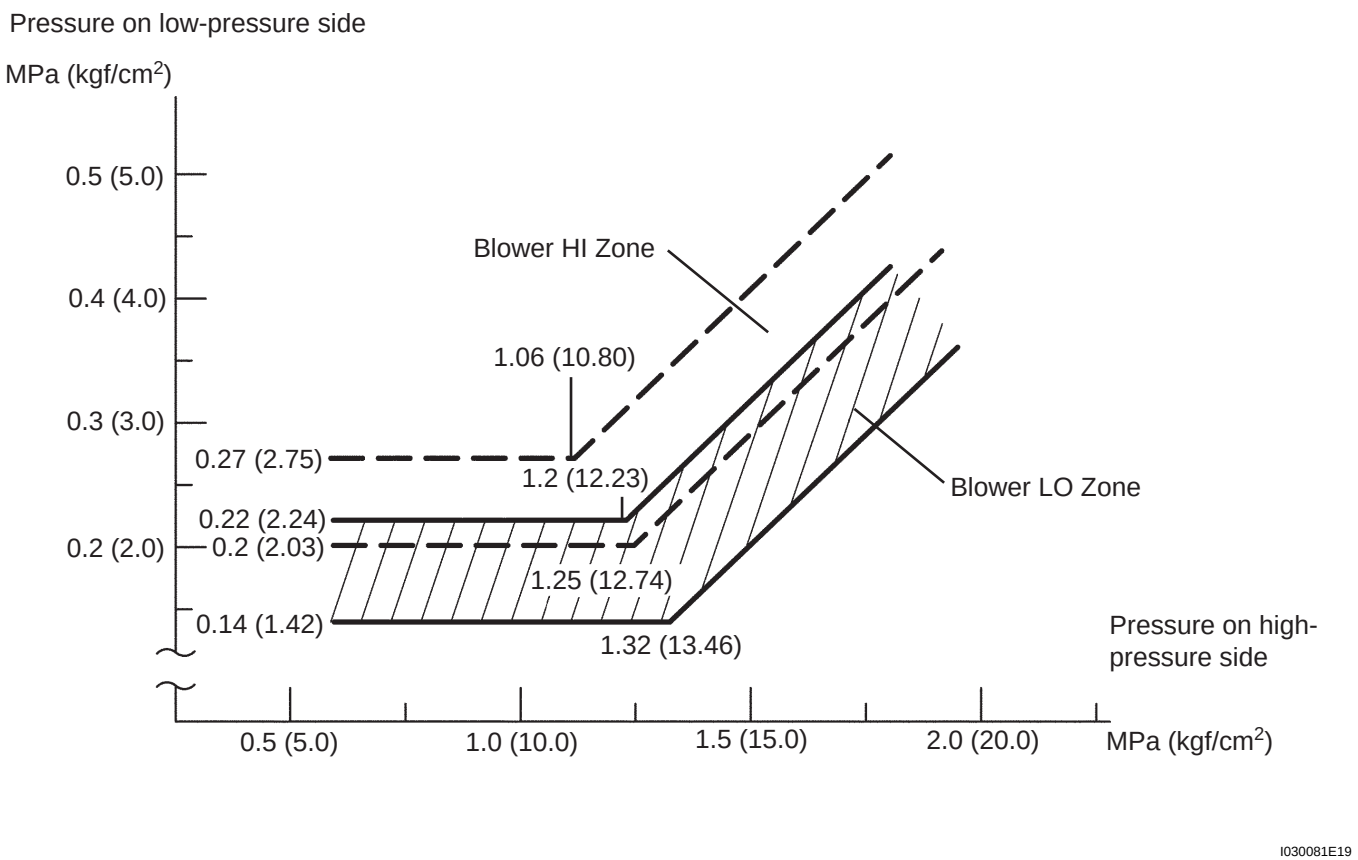
1. INSPECT REFRIGERANT PRESSURE WITH MANIFOLD GAUGE SET

(a) This method uses a manifold gauge set to locate problem areas. Read the manifold gauge pressure when these conditions are established.

Test conditions:

- Temperature at the air inlet is 30 to 35°C (86 to 95°F).
- Engine is running at 1,500 rpm.
- All doors are fully open.
- Blower speed control switch is at HI.
- Temperature control switch is at MAX. COOL.
- A/C switch is ON.

(b) Gauge readings (Reference)



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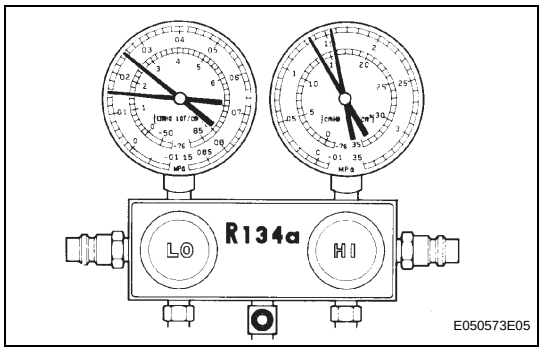
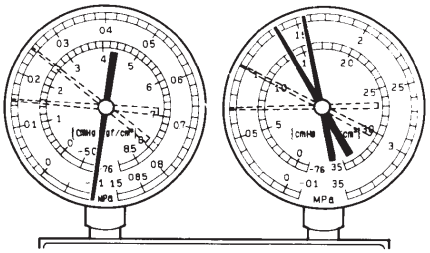


(1) Normally functioning refrigeration system
Gauge reading

Pressure side	Refrigerant volume
Low	**0.15 to 0.25 MPa (1.5 to 2.5 kgf/cm^2)**
High	**1.37 to 1.57 MPa (14 to 16 kgf/cm^2)**

(2) The A/C system periodically changes between normal and improper function due to moisture in the refrigerant system.

Condition : Periodically cools and then fails to cool

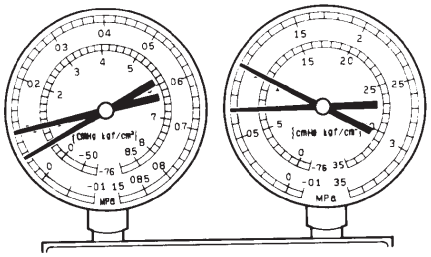


I022117E17

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 is restored	- Drier is 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) The A/C system does not function effectively due to insufficient cooling.

Condition : Cooling system does not function effectively.



I022118E10

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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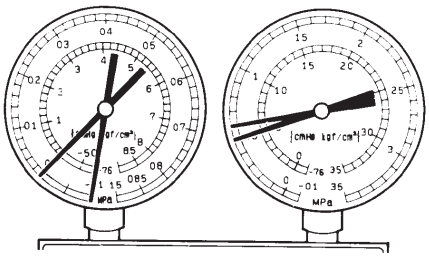
(4) The A/C system does not function effectively due to poor circulation of the refrigerant.

Condition : Cooling system does not function effectively.

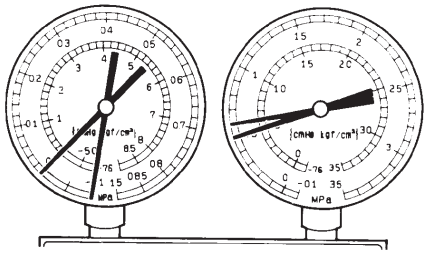


I022119E11

Symptoms	Probable Cause	Diagnosis	Corrective Actions
- 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) The A/C system does not function intermittently because the refrigerant does not circulate.

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

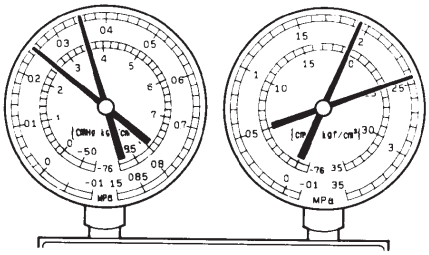


I022120E10

Symptoms	Probable Cause	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

(6) The A/C system does not function effectively due to overcharged refrigerant or insufficient cooling of the condenser.

Condition : Cooling system does not function effectively.



I022121E11

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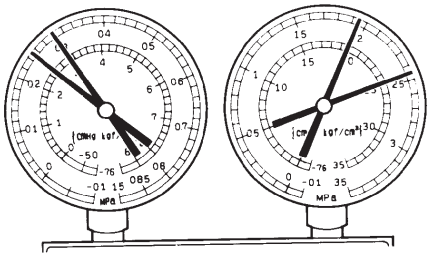
Symptoms	Probable Cause	Diagnosis	Corrective Actions
Pressure extremely high on both low and high-pressure sides	- Excessive refrigerant - Cooling performance of condenser insufficient	- Condenser is dirty - Condenser fan motor is malfunctioning - Excessive refrigerant	1. Clean condenser 2. Check condenser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

(7) The A/C system does not function due to air in the refrigeration system.

CAUTION:

The low-pressure piping may be very hot and cause serious burns.

Condition : Cooling system does not function.



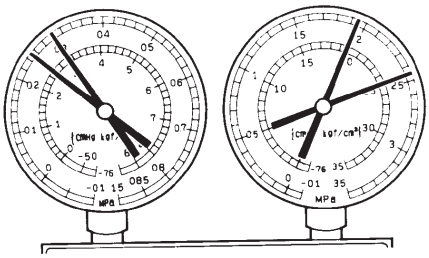
NOTE: These gauge indications occur when the refrigeration system opens and the refrigerant is charged without vacuum purging

I022122E12

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

(8) The A/C system does not function effectively due to an expansion valve malfunction.

Condition : Insufficient Cooling.



I022123E12

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

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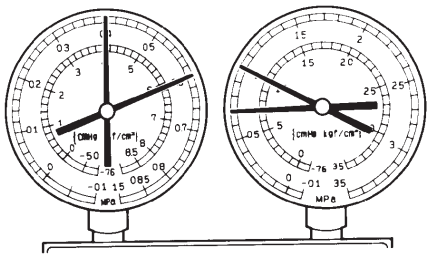
(9) The A/C system does not function due to a defective compressor.

Condition : Insufficient Cooling.

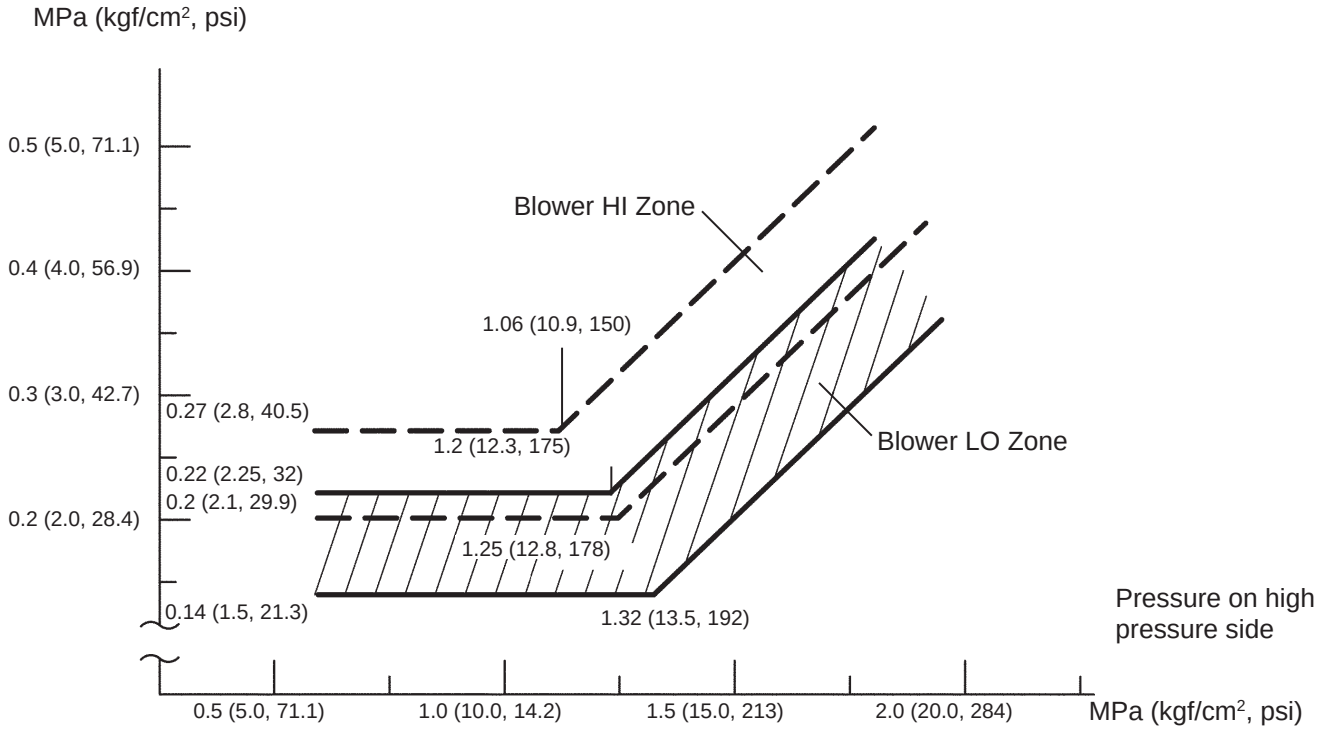


I022124E11

Symptoms	Probable Cause	Diagnosis	Corrective Actions
-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

Gauge readings (Reference)

Pressure on low pressure side



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