

Fig. 3—Vacuum Circuits Air Conditioning—Heating Unit

plication is as indicated in Fig. 3. The fresh air door is closed to outside air—open to recirculating air. The A/C door is open to A/C outlets and closed to heat. The heat defrost door is closed and the heater core by-pass door will be fully open.

**A/C**

When the car has been cooled to the desired temperature and the A/C button is pushed, the vacuum application at the fresh air-recirculating door actuator is transferred to opposite the rod side. This moves

the door away from the fresh-air inlet and closes the recirculating inlet. All other vacuum applications and door positions are the same as for the MAX A/C button.

**HEAT**

Pressing the HEAT button starts the blower, applies vacuum to the rod side of the air conditioning door actuator and opposite the rod side of the fresh air recirculating door actuator and to the back side of the defroster door actuator. The fresh air-recir-

PY165

culating door pivots away from the fresh-air inlet and closes off the recirculating inlet, supplying fresh air to the blower, which forces it through the evaporator coils and the heater core. The amount of heat added to the air by the heater core depends on the setting of the water flow control valve lever.

**DEFROST**

When the heater section is operating on Defrost, there will be a small amount of heat bleed through the heater outlets. Vacuum application will be as indicated. The fresh recirculating air door will be open to Fresh Air and the Defroster door will be open.

**REHEAT COOLING CONTROL**

The air-conditioning refrigeration system operates at full capacity constantly when either the "Max A/C" or "A/C" button is pushed. (Full capacity meaning maximum refrigeration according to the existing ambient temperature and humidity.) If the discharge air from the air conditioning outlets is too cold the air temperature may be increased by reheating the air after it has passed through the evaporator coil. The amount of reheating is determined by the temperature control slide lever which controls the water flow

to the heater core. Any desired air temperature can be obtained from the A/C outlets by adjusting the temperature control slide lever.

This unit has a heater core by-pass door which allows a portion of the cool air to pass under the heater core, then mix with the hotter air being discharged at the bottom of the heater core to give a more even discharge air temperature at the air conditioning outlets. The heater core by-pass door is open during air conditioning operation and closed during heater or defroster operation (Fig. 13).

**CONDENSATION DRAIN TUBES**

Condensation which accumulates on the bottom of the evaporator housing is expelled through a single molded rubber drain tube into the engine compartment. This tube must be kept open to prevent condensation from collecting in the bottom of the housing.

**ELECTRICAL CONTROLS AND CIRCUITS**

There are two switches, a push button switch (air conditioner and heater vacuum switch), and a fan switch (air conditioner and heater blower switch).

The power feed circuit is shown in (Fig. 4). A 20

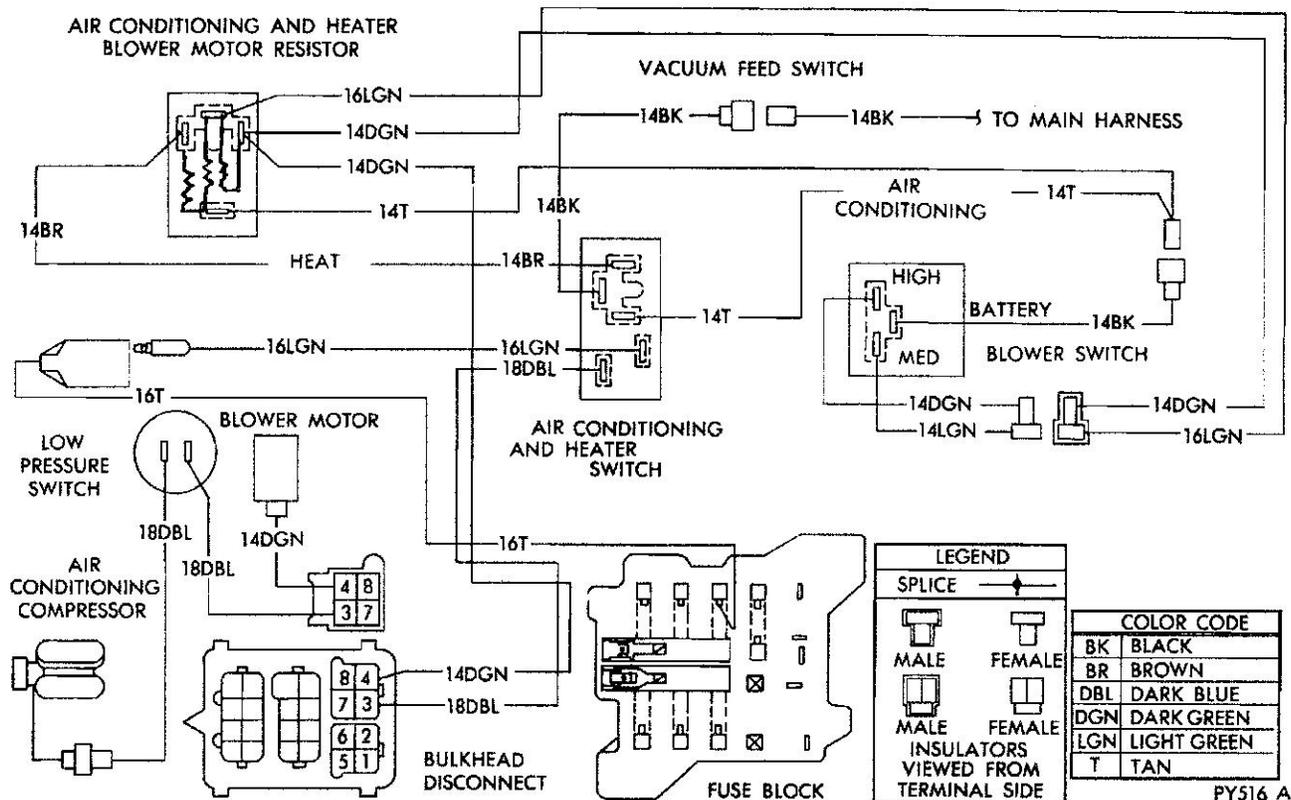


Fig. 4—Electrical Control Circuit

ampere fuse in the fuse block protects the circuit.

The compressor clutch circuit is energized when either the "Max.A/C" (maximum air conditioning) or the "A/C," (fresh air—air conditioning) push buttons are depressed. The "OFF" button turns off the system.

### **Blower Motor (Fan Switch)**

The power feed line from the push-button switch to the blower switch is energized only when the ignition is on and any push button, other than "Off," is depressed.

The switch is controlled by moving the control lever from left (low) to right (high).

### **Restrictor**

A plastic restrictor is installed in the vacuum hose leading to the A/C door actuator. This restrictor provides some delay in the opening of the A/C door after the "HEAT" or "DEFROST" button is depressed. This delay gives the blower time to expel condensation from the evaporator housing through the A/C outlets before it can be blown onto the windshield.

Should it become necessary to replace the vacuum hose leading to the A/C door actuator, the correct restrictor should be used.

## **EXPANSION VALVE**

### **Removal**

The system must be completely discharged before opening any of the refrigerant lines.

- (1) Disconnect equalizer from suction line fitting
- (2) Disconnect expansion valve from liquid line and evaporator. Use two wrenches to loosen each of these connections.
- (3) Carefully pull out capillary sensing tube from suction line well.
- (4) Remove rubber seal from the capillary sensing tube. Inspect condition of inlet screen.

### **Installation**

- (1) With new "O" rings and clean refrigerant oil on all fittings, connect expansion valve to liquid line and evaporator assembly using two wrenches to prevent rotation and twisting of the lines.
- (2) Connect equalizer tube to the fitting on suction line.
- (3) With a rubber seal on the capillary sensing tube, carefully insert the tube in the suction line well as far as it will go (approximately five inches).
- (4) After the expansion valve is installed, it must be completely tested and the system must be tested for leaks and recharged.

## **OPERATION OF ALL CONTROLS**

Satisfactory performance of the combined air-conditioning and heating system is dependent upon proper operation and adjustment of all operating controls, as well as proper functioning of all refrigeration system units. The inspections, tests and adjustments should be used to locate the cause of a malfunction. The tests in this manual have been arranged in a logical sequence that has proved to be the surest and shortest route to accurate diagnosis. It is recommended that they be followed and performed in the order in which they are presented.

Operating controls must be tested in the following sequence.

- (1) Inspect and adjust compressor drive belt.
- (2) Open vehicle windows.
- (3) Move temperature control slide lever to "Off" position.
- (4) Start engine and adjust engine speed to 1600 rpm for 6 cylinder engines and 1300 rpm for 8 cylinder engines. Use a reliable tachometer.
- (5) Push the Max. A/C button in.
- (6) Fresh-recirculating door should be closed to fresh air.
- (7) Test the blower operation at all three speed positions. If the blower does not operate correctly, refer to "Electrical Controls Circuit". Leave the blower switch in the "Low" position.
- (8) The compressor clutch should be engaged, the compressor operating, and the air conditioning system in operation. If the clutch does not engage, test the circuit as outlined under "Electrical Controls and Circuits."

### **Push Button Operation**

Reduce the engine speed to normal idle. With the engine operating at idle speed, the vacuum will be high and the vacuum actuators should operate quickly.

If the actuator operation is slow, check the source hose connection at the engine manifold.

Push each button to test the over-all operation of the electrical and vacuum controls.

The "Push Button Control Chart" summarizes the actions that should take place when each button is pushed. See "Chart." Also refer to "Vacuum controls and circuits."

If all the controls operate in the proper sequence but the action of the dampers and doors is slow or incomplete, inspect for mechanical misalignment, or binding.

## **TEMPERATURE CONTROL CABLE**

### **Installation**

The cable operated temperature control valve is

**PUSH BUTTON CONTROL CHART**

Button	Off	Max. A/C	A/C	Heat	Defrost
Fresh Air Door	Closed	Closed	Open	Open	Open
Recirculating Door	Open	Open	Closed	Closed	Closed
Air Conditioning Door	Open	Open	Open	Closed	Closed
By-Pass Door	Open	Open	Open	Closed	Closed
Heater Door	Closed	Closed	Closed	Open	Closed with Air Bleed
Defroster Doors	Closed	Closed	Closed	Closed with Air Bleed	Open
Blower Speed	Off	Hi-Med. Low	Hi-Med. Low	Hi-Med. Low	Hi-Med. Low
Compressor Clutch	Off	On	On	Off	Off

equipped with a self adjusting control cable. No adjustment is necessary after the initial installation.

(1) Place the temperature control lever, on the instrument panel, in the center position.

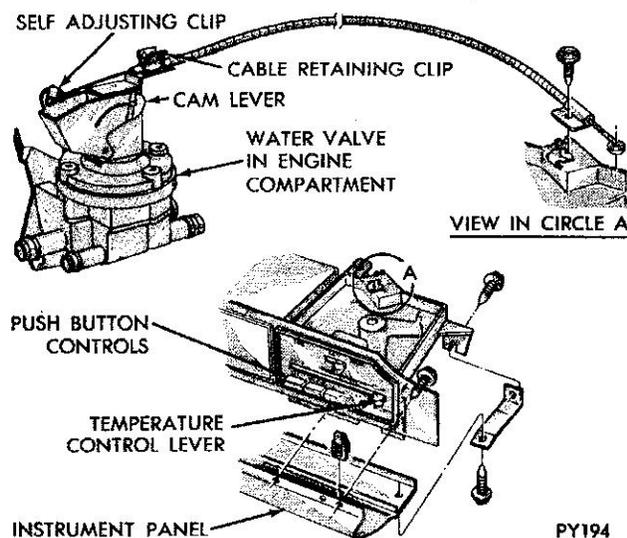
(2) Position self adjusting clip on cam lever pin and place cam lever on water valve, in full heat position. Snap cable housing into retaining clip and cable into self adjusting clip. (Fig 5).

(3) Move the temperature control lever on instrument panel to the full heat position to adjust the control.

**EVAPORATOR HEATING ASSEMBLY**

**Removal**

(1) Remove air cleaner from carburetor.



**Fig. 5—Water Temperature Control Valve**

(2) Disconnect battery negative cable.

(3) Drain cooling system and disconnect heater hoses at dash panel. Plug core tubes to prevent spilling coolant on interior of car.

(4) Slowly discharge refrigerant from system.

(5) Disconnect refrigerant lines at dash panel using two wrenches. Leave expansion valve attached to line. Cap all refrigerant openings.

(6) Disconnect blower motor wires and remove blower motor cooling tube and blower motor. (Fig. 6).

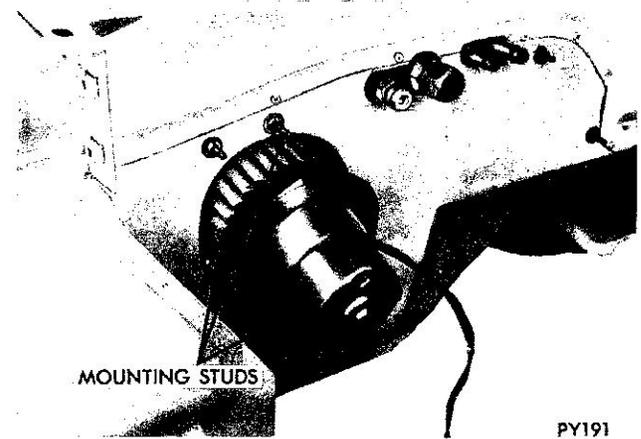
(7) Remove glove box.

(8) Remove appearance shield from lower edge of instrument panel.

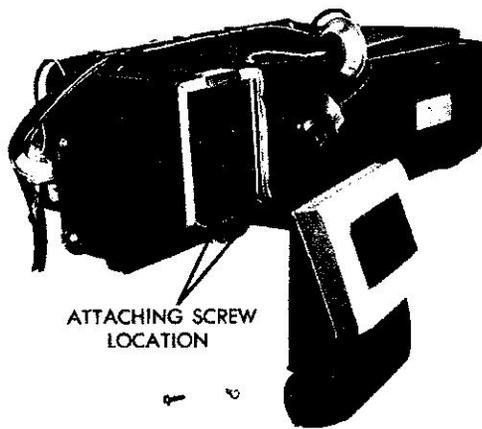
(9) Remove left spot cooler duct and air distribution housing. (Fig. 7).

(10) Disconnect wires from blower motor resistor, and antenna wire from bottom of radio.

(11) Remove radio, see "Radio Removal" Group 1.



**Fig. 6—Blower Motor Removal**



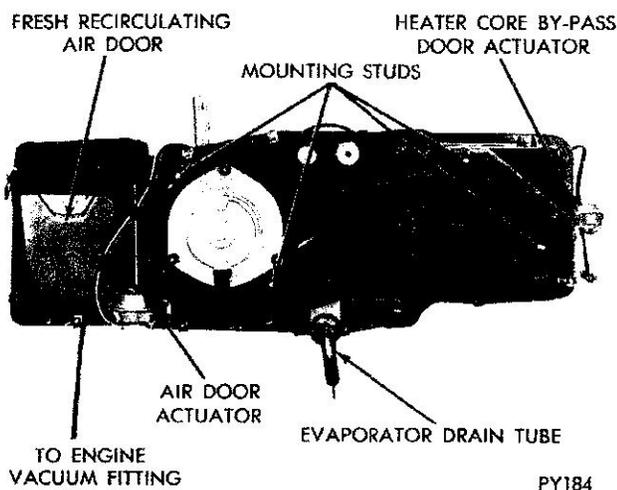
PY192

**Fig. 7—Air Distribution Housing Removal**

- (12) Disconnect vacuum harness from back of control switch.
- (13) Remove water valve cable from bracket on left end of housing.
- (14) Remove nuts from housing mounting studs in engine compartment. (Figs. 1 and 8).
- (15) Remove rubber drain tube.
- (16) Remove support bracket from housing to plenum panel.
- (7) Remove unit out from under instrument panel.

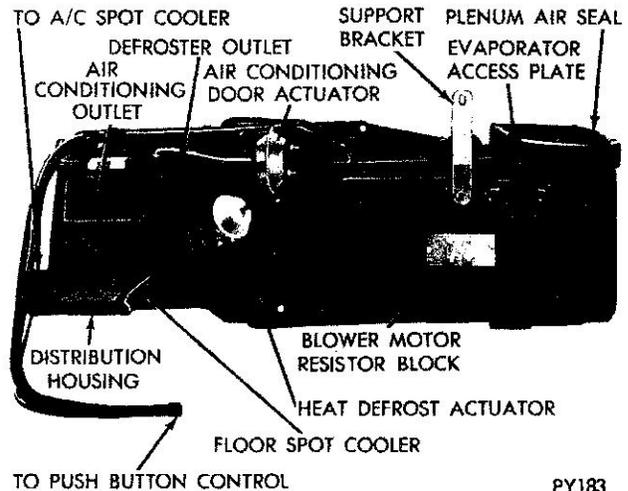
**Disassembly**

- (1) Carefully remove plenum air seal. (Fig. 9).
- (2) Disconnect vacuum hose from fresh air door actuator and by-pass door actuator.
- (3) Remove air seal from heater and evaporator core tubes.
- (4) Remove 18 screws holding front and rear covers together and one screw from between evaporator



PY184

**Fig. 8—Heater Evaporator Assembly (Rear View)**



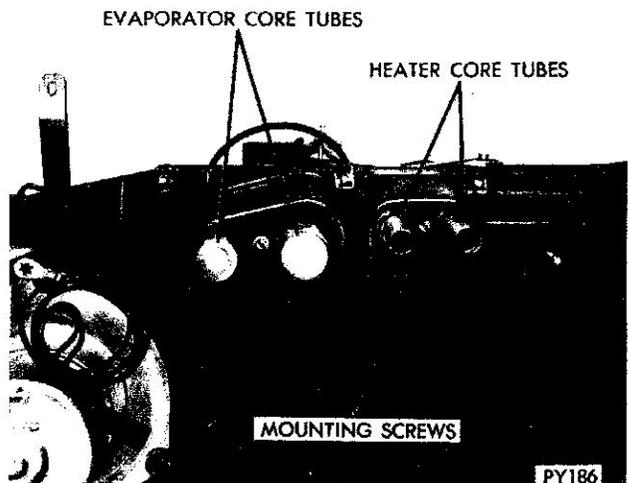
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**Fig. 9—Heater Evaporator Assembly (Front View)**

- core tubes. (Fig. 10). Separate housings.
- (5) Remove three screws from evaporator core access plate, remove plate, this will provide access to two evaporator core mounting screws. (Fig. 11).
- (6) Remove four screws holding evaporator core to front cover and remove core. (Fig. 12).
- (7) To remove the heater core, carefully lift left half of the housing seal from the rear cover as shown in Fig. 14. Do not remove the entire seal as the lower portion is a water seal.
- (8) Remove two core retaining screws from mounting plates and one from between core tubes in back of rear cover. Lift heater core out of housing. (Fig. 13).

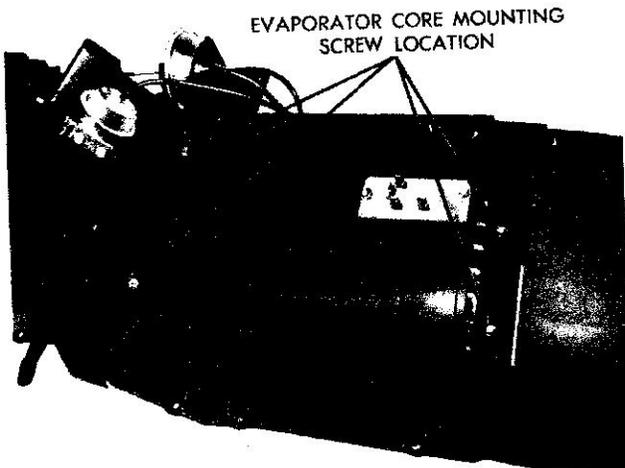
**Assembly**

- (1) Place heat door in up position before placing heater core in rear cover.



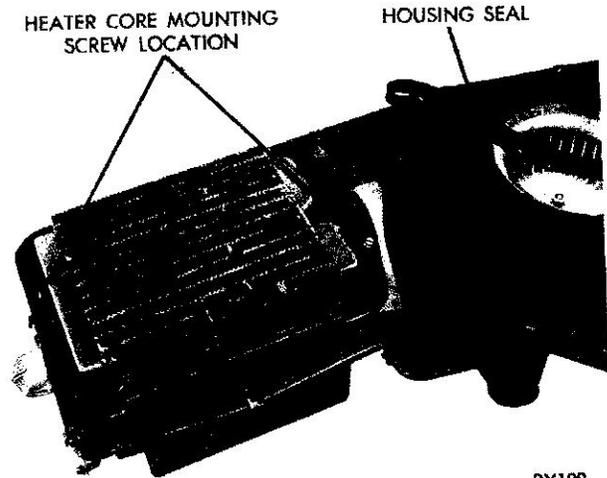
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**Fig. 10—Core Tube Mounting Screw Location**



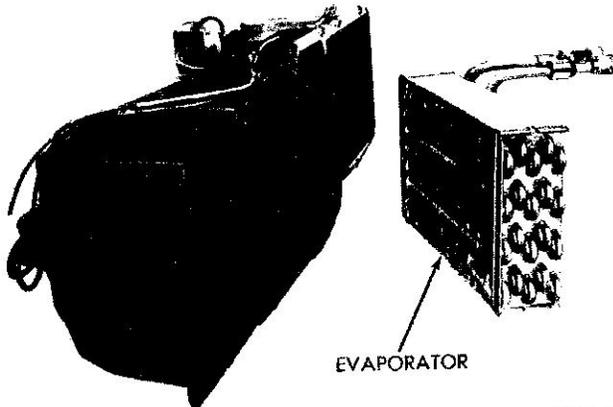
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**Fig. 11—Evaporator Core Removal**



PY188

**Fig. 14—Housing Seal Partially Removed**



PY187

**Fig. 12—Evaporator Core Removed**

(2) With heater core in position, install sheet metal retaining screws.

(3) Apply rubber cement to under side of raised portion of housing seal and carefully return it to its original position over the heater core.

(4) Install evaporator core in front cover and secure with four sheet metal screws. (Fig. 15).

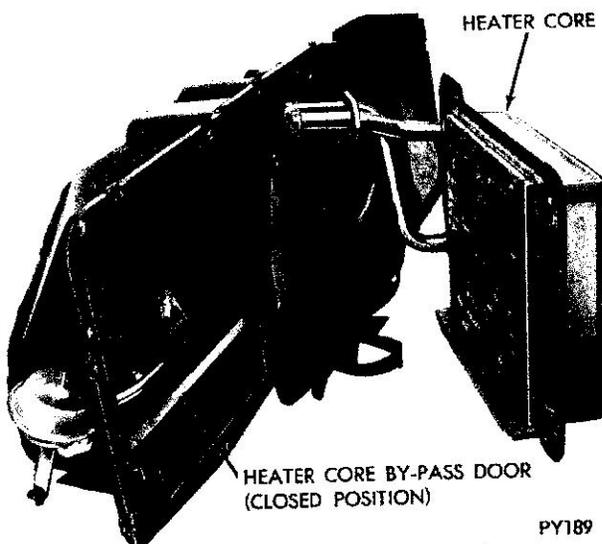
(5) Assemble front cover to rear cover, be sure cover seal is properly seated. Install 18 sheet metal screws around perimeter of cover and one screw between evaporator core tubes from back of rear cover.

(6) Install air seal over heater and evaporator core tubes.

(7) Connect all vacuum hoses to respective actuators. (Hose with red tracer to rod side of actuator).

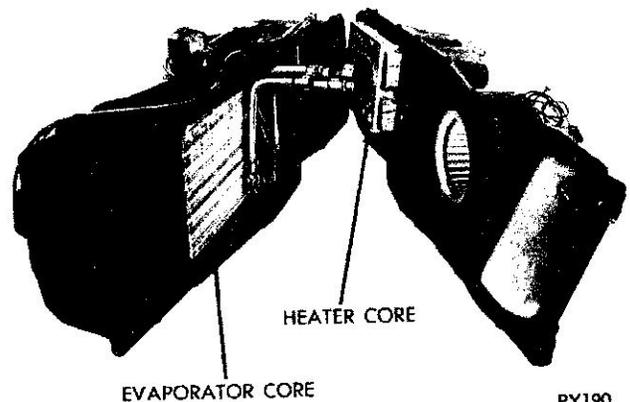
(8) Place evaporator core access cover plate on front of housing and secure with three sheet metal screws.

(9) Apply rubber cement to plenum air seal and install.



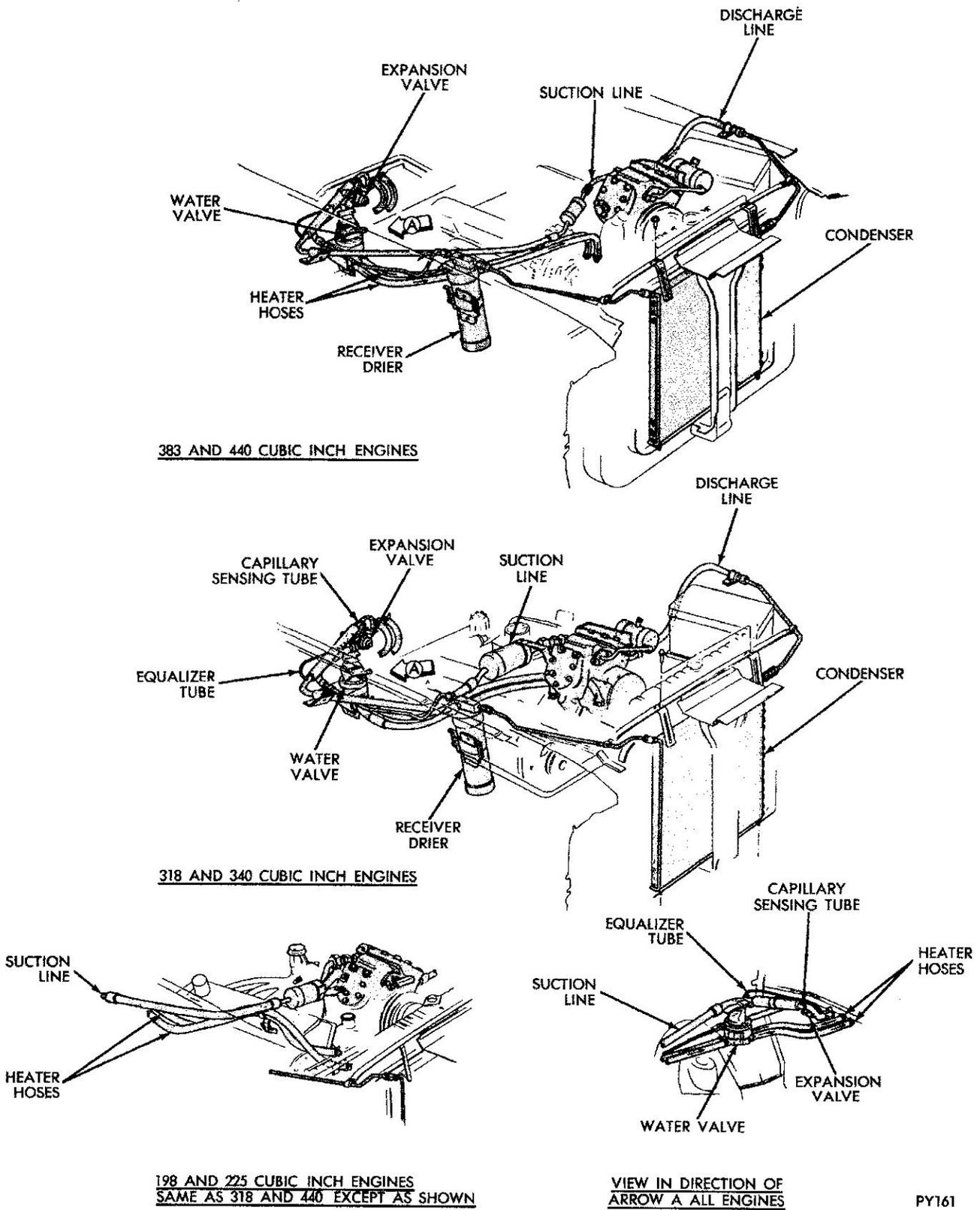
PY189

**Fig. 13—Heater Core Removed**



PY190

**Fig. 15—Evaporator and Heater Core Installed**



PY161

**Fig. 16—Air Conditioning and Heater Plumbing**

**Installation**

- (1) Position housing up under instrument panel.
- (2) Connect housing to plenum support bracket.
- (3) From engine compartment, install four retaining nuts on housing mounting studs; tighten to 24 inch pounds.
- (4) Connect vacuum harness to back of control switch. Place the water valve control cable in its retaining bracket.
- (5) Install radio, See "Radio Installation" Group 1.
- (6) Connect all wiring to blower motor resistor and plug antenna lead into bottom of radio.
- (7) Install center outlet air distribution housing and left spot cooler duct.
- (8) Install appearance shield to bottom of instrument panel.
- (9) Install glove box.
- (10) Install blower motor and connect wiring.
- (11) Connect blower motor cooling tube and install evaporator drain tube.
- (12) Connect refrigerant lines to evaporator core tubes. Examine "O" Rings, lubricate fittings and "O" ring freely with refrigerant oil. Use two wrenches to avoid twisting tubes. (Fig. 16).
- (13) Connect heater hoses to core tubes. Fill cooling system.
- (14) Evacuate system. Sweep test. Examine for leaks.