absorb it all. When moisture is combined with refrigerant oil, a sludge is formed. This sludge does not permit moving parts to be adequately lubricated. When moisture is combined with refrigerant, hydrofluoric and hydrochloric acids are formed. These acids are very corrosive to metal surfaces and leakage will eventually develop. If the air conditioning system is left open for a period of time or if the plugs are removed from the receiver-dryer, the desiccant will also absorb moisture from the air. Evacuating the system will not remove moisture from the desiccant.

A sight glass is installed in the receiver-dryer outlet port. If the refrigerant level is low, a steady stream of gas bubbles will be present in the liquid flowing from the receiver-dryer. These gas bubbles can be seen in the sight glass and are an indication that the system needs charging. However, bubbles may be present when the compressor clutch first engages but must disappear after a few seconds. If the sight glass is clear, the system either has a sufficient charge or is completely discharged.

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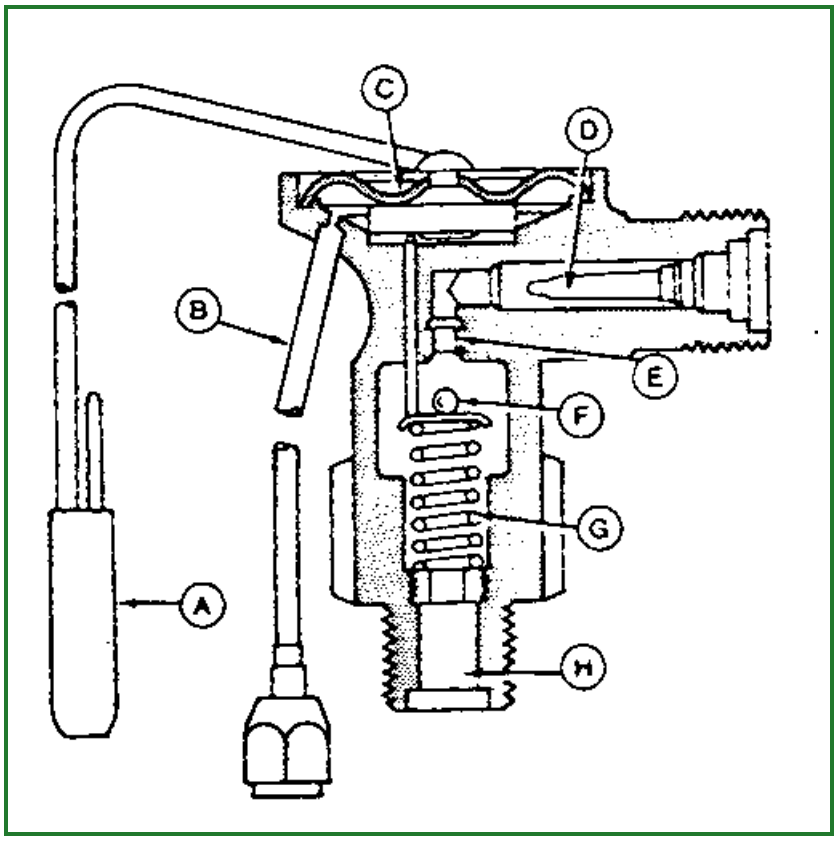
Expansion Valve Operation



T5961AK-UN: Expansion Valve

LEGEND:
A - Sensing Bulb
B - Equalizer Line
C - Diaphragm
D - Inlet Passage
E - Orifice
F - Valve Seat
G - Spring
H - Outlet Passage

The expansion valve is used to regulate the amount of refrigerant flowing into the evaporator. Since more refrigerant can be vaporized by warm moist air than cool dry air, the expansion valve adjusts flow to the maximum amount that can be vaporized in the evaporator depending upon the heat and humidity in the air.

The expansion valve is also an orifice used to cause a pressure drop in the liquid refrigerant to lower its boiling point, causing the refrigerant to vaporize as it is heated by the air flowing through the evaporator. Since heat is required to vaporize a liquid, the heat is removed from the air and added to the refrigerant.

The expansion valve is controlled by a gas filled sensing bulb (A) connected to a diaphragm (C). The sensing bulb is fastened to the evaporator outlet line and senses the temperature of the refrigerant leaving the evaporator. The bulb and line are wrapped with insulating tape to keep outside air temperature from affecting valve operation. If too much refrigerant is flowing through the evaporator, the liquid refrigerant will still be evaporating as it leaves the evaporator, causing a low temperature at the evaporator outlet. The low temperature causes the gas pressure in the sensing bulb to decrease. Spring (G) moves valve seat (F) closer to orifice (E), reducing the refrigerant flow. If outlet temperature is too warm, gas pressure in sensing bulb will increase, causing diaphragm (C) to move valve seat (F) away from orifice (E), increasing refrigerant flow.

If the expansion valve sensing bulb does not make good contact with the evaporator outlet line, or if the insulating tape is missing, frost will form on the evaporator outlet line. Frost forms because the sensing bulb will not be cooled to the actual line temperature. This will keep the expansion valve open too far and the refrigerant will still be evaporating as it leaves the evaporator, cooling the line to less than 0°C (32°F).