

BASIC PRINCIPLES (Continued)

- Return the liquid to the starting point in the refrigeration cycle.

The compressor and condenser perform these functions. The compressor pumps the refrigerant vapor (containing the hidden heat) out of the evaporator and suction accumulator drier, then forces it under high-pressure into the condenser which is located in the outside air stream at the front of the vehicle. The increased pressure in the condenser raises the Refrigerant-12 condensation or saturation temperature to a point higher than that of the outside air. As the heat transfers from the hot vapor to the cooler air, the Refrigerant-12 condenses back to a liquid. The liquid under high-pressure now returns through the liquid line to the fixed orifice tube for reuse.

It may seem difficult to understand how heat can be transferred from a comparatively cooler vehicle passenger compartment to the hot outside air. The answer lies in the difference between the refrigerant pressure that exists in the evaporator, and the pressure that exists in the condenser. In the evaporator, the compressor suction reduces the pressure and the boiling point below the temperature of the passenger compartment. Thus, heat transfers from the passenger compartment to the boiling refrigerant. In the condenser, the compressor raises the condensation point above the temperature of the outside air. Thus, the heat transfers from the condensing refrigerant to the outside air. The fixed orifice tube and the compressor simply create pressure conditions that permit the laws of nature to function.

Refrigerant-12 is readily absorbed by most types of oil. For this reason, a bottle of sterile mineral oil and a quantity of weak boric acid solution must always be kept nearby when servicing the air conditioning system. Should any liquid refrigerant get into the eyes, immediately use a few drops of mineral oil to wash them out, then wash the eyes clean with the weak boric acid solution. Seek a doctor's aid immediately even though irritation may have ceased. **Always wear safety goggles such as Rotunda Safety Shield Goggles 063-00003 or equivalent, when servicing any part of the refrigerant system.** The Refrigerant-12 in the system is always under pressure. Because the system is tightly sealed, heat applied to any part could cause this pressure to build up excessively.

To avoid a dangerous explosion, never weld, use a blow torch, solder, steam clean, bake body finishes, or use any excessive amount of heat on or in the immediate area of any part of the refrigerant system or refrigerant supply tank, while they are closed to the atmosphere, whether filled with refrigerant or not.

Ensure that Refrigerant-12 is both stored and installed in accordance with all state and local ordinances.

When admitting Refrigerant-12 gas into the cooling unit, always keep the tank in an upright position. If the tank is on its side or upside down, liquid Refrigerant-12 will enter the system and may damage the compressor.

GENERAL INFORMATION

Tools Required:

- Rotunda Safety Shield Goggles 063-00003

Safety Precautions

The refrigerant used in the air conditioner system is Refrigerant-12. Some vehicles may have Refrigerant-134a in the system. The same safety precautions as for R-12 should be observed. Refrigerant-12 is non-explosive, non-flammable, non-corrosive, has practically no odor and is heavier than air. Although it is classified as a safe refrigerant, certain precautions must be observed to protect the parts involved and the person working on the unit. Use only Refrigerant-12 such as Motorcraft YN-1A or YN-7 or equivalent. Liquid Refrigerant-12, at normal atmosphere pressures and temperatures, evaporates so quickly that it has the tendency to freeze anything it contacts. **For this reason, extreme care must be taken to prevent any liquid refrigerant from coming in contact with the skin and especially the eyes.**

Service Precautions

- Never open or loosen a connection before removing the refrigerant from the system with a recycling machine such as the Rotunda A/C Refrigerant Reclaim System (078-00800) or equivalent.
- When loosening a connection, if any residual pressure is evident, allow it to leak off before opening the fitting.
- A system which has been opened to replace a component or one which has discharged through leakage must be evacuated before charging.
- Immediately after disconnecting a component from the system, seal the open fittings with a cap or plug.
- Before disconnecting a component from the system, clean outside of the fittings thoroughly.
- Do not remove sealing caps from a replacement component until ready to install.
- Refrigerant oil will absorb moisture from the atmosphere if left uncapped. Do not open an oil container until ready to use, and install cap immediately after using. Store oil only in a clean, moisture-free container.