

# REFRIGERANT ON-VEHICLE INSPECTION

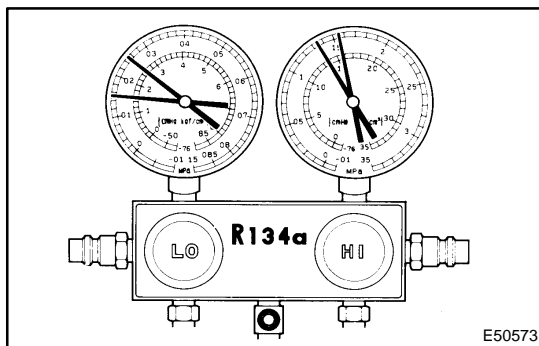
550IQ-01

## 1. INSPECT REFRIGERANT PRESSURE WITH MANIFOLD GAUGE SET

- (a) This is a method in which the trouble is located by using a manifold gauge set. Read the manifold gauge pressure when the 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 1500 rpm
- Blower speed control switch at "HI" position
- Temperature control dial at "COOL" position
- A/C switch ON
- Fully open doors



- (1) Normally functioning refrigeration system.

**Gauge reading:**

**Low pressure side:**

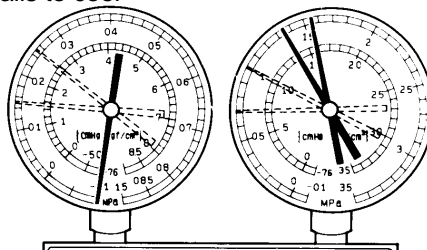
**0.15 – 0.25 MPa (1.5 – 2.5 kgf/cm²)**

**High pressure side:**

**1.37 – 1.57 MPa (14 – 16 kgf/cm²)**

- (2) Moisture present in refrigeration system.

Condition : Periodically cools and then fails to cool

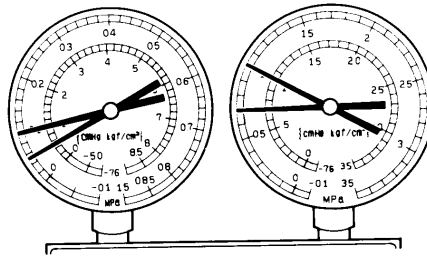


I22117

Symptom	Probable cause	Diagnosis	Remedy
During operation, pressure on low pressure side sometimes become a vacuum and sometime normal	Moisture in refrigerating system freezes at expansion valve orifice causing a temporary stop of cycle, however, when it melts, normal state is restored.	<ul style="list-style-type: none"> <li>• Drier in oversaturated state</li> <li>• Moisture in refrigerating system freezes at expansion valve orifice and blocks circulation of refrigerant</li> </ul>	(1) Replace condenser (2) Remove moisture in cycle by repeatedly evacuating air (3) Supply proper amount of new refrigerant

## (3) Insufficient cooling

Condition: Cooling system does not function effectively.

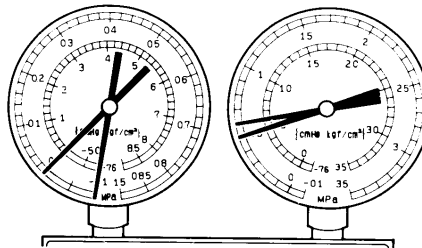


I22118

Symptom	Probable cause	Diagnosis	Corrective Actions
<ul style="list-style-type: none"> <li>Pressure low on both low and high pressure sides</li> <li>Insufficient cooling performance</li> </ul>	Gas leakage in refrigeration system	<ul style="list-style-type: none"> <li>Insufficient refrigerant</li> <li>Refrigerant leaking</li> </ul>	(1) Check for gas leakage and repair if necessary (2) Supply proper amount of new refrigerant (3) If indicated pressure value is close to a 0 when connected to gauge, create the vacuum after inspecting and repairing location of leak

## (4) Poor circulation of refrigerant

Condition: Cooling system close not function effectively.

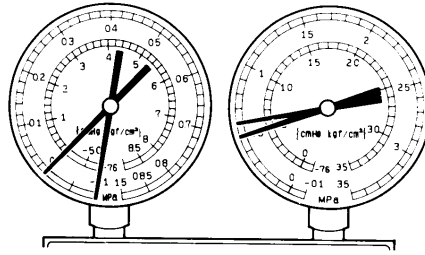


I22119

Symptom	Probable cause	Diagnosis	Corrective Action
<ul style="list-style-type: none"> <li>Pressure low on both low and high pressure sides</li> <li>Frost on pipe from condenser to unit</li> </ul>	Refrigerant flow obstructed by dirt in receiver	Receiver clogged	Replace condenser

## (5) Refrigerant does not circulate

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

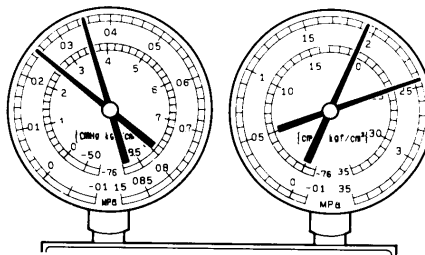


I22120

Symptom	Probable cause	Diagnosis	Corrective Actions
<ul style="list-style-type: none"> <li>Vacuum indicated on low pressure side, very low pressure indicated on high pressure side</li> <li>Frost or dew seen on piping before and after receiver/ drier or expansion valve</li> </ul>	<ul style="list-style-type: none"> <li>Refrigerant flow obstructed by moisture or dirt in refrigerating system</li> <li>Refrigerant flow obstructed by gas leaked from expansion valve</li> </ul>	Refrigerant does not circulate	<ol style="list-style-type: none"> <li>Check expansion valve</li> <li>Clean out dirt in expansion valve by air blowing</li> <li>Replace condenser</li> <li>Evaporate air and supply proper amount of new refrigerant.</li> <li>For gas leakage from expansion valve, replace expansion valve</li> </ol>

## (6) Refrigerant overcharged or insufficient cooling of condenser

Condition: Cooling system does not function dffectively.

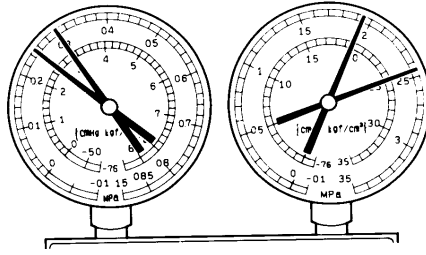


I22121

Symptom	Probable cause	Diagnosis	Remedy
<ul style="list-style-type: none"> <li>Pressure too high on both low and high pressure sides</li> </ul>	<ul style="list-style-type: none"> <li>Unable to develop sufficient performance due to excessive use of refrigerating system</li> <li>Insufficient cooling of condenser</li> </ul>	<ul style="list-style-type: none"> <li>Excessive refrigerant in cycle→too much refrigerant supplied</li> <li>Condenser cooling insufficient→condenser fins clogged at cooling fan</li> </ul>	<ol style="list-style-type: none"> <li>Clean condenser</li> <li>Check cooling fan with cooling fan motor operation</li> <li>If (1) and (2) are in normal state, check amount of refrigerant and supply proper amount of refrigerant</li> </ol>

## (7) Air present in refrigeration system

Condition: Cooling system does not function.



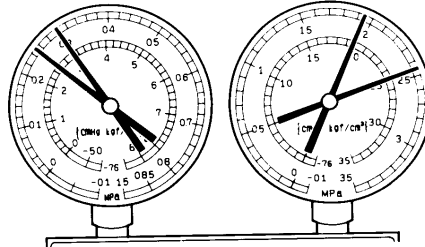
NOTE : These gauge indications are shown when the refrigerating system has been opened and the refrigerant charged without vacuum purging.

I22122

Symptom	Probable cause	Diagnosis	Corrective Actions
<ul style="list-style-type: none"> <li>Pressure too high on both low and high pressure sides</li> <li>The low pressure piping too hot to the touch</li> </ul>	Air entered in refrigerating system	<ul style="list-style-type: none"> <li>Air present in refrigerating system</li> <li>Insufficient vacuum purging</li> </ul>	(1) Check compressor oil to see if it is dirty or insufficient (2) Evacuate air and supply new refrigerant

## (8) Expansion valve improperly

Condition: Refrigerant functions insufficient.

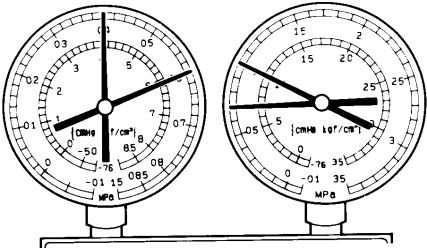


I22123

Symptom	Probable cause	Diagnosis	Corrective Actions
<ul style="list-style-type: none"> <li>Pressure too high on both low and high pressure sides</li> <li>Frost or large amount of dew on piping on low pressure side</li> </ul>	Trouble in expansion valve	<ul style="list-style-type: none"> <li>Excessive refrigerant in low pressure piping</li> <li>Expansion valve opened too wide</li> </ul>	Check expansion valve

(9) Defective compression compressor

Condition : Refrigerant is not effective.



I22124

Symptom	Probable cause	Diagnosis	Corrective Actions
<ul style="list-style-type: none"><li>• Pressure too high on low high pressure sides</li><li>• Pressure too low to on high pressure side</li></ul>	Internal leak in compressor	<ul style="list-style-type: none"><li>• Compression failure</li><li>• Leakage from valve damaged or broken sliding parts</li></ul>	Repair or replace compressor

Gauge readings (Reference)

