

# SECTION C

## HEATER SYSTEM (49000 SERIES)

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## DIVISION I SPECIFICATIONS AND ADJUSTMENTS

### 12-21 GENERAL SPECIFICATIONS

Recommended Coolant .....	Ethylene-glycol Base
Thermostat Opening Temperature .....	190°
Cooling System Capacity with Heater (Quarts) .....	19.7
Blower Motor Type .....	12 VDC
Blower Motor Fan .....	Squirrel Cage 12C-1

### 12-22 ADJUSTMENT OF TEMPERATURE SELECTOR LEVER AND TEMPERATURE DOOR

The control cable should be adjusted when equal springback is not obtained at both ends of lever travel. This adjustment should also be made when the heater and blower assembly has been removed or when temperature door does not open sufficiently to permit maximum air flow.

To adjust, position the TEMPERATURE lever to the "COOL" position and rotate the control cable adjuster

nut until equal springback is obtained at both ends of lever travel. See Figure 12-20.

## DIVISION II

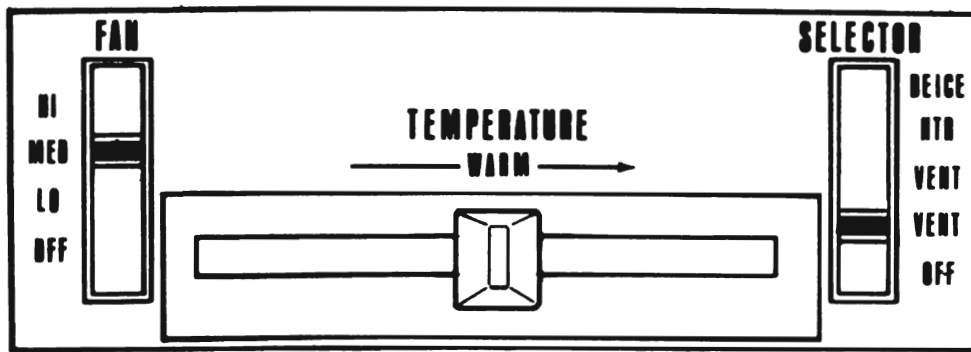
### DESCRIPTION AND OPERATION

#### 12-23 GENERAL DESCRIPTION

The heater system is an air mix type system that regulates the temperature of the air by varying the mixture of heated and unheated air.

The system consists of four major parts: (1) the heater and blower assembly (see Figure 12-21) which houses the blower motor, outside air door, temperature door, vent-heater door, heater core and vacuum diaphragms; (2) the heater selector assembly which contains the defroster door and reheat door and diaphragm (see Figure 12-22); (3) the vent distributor duct; and (4) the instrument panel control assembly (see Figure 12-23).

The coolant flows through the heater system as shown in Figure 12-24.



12-42A

Figure 12-20 Heater Instrument Panel Control Assembly

**12-24 DESCRIPTION OF AIR FLOW**

The flow of air in the heater system is shown in Figure 12-25. Air enters the plenum chamber thru an opening forward of the windshield.

Air then flows to the right hand portion of the plenum chamber and downward into the blower and heater assembly. When the outside

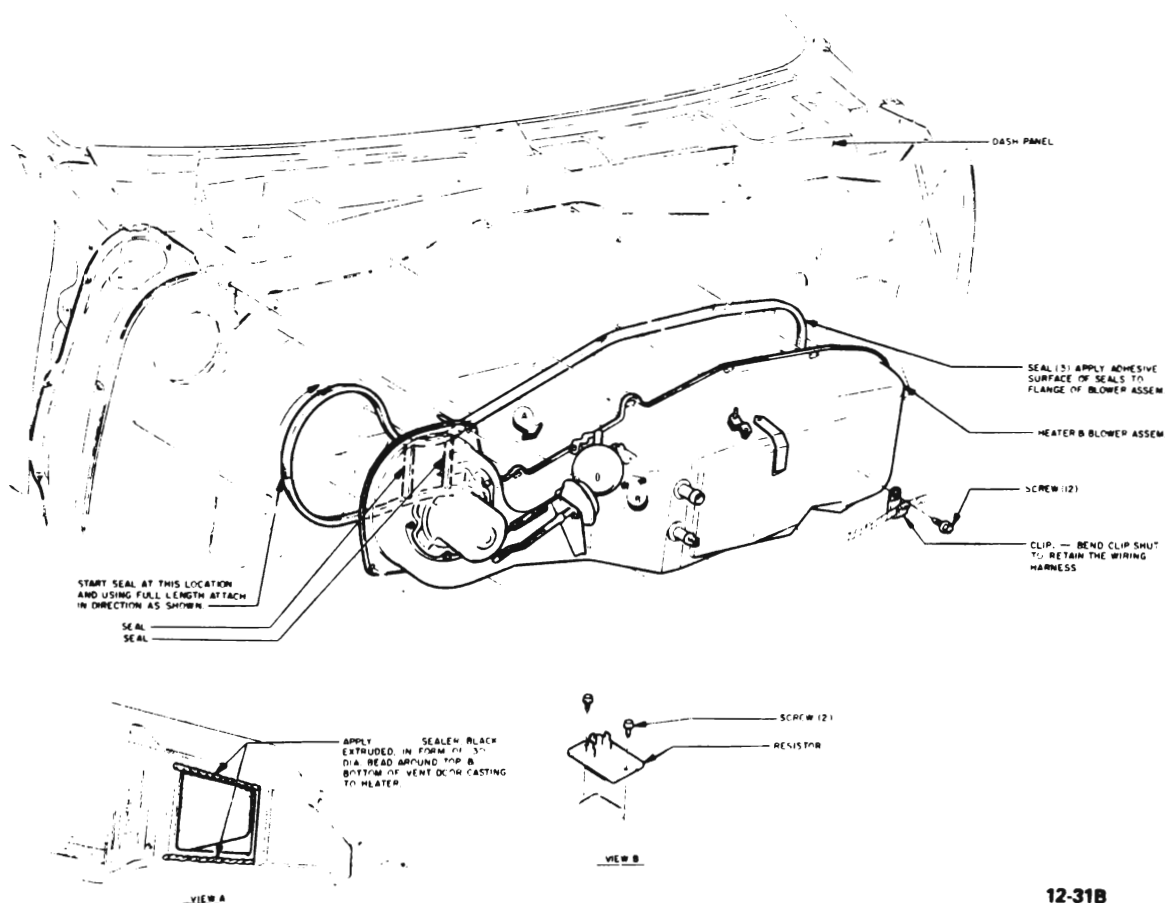
air inlet door is open the air flows past this door to the vent-heater door, where depending on the door position, the air flows either to upper level instrument panel outlets or to the heater or defroster outlets. When the air is directed toward the heater or defroster outlets, the proportion of the air by-passing and flowing thru the heater core is controlled by the temperature door. The air is then

directed to the heater selector assembly where the defroster door directs the air to the heater or defroster outlets. If the SELECTOR switch on the instrument panel is positioned to the upper or second "VENT" position, vacuum will be applied to the reheat door diaphragm and the reheat door will move to the midposition. Under these circumstances a split mode situation exists wherein the air flow is to both the instrument panel and heater or defroster outlets.

**12-25 OPERATION OF HEATER SYSTEM CONTROLS**

The heater system has two switches and one lever. See Figure 12-20. They function as follows:

1. FAN Switch - The FAN switch operates a four position switch. A two resistor blower resistor assembly is connected in series between the blower motor and the switch, and serves to reduce the speed of the motor. When the FAN switch is



12-31B

Figure 12-21 Heater and Blower Assembly Installation

12-20 HEATER SYSTEM (49000 SERIES)

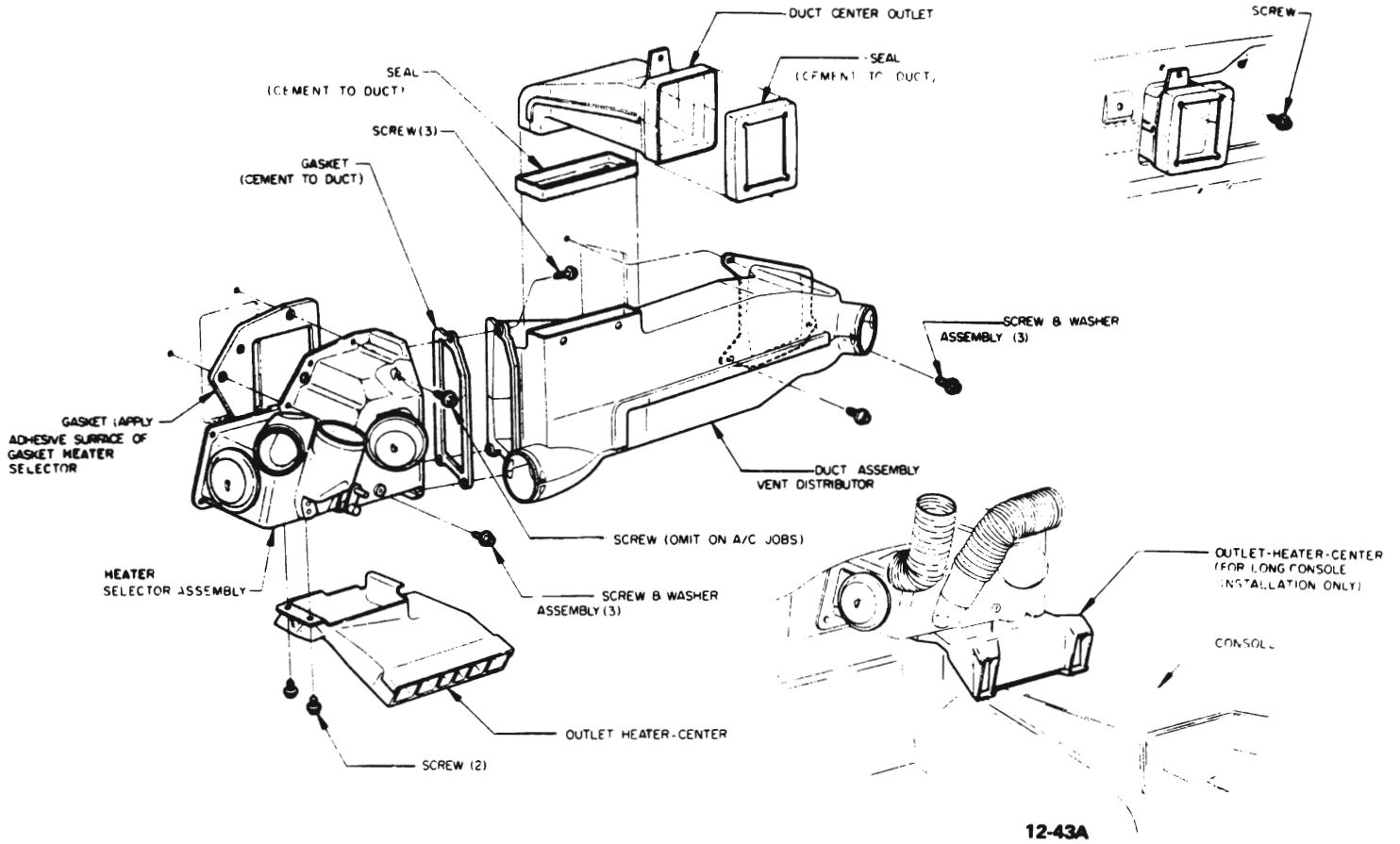


Figure 12-22 Heater Selector Assembly, Vent Distributor Duct and Center Outlet Installation

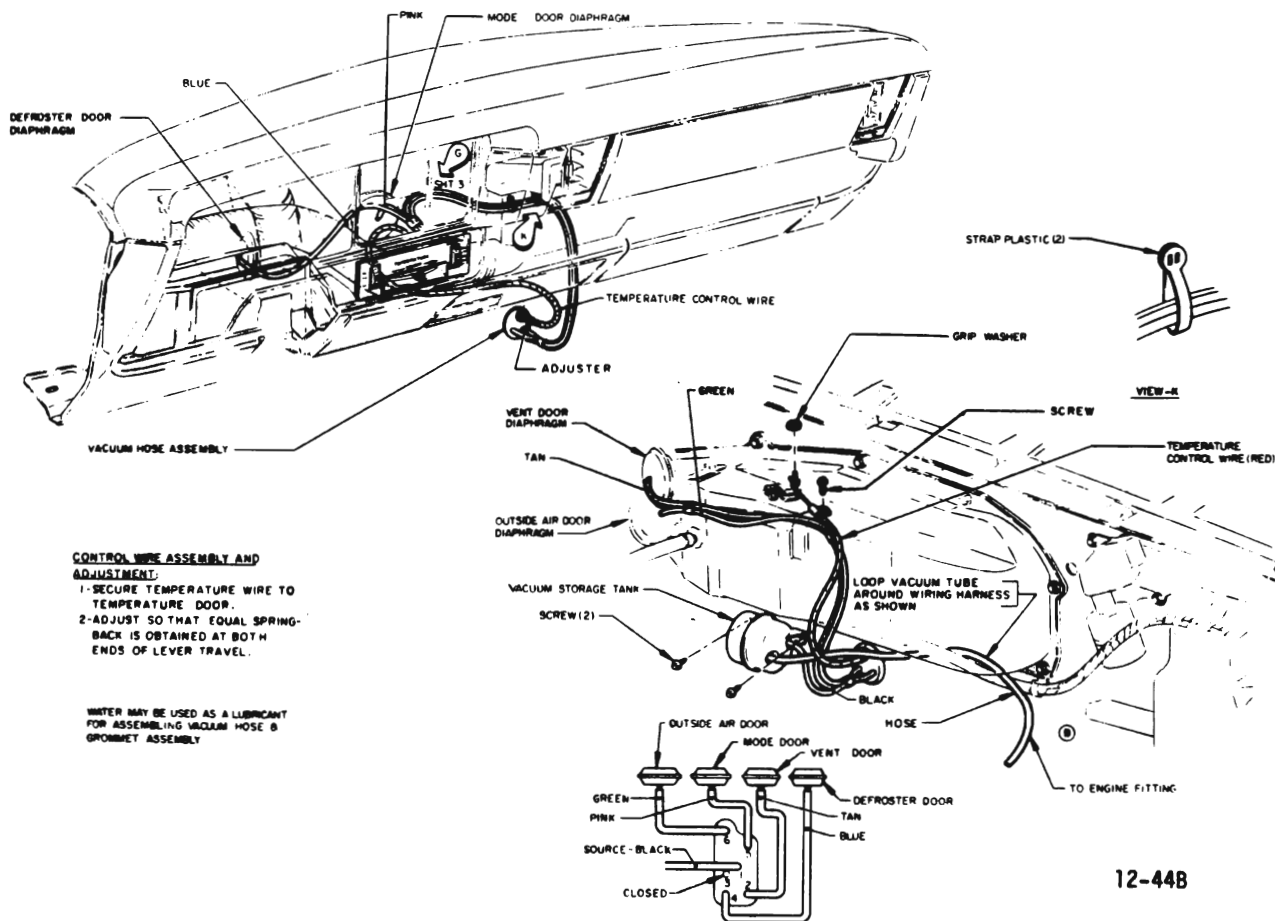


Figure 12-23 Vacuum Hose and Control Cable Installation

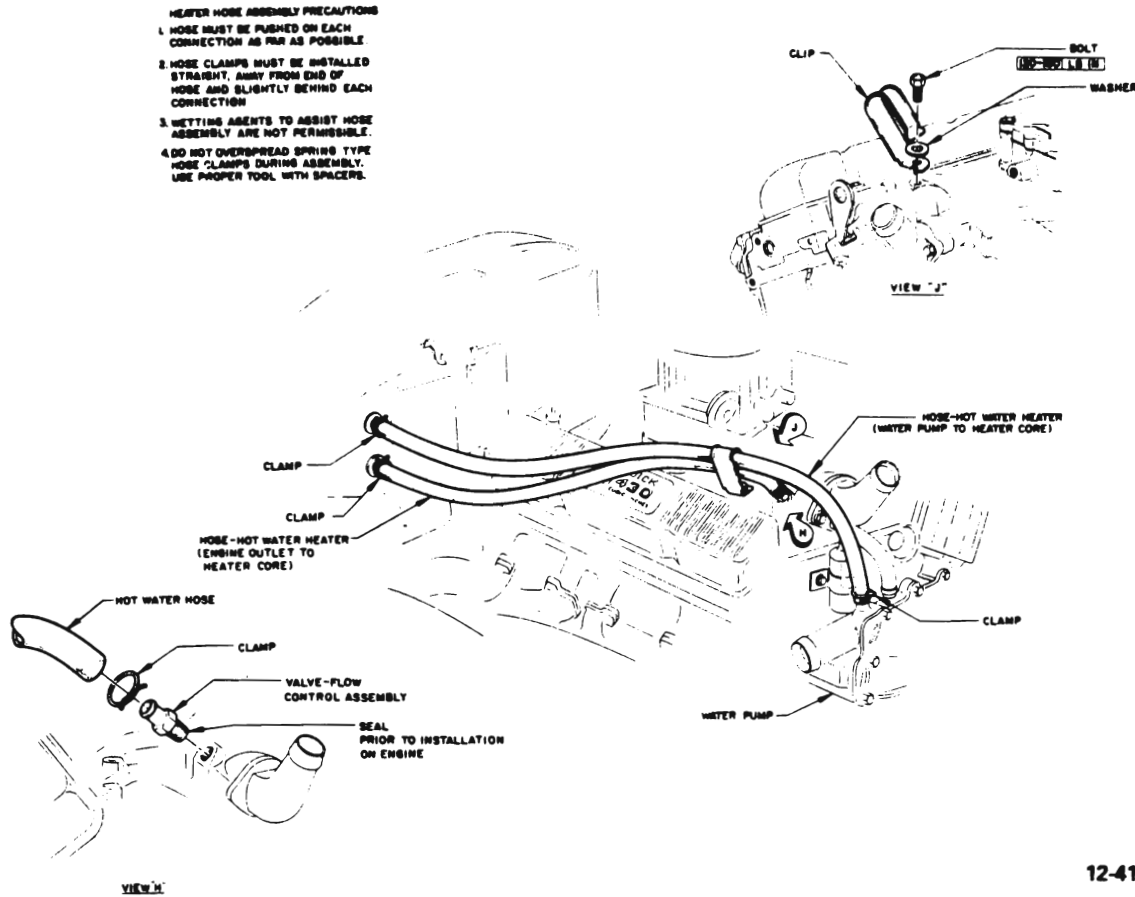


Figure 12-24 Heater Hose Installation

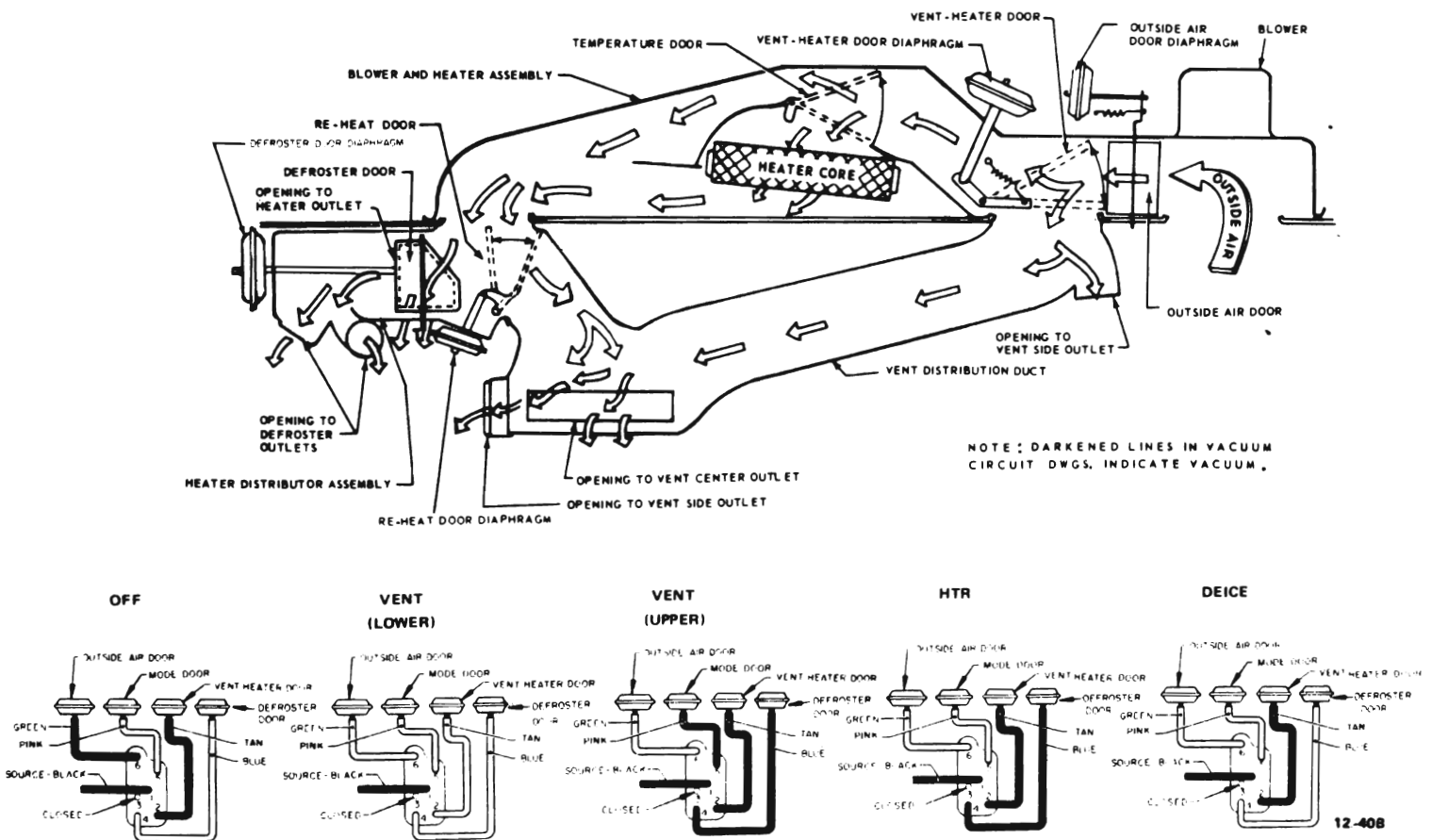


Figure 12-25 Heater System Air Flow

## 12-22 HEATER SYSTEM (49000 SERIES)

positioned fully downward, the blower motor is "OFF". Movement of the switch upward provides "LO", "MED" and "HI" blower speeds.

2. **TEMPERATURE Lever** - This lever regulates the position of the temperature door (see Figure 12-25) thru action of a control cable (see Figure 12-23). The **TEMPERATURE** lever is connected by a control wire to the temperature door on the heater assembly, and regulates the ratio of mixture between heated and unheated air, hence the temperature of the air. When the **TEMPERATURE** lever is positioned fully to the left, the temperature door is fully closed and prevents air flow through the heater core. When the **TEMPERATURE** lever is positioned midway in its range of travel, the temperature door is moved in proportion to allow more outside air to flow through the heater core and hence be warmed. When the **TEMPERATURE** lever is positioned fully to the right, the temperature door is fully open and directs all outside air through the heater core.

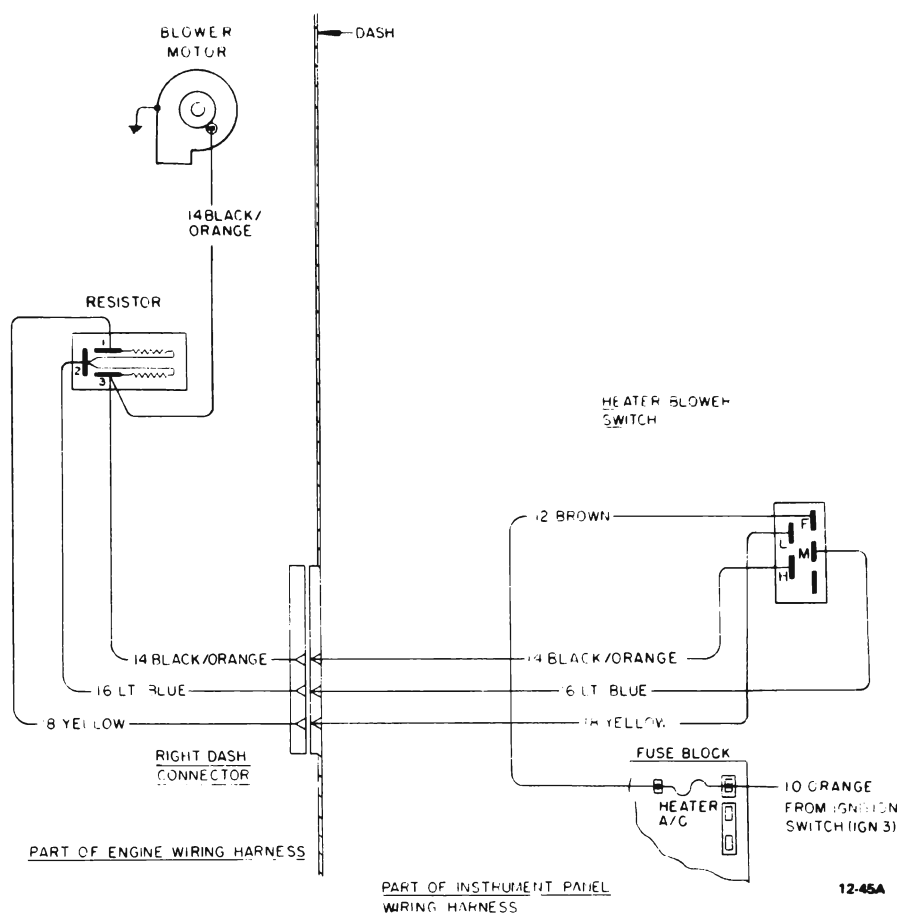


Figure 12-26 Heater System Wiring Diagram

3. **SELECTOR Switch** - This switch controls the vent-heater door, outside air door, defroster door and reheat door diaphragms. As the switch is moved up from "OFF" the following system changes are made:

a. **"OFF"** Position - In this position vacuum is applied to the outside air door and reheat door diaphragms to hold these doors closed. See Figure 12-25.

b. **"VENT"** Position (1st Detent) - In this position vacuum is cut off at the selector switch, hence all the vacuum diaphragms are released. The outside air door is pulled by its spring to the open position, and the vent-heater door is pulled by its spring to the vent position.

c. **"VENT"** Position (2nd Detent) - In this position vacuum is applied to the vent-heater door diaphragm and reheat door diaphragm and defroster door diaphragm. The vent-heater diaphragm pulls the door

closed to direct air flow thru the heater portion of the system. The reheat diaphragm positions the reheat door to redirect a portion of the air flow into the ducts leading to the instrument panel outlets and directing the balance of the air to the floor outlets. The defroster diaphragm positions the defroster door to allow air to flow to the floor outlet as the door is spring-loaded to the defrost position.

d. **"HTR"** Position - In this position vacuum is applied to the vent-heater door diaphragm to pull the door to the heater position. Vacuum is also applied to the defroster door diaphragm to allow air to flow to the floor outlet.

e. **"DEICE"** Position - In this position vacuum is applied only to the vent-heater door diaphragm to pull the door to the heater position.

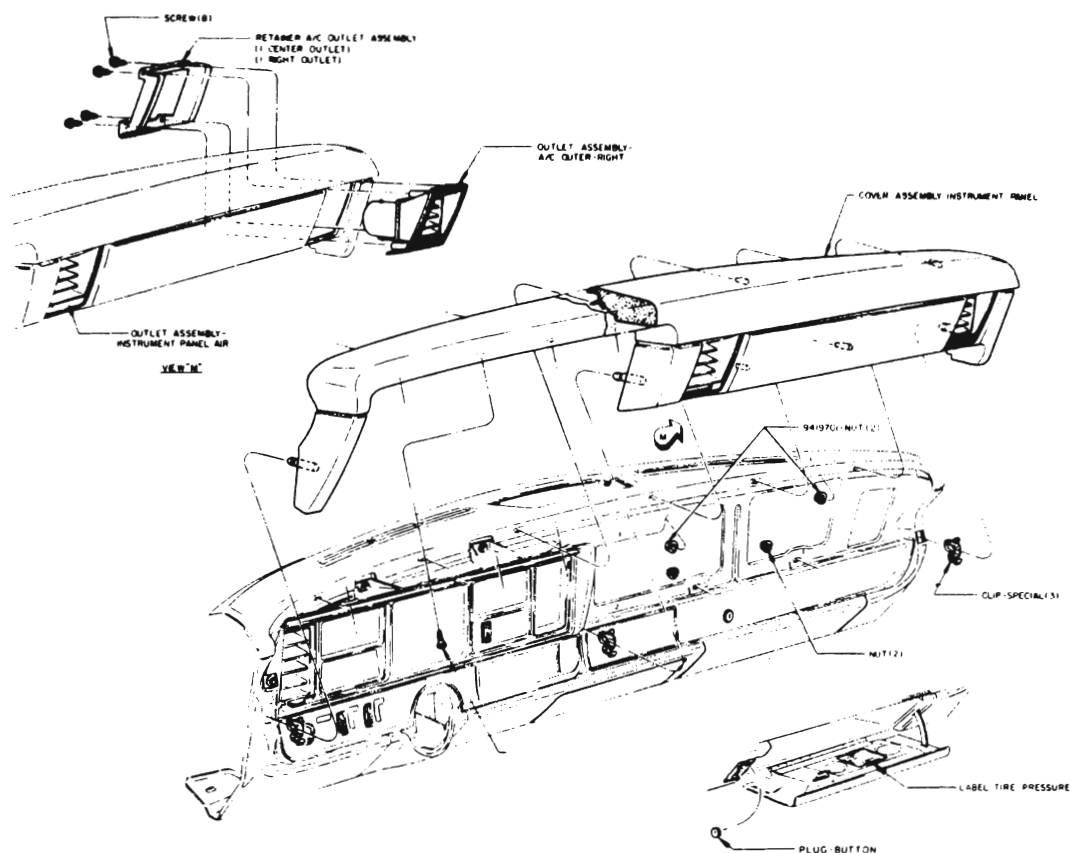
## DIVISION III

## SERVICE PROCEDURES

12-26 REMOVAL AND  
INSTALLATION OF HEATER  
CONTROL ASSEMBLY

## a. Removal.

1. Remove ash tray assembly.
2. Remove radio.
3. Loosen self-contained nuts on back of control assembly.
4. Move control assembly back and remove light sockets, electrical and vacuum connections, and Bowden cable.
5. Remove control assembly through ash tray opening.



12-468

Figure 12-27 Instrument Panel Cover Assembly

**b. Installation**

1. Install control assembly reverse of removal procedure.
2. Adjust TEMPERATURE control lever and cable as necessary.

### 12-27 REMOVAL AND INSTALLATION OF VENT DISTRIBUTOR DUCT

**a. Removal**

1. Remove instrument panel cover assembly. See Figure 12-27.
2. Remove center instrument panel outlet duct. See Figure 12-22.
3. Remove right and left instrument panel outlet air hoses. See Figure 12-28.

4. Remove three screws securing right end of vent distributor duct to dash. Remove three screws securing vent distributor duct to heater selector assembly.

5. Remove vent distributor duct assembly.

**b. Installation**

Install reverse of removal procedure and check for any possible air leaks along mating surfaces.

### 12-28 REMOVAL AND INSTALLATION OF HEATER SELECTOR ASSEMBLY

**a. Removal**

1. Remove instrument panel cover assembly. See Figure 12-27.

2. Remove center instrument panel outlet duct. See Figure 12-22.

3. Remove heater center outlet.

4. Remove left instrument panel outlet air hose. Remove right and left defroster hoses.

5. Disconnect defroster door and reheat door diaphragm vacuum hoses.

6. Remove three screws securing heater selector to vent distributor duct.

7. Remove heater selector assembly.

**b. Installation**

Install reverse of removal procedure and check for any possible air leaks along mating surfaces.

## 12-24 HEATER SYSTEM (49000 SERIES)

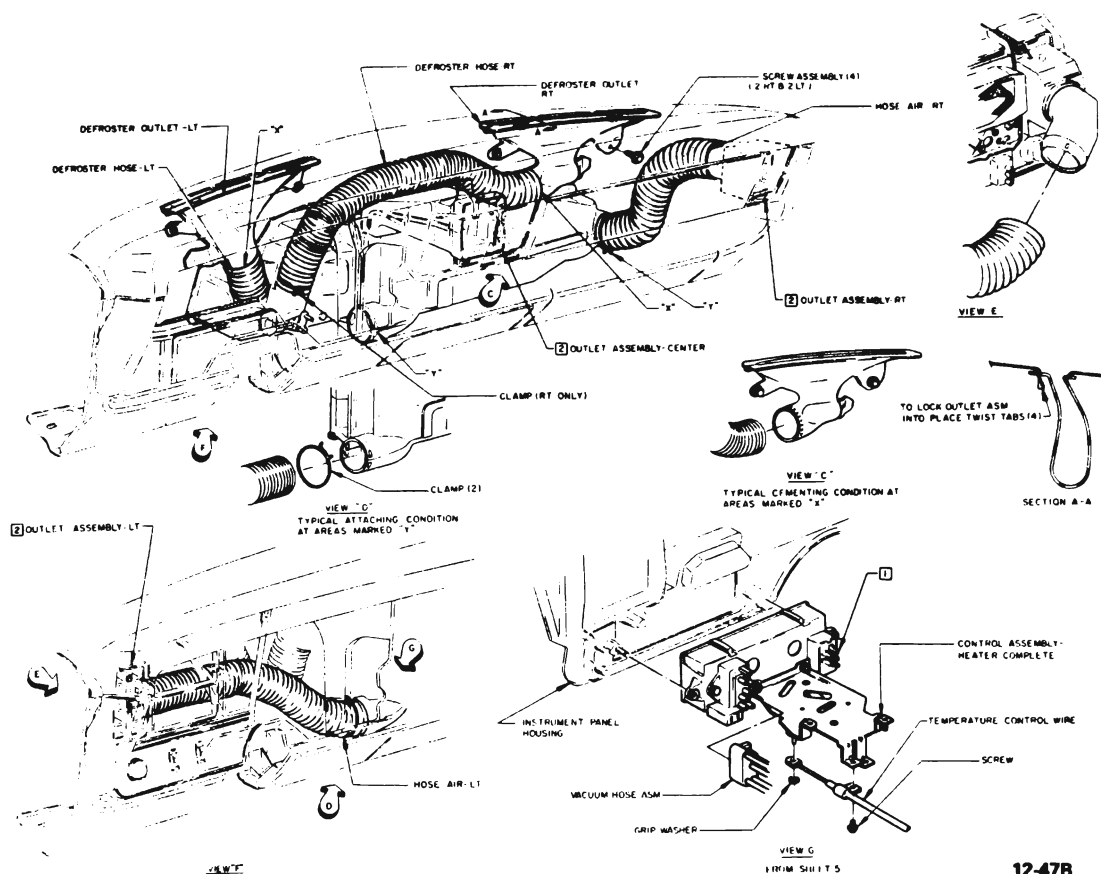


Figure 12-28 Installation of Air Duct Hoses

12-29 REMOVAL AND  
INSTALLATION OF  
BLOWER MOTOR

## a. Removal

1. Remove right front fender, refer to Group 110, Paragraph 110-24.

2. Disconnect blower motor wire. Remove screws securing blower motor to heater assembly and remove motor.

## b. Installation

Install reverse of removal procedure.

12-30 REMOVAL AND  
INSTALLATION OF  
BLOWER MOTOR AND  
HEATER ASSEMBLY OR  
HEATER CORE

## a. Removal

1. Drain radiator.
2. Remove right front fender, refer to Group 110, Paragraph 110-24.
3. Disconnect blower motor wire and blower motor resistor connectors.
4. Disconnect temperature door control cable. See Figure 12-23.
5. Disconnect vacuum hoses attached to outside door and vent-heater door vacuum diaphragms. See Figure 12-23.
6. Disconnect heater inlet and outlet hoses at heater assembly. See Figure 12-24.

7. Remove twelve screws securing blower and heater assembly to dash and remove assembly. See Figure 12-21.

## b. Installation

Install reverse of removal procedure. Check for air leaks along mating surfaces, check vacuum diaphragm and door operation, and check adjustment of temperature door cable.

## DIVISION IV

## TROUBLE DIAGNOSIS

12-31 HEATER-DEFROSTER  
DIAGNOSIS

**NOTE:** It is suggested that prior to inspecting a car for heater system malfunctions, the owner be questioned to determine if system is being operated correctly. All windows and vents must be closed to effect maximum heat buildup.

TROUBLE	CAUSE AND CORRECTION
<p><b>Blower Motor Inoperative</b></p>	<p>Blown fuse – Substitute new fuse.</p> <p>Loose connectors at blower motor, ignition switch, blower resistor, or blower switch (on instrument panel control) or broken or grounded wires – Visually check and use test light.</p> <p>Defective blower resistor or blower switch – Substitute new components.</p> <p>Defective blower motor – Substitute new component.</p>
<p><b>Insufficient Heating</b></p>	<p>Kinked vacuum hoses or defective SELECTOR switch – Check that there is no vacuum applied to diaphragm of outside air door, and that vacuum is applied to diaphragm of vent-heater door (see Figure 12-25) when SELECTOR switch is in "HTR" position.</p> <p>Sticking outside air door – Disconnect door lever spring and move door lever to check for smooth operation.</p> <p>Temperature door does not open sufficiently--Check operation and adjustment of door and TEMPERATURE switch (refer to paragraph 12-22).</p> <p>Check for dirt particles in engine thermostat.</p> <p>Insufficient coolant or plugged heater core – Feel and compare temperature of heater core inlet and outlet pipes. Both hoses should be hot and approximately same temperature.</p> <p>Check for dislodged diaphragm in flow control valve.</p>
<p><b>Insufficient Defrosting</b></p>	<p>Loose defroster hoses, incorrect deflection of air stream at defroster outlets or loss of volume of air to defroster outlets due to air leaks along mating surfaces – Visually check system and feel for air leaks.</p> <p>Defroster door does not open sufficiently – Check operation.</p>
<p><b>Insufficient Air thru Instrument Panel Outlets</b></p>	<p>Kinked vacuum hoses or defective SELECTOR switch – Check that no vacuum is applied to either outside air or vent-heater diaphragms when SELECTOR lever is in "VENT" position (see Figure 12-25).</p> <p>Sticking outside air and/or vent-heater doors – Disconnect door lever springs and move door lever to check for smooth operation.</p> <p>Defective vent-heater diaphragm – Substitute new diaphragm.</p>
<p><b>No Split Mode on Upper Vent Position. All Air Comes Out I.P. Outlets</b></p>	<p>See Figure 12-22 screw missing that is suppose to be omitted only on A/C jobs.</p>



**12-26 HEATER SYSTEM (49000 SERIES)**

TROUBLE	CAUSE AND CORRECTION
Blower motor inoperative.	<p>Check fuse.            Check for defective heater blower switch.            Check for defective blower resistor assembly.            Check for loose connectors or broken wires.            Check ignition switch (orange wire).</p>
Insufficient heating.	<p>Check operation of outside air door (paragraph 12-12), and temperature door (paragraph 12-13).            Check for air leaks around sealing edges of components.            Check for dirt in engine thermostat.            Check for sufficient coolant.            Check for dislodged diaphragm in flow control valve (46-48000 Series).            Check for air leaks thru dash, around doors, windows, etc.</p>
Inadequate defrosting.	<p>Check operation and adjustment of outside (paragraph 12-12), temperature door and/or defroster door. (Paragraph 12-13).</p> <p>Check for air leaks and for sufficient coolant.</p> <p>Check for loose or disconnected defroster air hoses and for position of defroster duct and instrument panel openings. Twist tabs provide positive position if properly installed.</p>
No air coming in car but motor running.	<p>Vacuum hoses disconnected or crossed.            Storage tank defective.</p>