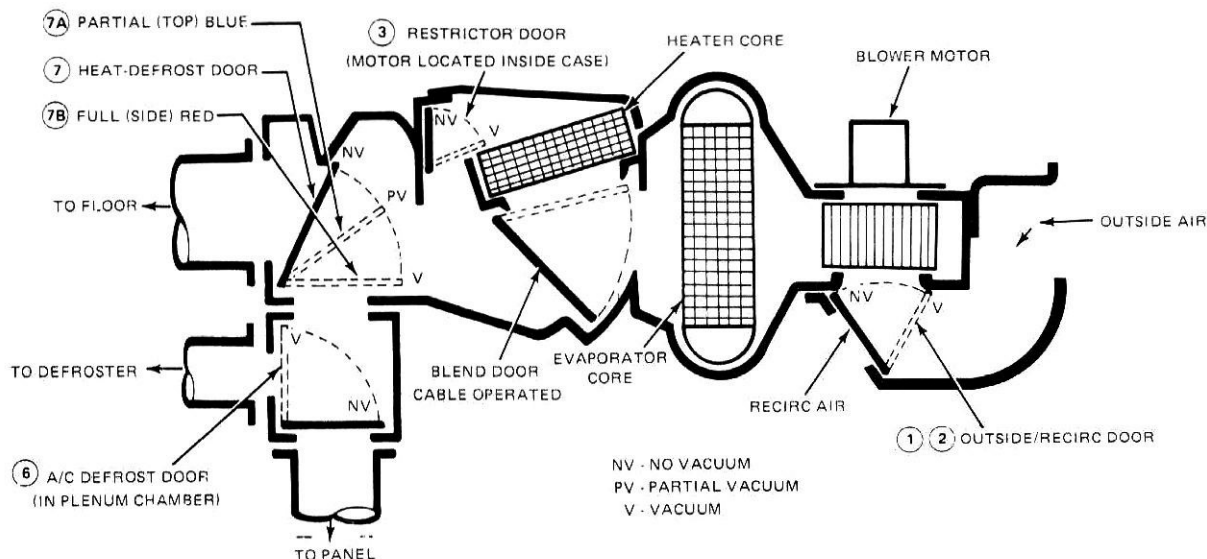
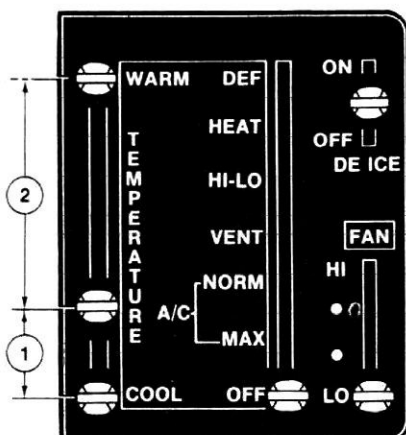




1978 FAIRMONT AND ZEPHYR
MANUAL A/C-HEATER SYSTEM VACUUM MOTOR TEST CHART

FUNCTION CONTROL LEVER POSITION	TEMPERATURE CONTROL LEVER POSITION	VACUUM MOTORS APPLIED WITH VACUUM				
		OUTSIDE RECIRC. DOOR	RESTRICTOR DOOR	HEAT DEFROST DOOR		A/C- DEFROST DOOR
				PARTIAL	FULL	
OFF	ANY POSITION	1-2	—	7A	7B	6
A/C [MAX NORM]	RANGE 1	1-2	3	—	—	6
	RANGE 2	1-2	—	—	—	6
	RANGE 1	—	3	—	—	6
	RANGE 2	—	—	—	—	6
VENT	RANGE 1	—	3	—	—	6
	RANGE 2	—	—	—	—	6
HI-LO	ANY POSITION	—	—	7A	—	6
HEAT	ANY POSITION	—	—	7A	7B	—
*DEFROST	ANY POSITION	—	—	—	—	—
VACUUM HOSE COLOR CODE		White	Green	Blue	Red	Yellow

*Compressor clutch engaged when ambient cut-off switch is closed.

— No Vacuum (atmosphere)

R2153-2A

FIG. 2 Manual A/C-Heater System Air Flow Schematic and Vacuum Control Chart

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AIR DISTRIBUTION

The distribution of air inside the vehicle is dependent on the position of the function control lever. Air can be distributed through the floor outlets, through the floor outlets and instrument panel registers, through the instrument panel registers only, and through the defroster nozzles (Fig. 3).

When the function control lever is in the OFF position, there is no air flow through the system because the blower is OFF. With the function control lever in MAX A/C, NORM A/C or VENT, air distribution is through the instrument panel registers (Fig. 4). When the function control lever is in the HI-LO position, air is distributed through the instrument panel registers and the floor outlets (Fig. 4). Moving the function control lever to HEAT distributes air flow out of the floor outlets with a small amount of air bled to the defroster nozzles (Fig. 5). With the function control lever in the DEF position, air distribution is from the defroster nozzles with a small amount of air bled to the floor outlets (Fig. 5).

TEMPERATURE CONTROL

Temperature is controlled by a cable operated air blend door and a vacuum operated restrictor door located within the evaporator case (Figs. 4 and 5). When the temperature control lever is in Range 1 shown in Fig. 2, the restrictor door is closed to stop air flow through the heater core. The air blend door can be closed to partially open, allowing only cooled or outside air to be discharged from the outlets, depending on the position of the temperature control lever.

When the temperature lever is moved to Range 2 shown in Fig. 2, the restrictor door is open allowing air flow through the heater core. Air flow is directed through and around the heater core for the desired temperature, depending on the position of the temperature control lever in Range 2.

FUNCTION CONTROL

The function control lever actuates an eight-port vacuum selector that controls air source intake and air distribution within the system. The function control lever also operates the blower ON-OFF switch and the A/C compressor clutch operating circuit. However, the actual turning ON or OFF of the compressor clutch is dependent on the position of the function control lever and the ambient cut-off switch. Both switches must be closed to energize the clutch for compressor operation (See Fig. 6).

BLOWER CONTROL

The blower speeds are controlled by a four position FAN switch and a resistor assembly located in the evaporator case downstream from the evaporator core. The switch is used to select low, two intermediate or the high fan speed. The fan is turned OFF by the function control lever when it is in the OFF position. This is accomplished by a switch integral with the control assembly. Contacts W and X, shown in the wiring diagram, are connected to the blower ON-OFF switch (Fig. 6).

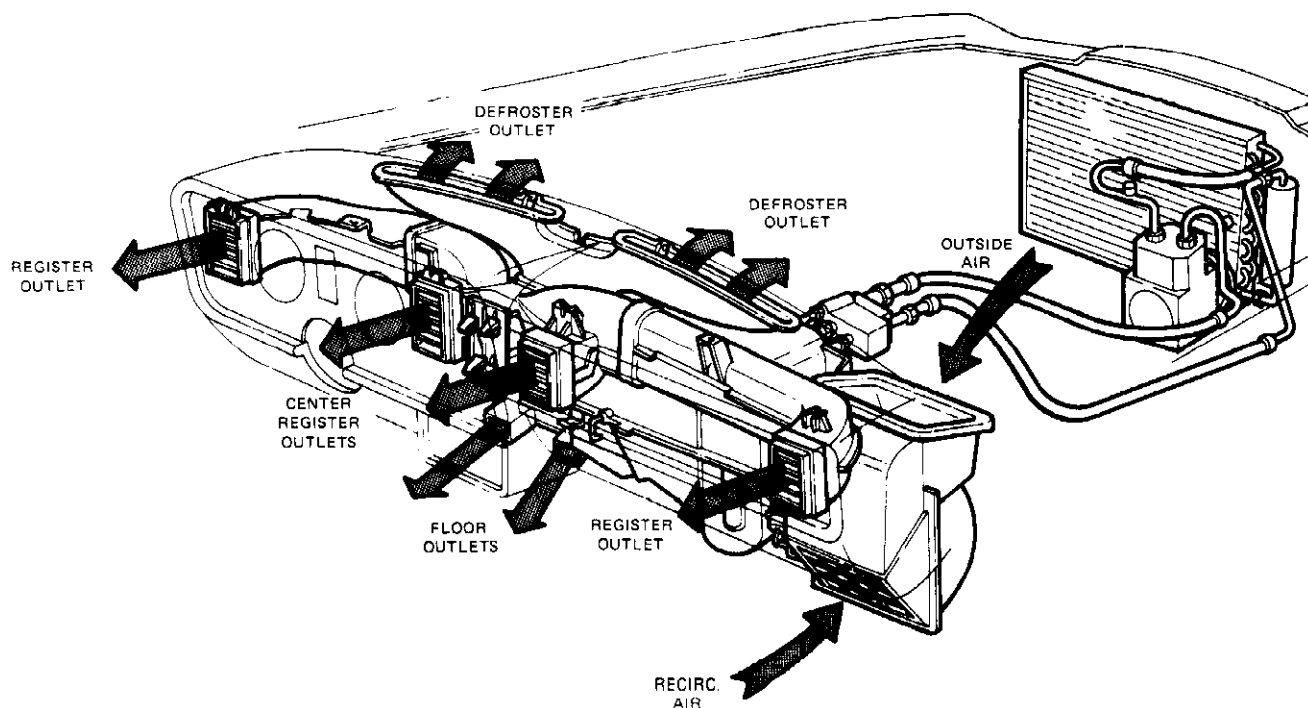
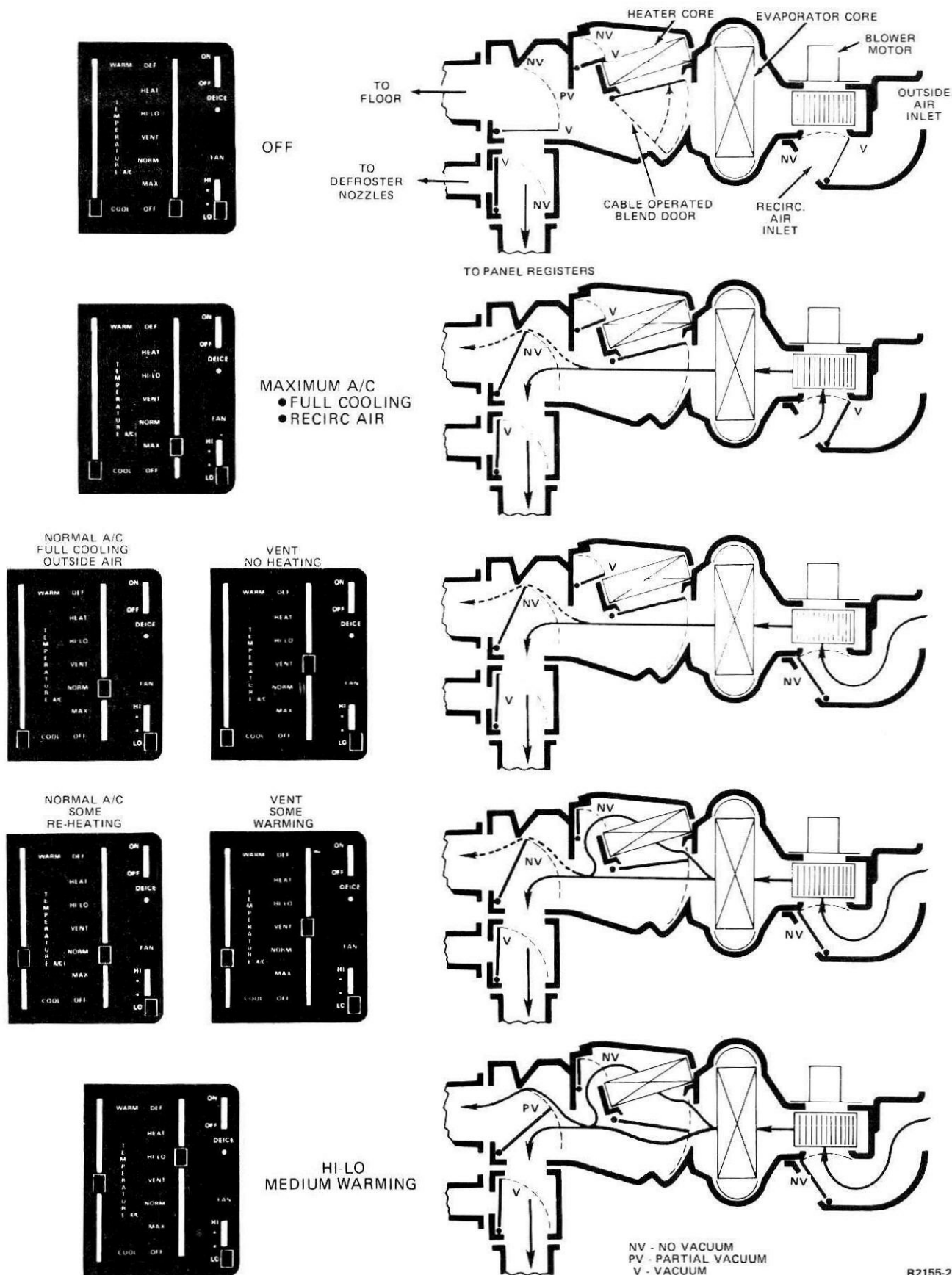
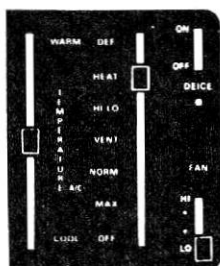
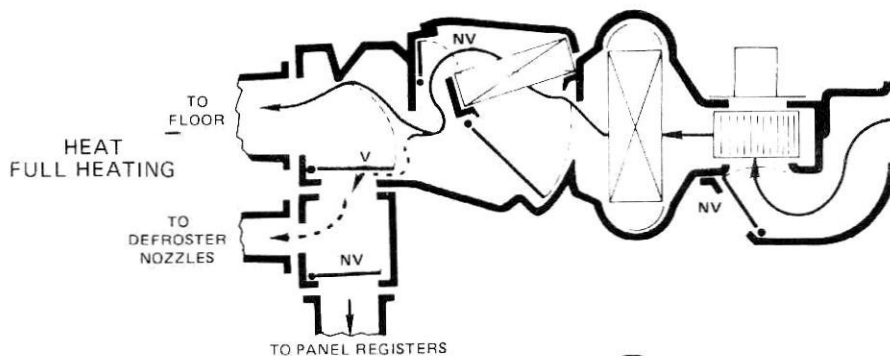
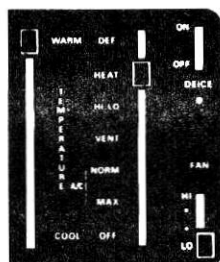
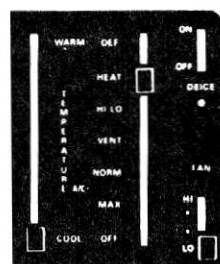
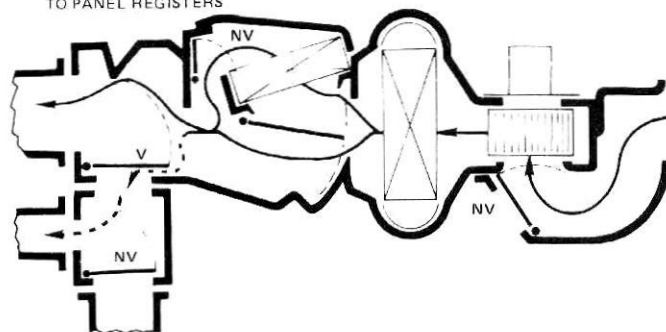
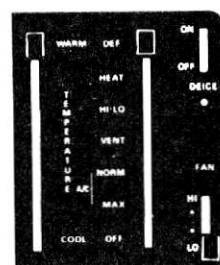
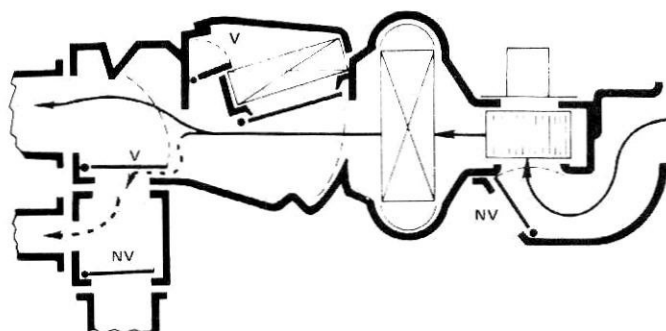
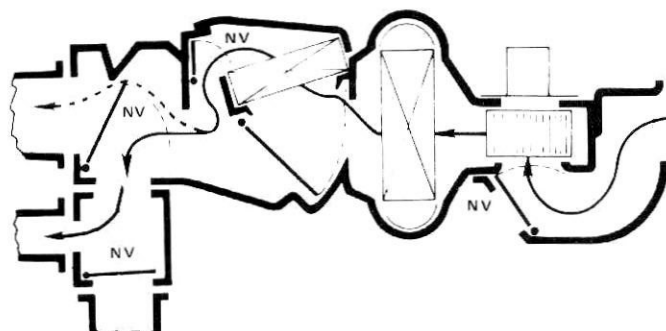
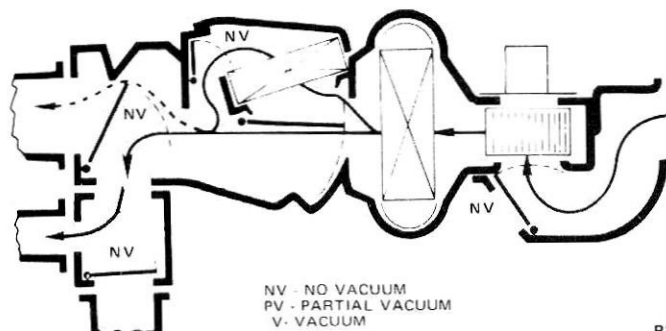


FIG. 3 Manual A/C-Heater System Air Distribution



R2155-2A

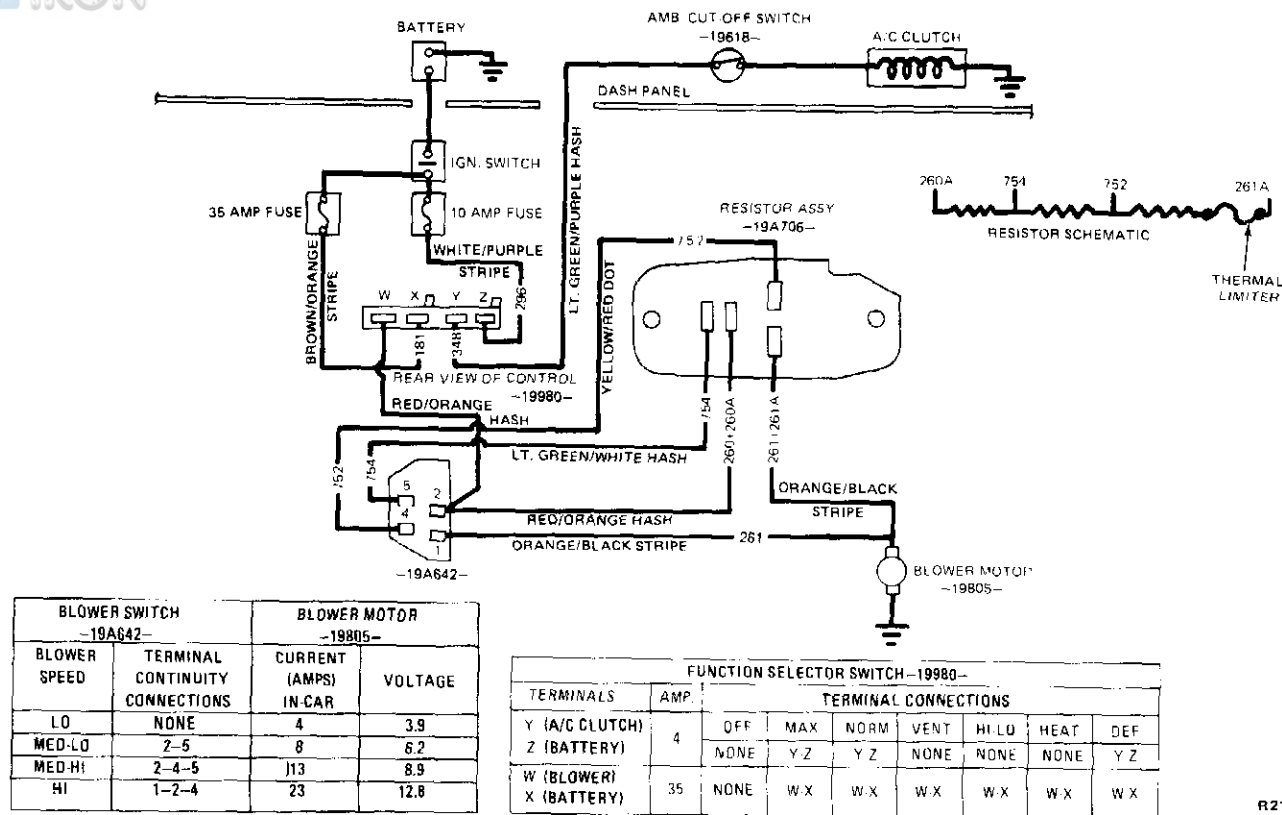
FIG. 4 Manual A/C Heater System Air Flow Chart 1

HEAT
MEDIUM HEATINGHEAT
MINIMUM HEATINGDEFROST
FULL HEATINGDEFROST
MEDIUM HEATING

NV - NO VACUUM
PV - PARTIAL VACUUM
V - VACUUM

R2156-2A

FIG. 5 Manual A/C Heater System Air Flow Chart 2



R2157-2A

FIG. 6 Manual A/C—Heater System Electrical Wiring Diagram and Continuity Test

SYSTEM COMPONENTS

EVAPORATOR CASE

The evaporator case assembly is located in the passenger compartment under the instrument panel on the right side (Fig. 1). It contains the evaporator and heater cores, the blower motor resistor, the cable operated air blend door, the restrictor door and the heat-defrost door. The vacuum motor for the restrictor door is located inside the evaporator case.

The evaporator case is attached to the vehicle dash panel with two self-tapping screws, two studs and nuts and a support bracket located over the evaporator core.

AIR INLET DUCT AND BLOWER HOUSING ASSEMBLY

The air inlet duct and blower housing assembly is located under the right side of the instrument panel and is attached to the evaporator case (Fig. 7) with one screw near the top and a stud and nut at the bottom. It is also attached to the cowl with a support bracket.

The air inlet duct contains the outside-recirc door and serves as the air passage to supply air to the blower for system operation. It is attached to the blower housing with two screws and three snap clips.

The blower assembly includes the blower housing, motor and wheel. It draws air from the air inlet duct and forces the air into the evaporator housing through the evaporator core. The blower motor should not be removed from the mounting flange because the position

of the motor in the mounting flange is pre-set to prevent interference of the blower housing and blower wheel.

DEFROSTER NOZZLE AND REGISTER DUCTS

The defroster nozzle and register ducts are attached to the instrument panel with self-tapping screws (Fig. 8). The A/C-heat distribution duct is attached to the center register duct with four screws and it is held against the evaporator plenum to complete the air duct passages.

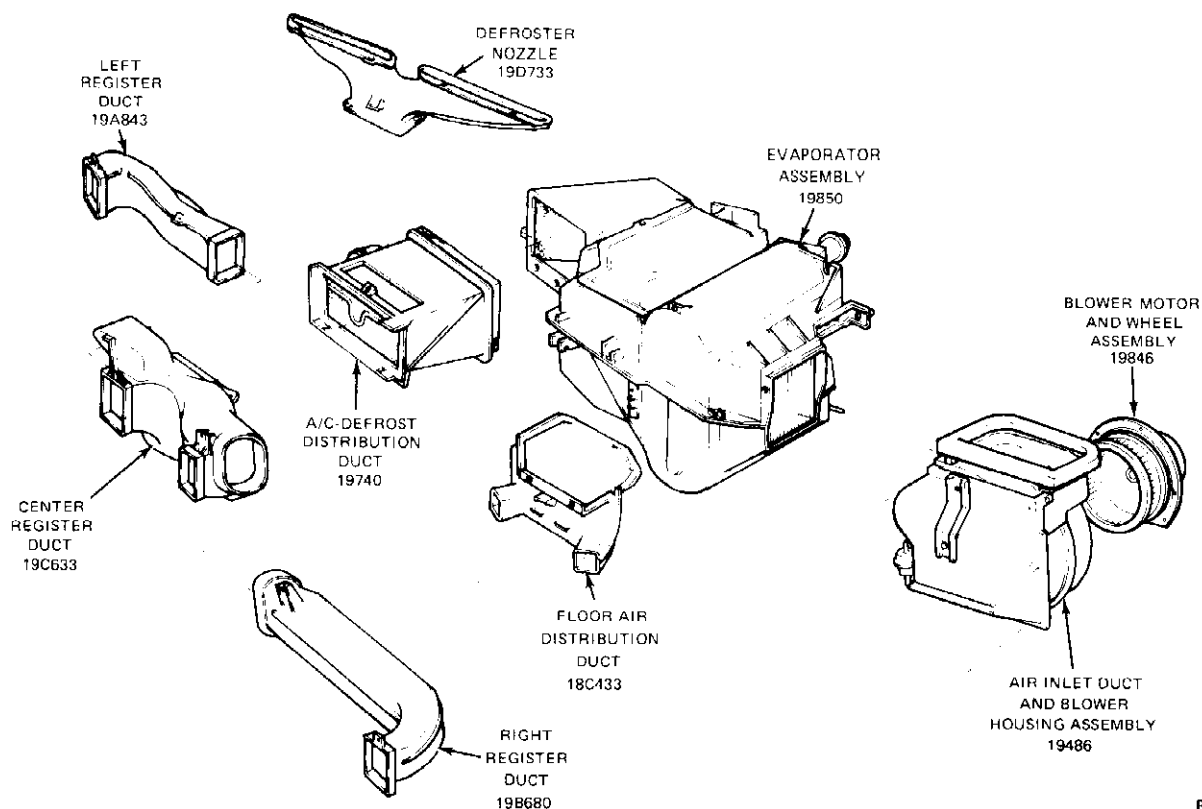
VACUUM MOTORS

Four vacuum motors are used in the A/C-heater system. One is used to operate the outside-recirculation door and is located on the air inlet duct behind the glove compartment. The motor opens the outside-recirc door to outside air with no vacuum.

The restrictor door vacuum motor is located inside the evaporator case near the heater core. This motor opens the restrictor door when there is no vacuum.

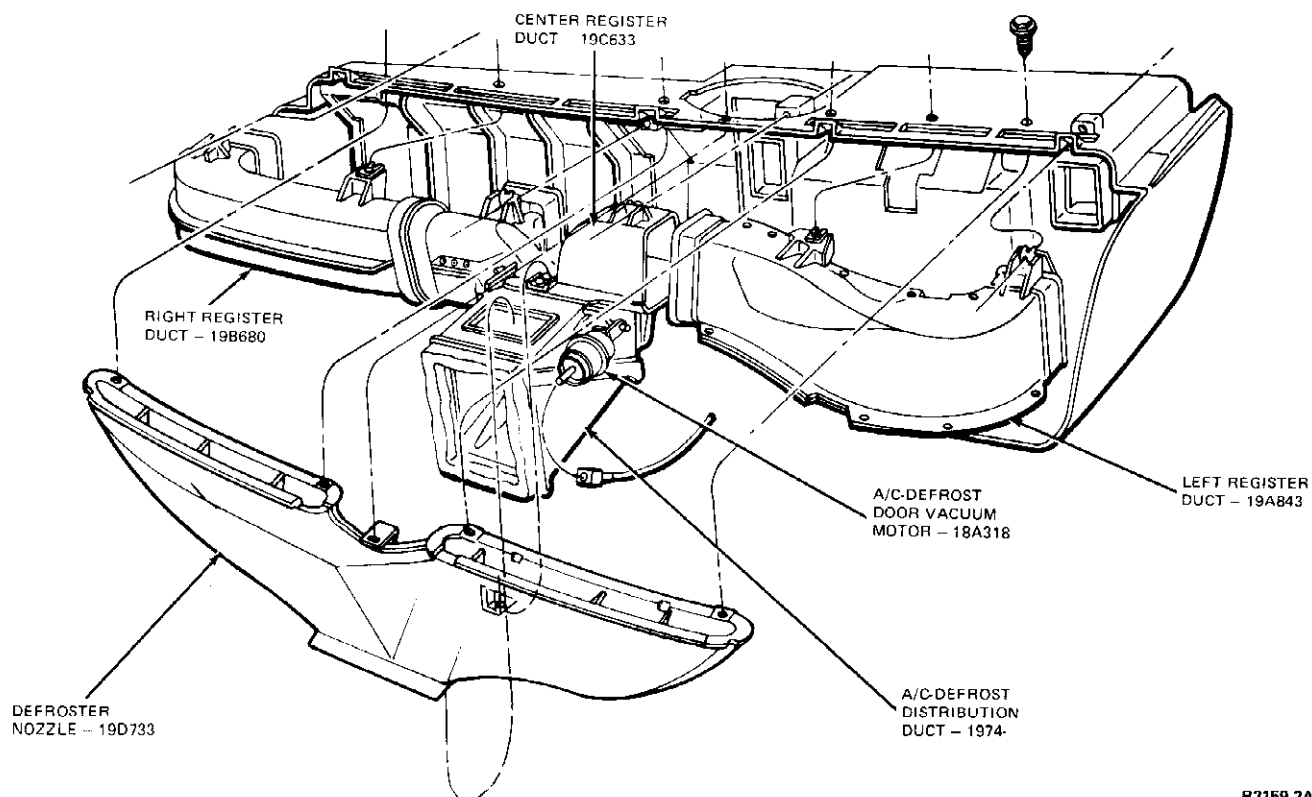
The A/C-defrost door vacuum motor is located on the left side of the A/C-heat distribution duct. This motor opens the A/C-defrost door for defroster operation when there is no vacuum.

The heat-defrost door vacuum motor is a dual diaphragm vacuum motor and is located on the left end of the evaporator case. Vacuum must exist at both diaphragm ports for full travel of the motor arm. Vacuum at the top or end port of the motor will give



R2158-2A

FIG. 7 Air Conditioner-Heater Assembly



R2159-2A

FIG. 8 Defroster Nozzle and Register Ducts Installation

about half travel of the motor arm. If vacuum is applied to the side port only, motor operation is minimal. If the vacuum hoses to this motor are reversed, the vacuum motor will not operate properly when the function control lever is in the HI-LO position (Fig. 2).

ELECTRICAL SYSTEM

The electrical system consists of the blower motor, blower speed switch, blower ON-OFF and clutch switch (integral with the control assembly), blower resistor with a thermal limiter, ambient cut-off switch, the magnetic clutch and the fuses and wiring to complete the circuit (Fig. 6).

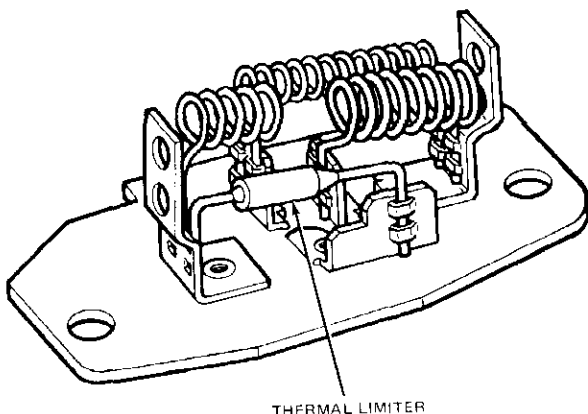
The blower motor is installed in the blower housing which is located behind the air inlet duct at the right end of the evaporator case. The motor and mounting flange are serviced as an assembly and should not be disassembled.

The blower (FAN) speed switch is mounted on the control assembly and, with the blower resistor, allows the selection of four blower speeds. This switch does NOT turn the blower OFF.

The blower motor resistor is installed in the side of the lower half of the evaporator case and is located behind the glove compartment. The resistor is used in conjunction with the blower speed switch to obtain the four blower speeds.

The resistor assembly also contains a thermal limiter which is used as a temperature protecting fuse. The thermal limiter is located a pre-set distance from the resistor coils (Fig. 9). If the temperature of the thermal limiter reaches 300°F (149°C), the limiter contacts will open interrupting the blower motor circuit for all blower speeds except high blower.

The ambient cut-off switch and the clutch switch are connected in series to control compressor operation. The ambient switch will open and close between 35°F minimum and 50°F maximum. The ambient cut-off switch is located behind the radiator grille on the right side and is bolted to the radiator support near the hood latch.



THERMAL LIMITER

R2160-1A

FIG. 9 Thermal Limiter Resistor Assembly

REFRIGERANT SYSTEM

The A/C-heater refrigerant system uses a By-pass orifice combination valve and a two cylinder compressor. The combination valve differs from the combination valve used on other systems in that it does not have a separate evaporator manifold plate. The evaporator tubes, except the liquid bleed line, attach directly to the expansion valve. The liquid bleed line attaches to a right-angle fitting on the STV housing. The service access gauge port valve is also on the expansion valve. A deflector is installed in the evaporator inlet tube at the expansion valve (Fig. 10) to reduce noise in the refrigerant system.

The service access gauge port valve located on the bottom side of the expansion valve is used to check the evaporator pressure. The high pressure service access gauge port valve is located in the liquid line near the expansion valve (Figs. 11, 12 and 13). This service access gauge port valve is the quick disconnect type and requires a special high pressure service access valve adaptor (Tool T77L-19703-A, Tool YT-367) when connecting a manifold gauge set to the valve.

COMBINATION VALVE

The combination valve is an assembly which combines the expansion valve, the suction throttling valve, and a service access gauge port valve into one integral unit (Fig. 14). It also has a STV manifold for attachment of the high pressure liquid line, the compressor suction line and the liquid bleed line. The combination valve mounts directly to the evaporator core tubes.

EXPANSION VALVE

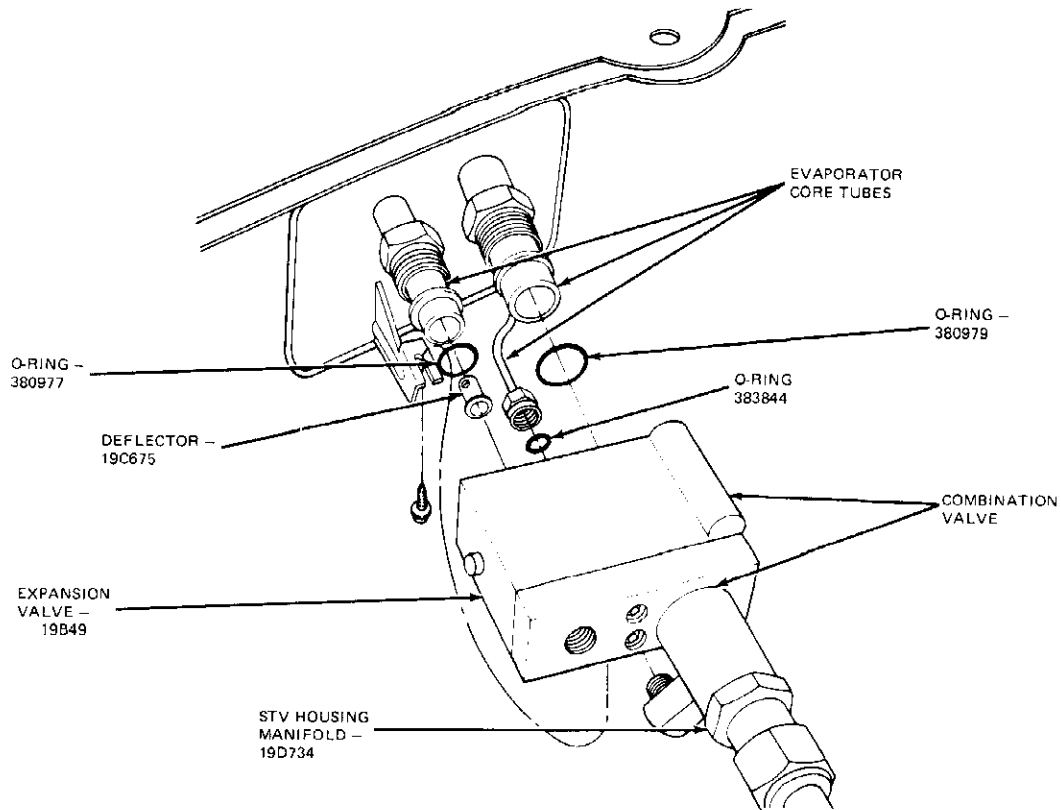
The expansion valve is a by-pass orifice block type valve similar to that used on Granada and Monarch vehicles. The valve is machined to accommodate the evaporator core inlet and outlet fittings, eliminating the need for an evaporator manifold plate (Fig. 15).

The BPO type expansion valve may cause a hissing or boiling type sound after the system has been shut down. This condition is caused by stabilization of pressures within the system and is normal.

SUCTION THROTTLING VALVE

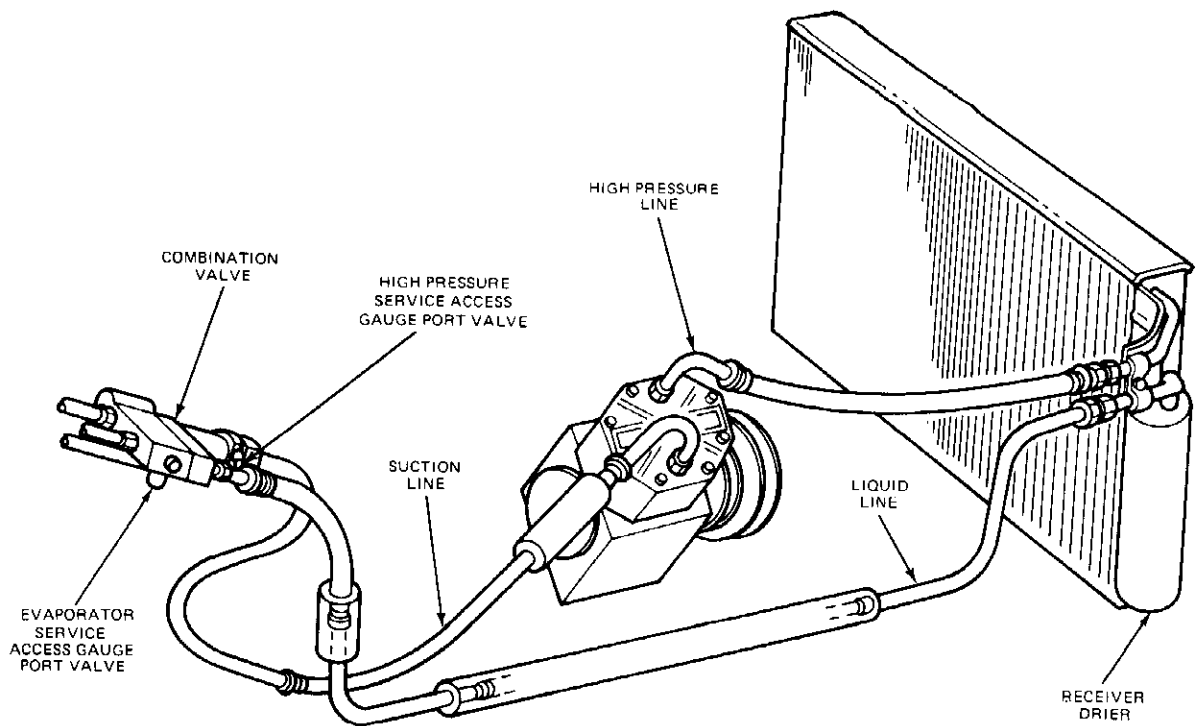
The suction throttling valve is the same mechanism used inside the individual STV assemblies, but has threads for attachment to the expansion valve body (Fig. 15). Its purpose is to control evaporator pressure to prevent ice or frost from blocking the flow of air through the heat exchanging surfaces of the evaporator. The gauge pressure at sea level must fall within the specified range as shown in Fig. 24. The pressure reading is higher at higher altitudes because of gauge error, not because of a change in pressure inside the evaporator.

Suction throttling starts when the compressor suction pressure decreases below the setting of the valve. Compressor suction pressure can continue to drop but the evaporator pressure is held steady by the controlling or throttling action of the STV.



R2161-2A

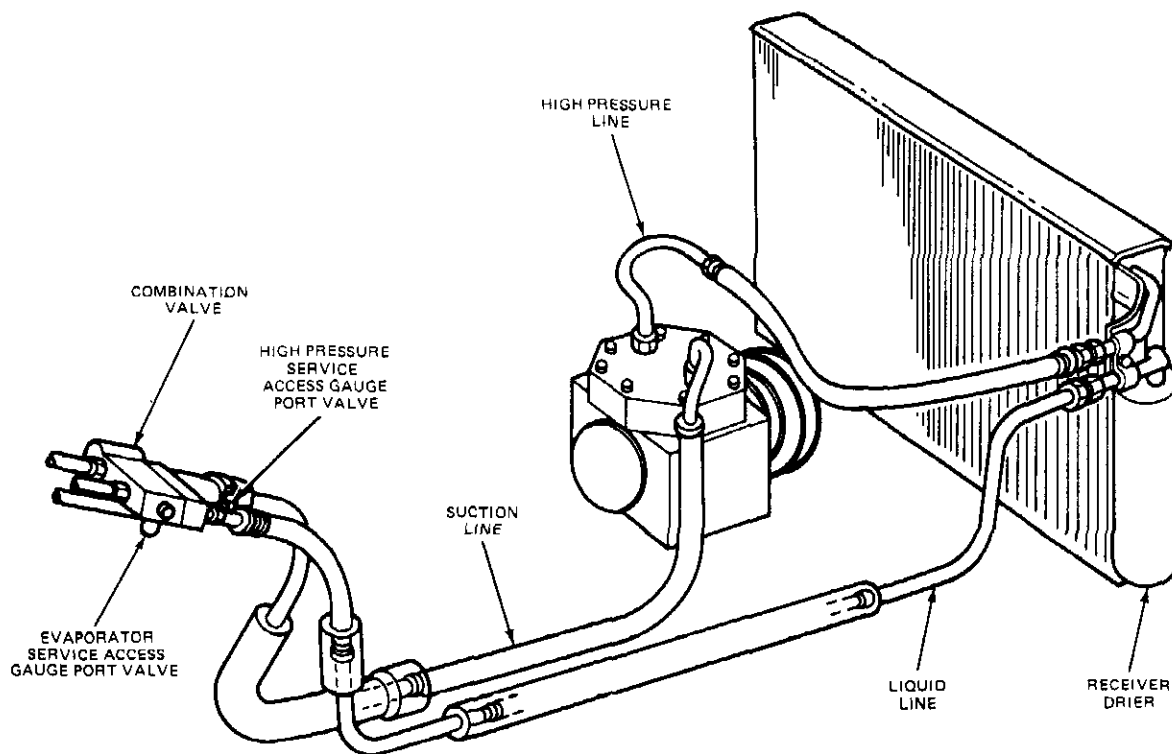
FIG. 10 Combination Valve Installation



R2162-2A

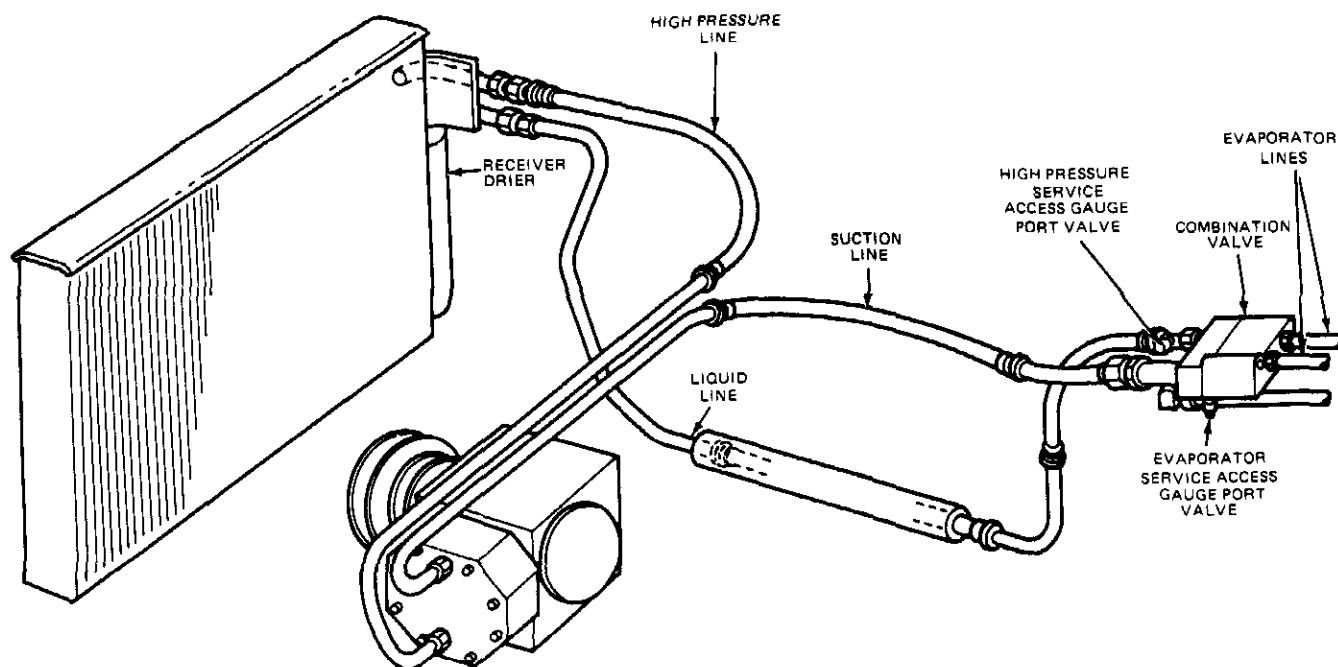
FIG. 11 Refrigerant Line Routing—2.3L Engine

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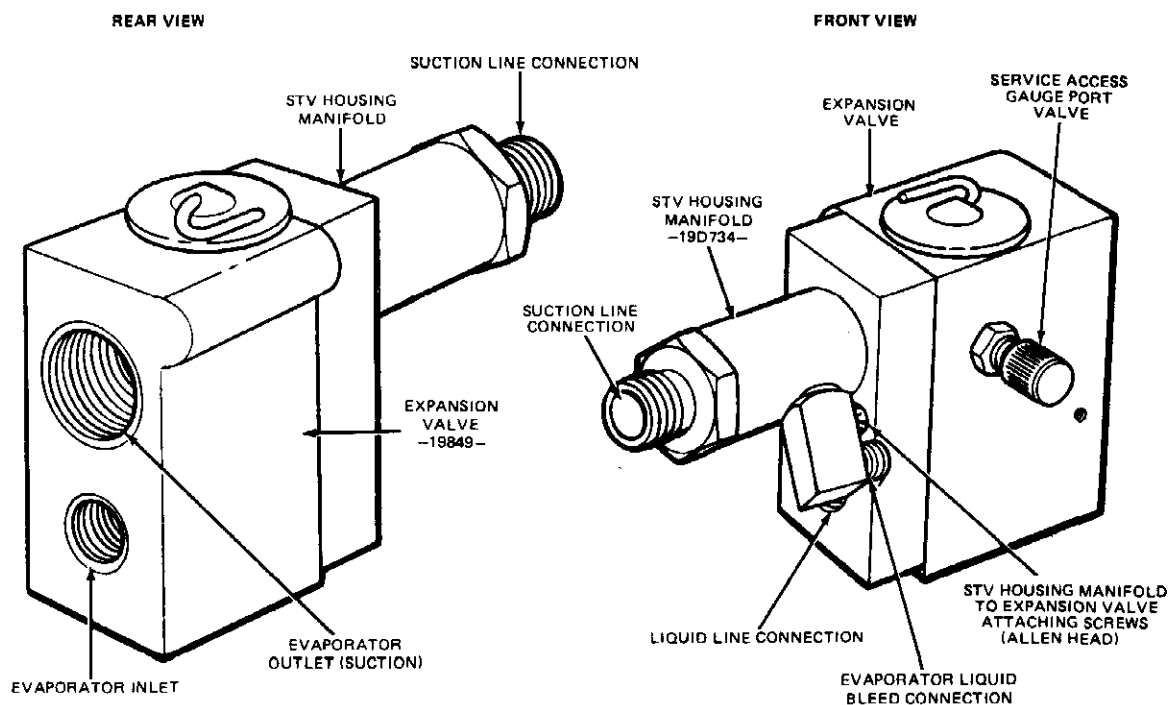
R2163-2A

FIG. 12 Refrigerant Line Routing—3.3L (200 CID)—6-Cylinder Engine



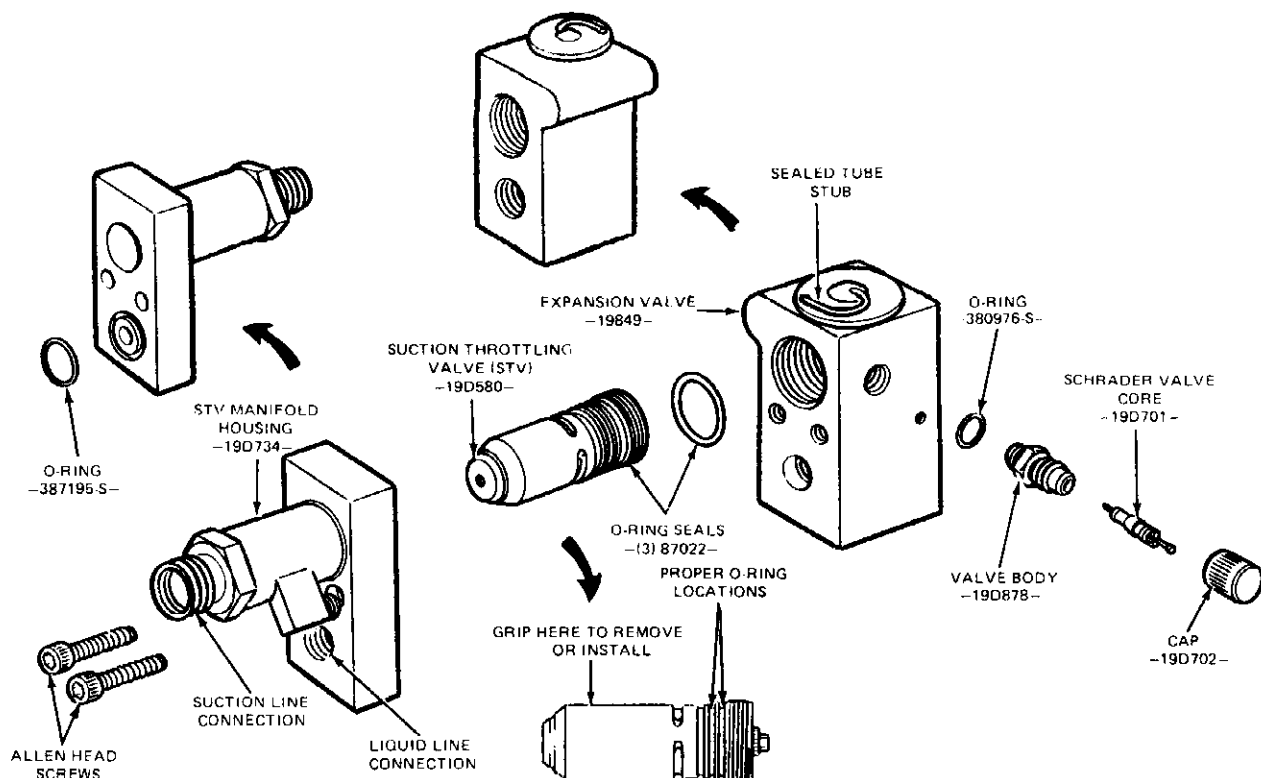
R2164-2A

FIG. 13 Refrigerant Line Routing—5.0L (302 CID) Engine



R2185-2A

FIG. 14 Combination Valve Assembly—Front and Rear View



R2186-2A

FIG. 15 Combination Valve Disassembled

PRESSURE DIFFERENTIAL VALVE

The pressure differential valve is a Schrader type valve that is calibrated to open at a pressure range of 10 to 20 psi. Its function is to by-pass oil laden refrigerant around the restriction formed when the STV is closed (due to reduced heat load on the A/C system) and thereby provide an assured oil return to the compressor. This valve is closed under high heat loads since ample refrigerant is moving through the compressor suction line back to the compressor.

CAUTION: DO NOT USE A SCHRADER TYPE SERVICE VALVE CORE FROM ONE OF THE SERVICE ACCESS GAUGE PORT VALVES TO REPLACE THE PRESSURE DIFFERENTIAL VALVE. To do so will result in compressor damage by oil starvation because the substituted valve core will never open. The calibrated pressure differential valve core is supplied installed in the STV manifold housing and is not serviced separately.

STV HOUSING MANIFOLD

The STV housing manifold provides a housing for the suction throttling valve (Fig. 16). It has connections for the high pressure liquid line on the front of the manifold, the compressor suction line on the end of the STV housing and the liquid bleed line on the side of the STV housing.

The manifold is attached to the expansion valve with two socket head (ALLEN) screws tightened to 4 to 6 ft-lb torque.

CONDENSER AND RECEIVER-DRIER ASSEMBLY

The condenser and receiver-drier assembly is mounted to the radiator support in front of the radiator. The receiver-drier is attached to a bracket on the right side of the condenser.

A/C COMPRESSOR AND CLUTCH

The A/C compressor is the two cylinder type and is installed in the upright position on the right side of 2.3L and 3.3L (200 CID) engines (Figs. 17, 18 and 19). The compressor is mounted in a horizontal position on the left side of the 5.0L (302 CID) engine (Fig. 20). An idler pulley is included to adjust the compressor belt tension on 2.3L and 5.0L (302 CID) engines. The 3.3L (200 CID) engine uses the alternator to adjust compressor belt tension.

PRESSURE RELIEF VALVE

A pressure relief valve is installed on York and Tecumseh compressors to relieve excessive high pressure build-ups (450 psig and above) and prevent damage to the compressor and other A/C components. The pressure relief valve is located on the back side of the compressor.

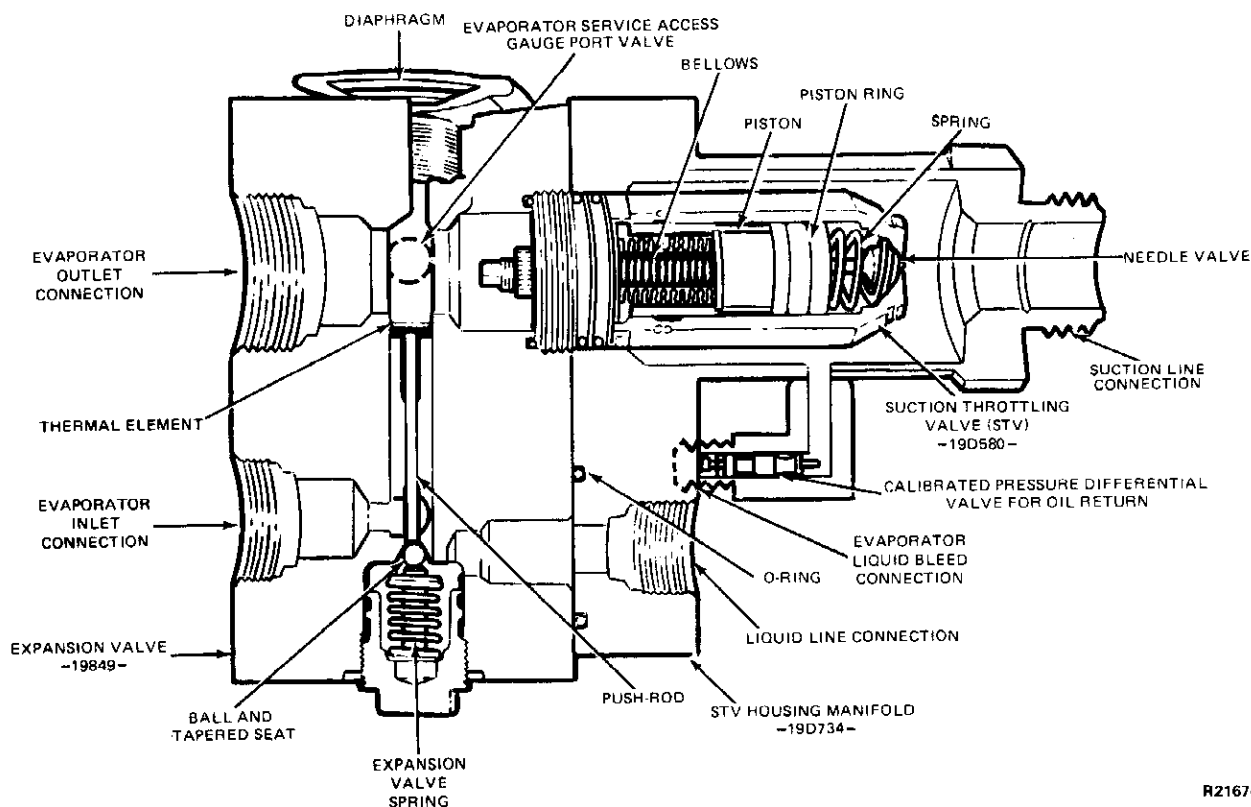


FIG. 16 Combination Valve Assembly—Cut-Away View

R2167-2A

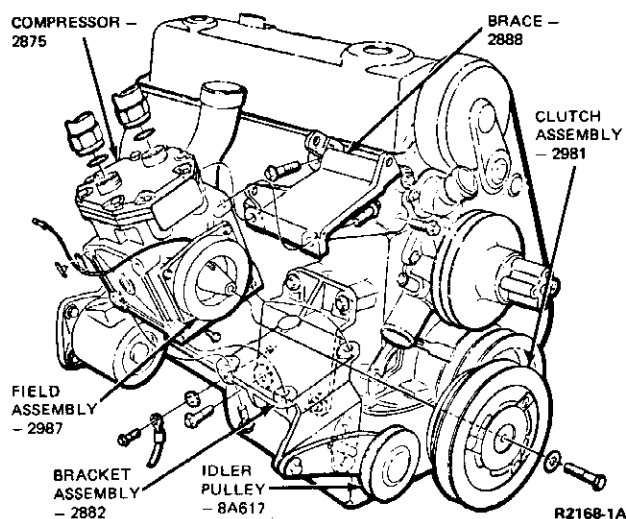


FIG. 17 A/C Compressor Installation—2.3L Engine—49 States With Standard Transmission and California With Standard and Auto Transmission

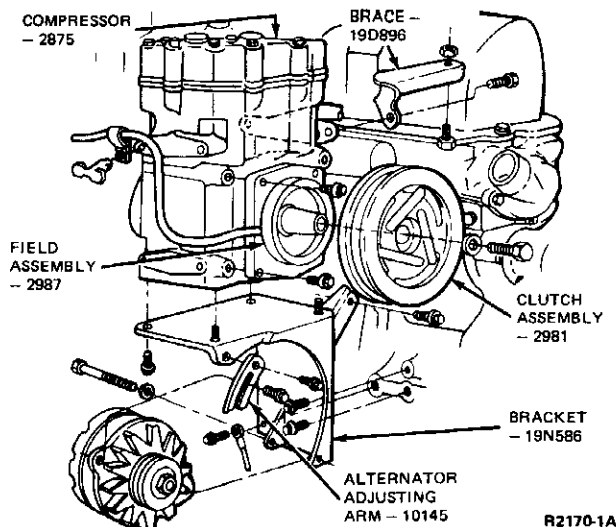


FIG. 19 A/C Compressor Installation—3.3L (200 CID) Engine

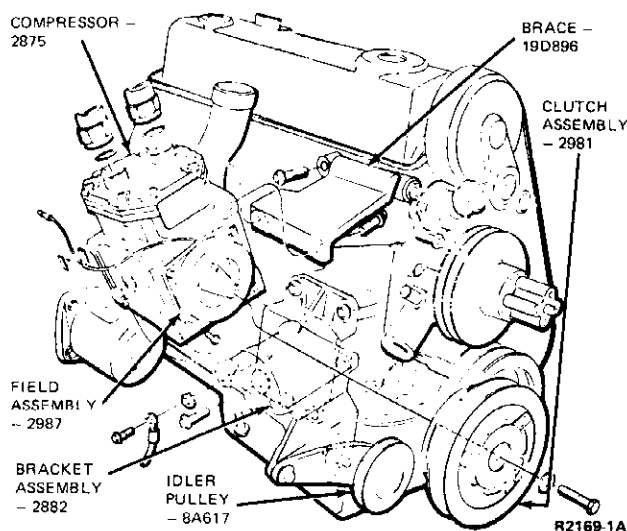


FIG. 18 A/C Compressor Installation—2.3L Engine—49 States and Canada w/Auto Transmission

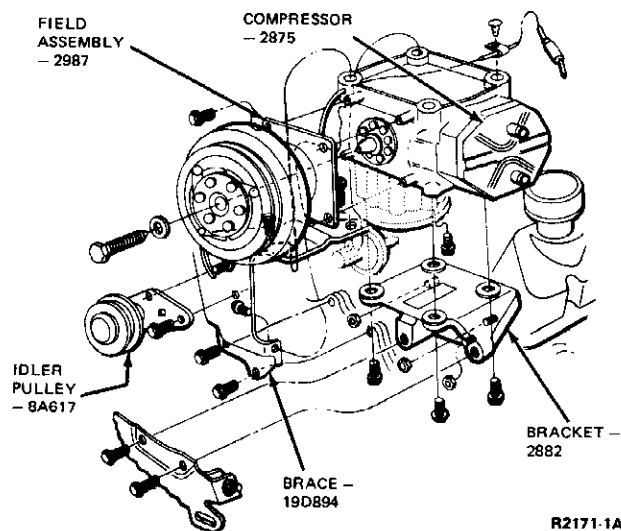


FIG. 20 A/C Compressor Installation 5.0L (302 CID) Engine

DIAGNOSIS AND TESTING

BLOWER MOTOR VOLTAGE TEST

1. Fabricate a short jumper wire with a male spade connector on one end and a female spade connector on the other end. Strip any insulation from the female connector.
2. Separate the blower motor feed wire at the inline connector (orange w/black stripe) and install the jumper wire in the blower motor feed wire.
3. Connect the positive (+RED) lead of a voltmeter to the female connector of the jumper wire (Fig. 21).
4. Connect the negative (- BLACK) lead of the voltmeter to a good ground (Fig. 21).
5. Place the TEMPERATURE Control Lever in the mid-position for an average air flow around and through the heater core.
6. Place the Function Control Lever in the HEAT position to turn the blower motor on. Turn the ignition switch to the ON position.
7. With a fully charged battery, the blower voltage should be within the specified range for each blower (FAN) switch position as indicated in the blower switch chart of the Electrical Wiring Diagram (Fig. 6).

BLOWER MOTOR CURRENT DRAW TEST

1. Separate the blower motor feed wire at the connector (orange/black stripe).
2. Connect the positive (+) ammeter lead to the male spade connector and the negative (-) ammeter lead to the female spade connector (Fig. 22).

3. Place the TEMPERATURE Control Lever in the mid-position and the Function Control Lever in the HEAT position to turn the blower ON.
4. Turn the ignition switch to the ON position.
5. With a fully charged battery, the blower motor current draws (amps) should be approximately as indicated for each blower speed in the blower switch chart of the Electrical Wiring Diagram (Fig. 6).

VACUUM SYSTEM TESTS

To test the A/C-heater control system, start the engine and move the function control lever slowly from one position to another. A momentary hiss should be heard as the function control lever is moved from one position to another indicating that vacuum is available at the control assembly. A continuous hiss at the control assembly indicates a major leak **somewhere** in the system. It **does not** necessarily indicate that the leak is at the control assembly.

If a momentary hiss **cannot** be heard when the function control lever is moved from one position to another, check for a kinked, pinched or disconnected vacuum supply hose (Fig. 23). Also inspect the check valve between the intake manifold and the vacuum reservoir to be sure it is working properly.

If a momentary hiss can be heard when the function control lever is moved from one position to another, vacuum is available at the control assembly. Then, cycle the function control through each position with the blower on HI and check the location(s) of the discharge air. The air flow schematic and vacuum control chart

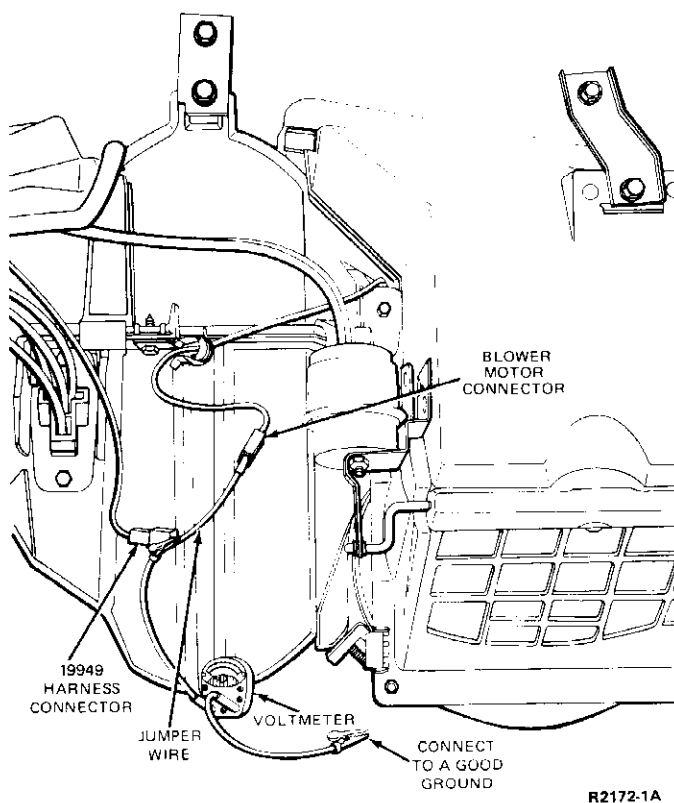


FIG. 21 Blower Motor Voltage Test

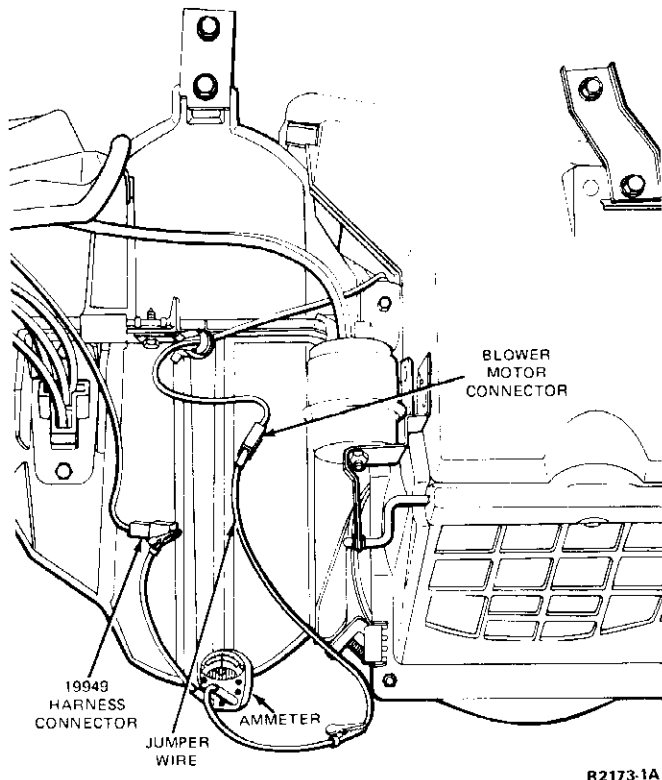
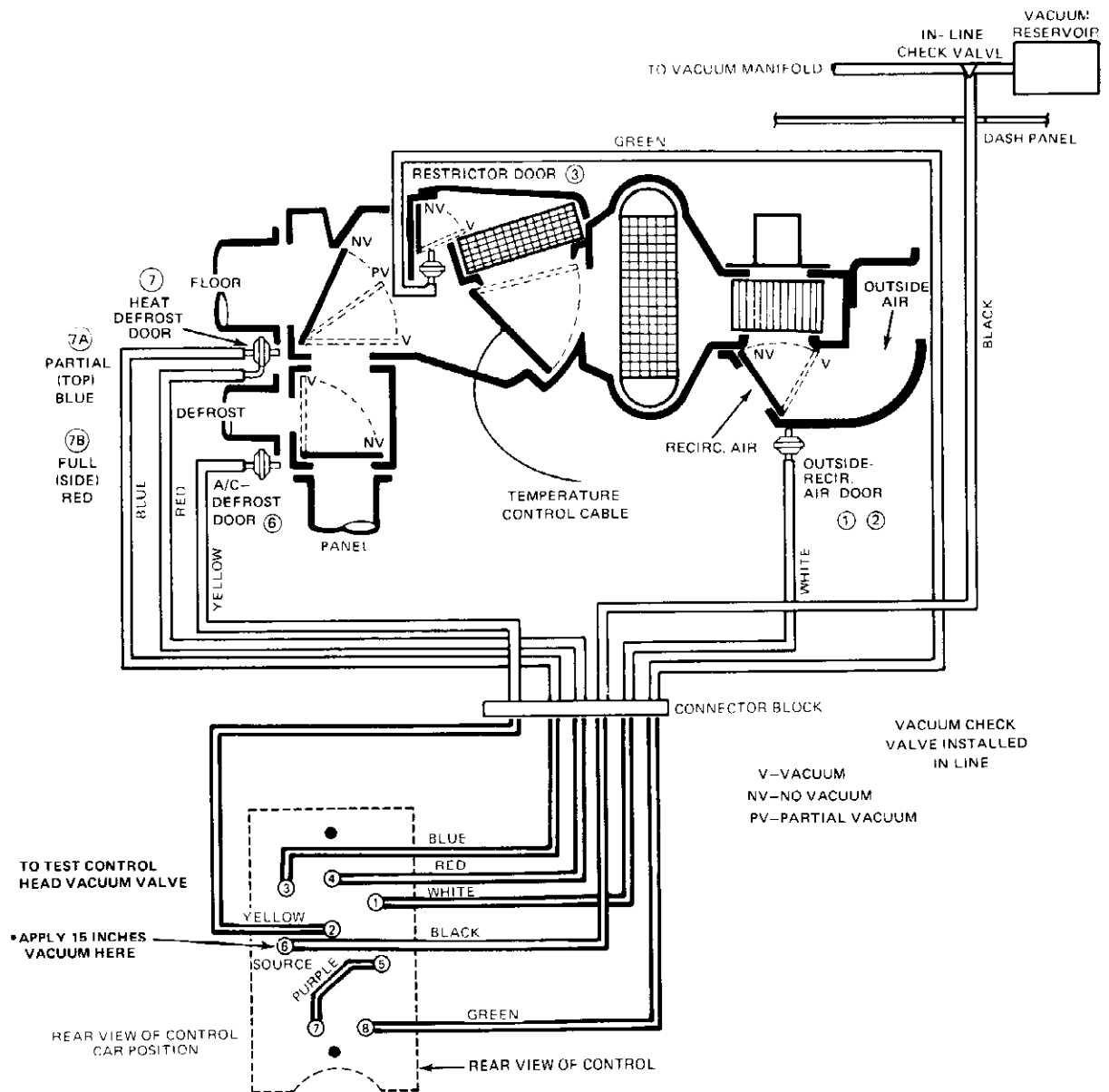


FIG. 22 Blower Motor Current Draw Test



•CHECK FOR VACUUM TO OTHER PORTS PER CHARTS

•REPLACE CONTROL HEAD IF NOT PER CHARTS

FUNCTION SELECTOR LEVER		DETENT POSITIONS						
PORT	FUNCTION	OFF	MAX	NORM	VENT	HI-LO	HEAT	DEF
1	OUTSIDE RECIRC	V	V	-	-	-	-	-
2	PANEL-DEF	V	V	V	V	V	-	-
3	PANEL FLOOR	V	-	-	-	V	V	-
4	FULL FLOOR	V	-	-	-	-	V	-
5	TO PORT 7	-	V	V	V	-	-	-
6	SOURCE	V	V	V	V	V	V	V

TEMPERATURE LEVER POSITION			
PORT	FUNCTION	COOL	WARM
7	FROM PORT 5		EXT. CONNECTED TO PORT 5
8	RESTRICTOR	V	

0° 12°

42°

FIG. 23 Manual A/C-Heater System Vacuum Schematic and Selector Test

shown in Fig. 2 gives the vacuum motors applied for each position of the function and temperature control levers along with an air flow diagram of the system. The air flow diagram shows the position of each door when vacuum is applied and, their no vacuum position. With this chart, air flow for each position of the control assembly can be determined. If a vacuum motor fails to operate, the motor can readily be found because the air flow will be incorrect.

If a vacuum motor is inoperative, check the operation of the motor with a vacuum tester, Tool 21-0014. If the vacuum motor operates properly, the vacuum hose is probably pinched, kinked, disconnected or has a hole in it (Fig. 23).

REFRIGERANT SYSTEM

Diagnosis of the Fairmont and Zephyr refrigerant system must be done by analyzing the high pressure and the evaporator pressure readings. Compare the pressure readings to the charts shown in Fig. 24 to determine if the system pressures are normal. The conditional requirements for the refrigerant system tests must be satisfied to obtain accurate pressure readings.

If the conditional requirements are not satisfied, the pressure readings will not be accurate and could indicate that a normal system is not functioning properly. If the conditional requirements cannot be satisfied, the pressure readings will not be accurate but can be used to determine what is causing the problem in the system. Compare the pressure results with the pressure conditions in the pressure evaluation chart shown in Fig. 25. Once the problem is corrected, take additional pressure readings while meeting the conditional requirements for the pressure tests to be sure the problem has been corrected.

The evaporator service access gauge port valve is located on the bottom side of the combination valve (Fig. 14). The high pressure service access gauge port valve is located on the liquid line near the combination valve (Figs. 11, 12 and 13). This system does not contain a low pressure service access gauge port valve. A special adaptor (Tool T77L-19703-A or Tool VT-367) is necessary to connect a manifold gauge set to the high pressure service access gauge port valve. This adaptor is the quick connect type and is installed by pushing it on the gauge port valve. The quick connect adaptor should seal the hose when the adaptor is disconnected from the high pressure service access gauge port valve and eliminate accidental discharge of refrigerant from the hose.

THE CONDITIONAL REQUIREMENTS FOR THE STV/BPO SYSTEM TEST MUST BE SATISFIED TO OBTAIN ACCURATE PRESSURE READINGS.

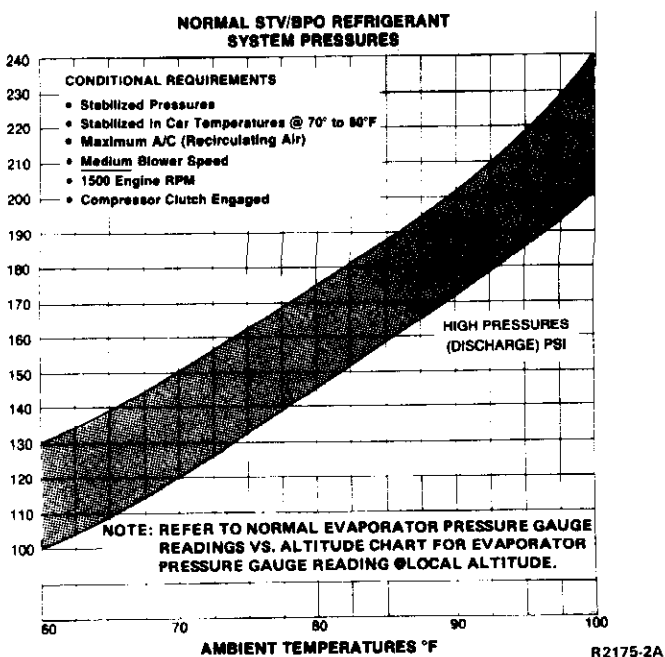
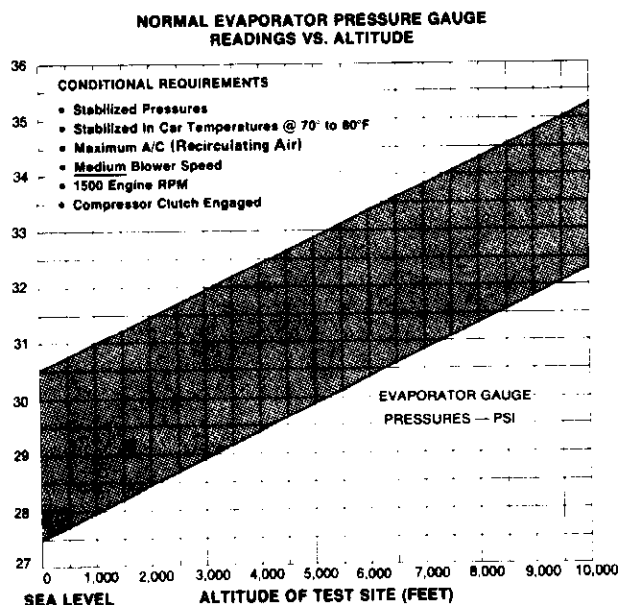


FIG. 24 Normal STV/BPO Refrigerant System Pressures

PROBLEM REFRIGERANT SYSTEM PRESSURE EVALUATION

For Systems Without Low Pressure Suction Service Access Gauge Port Valve

NOTE: Normal system conditional requirements must be maintained to properly evaluate refrigerant system pressures. Refer to chart applicable to system under test.			
HIGH PRESSURE		EVAPORATOR PRESSURE	POSSIBLE PROBLEM/COMPONENT
@ LIQUID LINE	@ COMPRESSOR		
HIGH	HIGH	HIGH	ENGINE OVERHEATING / EXPANSION VALVE SENSING BULB — Poor Contact, Inadequate Insulation
HIGH	HIGH	NORMAL TO HIGH	HEATER WATER VALVE — Insufficient Closure / EVAPO-RATOR — Too Much Air Flow · Reset Blower to Conditional Requirement / EXPANSION VALVE — Sticking Open
HIGH	HIGH	NORMAL	AIR IN REFRIGERANT SYSTEM REFRIGERANT — Overcharge
HIGH	HIGH	LOW	COMPRESSOR-TO-CONDENSER A/C LINE — Restriction; After Service Access Valve
NORMAL TO HIGH	NORMAL TO HIGH	HIGH	CONDENSER — Inadequate Air Flow (Bent Fins, Debris, Loose Radiator Fan Belt, Slipping Fan Clutch)
NORMAL TO HIGH	NORMAL TO HIGH	NORMAL TO HIGH	HUMIDITY WELL ABOVE NORMAL
NORMAL TO HIGH	NORMAL TO HIGH	NORMAL	EXCESSIVE REFRIGERANT OIL
NORMAL	NORMAL	LOW	SUCTION THROTTLING VALVE — Sticking Open — May Cause Iced-Up Evaporator, May Be Related to Moisture.
NORMAL TO ERRATIC	NORMAL TO ERRATIC	NORMAL TO ERRATIC	MOISTURE IN REFRIGERANT SYSTEM — Affects Expansion Valve and STV Functions.
ERRATIC	ERRATIC	ERRATIC	EXPANSION VALVE SENSING BULB — Kinked Capillary Tube
NORMAL TO LOW	NORMAL TO LOW	NORMAL	EVAPORATOR — Restriction, Inadequate Air Flow · Reset Blower to Conditional Requirement and/or Confirm Blower Condition
LOW	HIGH	LOW	RECEIVER/DRIER — Restriction / A/C LIQUID LINE — Restriction, Before Service Access Valve / CONDENSER — Restriction
LOW	LOW	NORMAL TO HIGH	A/C SUCTION LINE — Restriction; SUCTION ACCUMULATOR — Restriction
LOW	LOW	HIGH	COMPRESSOR — Damaged Valves · (Inadequate compression) SUCTION THROTTLING VALVE — Sticking Closed — May Be Related to Moisture.
LOW	LOW	LOW	EVAPORATOR — Iced-up / CONDENSER — Plugged / RE-CEIVER/DRIER — Plugged / A/C LIQUID LINE — Restriction; After Service Access Valve / EXPANSION VALVE SENSING BULB — Perforated Bulb / EXPANSION VALVE — Sticking Closed / REFRIGERANT LEAK AND/OR UNDERCHARGE COMPRESSOR-TO-CONDENSER A/C LINE — Restriction; Before Service Access Valve
ADDITIONAL POSSIBLE PROBLEM COMPONENTS ASSOCIATED WITH INADEQUATE COMPRESSOR OPERATION			
COMPRESSOR CLUTCH — Slipping / COMPRESSOR DRIVE BELT — Loose / CLUTCH COIL — Shorted Coils; Slipping / CLUTCH COIL — Open Circuit / AMBIENT CUT-OFF SWITCH — Sticking Open / BLOWN CLUTCH CIRCUIT FUSE / Improper Clutch Circuit Contact in Control Assembly Switch			
ADDITIONAL POSSIBLE PROBLEM COMPONENTS ASSOCIATED WITH A COMPRESSOR FAILURE			
PRESSURE DIFFERENTIAL VALVE (In Liquid Bleed Line) — Sticking Closed / AMBIENT CUT-OFF SWITCH — Sticking Closed / SUCTION THROTTLING VALVE — Sticking Open / REFRIGERANT LEAK			

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FIG. 25 Refrigerant System Pressure Evaluation

ADJUSTMENTS

TEMPERATURE CONTROL CABLE ADJUSTMENT

The temperature control cable is self-adjusting with the movement of the temperature control lever to the top of the slot in the bezel face of the control head.

1. Insert the end of a small pocket screwdriver in the end loop of the temperature control cable, at the crank arm (Fig. 26).
2. Slide the self-adjusting cable attaching clip down the shaft (away from the loop) approximately one (1) inch.
3. Move the temperature control lever to the top of the slot in the bezel face of the control head.

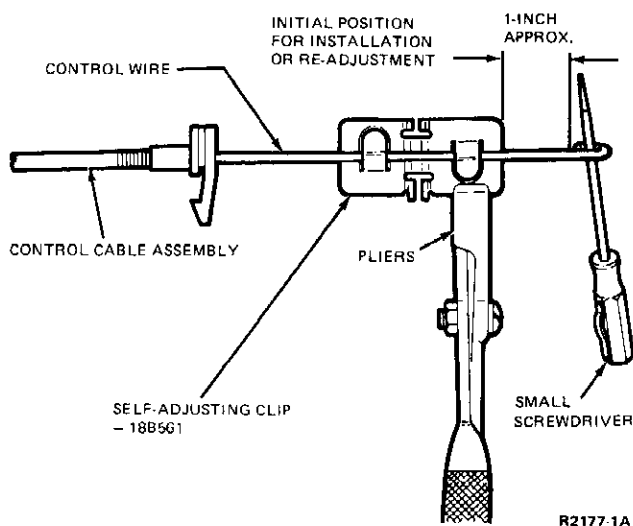


FIG. 26 Control Cable Pre-Set Adjustment

4. Check total lever travel. A space of approximately 1/4 inch should exist, between the control lever and the ends of the slot, at both ends of the slot.

COMPRESSOR DRIVE BELT ADJUSTMENT

3.3L (200 CID) Engine

1. Check the belt tension with Tool T63L-8620-A or equivalent. The belt tension should be within specification.
2. If the belt tension is not within specification, loosen the alternator mounting bolt to a snug position and loosen the alternator adjusting arm bolt (Fig. 19).
3. Place an open end wrench on the alternator adjusting arm bolt boss and apply pressure on the boss with the wrench until the belt tension is within specification. Then, tighten the alternator adjusting arm bolt while maintaining the belt tension.
4. Remove the wrench and belt tension gauge.

2.3L and 5.0L (302 CID) Engines

1. Check the belt tension with Tool T63L-8620-A or equivalent. The belt tension should be within specifications.
2. If the belt tension is not within specification, loosen the two idler pulley arm attaching bolts until they are just snug (Figs. 17, 18 and 20).
3. Insert the end of a 1/2 inch flex-handle into the square hole in the idler arm and apply pressure to the idler arm with the flex handle until the belt tension is within specification. Then, tighten the idler arm attaching bolts while holding pressure on the idler arm. Then, tighten the idler arm bolts to specification.
4. Remove the belt tension gauge and the flex handle.

REMOVAL AND INSTALLATION

COMPRESSOR

REMOVAL

1. Discharge the refrigerant from the A/C system at the service access gauge port valve located on the underside of the combination valve. Observe all safety precautions.
2. Energize the magnetic clutch and remove the clutch retaining bolt.
3. On 2.3L and 5.0L (302 CID) engines, loosen the idler attaching screws and release the drive belt tension (Figs. 17, 18 and 20).
4. On 3.3L (200 CID) engines, loosen the alternator attaching bolt and the adjusting arm bolt. Then, release the compressor and alternator belt tension (Fig. 19).
5. Remove the drive belt from the compressor clutch pulley.
6. Install a 5/8-11 bolt in the compressor shaft hole of the clutch and, with the clutch energized, tighten the bolt to push the clutch from the compressor shaft.

7. Disconnect the clutch field wire at the connector.
8. Remove the refrigerant lines from the compressor and plug the lines and compressor ports to prevent the entrance of dirt and excessive moisture.
9. Remove the compressor mounting bolts as shown in Figs. 17 through 20 and remove the compressor.
10. Remove the clutch field coil from the compressor if the compressor is to be replaced.

INSTALLATION

1. If the compressor is to be replaced, drain the oil from the old compressor into a suitable container. Then, remove oil from the new compressor until the amount drained from the old compressor is equal to the amount in the new compressor.
2. Install the clutch field coil on the compressor if it was removed or if the compressor was replaced.
3. Position the compressor to the compressor mounting bracket(s), and install the attaching bolts and lock washers. Tighten the bolts to specification.
4. Connect the refrigerant lines to the compressor. Use new O-rings dipped in clean refrigeration oil.

5. Install the pulley and clutch drive assembly on the compressor shaft. Connect the clutch field coil wire at the connector and energize the clutch. Then, tighten the clutch retaining bolt to specification.
6. Install the drive belt on the compressor clutch pulley and tighten the belt to specification following the procedure under Compressor Drive Belt Adjustment.
7. Leaktest, evacuate, and charge the refrigeration system following the recommended procedures and safety precautions.

CONDENSER

REMOVAL

1. Discharge the refrigerant from the A/C system at the service access gauge port valve located on the underside of the combination valve. Observe all safety precautions.
2. Remove six radiator grille attaching screws and remove the radiator grille. Move the ambient cut-off switch away from the front of the radiator and condenser.
3. Disconnect and remove the battery from the battery tray.

4. Disconnect the two refrigerant lines at the fittings on the right side of the radiator (Fig. 27).
5. Remove four bolts attaching the condenser to the radiator support and remove the condenser and receiver-drier from the vehicle.
6. Disconnect the refrigerant lines from the receiver-drier. Then, remove the two receiver-drier attaching bolts and remove the receiver-drier. Tightly cap the receiver-drier if it is to be re-used.

INSTALLATION

1. Connect the refrigerant lines to the receiver-drier using new O-rings dipped in refrigeration oil.
2. Position the receiver-drier to the condenser and install the two attaching screws.
3. Position the condenser assembly to the radiator support brackets and install the attaching bolts.
4. Connect the refrigerant lines to the condenser assembly using new O-rings dipped in refrigeration oil.
5. Position the radiator grille and the ambient cut-off switch to the vehicle and install the six attaching screws. The ambient cut-off switch should be mounted at the grille right mounting bracket.

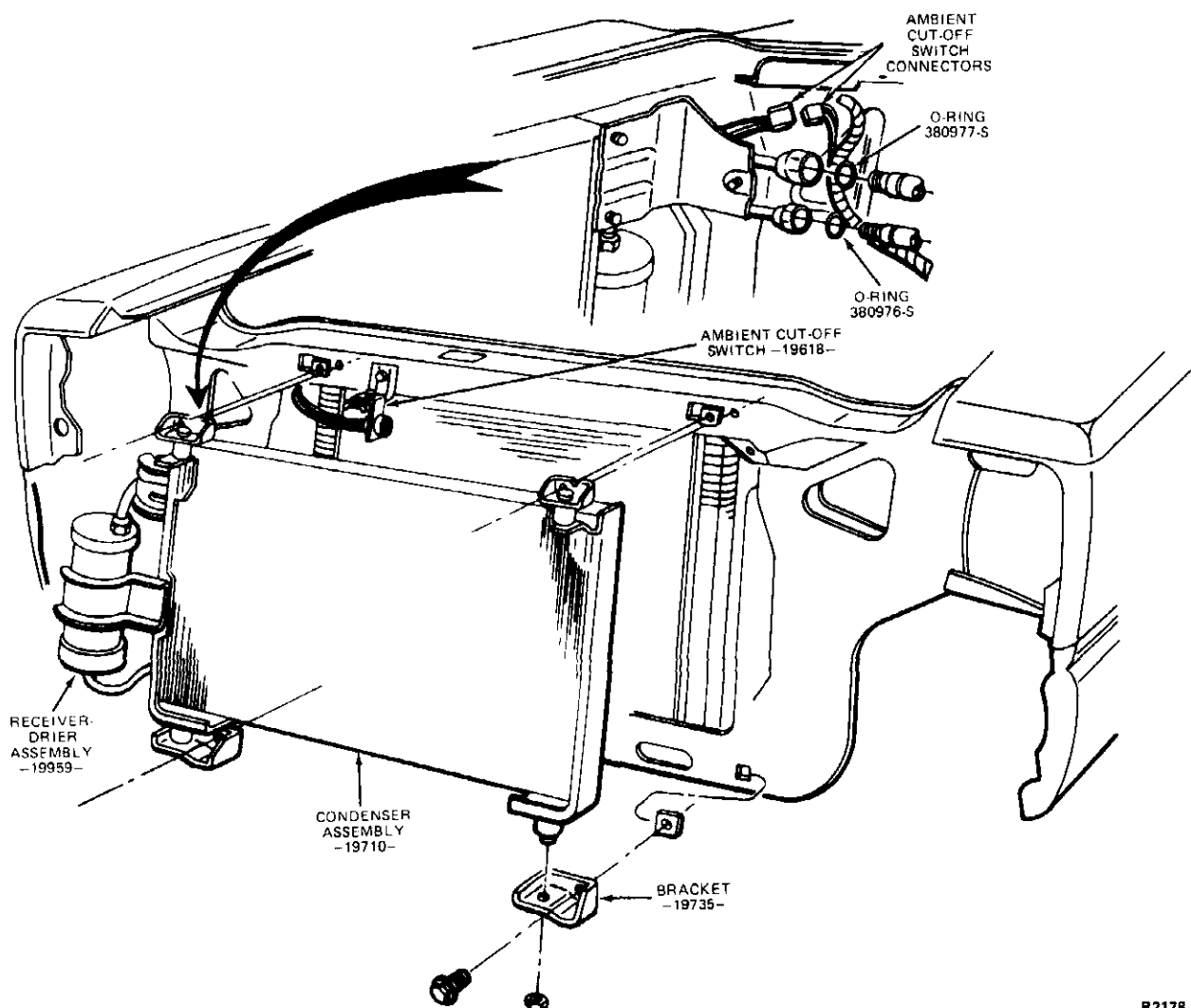


FIG. 27 Condenser and Receiver—Drier Installation

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6. Install and connect the battery.
7. Leaktest, evacuate and charge the refrigerant system following the recommended procedures and safety precautions.

RECEIVER-DRIER

REMOVAL

1. Discharge the refrigerant from the A/C system at the service access gauge port valve located on the underside of the combination valve. Observe all safety precautions.
2. Remove six radiator grille attaching screws and remove the radiator grille. Place the ambient cut-off switch away from the front of the radiator and condenser.
3. Disconnect the refrigerant lines from the receiver-drier (Fig. 27).
4. Remove two screws attaching the receiver-drier to the condenser and remove the receiver-drier.

INSTALLATION

1. Connect the refrigerant lines to the receiver-drier using new O-rings dipped in refrigeration oil.
2. Position the receiver-drier mounting bracket to the condenser and install the two attaching screws.
3. Position the radiator grille and ambient cut-off switch to the vehicle and install the six attaching screws. The ambient cut-off switch should be mounted at the grille right mounting bracket.
4. Leaktest, evacuate and charge the refrigerant system following the recommended procedures and safety precautions.

REFRIGERANT LINES

1. Discharge the refrigerant from the A/C system at the service access gauge port valve located on the underside of the combination valve. Observe all safety precautions.
2. Disconnect and remove the refrigerant line using a wrench on each side of each fitting.
3. Route the new refrigerant line with the protective caps installed as shown in Figs. 28, 29 or 30.
4. Connect the refrigerant line into the system using new O-rings dipped in refrigeration oil. Use two wrenches when tightening the fittings.
5. Leaktest, evacuate and charge the refrigerant system following the recommended procedures and safety precautions.

EXPANSION VALVE

REMOVAL

1. Discharge the refrigerant from the A/C system at the service access gauge port valve located on the underside of the combination valve. Observe all safety precautions.
2. Remove the high and low pressure refrigerant lines and the liquid bleed line from the STV housing manifold of the combination valve. Use a back-up wrench on the STV housing manifold to prevent component damage.
3. Remove the evaporator high and low pressure fittings from the combination valve. Again use a back-up wrench on the STV housing manifold to prevent damage to the evaporator core tubes.

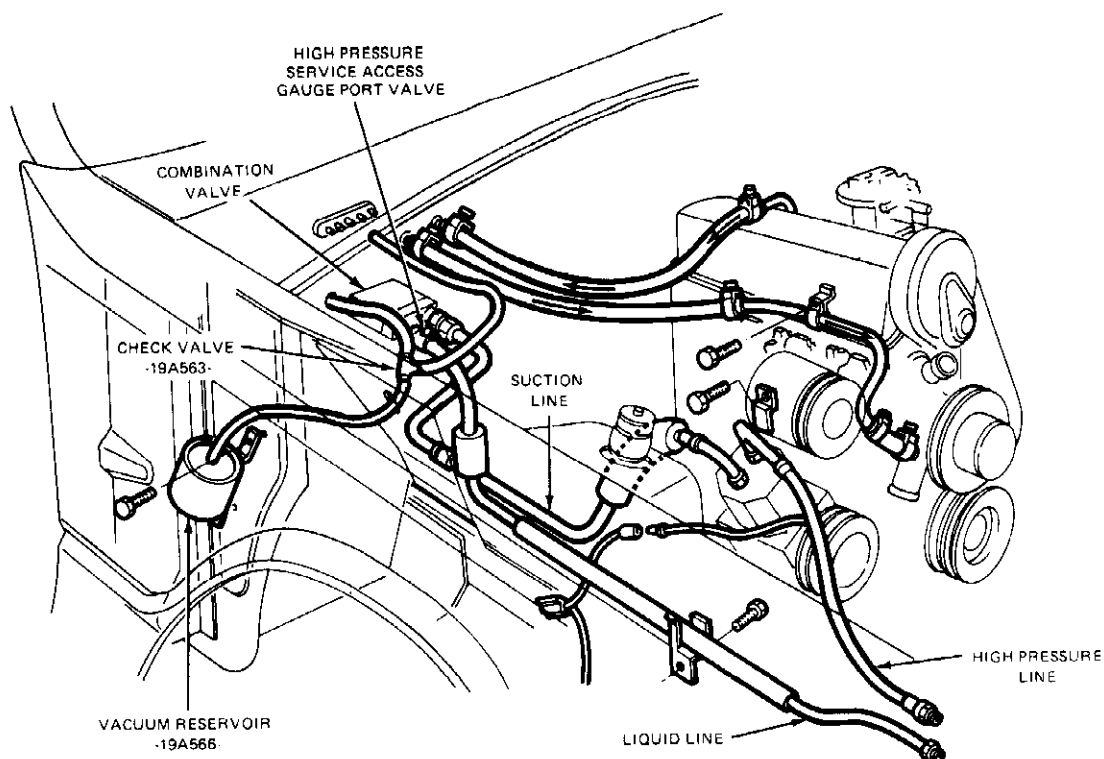
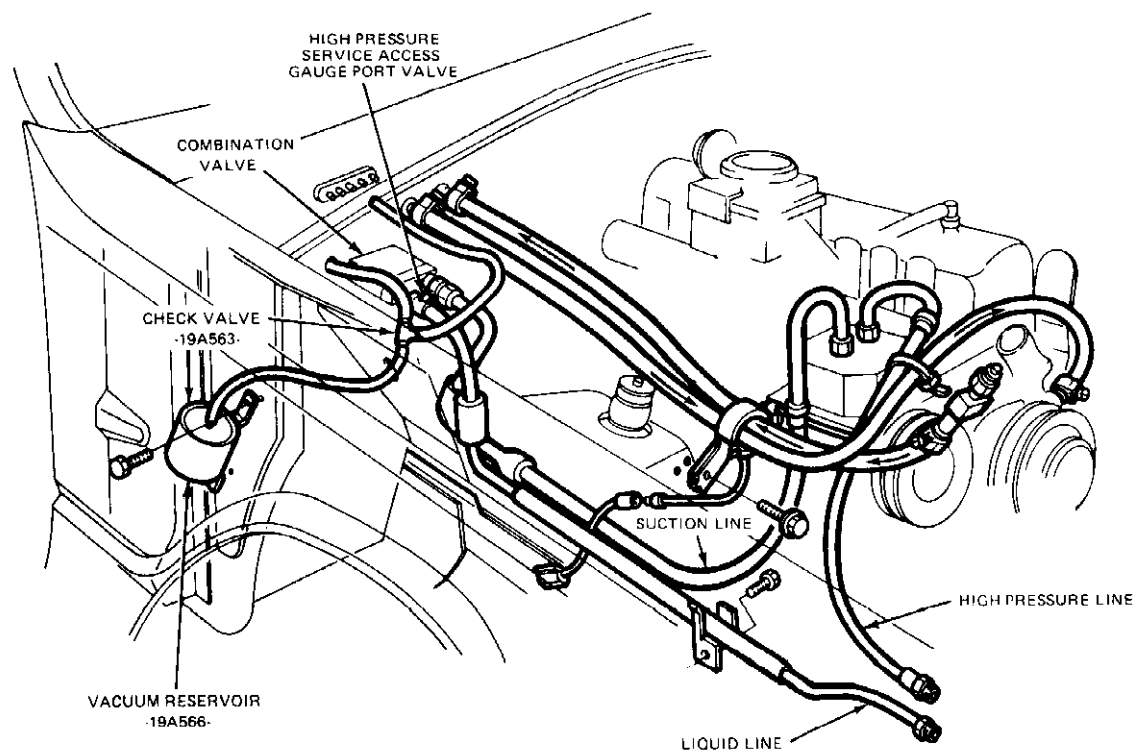


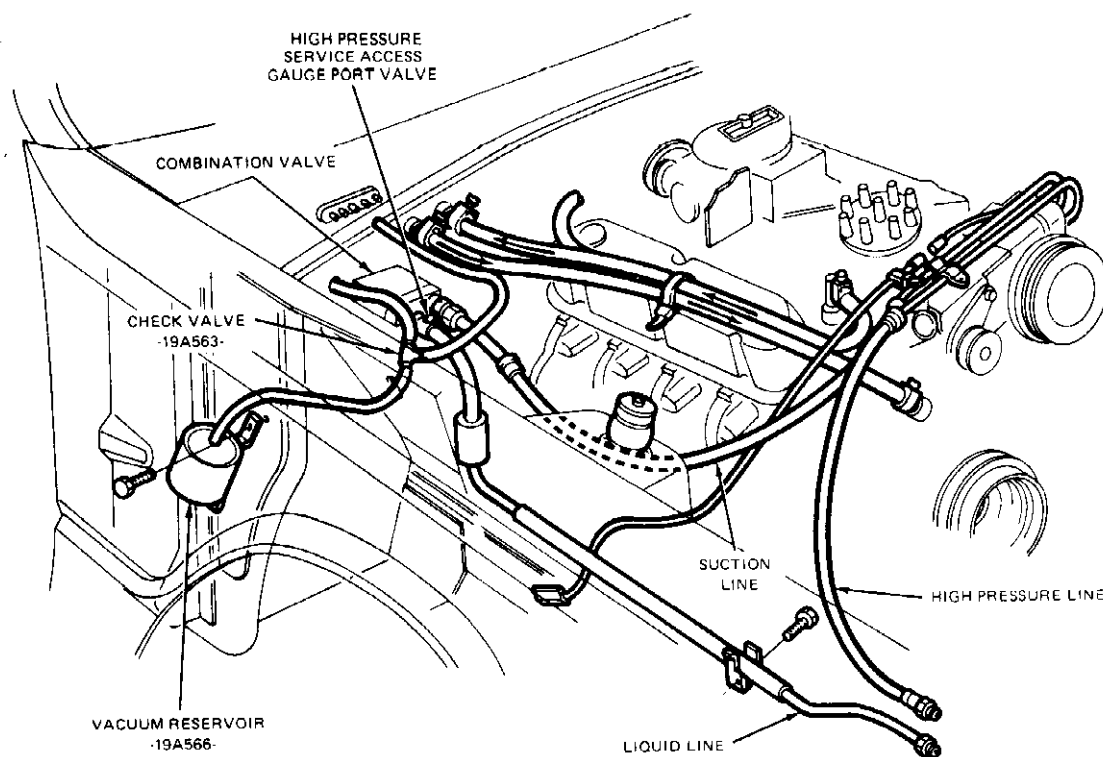
FIG. 28 Refrigerant Lines and Heater Hose Routings—2.3L I-4 Engine

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R2180-2A

FIG. 29 Refrigerant Lines and Heater Hose Routings—3.3L (200 CID) I-6 Engine



R2181-2A

FIG. 30 Refrigerant Lines and Heater Hose Routings—5.0L (302 CID) V-8 Engine

4. Remove one screw attaching the support bracket to the underside of the combination valve and remove the combination valve.
5. Remove two Allen head cap screws attaching the STV housing manifold to the expansion valve (Fig. 15). Remove the STV housing manifold from the expansion valve.
6. Remove the STV from the expansion valve with STV Wrench T77L-19703-D, Tool YT-366 or a pair of curved jaw "channel lock" type pliers. Grip the STV only in the location shown in Fig. 15.

INSTALLATION

Use new O-rings dipped in refrigeration oil during assembly and installation of the combination valve.

1. Install the STV in the expansion valve using a new O-ring dipped in refrigeration oil.
2. Install two O-rings on the STV as shown in Fig. 15.
3. Assemble the STV housing manifold to the expansion valve using new O-rings. Install the two Allen head screws and tighten them to 4-6 ft-lb torque.
4. Install the restrictor in the evaporator core inlet tube as shown in Fig. 10.
5. Install new O-rings in the evaporator tube ports of the combination valve. Then, install the combination valve on the evaporator core tubes. Use a back-up wrench on the STV housing manifold to prevent component damage while tightening the evaporator core tube nuts.
6. Install the screw attaching the combination valve to the support bracket.
7. Connect the refrigerant lines and the liquid bleed line to the STV housing manifold using new O-rings dipped in refrigeration oil. Use a back-up wrench on the STV housing manifold when tightening the refrigerant lines to prevent component damage.
8. Leaktest, evacuate and charge the refrigerant system following the recommended procedures and safety precautions.

SUCTION THROTTLING VALVE (STV)

REMOVAL

1. Discharge the refrigerant from the A/C system at the service access gauge port valve located on the underside of the combination valve. Observe all safety precautions.
2. Remove the high and low pressure refrigerant lines and the liquid bleed line from the STV housing manifold of the combination valve. Use a back-up wrench on the STV housing manifold to prevent component damage.
3. Remove two Allen head cap screws attaching the STV housing manifold to the expansion valve (Fig. 15). Remove the STV housing manifold from the expansion valve.
4. Remove the STV from the expansion valve with STV Wrench T77L-19703-D, Tool YT-366 or a pair of curved jaw "channel lock" type pliers. Grip the STV only in the location shown in Fig. 15.

INSTALLATION

Use new O-rings dipped in refrigeration oil during assembly and installation of the STV.

1. Install the STV in the expansion valve using a new O-ring dipped in refrigeration oil.
2. Install two O-rings on the STV as shown in Fig. 15.
3. Assemble the STV housing manifold to the expansion valve using a new O-ring. Install the two Allen head screws and tighten them to 4-6 ft-lb torque.
4. Connect the refrigerant lines and liquid bleed line to the STV housing manifold using new O-rings dipped in refrigeration oil. Use a back-up wrench on the STV housing manifold when tightening the refrigerant lines to prevent component damage.
5. Leaktest, evacuate and charge the refrigerant system following the recommended procedures and safety precautions.

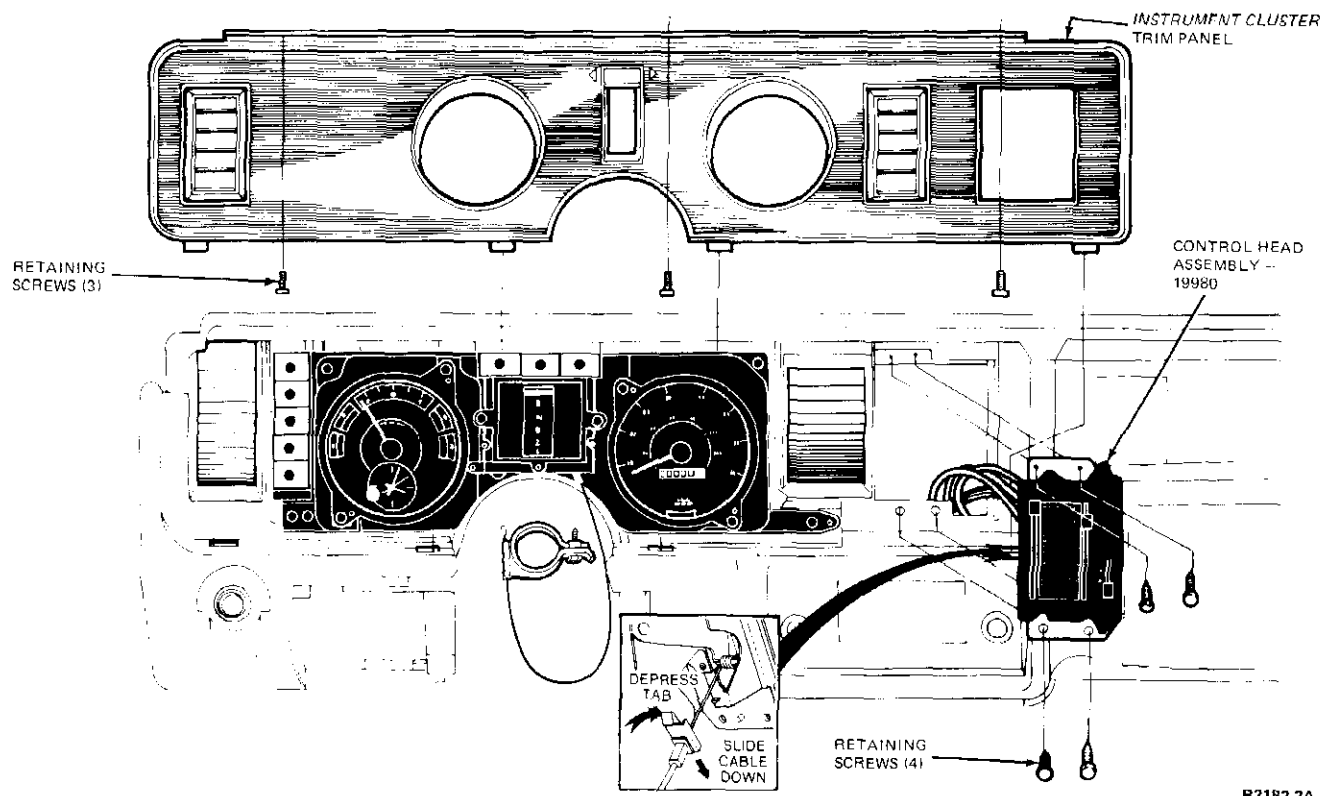
CONTROL ASSEMBLY

REMOVAL

1. Remove three screws attaching the upper edge of the instrument cluster trim panel to the instrument panel and remove the trim panel (Fig. 31).
2. Disconnect the temperature cable from the evaporator case.
3. Remove four screws attaching the control assembly to the instrument panel.
4. Pull the control assembly out from the instrument panel and disconnect the temperature cable from the control assembly.
5. Disconnect the wire connectors from the control assembly and the illumination wires at the connector.
6. Remove the push nuts retaining the vacuum harness connector to the control assembly. Then, remove the vacuum harness connector from the control assembly.

INSTALLATION

1. Connect the vacuum harness connector to the control assembly and install the push nuts.
2. Connect the two wire connectors to the control assembly and connect the illumination wires to the harness.
3. Connect the temperature control cable to the control assembly.
4. Position the control assembly to the instrument panel opening. Be sure the locating pins at the top and bottom of the control assembly are inserted into the locating pin holes in the instrument panel.
5. Install four screws to attach the control assembly to the instrument panel.
6. Install the instrument cluster trim panel.
7. Connect the temperature cable to the evaporator case and adjust the cable as outlined under Adjustments.



R2182-2A

FIG. 31 Manual A/C—Heater System Control Head Assembly—Removal

BLOWER (FAN) SWITCH

REMOVAL

1. Remove the fan switch knob from the switch shaft by placing a screwdriver blade between the knob spring retainer and the control assembly. Then, pull on the screwdriver applying pressure on the spring retainer and pull the knob off the switch shaft.
2. Remove three screws attaching the upper edge of the instrument cluster trim panel to the instrument panel and remove the trim panel.
3. Disconnect the temperature control cable from the evaporator case (Fig. 32).
4. Remove four screws attaching the control assembly to the instrument panel, and pull the control away from the instrument panel.
5. Remove the screw attaching the fan switch to the control head. Separate the switch from the control head and disconnect the wire connector from the switch.

4. Install the instrument cluster trim panel. Then, push the blower switch knob on the fan switch shaft.
5. Connect the temperature cable to the evaporator case (Fig. 32).

TEMPERATURE CONTROL CABLE

REMOVAL

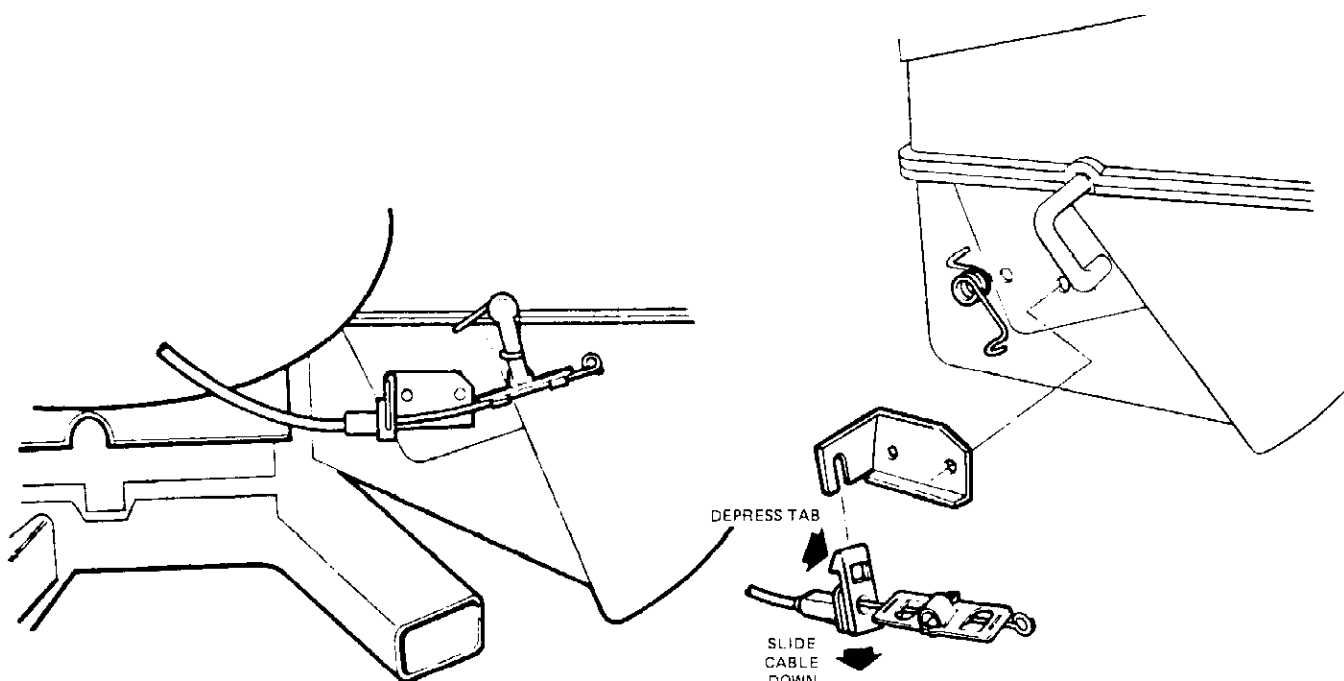
1. Reach under the instrument panel and disconnect the temperature control cable from the blend door and the cable bracket (Fig. 32).
2. Remove three screws attaching the upper edge of the instrument cluster trim panel to the instrument panel and remove the trim panel.
3. Remove four screws attaching the control assembly to the instrument panel.
4. Pull the control assembly away from the instrument panel and disconnect the temperature cable from the control assembly.
5. Remove the cable from under the instrument panel.

INSTALLATION

INSTALLATION

1. Connect the wire harness connector to the fan switch and position the switch to the control assembly. Be sure the locating pin is inserted in the hole of the switch mounting bracket.
2. Position the control assembly to the instrument panel opening. Be sure the locating pins at the top and bottom of the control assembly are inserted into the locating pin holes in the instrument panel.
3. Install the four screws to attach the control assembly to the instrument panel.

1. Position the self-adjusting clip on the control cable to the dimension shown in Fig. 26.
2. Position the control cable behind the instrument panel and connect the cable to the temperature lever on the control assembly.
3. Position the control assembly to the instrument panel opening. Be sure the locating pins at the top and bottom of the control assembly are inserted into the locating pin holes in the instrument panel.
4. Install the four screws attaching the control assembly to the instrument panel.



R2183-2A

FIG. 32 Temperature Control Cable—Removal

5. Install the instrument cluster trim panel.
6. Connect the self-adjusting clip to the blend door crank. Then, connect the cable to the cable bracket on the evaporator case (Fig. 32).
7. Move the TEMPERATURE control lever to the WARM position and the cable will adjust to the correct length.

REGISTER ASSEMBLY

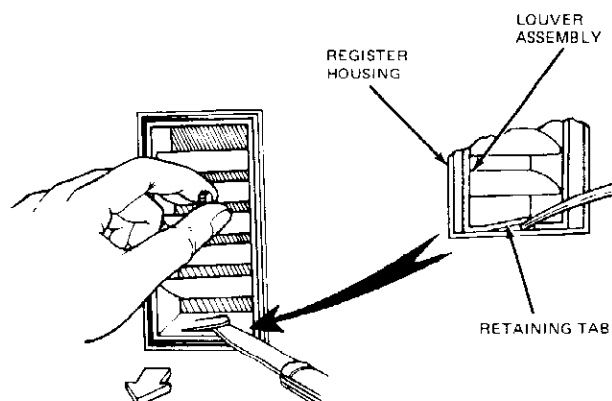
REMOVAL

1. Insert a thin blade under the retaining tab (Fig. 33) and pry the retaining tab toward the louvers until the retaining tab pivot clears the hole in the register opening.
2. Pull the register assembly end out from the housing only enough to prevent the pivot from going back into the pivot hole.
3. Repeat Step 1 for the other retaining tab and pull the register assembly from the register opening.

INSTALLATION

The pivots on each end of the register assembly are different diameters and therefore determine the installed position of the register assembly.

1. Position the register assembly into the opening with the largest diameter pivot near the largest pivot hole.
2. Depress the retaining tabs, push the register assembly into the register opening and engage the retainer tab pivots in the pivot holes.



INSERT A THIN BLADE THROUGH THE LOUVER AND CAREFULLY PRY THE RETAINING TAB TOWARD THE LOUVERS TO ALLOW THE PIVOT TO CLEAR THE HOLE IN THE REGISTER OPENING.

R2184-1A

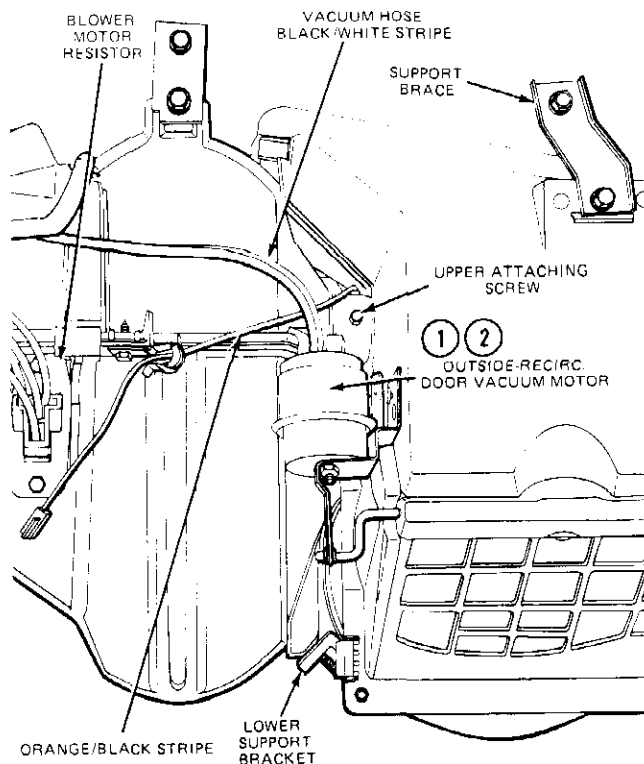
FIG. 33 Instrument Panel Register Removal

AIR INLET DUCT AND BLOWER HOUSING ASSEMBLY

REMOVAL

1. Remove the glove compartment and disconnect the hose from the outside-recirc door vacuum motor (Fig. 34). Remove the instrument panel lower right-to-side cowl attaching bolt.
2. Remove the screw attaching the support brace to the top of the air inlet duct.
3. Disconnect the blower motor power lead at the wire connector.

4. Remove the nut retaining the blower housing lower support bracket to the evaporator case (Fig. 34).
5. Remove the side cowl trim panel and remove the blower ground wire screw.
6. Remove one screw attaching the top of the air inlet duct to the evaporator case (Fig. 34).
7. Move the air inlet duct and blower housing assembly down and away from the evaporator case.



R2185-1A

FIG. 34 Fairmont and Zephyr Air Inlet Duct and Blower Housing Assembly

INSTALLATION

1. Tape the blower motor power lead to the air inlet duct to keep the wire away from the blower outlet during installation.
2. Position the air inlet duct and blower housing assembly to the evaporator case, inserting the flange at the top of the blower outlet into the opening in the evaporator case. Slide the blower housing lower bracket over the stud and install the retaining nut. Be sure the blower wire is routed to the passenger side of the evaporator case.
3. Install the screw to retain the air inlet duct to the evaporator case.
4. Hold the outside-recirc door open and rotate the blower wheel to be sure it rotates freely. If an interference exists, remove the blower motor and wheel and correct the condition.
5. Connect the blower motor power lead to the harness at the connector.
6. Install the air inlet duct-to-cowl support brace attaching screw.
7. Connect the vacuum hose to the outside recirc door vacuum motor and install the glove compartment.
8. Connect the blower motor ground wire to the cowl side panel with the ground screw.
9. Install the instrument panel lower right side attaching bolt. Then, install the right cowl side trim panel.

BLOWER MOTOR RESISTOR

The blower motor resistor and thermal limiter assembly are installed on the passenger side of the evaporator case behind the glove compartment (Fig. 34). To remove the thermal limiter and resistor, remove the glove compartment and pull the wire connector from the resistor. Remove the two attaching screws and pull the resistor from the housing. Use only the specified resistor assembly for Service replacement. Do not apply sealer to the resistor board mounting surface.

BLOWER MOTOR AND WHEEL ASSEMBLY REMOVAL

1. Remove the air inlet duct and blower housing assembly from the vehicle.
2. Remove four blower motor mounting plate screws and remove the blower motor and wheel assembly from the blower housing (Fig. 35). **DO NOT remove the mounting plate from the motor.**
3. Remove the blower wheel from the motor shaft.

INSTALLATION

1. Install the blower wheel on the blower motor shaft until the outside edge of the blower wheel is $3 \frac{3}{4}$ inches from the blower motor mounting plate. Then, install the new retaining clip on the blower wheel.
2. Tape the blower motor power lead to the air inlet duct to keep the wire away from the blower outlet during installation.
3. Position the blower motor and wheel assembly to the blower housing with the flat side of the flange near the blower outlet. Install the four attaching screws.
4. Install the air inlet duct and blower housing assembly in the vehicle.

INSTRUMENT PANEL PAD

1. Remove three screws attaching the instrument cluster trim panel to the instrument panel pad (Fig. 36).
2. Remove one screw attaching the pad to the instrument panel at each defroster opening (Fig. 36).
3. Remove four screws attaching the edge of the instrument panel pad to the instrument panel and remove the pad.
4. To install, position the pad to the instrument panel and install the four screws along the edge.
5. Install one screw at each defroster opening.
6. Place the instrument cluster trim panel in position and install the three screws along the upper edge of the trim panel.

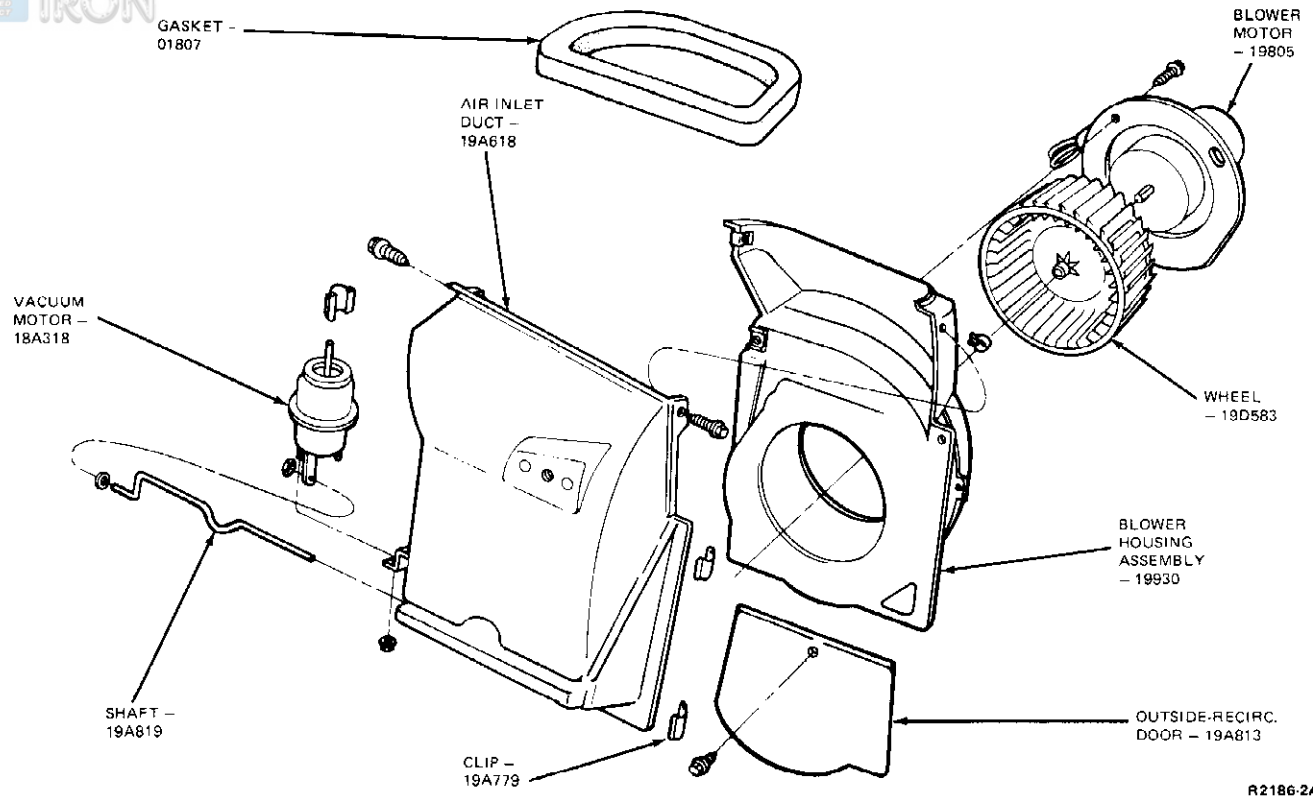


FIG. 35 Air Inlet Duct and Blower Housing Assembly Disassembled

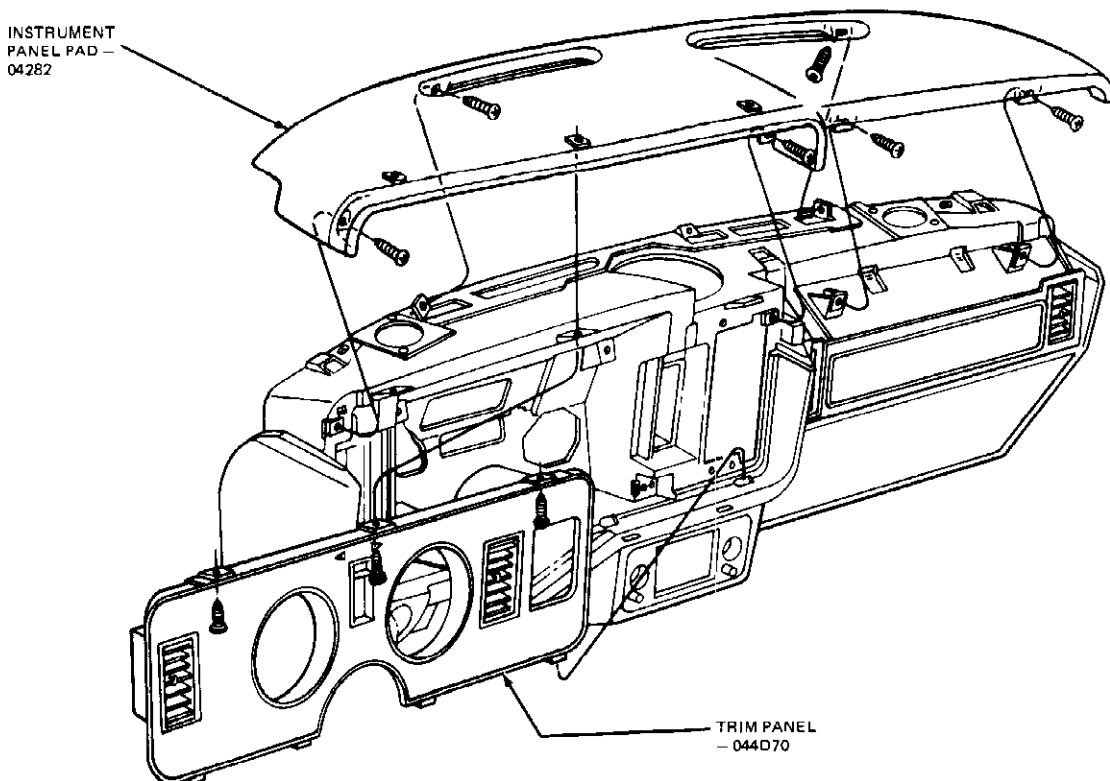


FIG. 36 Instrument Panel Pad Installation

INSTRUMENT PANEL

REMOVAL

1. Disconnect the ground cable from the battery.
2. Remove the instrument panel pad following the procedure under Instrument Panel Pad removal.
3. Remove two screws attaching the steering column opening lower cover to the instrument panel and remove the cover.
4. Remove two nuts and the bracket retaining the steering column to the instrument panel and brake pedal support, and lay the steering column against the seat.
5. Remove one screw attaching the instrument panel to the brake pedal support at the steering column opening (Fig. 37).
6. Remove one screw attaching the lower brace to the lower edge of the instrument panel below the radio.
7. Remove one screw attaching the brace to the lower edge of the instrument panel.
8. Disconnect the temperature control cable from the temperature blend door and the evaporator case bracket.
9. Disconnect the 7-port vacuum hose connectors at the evaporator case.
10. Disconnect the blower resistor wire connector from the resistor on the evaporator housing, and the blower motor feed wire at the in-line connector near the blower resistor wire connector.
11. Support the instrument panel and, with an angle Phillips screwdriver, remove three screws attaching the top of the instrument panel to the cowl (Fig. 37).

12. Remove one screw attaching each end of the instrument panel to the cowl side panels.
13. Move the instrument panel rearward and disconnect the speedometer cable from the speedometer and any wires that will not allow the instrument panel to lay on the front seat. Use care not to scratch the instrument panel or the steering column.

INSTALLATION

1. Place the instrument panel near the installed position and connect any wires or connectors that were disconnected during removal.
2. Connect the speedometer cable to the speedometer.
3. Place the instrument panel in position and install one screw at each end of the instrument panel (Fig. 37).
4. Install three screws along the top front edge of the instrument panel with an angle Phillips screwdriver.
5. Connect the two support braces to the lower edge of the instrument panel with one screw each.
6. Connect the temperature control cable to the temperature blend door crank arm and the bracket.
7. Connect the vacuum hoses at the 7-port connectors and the blower motor wires at the resistor and in-line connector near the resistor.
8. Install the screw attaching the instrument panel to the brake pedal support.
9. Position the steering column to the brake pedal support and install the retainer with two nuts.

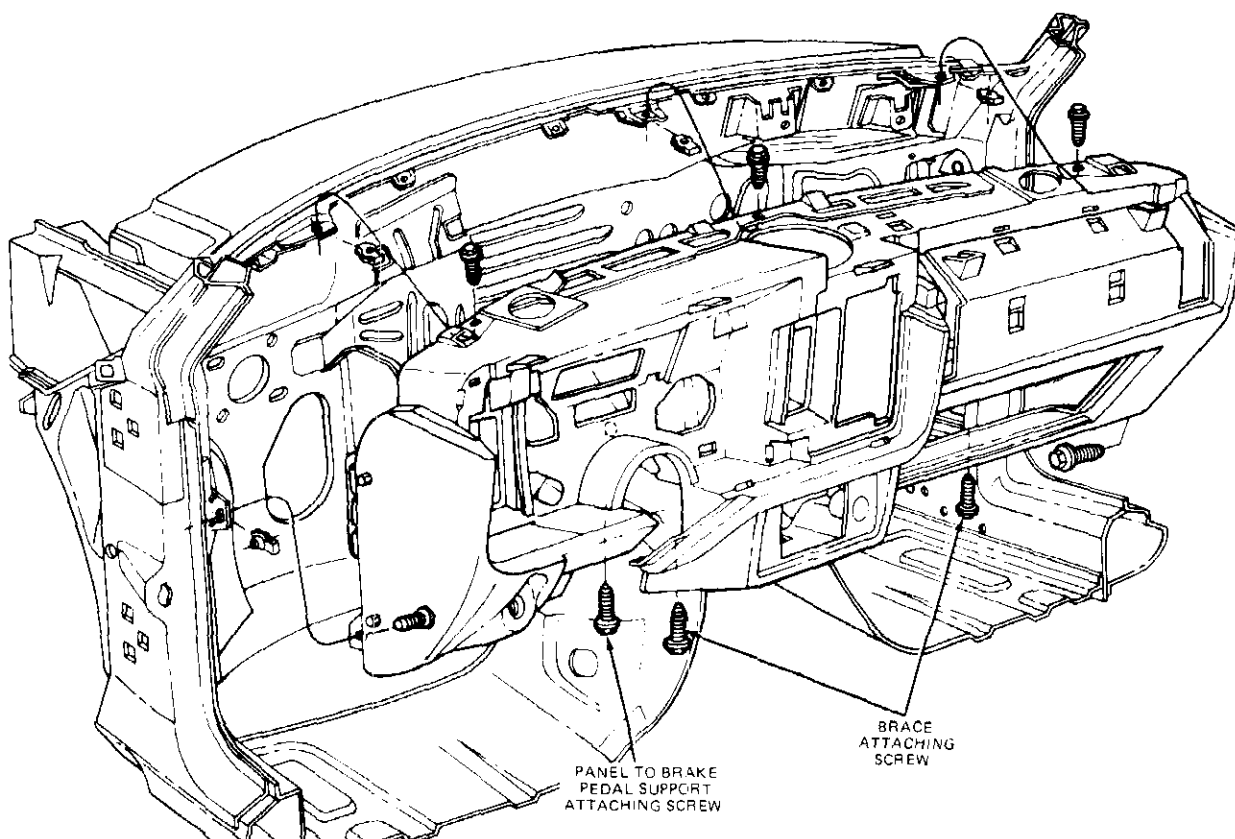


FIG. 37 Instrument Panel Installation

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10. Position the steering column opening cover to the instrument panel and install the two attaching screws.
11. Install the instrument panel pad and connect the ground cable to the battery.
12. Connect the temperature control cable to the temperature blend door crank arm.

REGISTER DUCTS AND/OR DEFROSTER NOZZLE

REMOVAL

1. Remove the instrument panel and lay it back against the front seat following the procedure under Instrument Panel Removal.
2. Remove the radio speaker from the top center of the instrument panel, if so equipped.
3. Working through the radio speaker opening, remove one screw attaching the defroster nozzle to the center register duct.
4. Remove four screws attaching the defroster nozzle to the top of the instrument panel (Fig. 8) and remove the defroster nozzle.
5. To remove the right or left register duct, remove one screw attaching the duct to the top of the instrument panel (Fig. 8).
6. Remove one screw attaching the duct to the instrument panel at the register opening and remove the register duct.
7. To remove the center register duct and/or the A/C-defrost distribution duct, remove the right and left register ducts. Then, remove one screw from each center register opening and remove the center register duct and A/C-defrost duct from the instrument panel.
8. Remove four screws attaching the A/C-defrost duct to the center register duct. Then, separate the center register duct from the A/C-defrost distribution duct.

INSTALLATION

1. Apply caulking cord on three sides of the A/C-defrost distribution duct opening on the center register duct.
2. Position the A/C-defrost distribution duct to the center register duct and install the four attaching screws.
3. Position the center register duct to the instrument panel and install one screw over each center register to retain the center register duct to the instrument panel.
4. Install the right and left register ducts retaining each duct in place with two screws (Fig. 8).
5. Position the defroster nozzle to the instrument panel and the A/C-defrost distribution duct. Then, install four screws to attach the defroster duct to the instrument panel at the defroster openings.
6. Working through the radio speaker opening, install one screw to attach the defroster nozzle to the center register duct.
7. Install the radio speaker in the top center of the instrument panel, if so equipped.

8. Install the instrument panel following the procedure under Instrument Panel Installation.

EVAPORATOR CASE

REMOVAL

1. Remove the instrument panel and lay it on the front seat following the procedures under Instrument Panel Removal.
2. Discharge the refrigerant from the A/C system at the service access gauge port valve located on the underside of the combination valve. Observe all safety precautions.
3. Once the refrigerant is discharged from the system, remove the high and low pressure hoses from the combination valve. Use a back-up wrench on the STV housing manifold to prevent component damage. Cap the combination valve and hose openings to prevent the entrance of dirt and excessive moisture.
4. Drain the engine coolant from the cooling system and remove the hoses from the heater core. Plug the hoses and core.
5. Remove the screw attaching the air inlet duct and blower housing assembly support brace to the cowl top panel (Fig. 34).
6. Disconnect the vacuum supply hose (black) from the in-line vacuum check valve in the engine compartment.
7. Disconnect the blower motor ground wire from the cowl side panel and the wire harness from the resistor and motor lead.
8. Working under the hood, remove two nuts retaining the evaporator case to the dash panel.
9. In the passenger compartment, remove the screw attaching the evaporator case support bracket to the cowl top panel.
10. Remove one nut retaining the bracket at the left end of the evaporator case to the dash panel, and one nut retaining the bracket below the evaporator case to the dash panel.
11. Carefully pull the evaporator case away from the dash panel and remove the evaporator case assembly from the vehicle.

INSTALLATION

1. Position the evaporator case assembly in the vehicle and install the screw attaching the evaporator case support bracket to the cowl top panel.
2. Check the evaporator case drain tube to be sure it is through the dash panel and is not pinched or kinked.
3. Install one nut retaining the mounting bracket at the left end of the evaporator case to the dash panel, and another nut to retain the bracket below the evaporator case to the dash panel.
4. Working under the hood, install two nuts retaining the evaporator case to the dash panel. Tighten the four nuts (2 in engine compartment and 2 in the passenger compartment) and the one support bracket attaching screw.