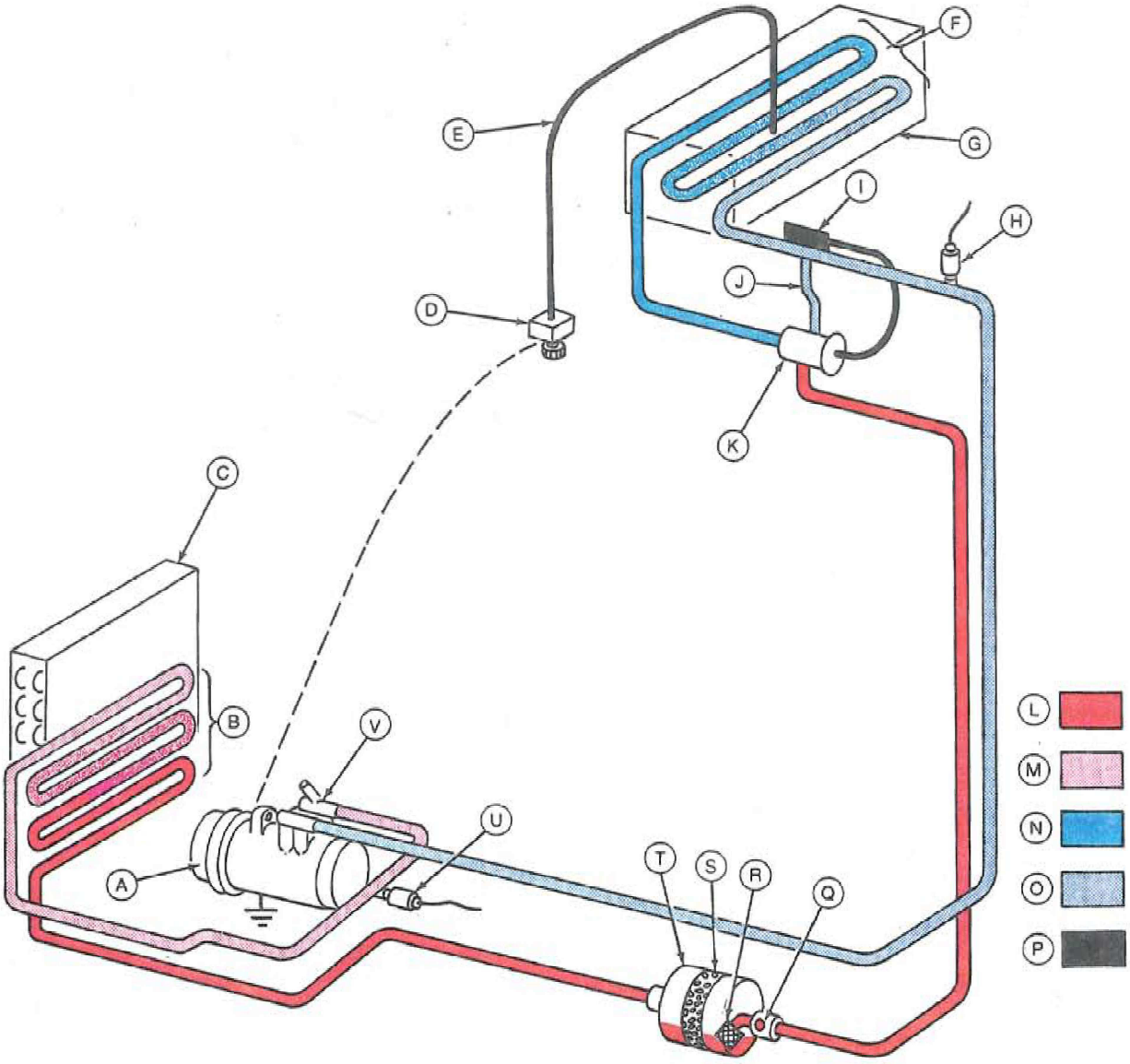

Pictorial Diagram of Air Conditioning System

A—Magnetic Clutch
B—Heat Transfer From Refrigerant Gas to Outside Air
C—Condenser
D—Temperature Control Switch
E—Sensing Tube
F—Heat Transfer From Cab Air To Refrigerant
G—Evaporator
H—Lo-Pressure Sensing Switch
I—Temperature Sensing Bulb
J—External Equalizer Line
K—Thermal Expansion Valve
L—High Pressure Liquid
M—High Pressure Gas
N—Low Pressure Liquid
O—Low Pressure Gas
P—Sensing Tube Gas
Q—Sight Glass
R—Pickup Tube
S—Dessicant
T—Receiver-Dryer
U—Hi-Pressure Sensing Switch
V—Compressor

THE SYSTEM CYCLE

The compressor (A) draws low pressure refrigerant from the evaporator (G) and compresses it to a high pressure. This causes its temperature to rise higher than that of the outside air.

As the high pressure gas passes through the condenser (C) heat is removed and transferred to the outside air being drawn through the condenser core. This cools the gas and condenses it into a liquid (still under high pressure).

The high pressure liquid then passes through the receiver-dryer (T) where a special filter removes contaminants (moisture, acids, solids, etc.). The receiver-dryer also acts as a reservoir for refrigerant.

The actual cooling and drying of cab air takes place at the evaporator. Refrigerant flow through the evaporator is controlled by the expansion valve (K). The expansion valve is a diaphragm-type valve that uses an orifice to reduce the flow of high pressure liquid refrigerant into the evaporator, causing refrigerant temperature and pressure to drop.

The pressurizer blowers pull warm cab air through the evaporator where it is cooled by the refrigerant. The heat absorbed by the evaporator causes the refrigerant to boil and vaporize.

Moisture (from the air) is collected on the evaporator core during the cooling process and drained away through tubes connected to a drip pan under the evaporator. With the cab air cooled and dehumidified the air conditioning cycle is complete.

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AIR CONDITIONING SYSTEM CONTROLS

There are two types of controls used in the air conditioning system: temperature balance controls and system protection controls.

TEMPERATURE BALANCE CONTROLS

The temperature balance controls are the thermostatic temperature control switch (D) and the thermal expansion valve (K). The system protection controls are the high pressure sensing switch (U), low pressure sensing switch (H) and the warning system relay (not shown) located under cab roof on right side.

The thermostatic temperature control switch is a rotary-type switch with a gas filled temperature sensing tube (E) inserted in the evaporator core (G). The switch end of the sensing tube uses a diaphragm to control two external contacts wired to the compressor clutch. When the cab air needs to be cooled (to a preselected temperature setting inside the cab) the gas in the sensing tube expands the diaphragm completing the circuit in the switch and engaging the compressor clutch. The compressor continues to operate until the preselected cab temperature is reached.

The expansion valve regulates the amount of refrigerant allowed to pass into the evaporator. It has a sensing bulb (I) and tube filled with low pressure gas attached to the evaporator outlet pipe. As the evaporator outlet temperature increases, the gas in the bulb expands, opening the expansion valve. This increases the amount of refrigerant flowing through the evaporator. As evaporator outlet temperature decreses, the gas in the bulb contracts and closes the expansion valve.

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