SECTION 11-B
HEATER SYSTEM

CONTENTS OF SECTION 11-B

11-5 DESCRIPTION AND OPERATION OF HEATER SYSTEM (4400-4600 AND 4800 SERIES)

The heater system for the 4400, 4600 and 4800 Series cars is a air-mix type system in which the temperature of the air is varied by diluting heated air with unheated air. The outside air, after it enters the system, is divided into two air streams. Part of the air flow is diverted to the heater core and the balance of the air flow is by-passed around the heater core.

The heater system consists of four major assemblies: (1) a blower and air inlet assembly (see Figure 11-30) which contains the blower fan and motor, and outside air door; (2) a heater assembly which houses the heater core, temperature door and defroster door; (3) right and left floor ducts, and also a floor duct adapter which houses the rear heat door; (4) a heater control assembly (see Figure 11-31) which regulates the opening and closing of doors in system.

The flow of coolant through the heater system is as shown in Figure 11-32 for 4400 Series cars, and Figure 11-33 for 4600 and 4800 Series cars. A manual gate water valve shuts off circulation of coolant through the heater core when system is not operating.

a. Description of Air Flow

The air flow begins at air intake

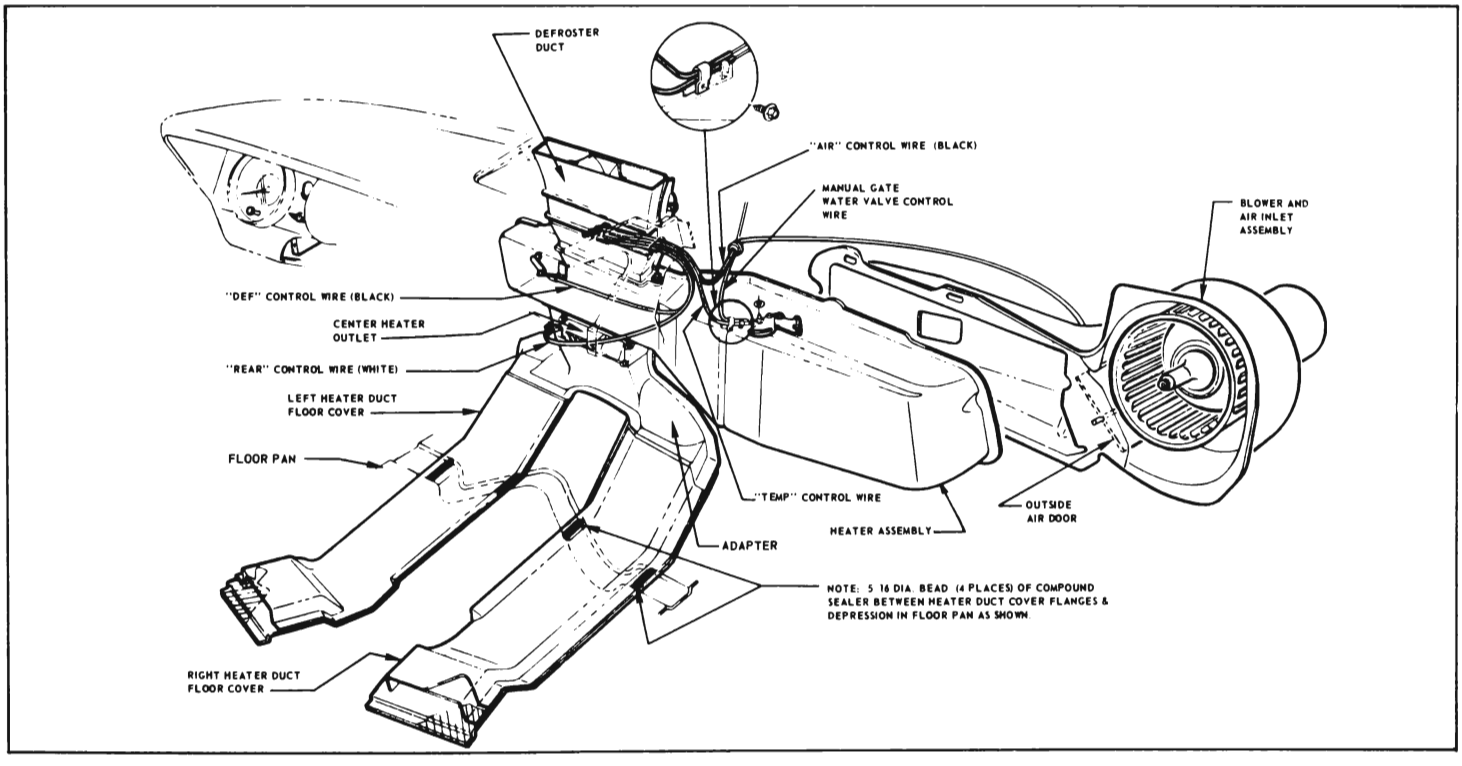


Figure 11-30—Heater System - 4400, 4600 and 4800 Series

grille located on the cowl forward of the windshield (see Figure 11-34). The outside air passes through the air intake grille into the cowl air chamber, and then into the blower and air inlet assembly (see Figure 11-30). The air flows through the blower, past the open outside air door and to the heater assembly.

At the heater assembly, the air stream divides and may flow through the heater core or through the duct by-passing the core. The regulation of the flow of air at this point is controlled by the temperature door. When the door is fully closed, air flow through heater core is blocked and all air is forced to circulate around the core. When the door is fully open, the air stream through the by-pass around the core is blocked and all air is forced through the heater core. Intermediate positioning of the door mixes heated and unheated air in proportionate amounts.

After the air passes through or around, or both through and around the heater core, it is directed to the defroster door. When the defroster door is closed all air is channeled to the front and/or rear floor area. When the defroster door is fully open all air is ducted to the defroster outlet. Intermediate positioning of the defroster valve apportions air to both the defroster and the floor. Depending on how much heat is being directed to the defroster outlet, the balance of the air stream will flow through the center heater outlet (see Figure 11-34) to the front floor area and to the rear floor area through rear floor ducts. The air flow to the rear floor is regulated by the rear heat door.

b. Description and Operation of Heater System Controls

The heater system for 4400, 4600 and 4800 Series cars consists of four controls: AIR, TEMP, DEFR, and REAR control levers (see Figure 11-35). They function as follows:

1. AIR Control Lever—The AIR control lever regulates the positioning of the outside air door, and operation of the blower motor. The lever has four positions. The first position opens the outside air door which must be open to initiate air circulation through the system. The second, third and fourth positions activate the blower motor to low, medium and high speeds.

The heater door control assembly (see Figure 11-36) actually performs the afore mentioned functions. The unit is located on the blower and air inlet assembly and is directly linked to the outside air door. In addition, the unit houses the heater blower switch. A control cable directly connects the heater door control assembly to the AIR lever.

2. TEMP Control Lever—The TEMP control lever opens or closes the temperature door, and also manual gate valve. Movement of the control forward dilutes heated air with gradually decreasing amounts of unheated air.

3. DEFR Control Lever—This lever regulates the opening and closing of the defroster door. Positioning of the lever forward diverts the air flow to the defroster outlet. The defroster door will divert all of, or a portion of the available air to the defroster outlets.

4. REAR Control Lever—The rear control lever opens and closes the rear heat door located in the adapter assembly. When this door is open it diverts an amount of air, proportionate to its opening, to the rear seat.

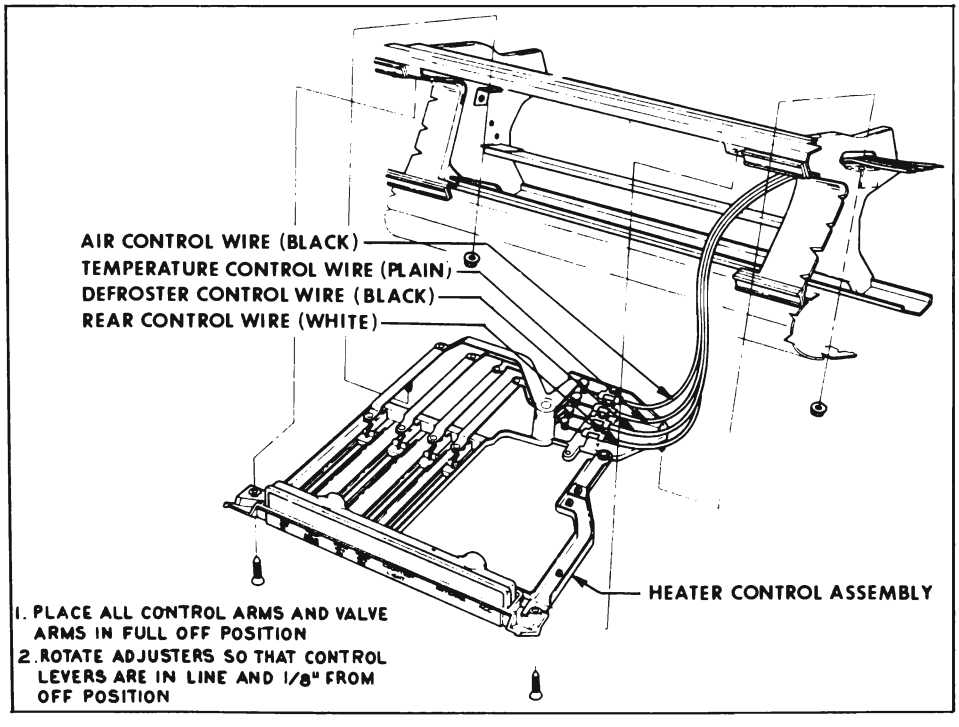
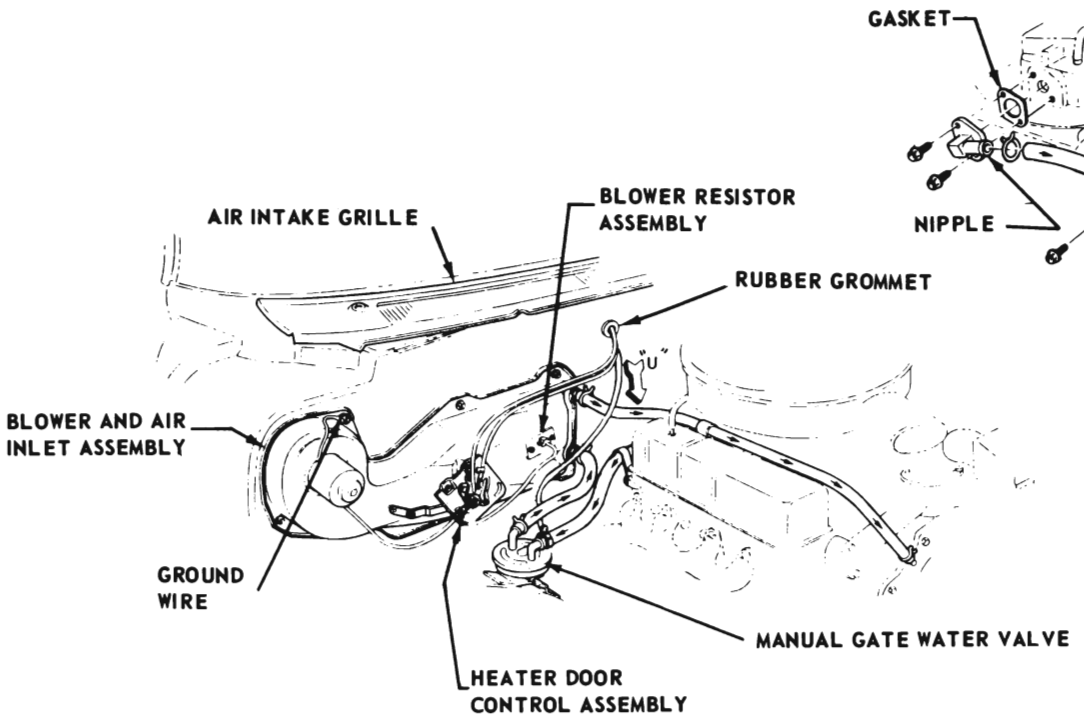


Figure 11-31—Heater Control Wire Adjustment - 4400, 4600 and 4800 Series

c. Description of Ventilation Doors

An outside air vent is provided on each of the floor side kick pads. The opening and closing of the vent doors is controlled by a LEFT VENT and a RIGHT VENT control knob on the instrument panel.



VIEW IN DIRECTION OF ARROW "U"

NOTE: HEATER HOSE ASSEMBLY PRECAUTIONS

1-HOSE MUST BE PUSHED ON EACH CONNECTION AS FAR AS POSSIBLE.

2-HOSE CLAMPS MUST BE INSTALLED STRAIGHT, AWAY FROM END OF HOSE AND SLIGHTLY BEHIND BEAD ON EACH CONNECTION.

3-NOT PERMISSABLE TO USE ANY WETTING AGENTS TO ASSIST HOSE ASSEMBLY.

4-TIGHTEN ALL SCREW TYPE CLAMPS TO 16–22 LB.-IN.

5-DO NOT OVERSPREAD SPRING TYPE HOSE CLAMPS DURING ASSEMBLY -- USE PROPER TOOL WITH SPACERS.

Figure 11-32—Heater System Water Flow - 4400 Series

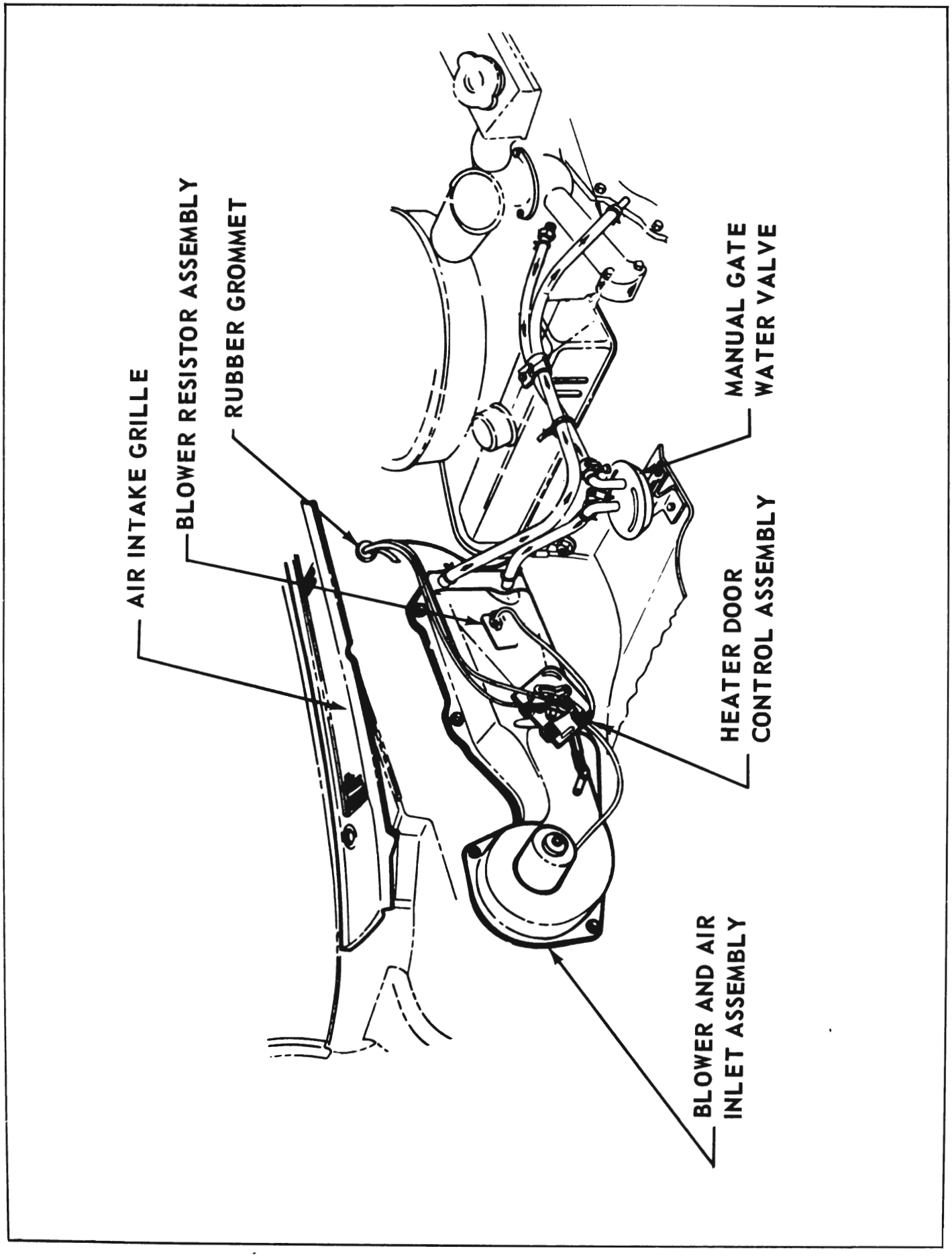


Figure 11-33—Heater System Water Flow - 4600 and 4800 Series

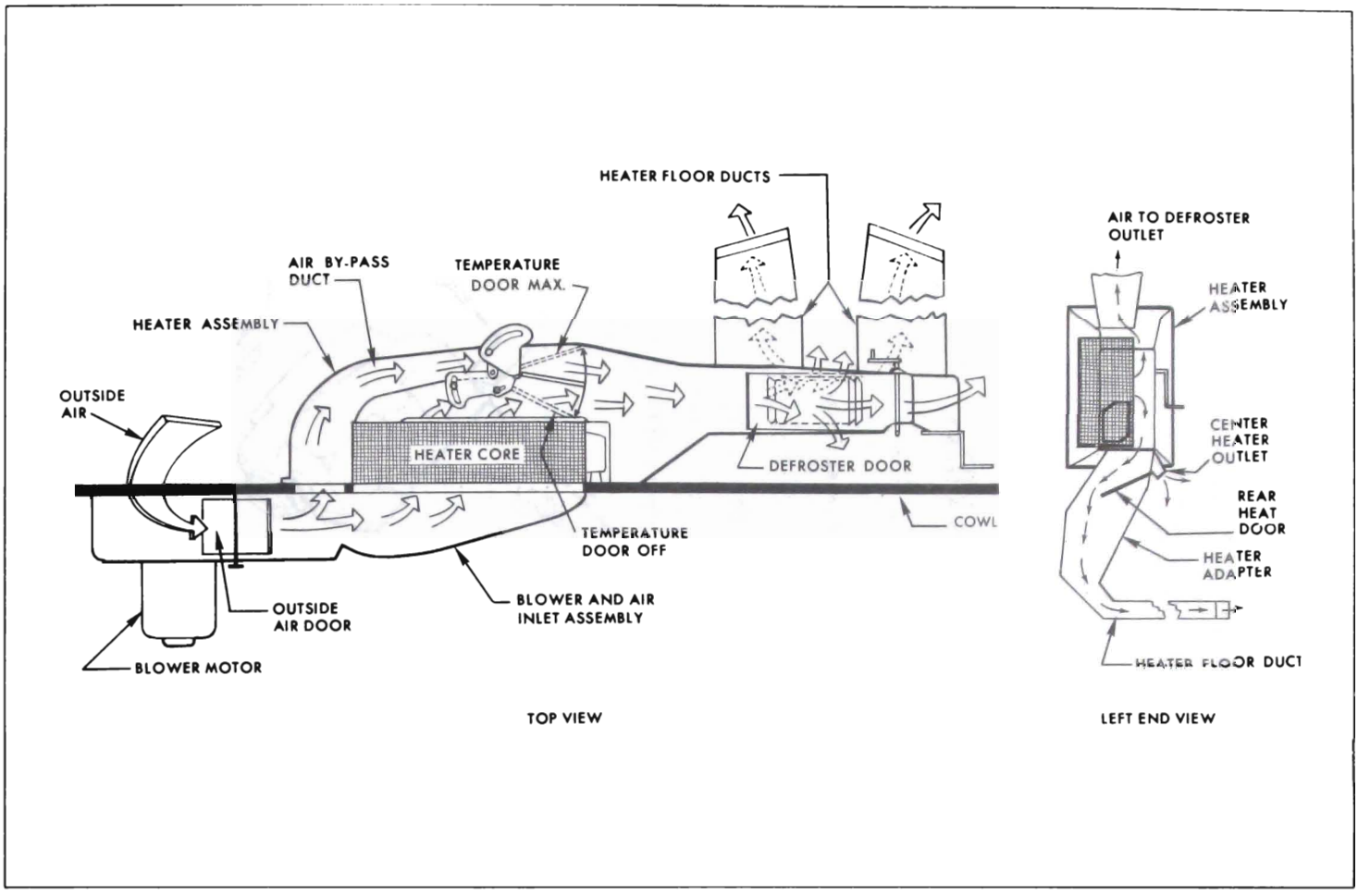


Figure 11-34—Heater System Air Flow - 4400, 4600 and 4800 Series

11-6 DESCRIPTION AND OPERATION OF HEATER SYSTEM (4700 SERIES)

The heater system for the 4700 series cars is essentially similar to the system for 4400, 4600 and 4800 series cars in so far as it is an air-mix type system, and the air flow is basically the same. The heater system has six major assemblies: (1) a blower assembly (see Figure 11-37) which houses the blower fan and motor; (2) an outside air door and case assembly which contains the outside air door, blower resistor assembly and the vacuum diaphragm to operate the door; (3) the air inlet assembly which houses the temperature door; (4) a heater assembly which contains the heater core; (5) console center duct and adapter assemblies (see Figure 11-38); (6) a heater and defroster control assembly which controls regulation of doors and blower motor.

The flow of coolant thru the heater system is as shown in Figure 11-39. A manual gate water valve shuts off flow of coolant thru heater core when system inoperative.

a. Description of Air Flow

The air flow (see Figure 11-40) is similar to 4400, 4600, and 4800 series heater system, except that the temperature door is located in the air inlet assembly. In addition, no rear heat door is provided so that there is a constant flow of heat to the rear outlets as well as the front outlets when air is being directed to the floor of the car.

b. Description and Operation of Heater System Controls

The heater system for the 4700 series cars has three control levers: HEATER TEMP lever, DEFROSTER lever, and BLOWER lever (see Figure 11-41). They function as follows:

Figure 11-35—Heater System Control Levers - 4400, 4600 and 4800 Series

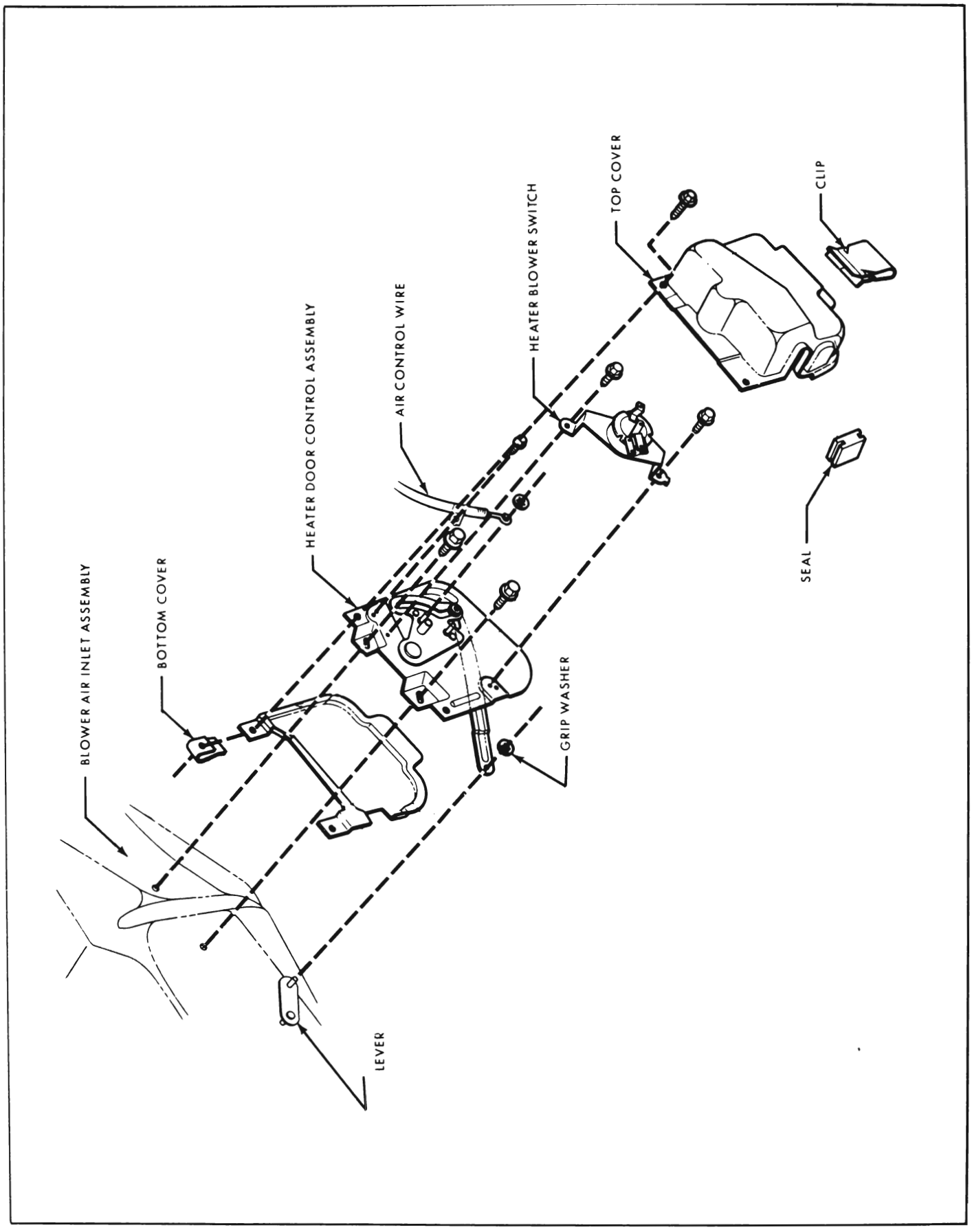


Figure 11-36—Heater Door Control Assembly - 4400, 4600 and 4800 Series

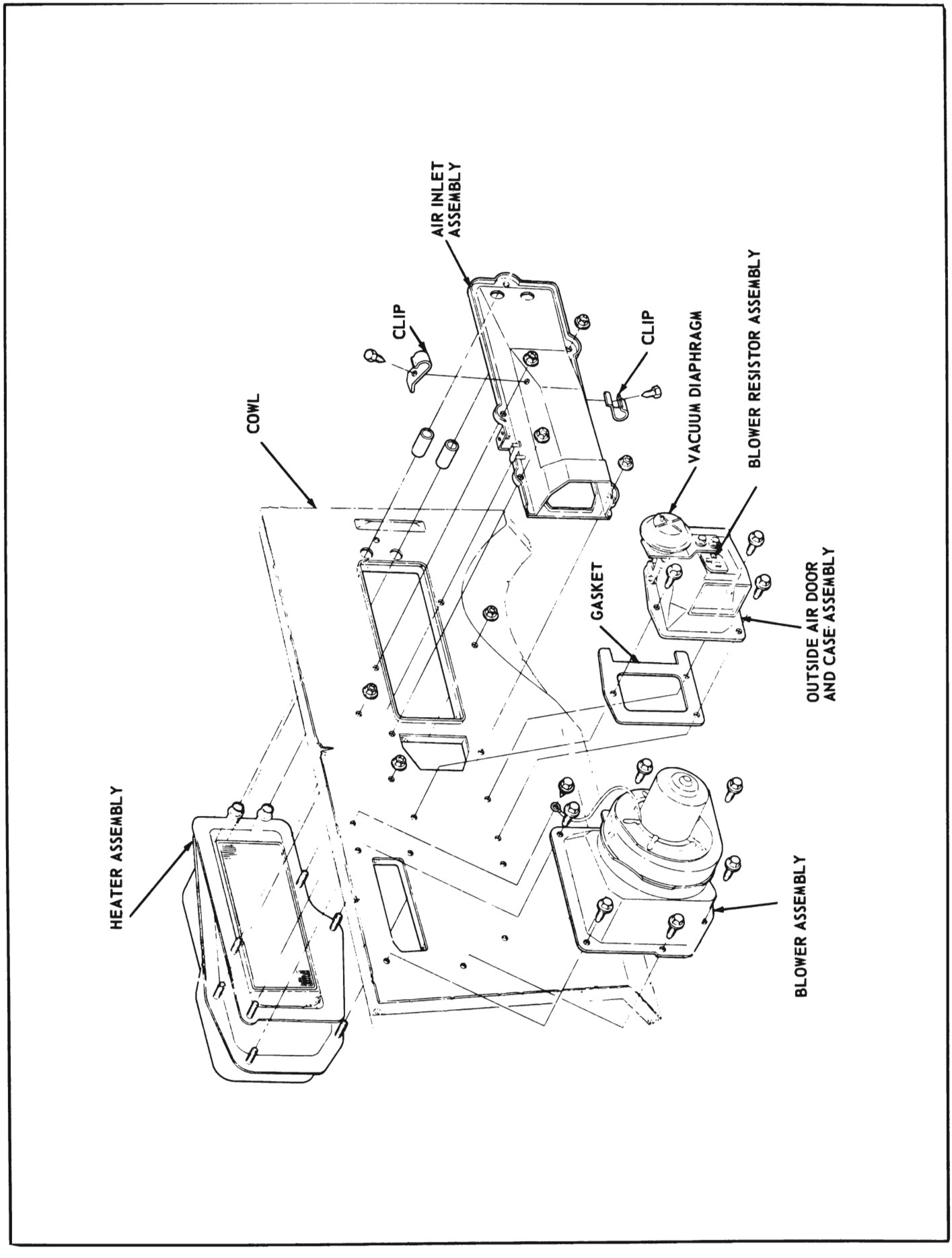


Figure 11-37—Heater System Installation - 4700 Series

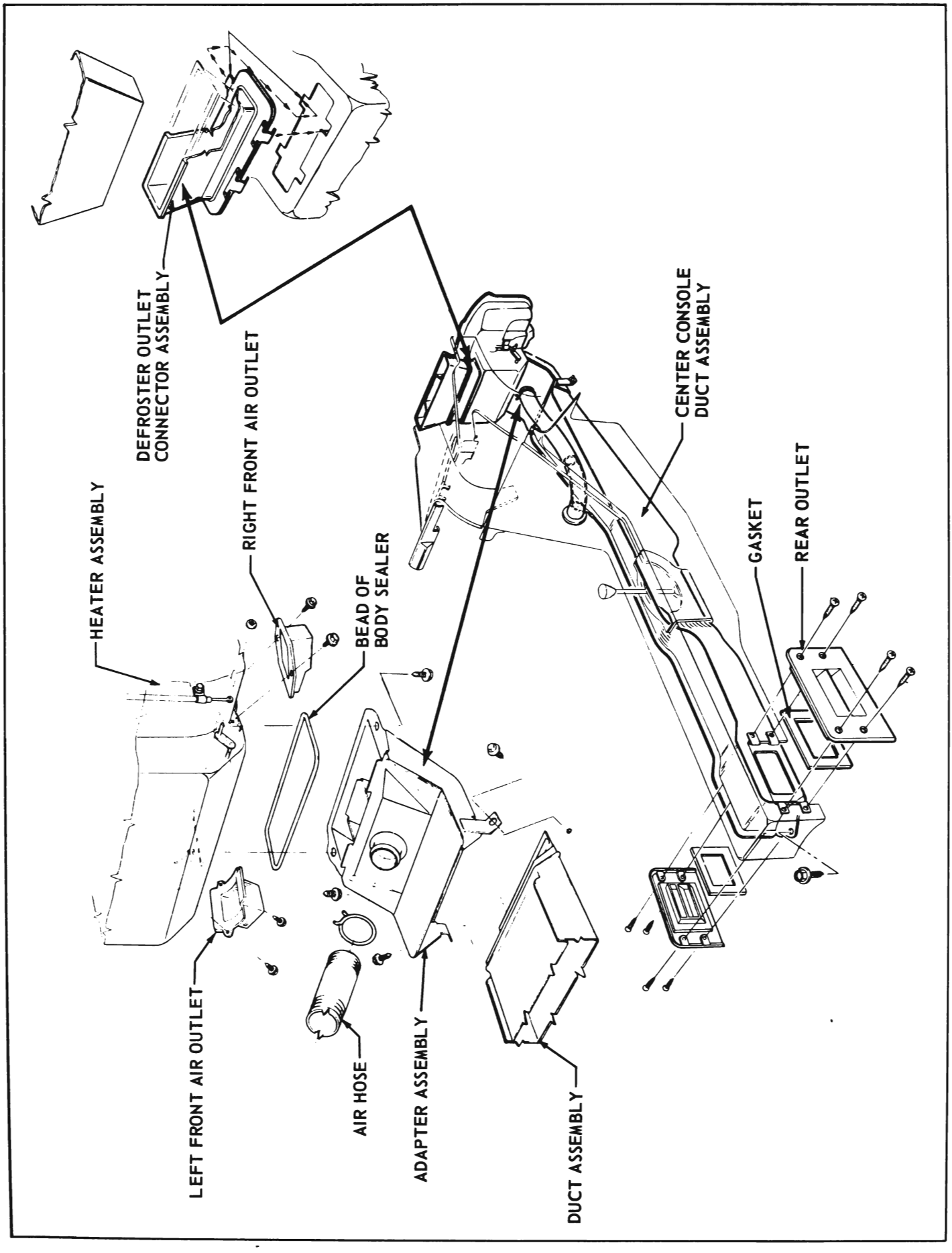


Figure 11-38—Heater System Installation - 4700 Series

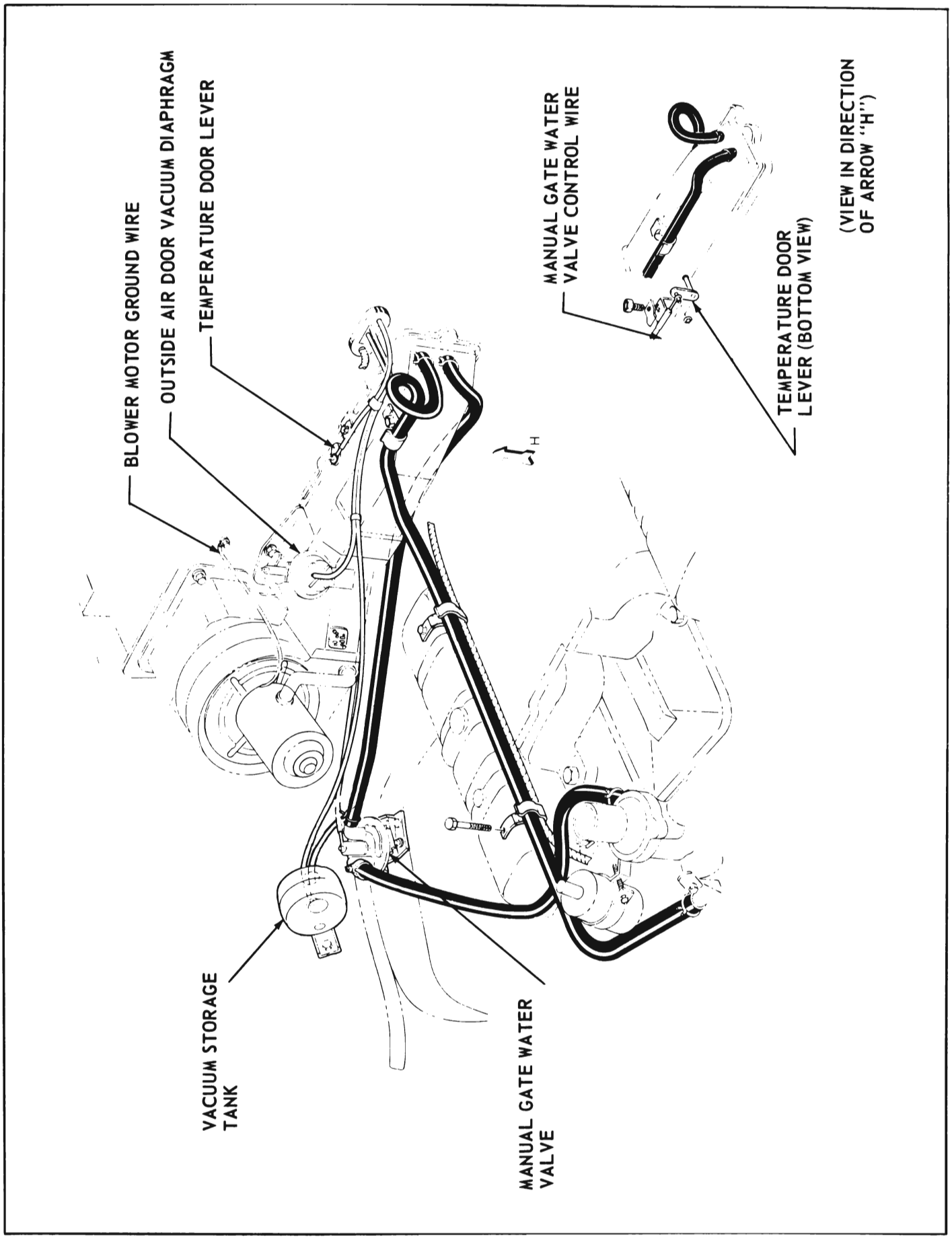


Figure 11-39—Heater System Coolant Circulation - 4700 Series

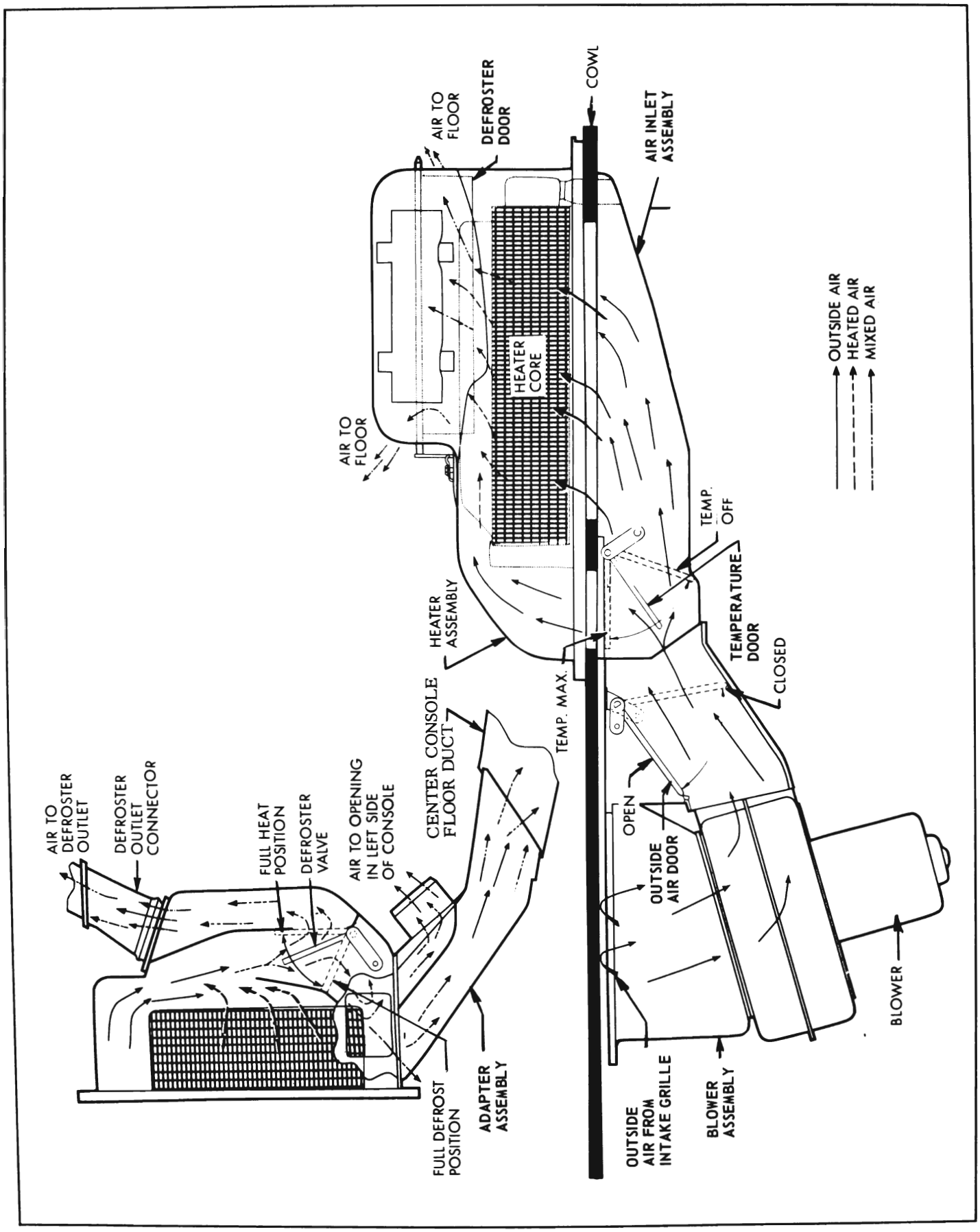


Figure 11-40—Heater Air Flow - 4700 Series

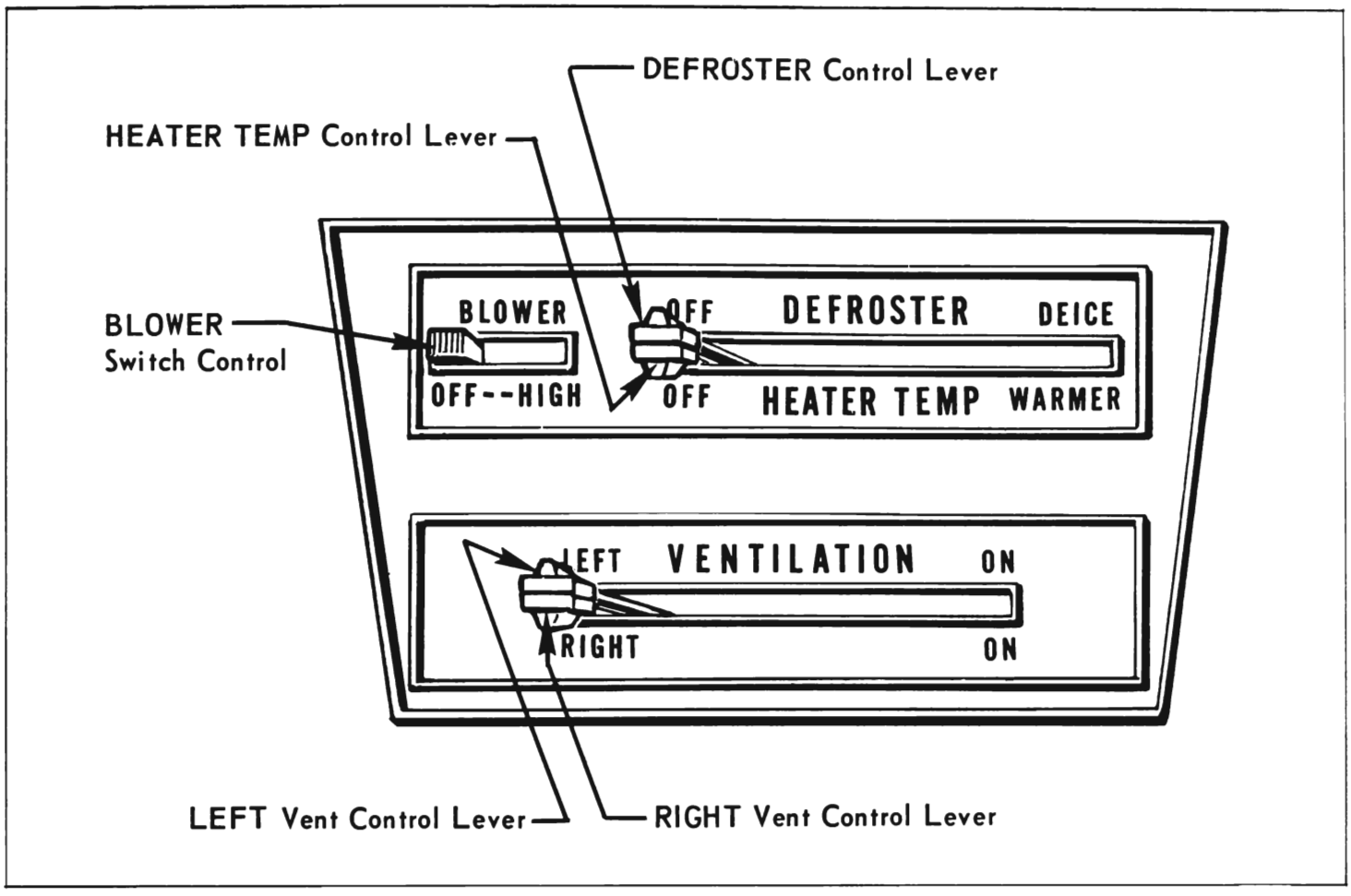


Figure 11-41—Heater System Control Levers - 4700 Series

1. HEATER TEMP Control Lever - This lever regulates the positioning of the temperature door, outside air door, closes one of the electrical switches necessary for operation of the blower motor, and also opens the manual gate water valve. Initial movement of the lever from OFF position applies vacuum to the vacuum diaphragm controlling the outside air door, and closes a switch in the blower circuit. Further movement of the lever opens the temperature door and manual gate water valve.

2. DEFROSTER Control Lever—This lever regulates the positioning of the defroster door. In addition, similar to the HEATER TEMP control, the lever also opens the outside air door and closes a switch in the blower circuit. Initial movement of the lever just past OFF position applies vacuum to the outside air door vacuum diaphragm and closes one of the blower circuit switches. Further movement of the lever opens the defroster door.

3. BLOWER Switch Control - This control operates a three position blower switch. First, second and third positions of lever respectively provide low, medium, and high blower speeds.

NOTE: For blower motor operation both switches (the switch controlled jointly by the HEATER TEMP and DEFROSTER control levers, and the switch controlled by the BLOWER lever) must be closed.

11-7 SERVICING HEATER SYSTEM COMPONENTS (4400-4600 AND 4800 SERIES)

a. Air, Temperature, Defroster and Rear Control Wire Adjustment

The air, temperature, defroster and rear control wires (see Figure 11-31) are all adjusted by means of adjuster nuts. To gain access to the adjuster nuts remove the glove box from instrument panel. Adjust position of control lever to full off and rotate adjuster nut until lever knobs are in line and lever has approximately 1/8 inch springback from full off position. Work lever thru travel several times and recheck for proper adjustment.

NOTE: When adjusting the air control wire, the manual gate water valve control wire should be disconnected. To install water valve control wire refer to subparagraph "b".

b. Manual Gate Water Valve Control Wire Installation

1. Position TEMP control lever and lever of manual gate water valve to full off.

NOTE: To set water valve to closed position--rotate lever in a clockwise direction until it touches pipe. TEMP control lever should have 1/8 inch springback (ref. subpar. "a") before installing wire.

2. Attach control wire to water valve lever and temperature door lever and secure in position. Work TEMP lever thru its travel several times and recheck for approximately 1/8 inch springback action, and to insure no binding action exists.

c. Heater Door Control Assembly Adjustment

The following adjustment is recommended if there is not full travel of the AIR control lever, or if the heater door control assembly is removed.

1. Position AIR control lever on instrument panel to full on.

2. Remove top cover (see Figure 11-36) from heater door control assembly and disconnect air control wire.

3. Loosen screws securing control assembly to blower and air inlet assembly and reposition control assembly so that lever of outside air door is fully open.

NOTE: To open outside air door, the door lever should be rotated in a clockwise direction.

When making adjustment be sure lever of heater door control assembly is fully extended.

4. Secure control assembly in position and reassemble air control wire to assembly.

5. Readjust air control wire as necessary (ref. subpar. "a").

6. Reassemble heater door control assembly and seal edges with body sealer.

d. Removal of Heater System Components

To remove heater core it is necessary to take out heater assembly. Removal of all components of heater system will be obvious on inspection (see Figures 11-42 and 11-43).

NOTE: Removal of two screws (see Figure 11-42) securing blower and air inlet assembly to cowl may be facilitated by taking off of hood right-hand hinge, and also right fender skirt antenna access hole cover (see Figure 11-9).

e. Right Vent and Left Vent Control Wire Adjustment

To adjust vent controls (see Figure 11-44), set vent knob 1/8 inch from full off position, fully close vent door and secure control wire sheath in position. To gain access to control wire clamp remove floor kick pads.

11-8 SERVICING HEATER SYSTEM COMPONENTS (4700 SERIES)

a. Heater Temperature and Defroster Control Wire Adjustment

The heater temperature and defroster levers are adjusted by means of adjuster nuts on the control wires (see Figure 11-45). To gain access to adjuster nuts remove three screws securing console left trim panel to center console and take out trim panel. Adjust control levers to full off and rotate adjuster nuts until lever knobs are in line and approximately 1/8 inch springback exists. Work lever back and forth several times and recheck for proper adjustment.

NOTE: When adjusting the heater temperature control wire, disconnect the control wire linking the manual gate water valve and the bottom lever of the temperature door (see Figure 11-39).

b. Manual Gate Water Valve Control Wire Installation

Position TEMP control lever and lever of manual gate water valve to full off.

NOTE: TEMP control lever should have 1/8 inch springback (Ref. subpar. "a"). To set water valve to closed position - rotate lever in a clockwise direction until it touches pipe.

Attach control wire to water valve lever and temperature door lever and secure in position. Work TEMP lever thru its travel several times and recheck for approximately 1/8 inch springback action, and to insure no binding action exists.

c. Removal of Heater System Components

To remove heater core it is necessary to take out heater assembly. Removal of all components of heater system will be obvious on inspection (see Figures 11-37, 11-38, and 11-46).

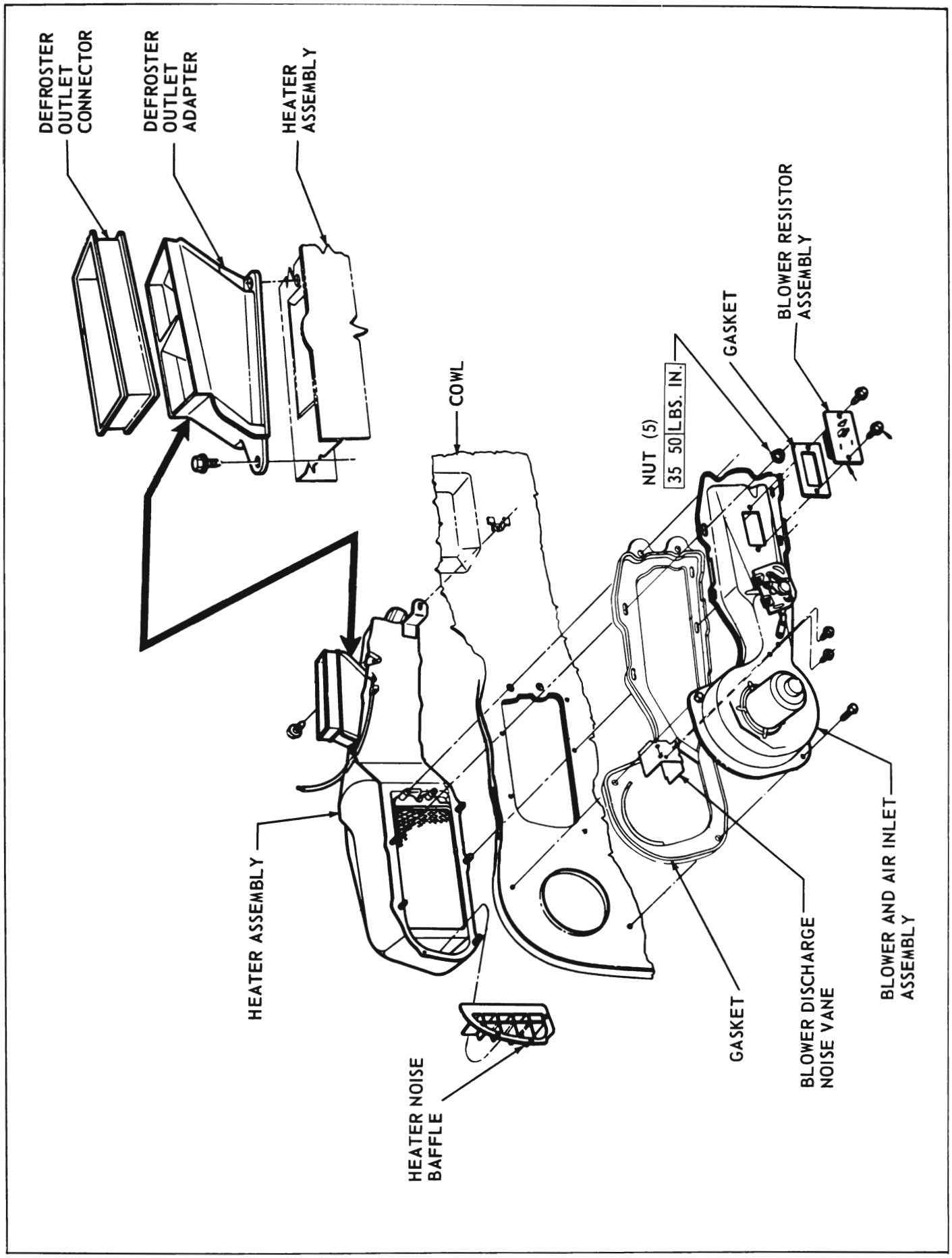


Figure 11-42—Heater System Installation - 4400, 4600 and 4800 Series

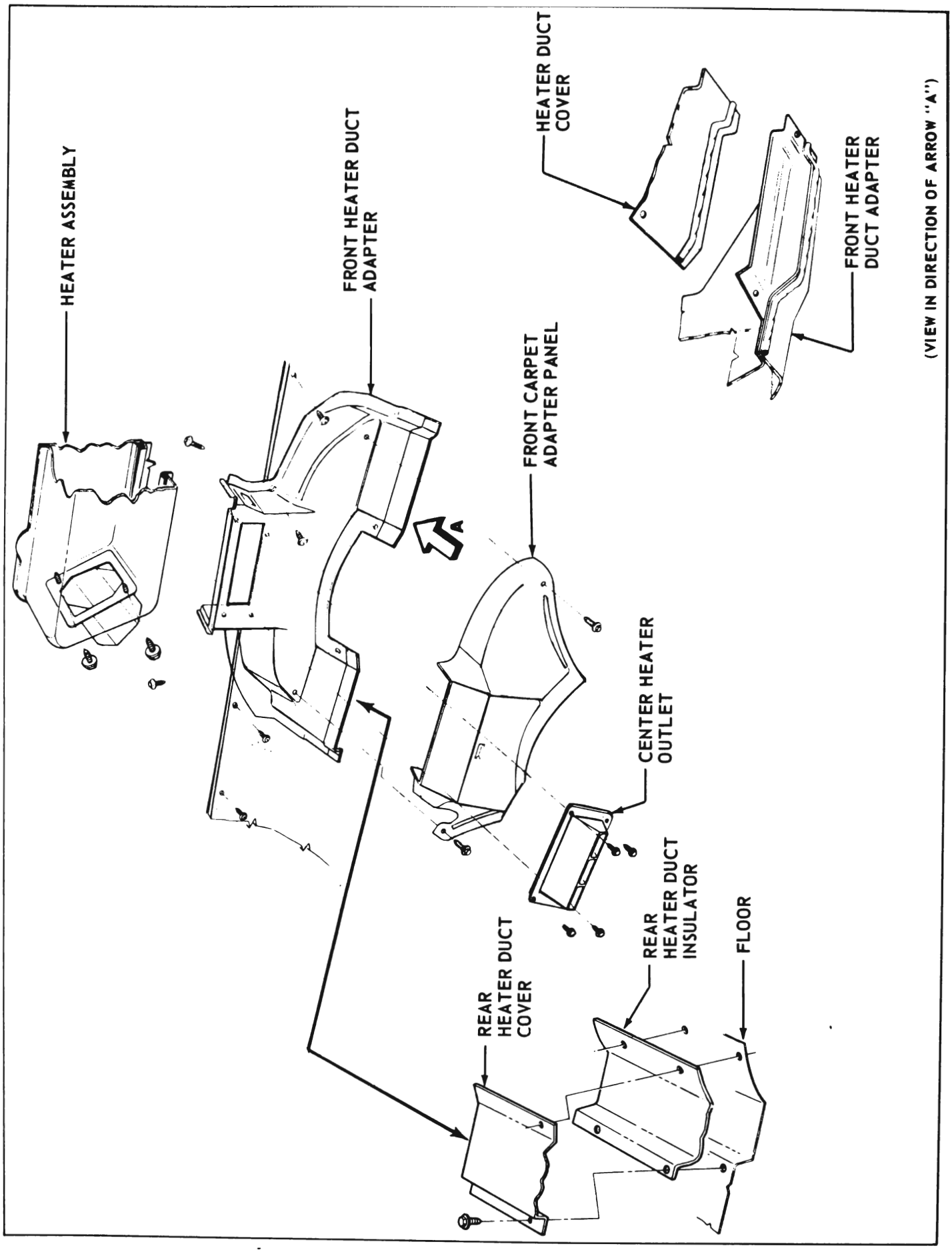


Figure 11-43—Heater System Installation - 4400, 4600 and 4800 Series

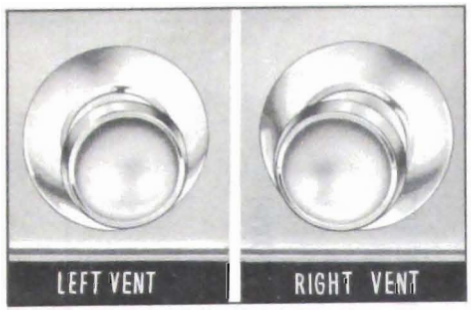


Figure 11-44—Vent Controls - 4400, 4600 and 4800 Series

d. Left and Right Vent Control Wire Adjustment

To adjust vent controls (see Figure 11-41) remove three screws and take out console left trim panel (see Figure 11-45). Rotate vent control wire adjuster nuts to obtain 1/8 inch springback when lever in full off position.

11-9 HEATER SYSTEM TROUBLE DIAGNOSIS

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

TROUBLE	CORRECTION
4400, 4600 & 4800 Series	
1. Blower motor inoperative.	1a. Check fuse. . 1b. Check for defective heater blower switch (see Figure 11-36). 1c. Check motor ground wire (see Figure 11-32). 1d. Check for defective blower resistor assembly (see Figure 11-32). 1e. Check for loose connectors or broken wires.
2. Insufficient heating.	2a. Check operation of outside air door (ref. subpar. 11-7, "a" and "c"), temperature door, and rear heat door to insure full opening and closing. 2b. Check for air leaks around sealing edges of components. 2c. Check for insufficient coolant.
3. Inadequate defrosting.	3a. Check operation of outside air door (ref. subpar. 11-7, "a" and "c"), temperature door or defroster door. 3b. Also refer to above corrections 2b and 2c.
4700 Series	
4. Blower motor inoperative.	4a. Check fuse. 4b. Check for defective heater blower switches (2) located on heater-defroster control assembly. 4c. Check blower motor ground wire (see Figure 11-39). 4d. Check for defective blower resistor assembly (see Figure 11-37). 4e. Check for loose connections or broken wires.
5. Insufficient heating.	5a. Check operation of outside air door (ref. subpar. 11-6, "b"), and temperature door (ref. subpar. 11-8, "a"). 5b. Also refer to above corrections 2b and 2c.
6. Insufficient defrosting.	6a. Refer to correction 5a. 6b. Check operation of defroster door (ref. subpar. 11-8 "a").

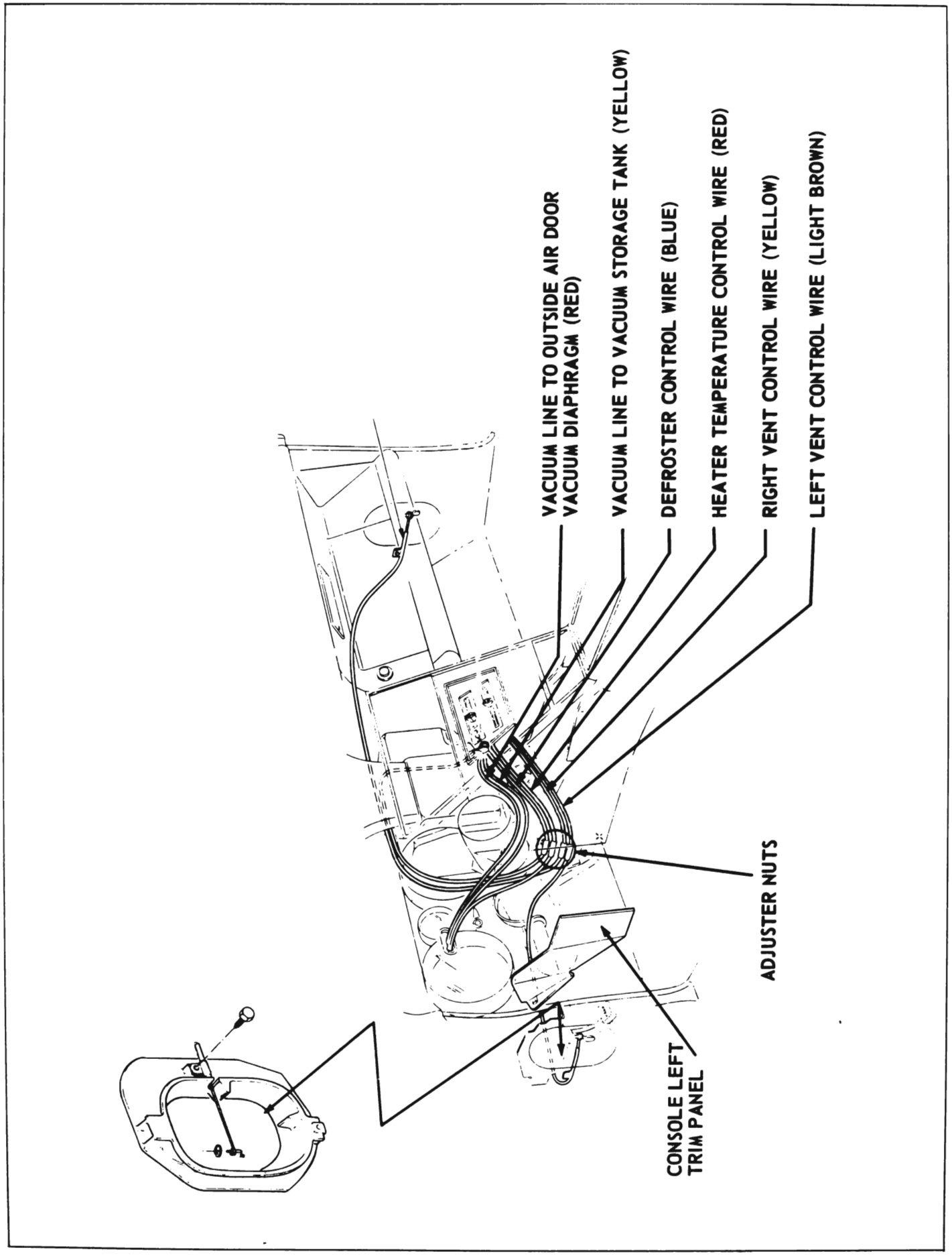


Figure 11-45—Heater System Control Wires - 4700 Series

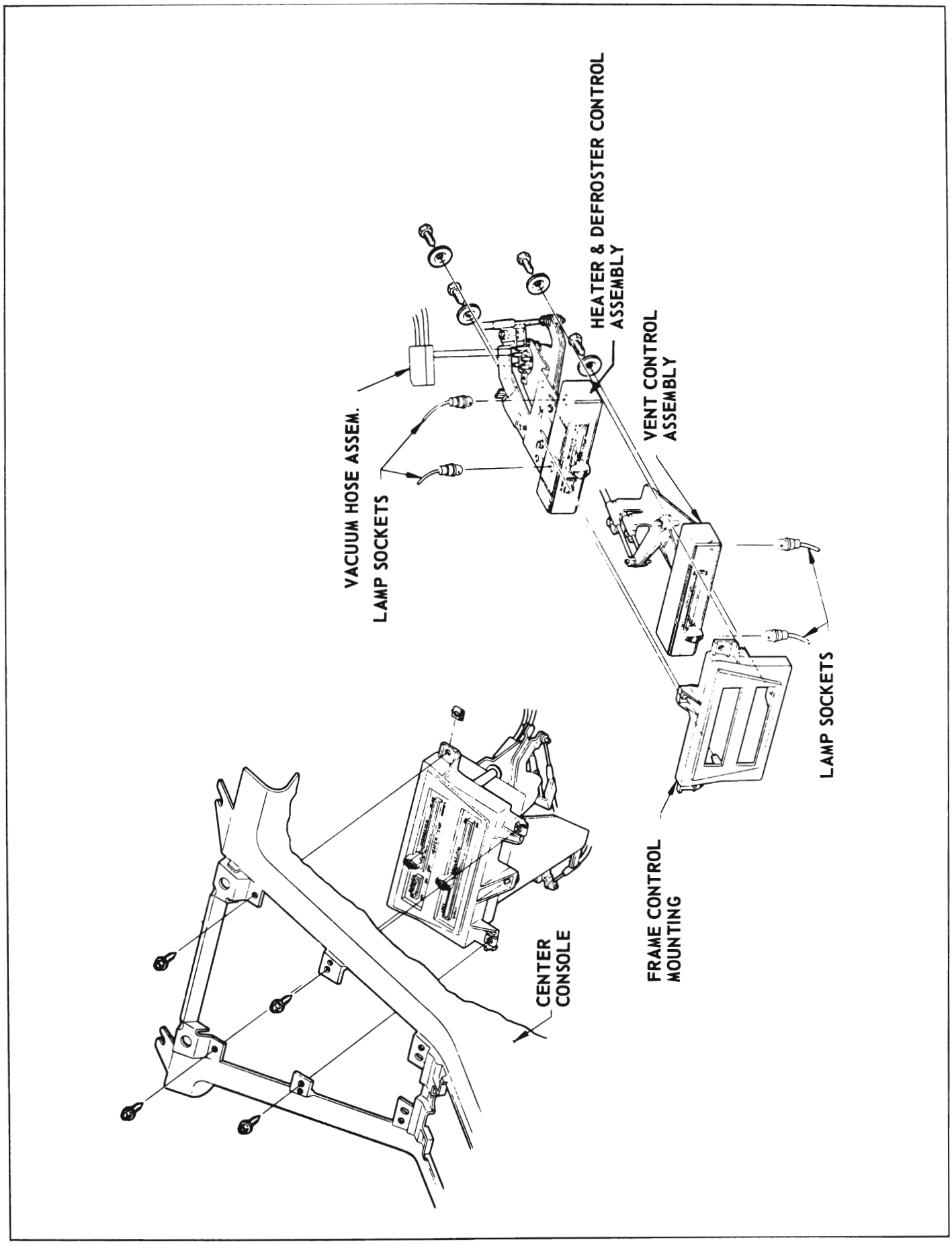


Figure 11-46—Heater and Defroster, and Vent Control Assemblies Installation - 4700 Series