

SECTION 11-B HEATER AND VENTILATION

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11-7 HEATER-DEFROSTER

There are three different heater systems used. These systems control the temperature by an air-mix process which vary amounts of hot and cold air to obtain the desired outlet temperature. The outside air entering the heater is separated into two air streams by a dividing baffle (temperature valve) in the air inlet, whereby part of the air passes through the heater core and the rest by-passes the core through a separate duct.

The 4700 Series heater and the

4400, 4600 and 4800 Series are very similar in operation. As the 4400, 4600 and 4800 optional heater-air conditioner operates differently from the standard heater, it is described in paragraphs 11-8 and 11-15. The 4700 standard heater operates the same as the heater used on 4700 air conditioner equipped cars. See paragraph 11-8.

a. Description of 4400, 4600 and 4800 Heater

The 4400, 4600 and 4800 Series heater, blower and air inlet assembly is located on the right side of the cowl in the engine

compartment. The air inlet directs incoming air to the heater assembly located under the instrument panel. An outside air valve is located in the air inlet. See Figure 11-26.

The heater assembly, besides housing the heater core and defroster valve, has a temperature valve and an air by-pass around the heater core. Front floor heating is achieved through openings in left end of case and floor duct connector. A rear floor duct is connected to the heater case by an adapter which houses a shut-off valve. The rear duct runs underneath the front seat to provide

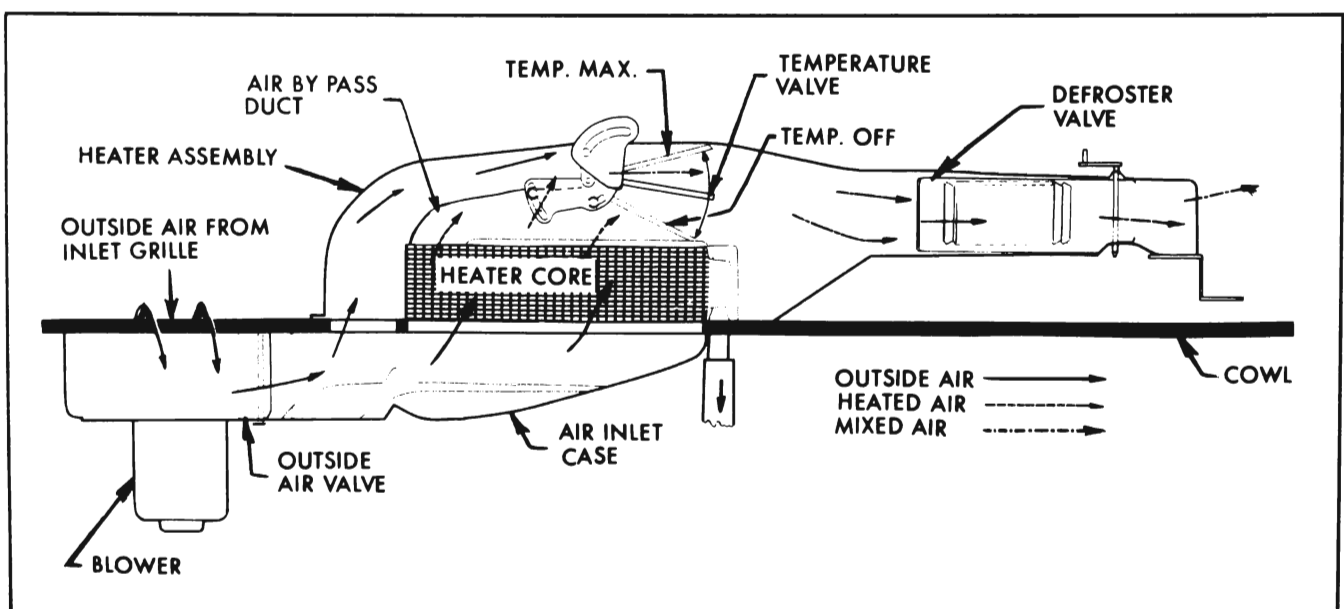


Figure 11-26—Heater Air Flow—4400, 4600-4800 Series

rear floor heating if desired. The defroster valve permits full lower lever air, lower lever-defroster air or full defroster air.

When the 4400, 4600 and 4800 heater system is in operation, outside air enters the cowl through the air inlet grille forward of the windshield. The air then flows through the blower and is routed into the heater assembly, either through the by-pass duct or heater core, depending on the position of the temperature valve. See Figure 11-26.

The air flow from the heater case to the front floor, rear floor and defrosters is determined by the position of the rear heat shut-off valve and the defroster valve.

The position of the temperature valve controls the heater air outlet temperature. If the valve is positioned so that the air by-pass duct is shut off, all air will be routed through heater core and outlet temperature will be maximum. When valve is positioned so that the heater core is closed

off, all air will enter heater case through the by-pass duct and will not be heated. As the temperature valve may be positioned anywhere from maximum heat to Off, the outlet temperature may be adjusted as desired.

Figure 11-28 shows the water flow to and from the heater core and the location of the heater control valve. The heater control valve which is operated by the "Air" lever wire controls the opening and closing of the outside air valve and the three blower motor speeds.

NOTE: The heater hose from the engine water manifold to heater core inlet pipe is 5/8" I. D. hose. The hose from core outlet to water pump is 3/4" I. D. As there is no water shut off valve to the heater core, the smaller inlet hose allows a slight reduction in pressure in the core.

b. Description of 4700 Series Heater

The heater used on the 4700 operates basically the same as the

4400, 4600 and 4800 heater even though the parts are not interchangeable between the two systems.

The 4700 blower and air inlet assembly is located on the right side of cowl in the engine compartment. Attached to the blower outlet is a shut-off valve case which connects the blower to the air inlet case. See Figure 11-29. The outside air valve is located in the shut-off valve case.

The air inlet case contains the temperature valve and has a manual water valve attached to it. The air inlet case is lined up so that air will be directed into the heater assembly. The heater assembly contains the heater core, an air by-pass, openings for front floor heating, defroster valve, opening for rear floor duct adapter and an opening for the defroster outlet connector. The rear floor duct adapter contains a rear shut-off valve. The rear floor duct is located inside the console and directs air to two outlets, one located on each side

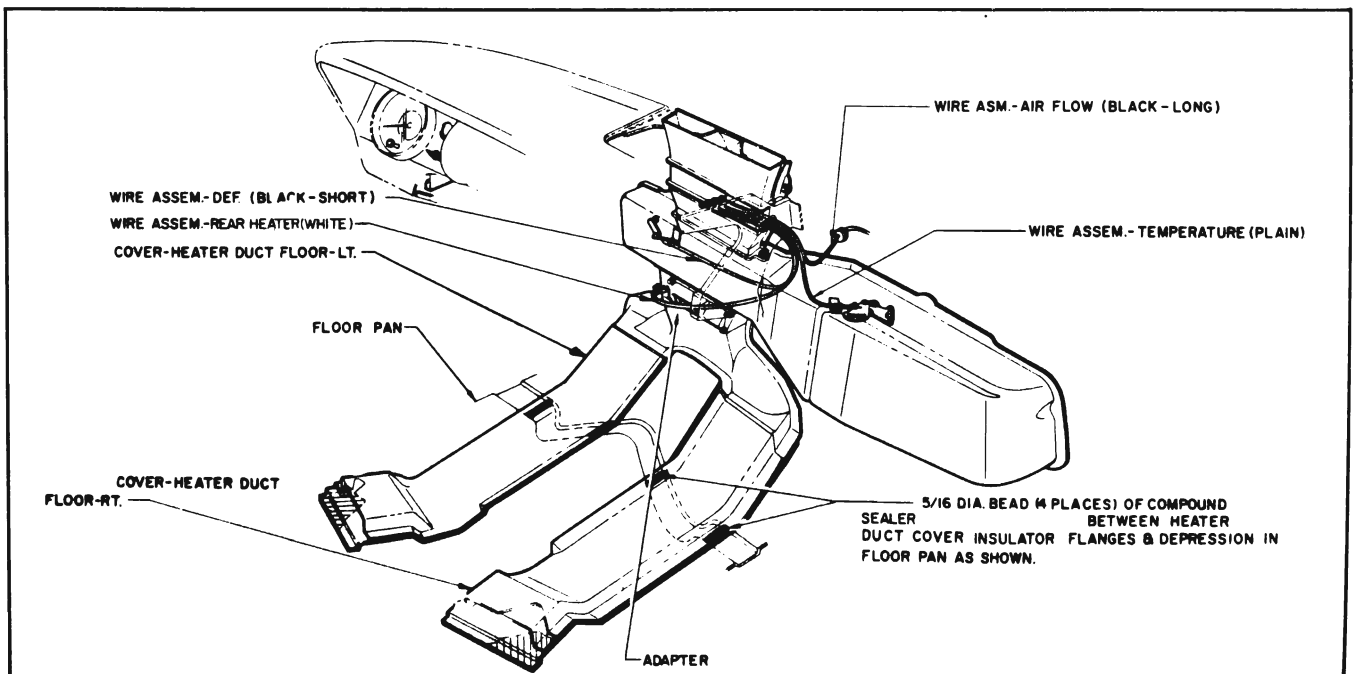


Figure 11-27—Heater Air Distribution System—4400, 4600-4800 Series

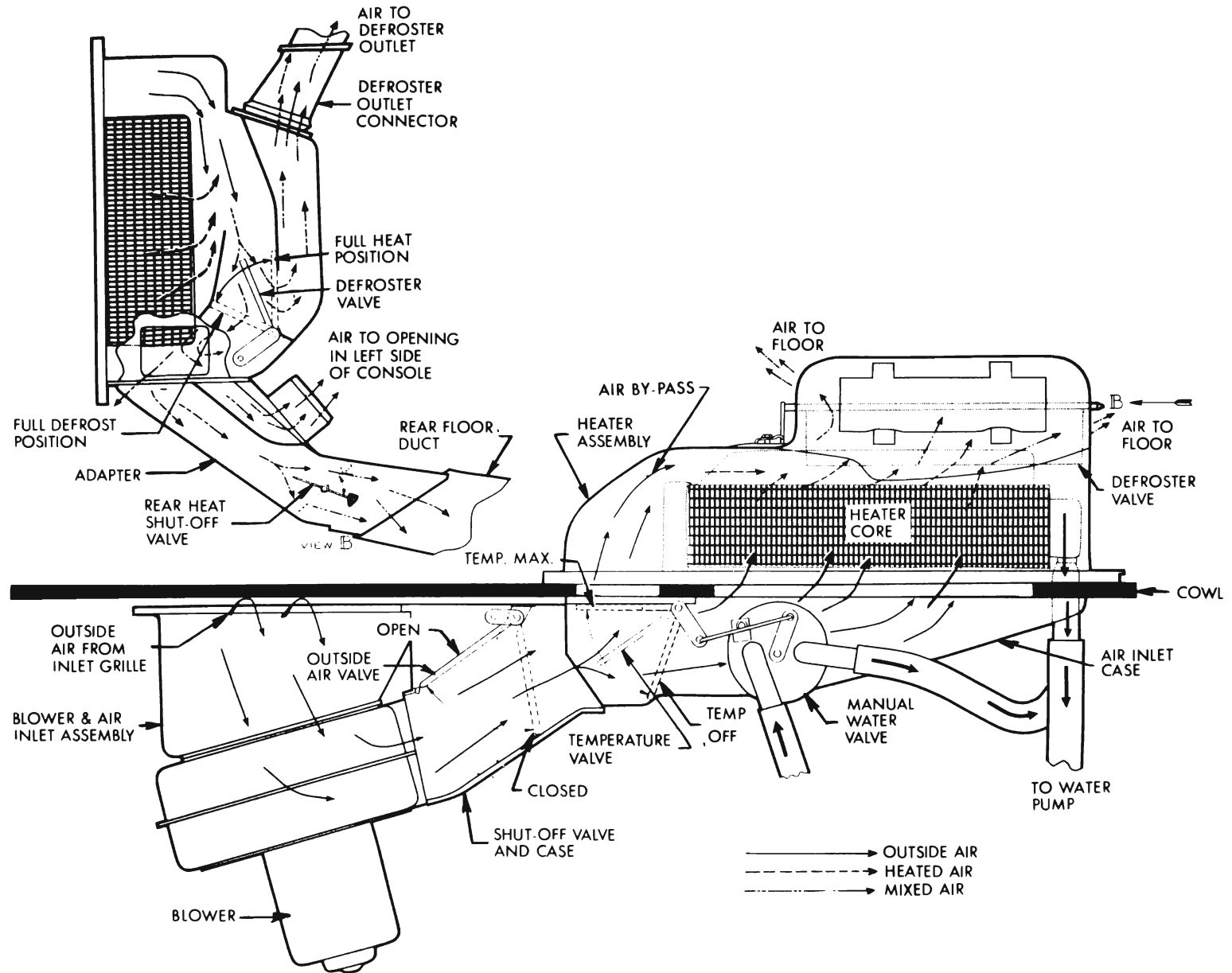


Figure 11-29—Heater Air Flow—4700 Series

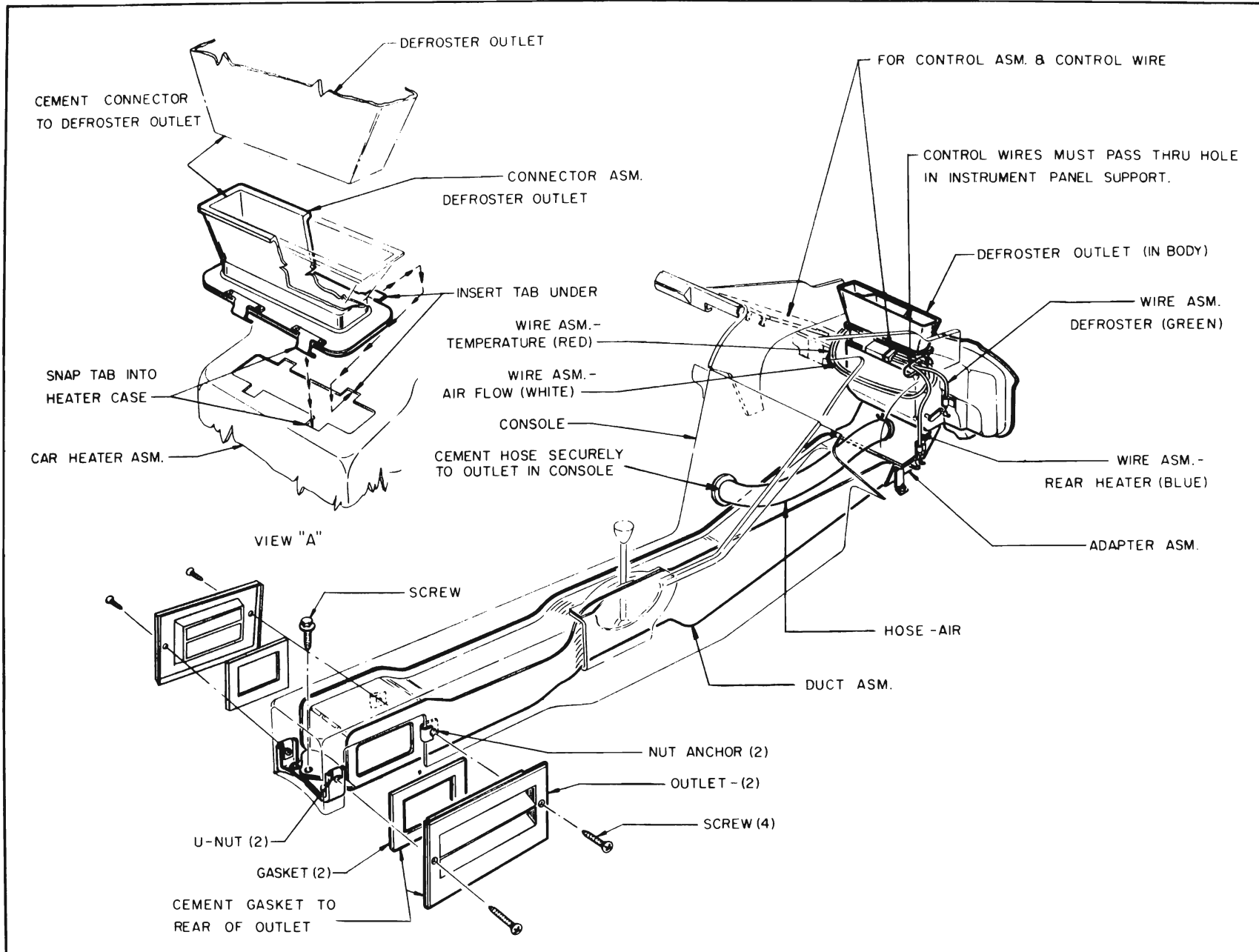


Figure 11-30—Heater Air Distribution System—4700 Series

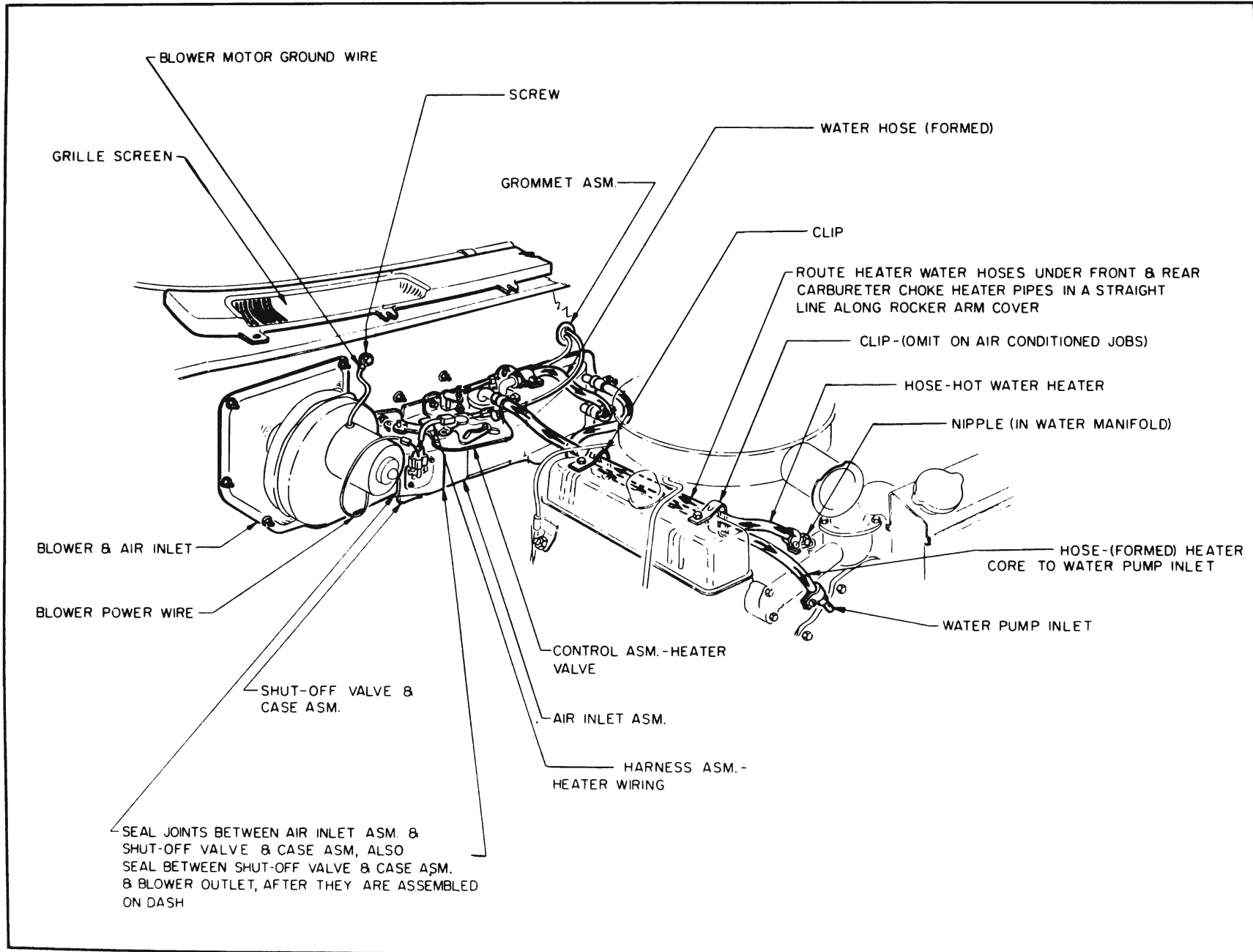


Figure 11-31—Heater Water Flow—4700 Series

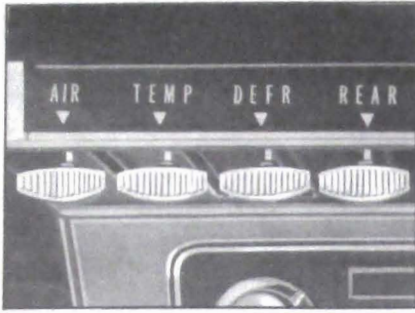


Figure 11-32—Heater—Defroster Control Levers

If heat is desired, the “TEMP” lever is moved forward from the off position.

The “DEFR” lever controls the amount of air to the windshield or to the lower area of car. The further this lever is moved forward from the off position, the greater the amount of air to the windshield.

The “REAR” lever controls the air valve located in the floor duct adapter. When moved from the off position the valve is opened, and the further forward the lever is pushed, the greater the air flow to the rear area of the car.

11-8 HEATER-DEFROSTER ON AIR CONDITIONER CARS

a. 4400-4600-4800 Series

The heater used on the 4400, 4600 and 4800 Series Air Conditioner Cars is of completely different construction than the standard heater. This heater may be used in combination with the air conditioner and has a manual water valve located on right front fender skirt. To operate heater, the “CLIMATE” control described in paragraph 11-15 and shown in Figure 11-64 must be at the “HEAT” position. The four levers will then operate the same as on the standard heater. The heater outlet temperature is controlled by the air-mix process.

The controls and air distribution system for the heater-air conditioner is covered in paragraph 11-15.

The heater used with air conditioner has the same “REAR” and “DEFR” control wire adjustments as the standard heater. The “AIR” lever wire connects to the blower and circuit control assembly mounted on the heater case under the instrument panel. The “TEMP” lever wire attaches to the temperature valve in the heater which has a second cable attached to its operating lever. This wire connects with the manual water valve located on the right fender skirt. Thus, first movement of the “TEMP” lever from off, fully opens the water valve and slightly repositions temperature valve to allow some air to pass through heater core.

b. 4700

The heater used on 4700 air conditioner cars operates the same as the standard heater as far as controls are concerned. A different control valve assembly is required as vacuum diaphragms are used to open and close air valves to direct the air flow through the heater and/or the air conditioner system.

The adjustment on the control lever wires are the same as the standard heater except the “AIR” wire which attaches to the control valve. This adjustment is covered in paragraph 11-17.

11-9 HEATER-DEFROSTER SERVICE PROCEDURES

For information pertaining to heater air conditioner cars refer to paragraph 11-17.

a. Control Wire Adjustment

The heater and defroster control wires are adjusted by rotating the adjusters which are part of the wire assembly.

To adjust any of the control wires, position the valve in the full off position. Then rotate the adjuster so that lever on instrument panel will be 1/8" from full off position. See Figures 11-33 and 11-34.

IMPORTANT: Always recheck adjustment, by again placing valve in off position and checking portion of lever on instrument panel. Levers should be lined up and 1/8" from off when valve is full off.

b. Manual Water Valve Adjustment—4700

The manual water valve on the 4700 Series heater is adjusted after the “TEMP” lever has been properly adjusted. To adjust this valve place “TEMP” lever 1/8" from full off.

Loosen the set screw on the water valve operating lever. See Figure 11-35. Rotate water valve lever to the full off or closed position (extreme clockwise) and tighten set screw.

c. Adjustment of Heater Control Valve Assembly

If the heater control valve is removed or if there is not full travel of the “AIR” lever the control must be adjusted. This is done by loosening the valve mounting screws and positioning the outside air valve to the full on (wide open) position, then with “AIR” lever full on, tighten the valve mounting screws. See Figure 11-36 and 11-37. After the

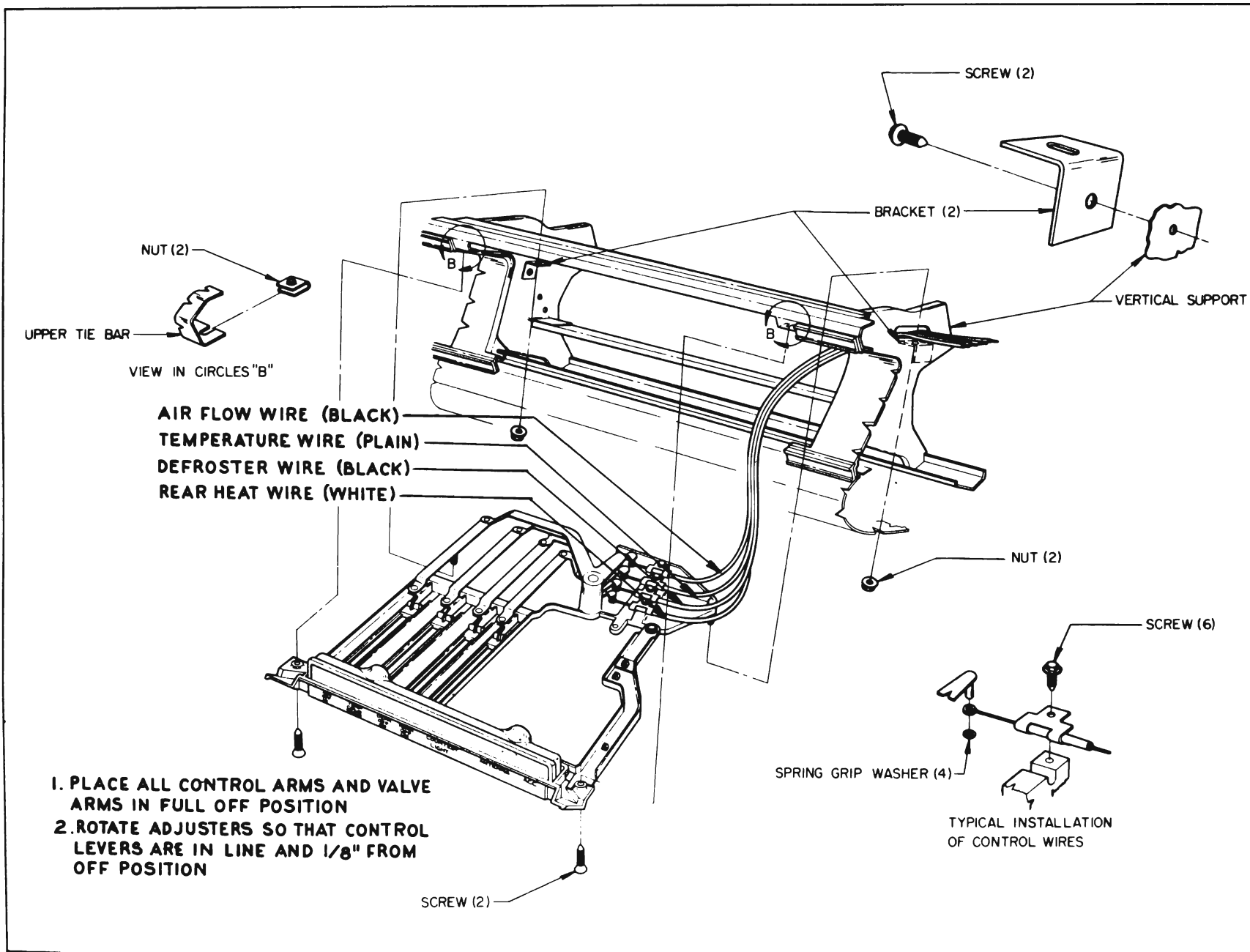


Figure 11-33—Heater Control Wire Adjustment—4400-4600-4800 Series

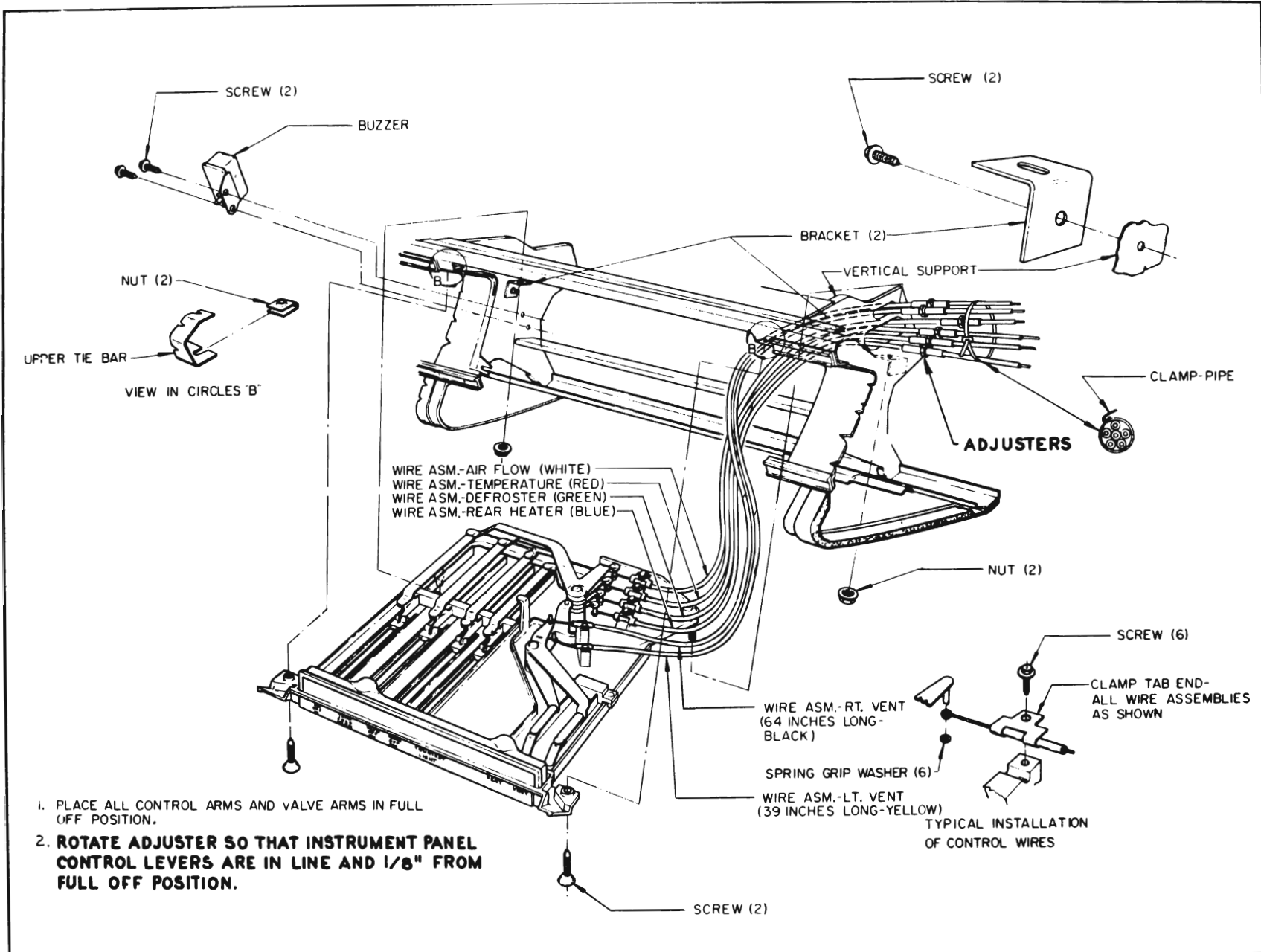


Figure 11-34—Heater and Vent Control Wire Adjustment—4700 Series

control valve has been adjusted the "AIR" lever control wire adjustment should be checked.

d. Removal of Heater Core and Air Inlet

To remove the heater core it is necessary to remove the heater assembly from under the instrument panel. Figures 11-38 and 11-39 shows the installation of the heater assembly and air inlet and blower assembly.

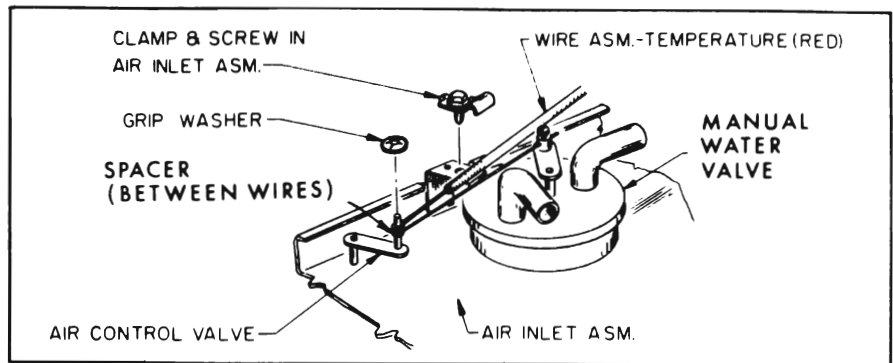


Figure 11-35—Manual Water Valve—4700 Series

11-10 HEATER-DEFROSTER TROUBLE DIAGNOSIS

COMPLAINT AND CAUSE	CORRECTION
a. <u>Insufficient Heating</u>	
1. Incorrect operation of controls.	1. Advise operator of correct operation of controls.
2. Outside air ventilators in cowl side panels not closed.	2. Check operation and adjustment of vent control wires.
3. Low engine coolant level.	3. Fill radiator to proper level. Fully open manual water valve on 4700 Series and run engine to clear air lock.
4. Failure of engine cooling system to warm up.	4. Check radiator cap and engine thermostat. Check for foreign material in thermostat. Replace if required.
5. Kinked heater hose.	5. Remove kink or replace hose.
6. Foreign material obstructing water flow in heater core.	6. Remove foreign material.
7. Temperature valve improperly adjusted.	7. Adjust "TEMP" lever control wire.
8. Heater outside air valve not open.	8. Check operation of valve and adjustment of "Air" control lever wire.
9. Blower inoperative.	9. See subparagraph d.
10. Heater hoses improperly installed.	10. See Figures 11-28 and 11-31.

11-10 HEATER-DEFROSTER TROUBLE DIAGNOSIS (Cont'd.)

COMPLAINT AND CAUSE	CORRECTION
b. <u>Inadequate Defrosting</u> 1. Outside air valve not open. 2. Defroster valve not operating properly. 3. Obstructions in defroster outlets at windshield. 4. Blower inoperative.	1. Check operation of valve and adjustment of "Air" control lever. 2. Check operation of valve and adjustment of "Defr" control lever wire. 3. Remove obstruction. 4. See subparagraph d.
c. <u>Too Warm in Car</u> 1. Incorrect operation of controls. 2. Loose "Temp" control wire.	1. Advise operator of correct operation of controls. 2. Adjust wire.
d. <u>Blower Inoperative</u> 1. Blown fuse. 2. Defective motor. 3. Open circuit. 4. Defective blower switch.	1. Replace 30 amp blower fuse on fuse block. 2. Replace. 3. Check wiring connections on blower switch and resistor. Locate open circuit and correct. 4. Replace.
e. <u>Inadequate Air to Rear Floor</u> 1. Shut-off valve in adapter not operating properly. 2. Foreign materials obstructing flow of air of floor duct.	1. Check operation of valve and adjustment of "Rear" control lever wire. 2. Check for objects blocking outlets of duct. Make sure passages in duct are completely open.

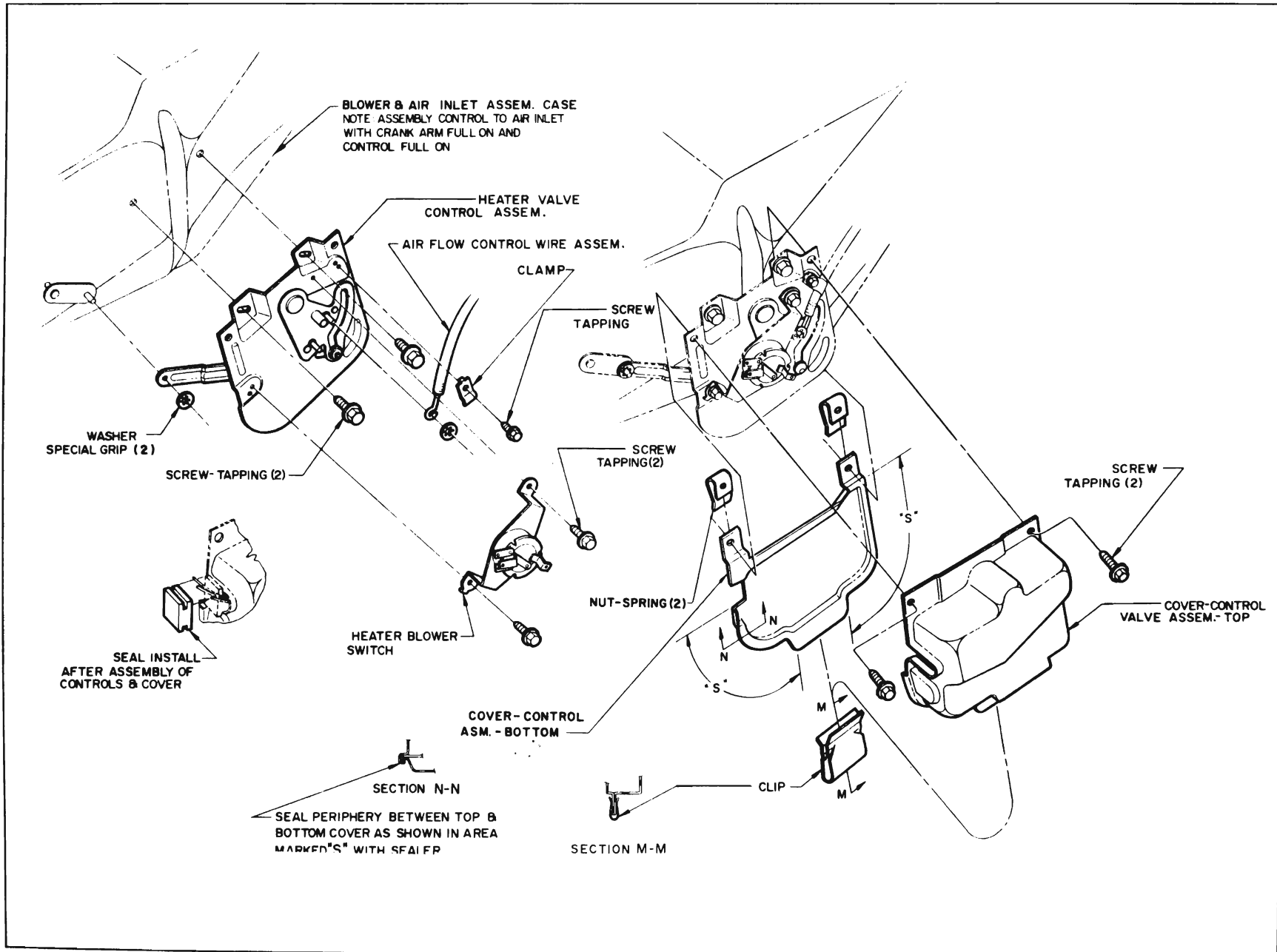


Figure 11-36—Heater Control Valve—4400-4600-4800 Series

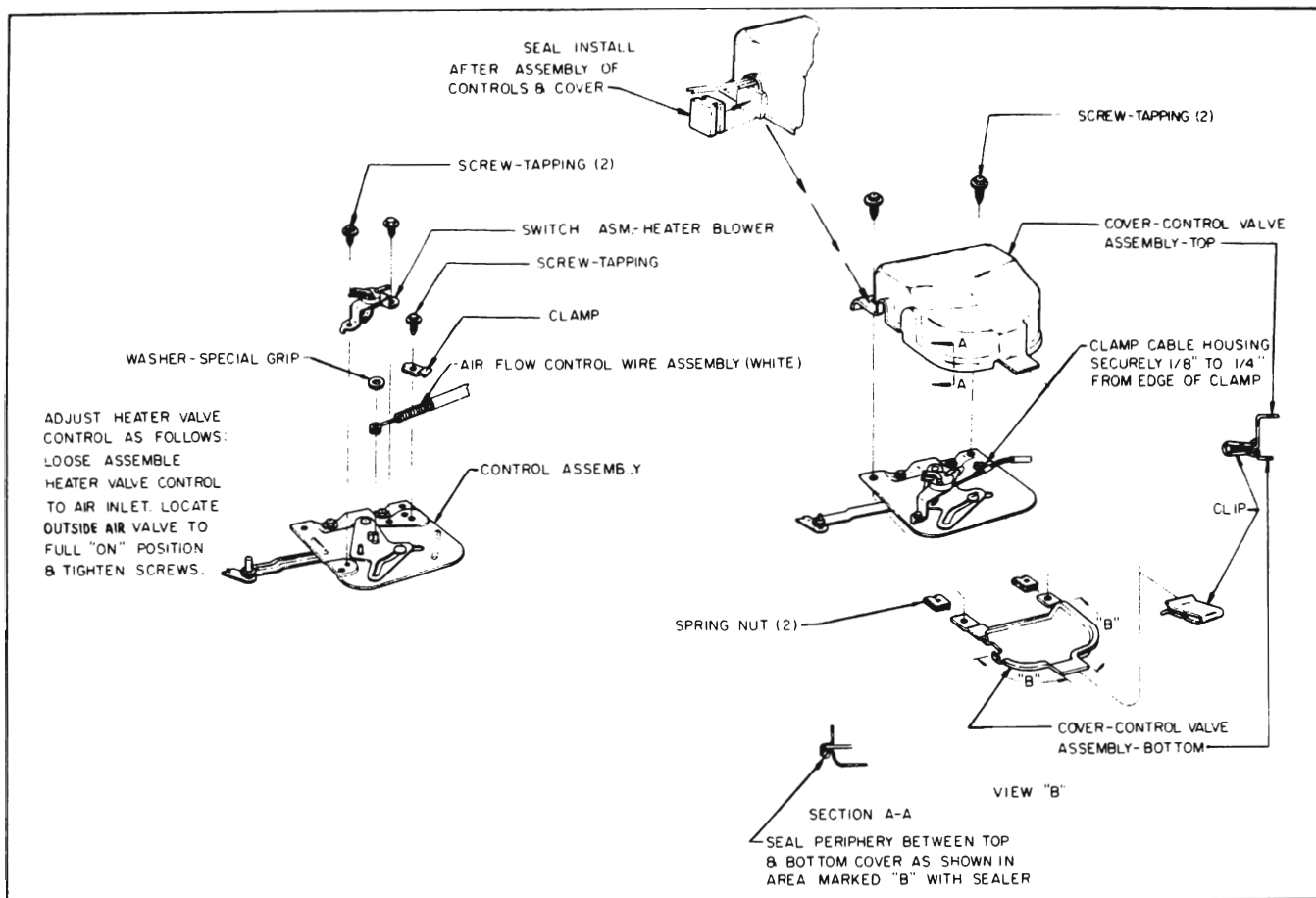


Figure 11-37—Heater Control Valve—4700 Series

11-11 OUTSIDE AIR VENTILATION

NOTE: The air conditioner system may be used for outside air ventilation without cooling. See paragraphs 11-14 and 11-15.

a. Description

Ventilation outlets in each cowl kick pad provide for outside air circulation directly to the passenger compartment. The control levers for the vents on the 4400-

4600 and 4800 are located on each side of the steering column in the instrument cluster. See Figure 11-40. The vent controls on the 4700 are located in upper edge of instrument panel to the right of the heater controls. See Figure 11-41.

On 4700 cars equipped with air conditioner, the vent controls consist of two push pull knobs, one located on each extreme lower edge of the instrument panel.

b. Control Wire Adjustment

On cars equipped with the lever type vent controls, the control wires are adjusted in the same manner as the heater control wires (par. 11-9).

To adjust the push-pull type vent control, set vent knob 1/8" from full off position, fully close vent valve and clamp sheath of control wire.

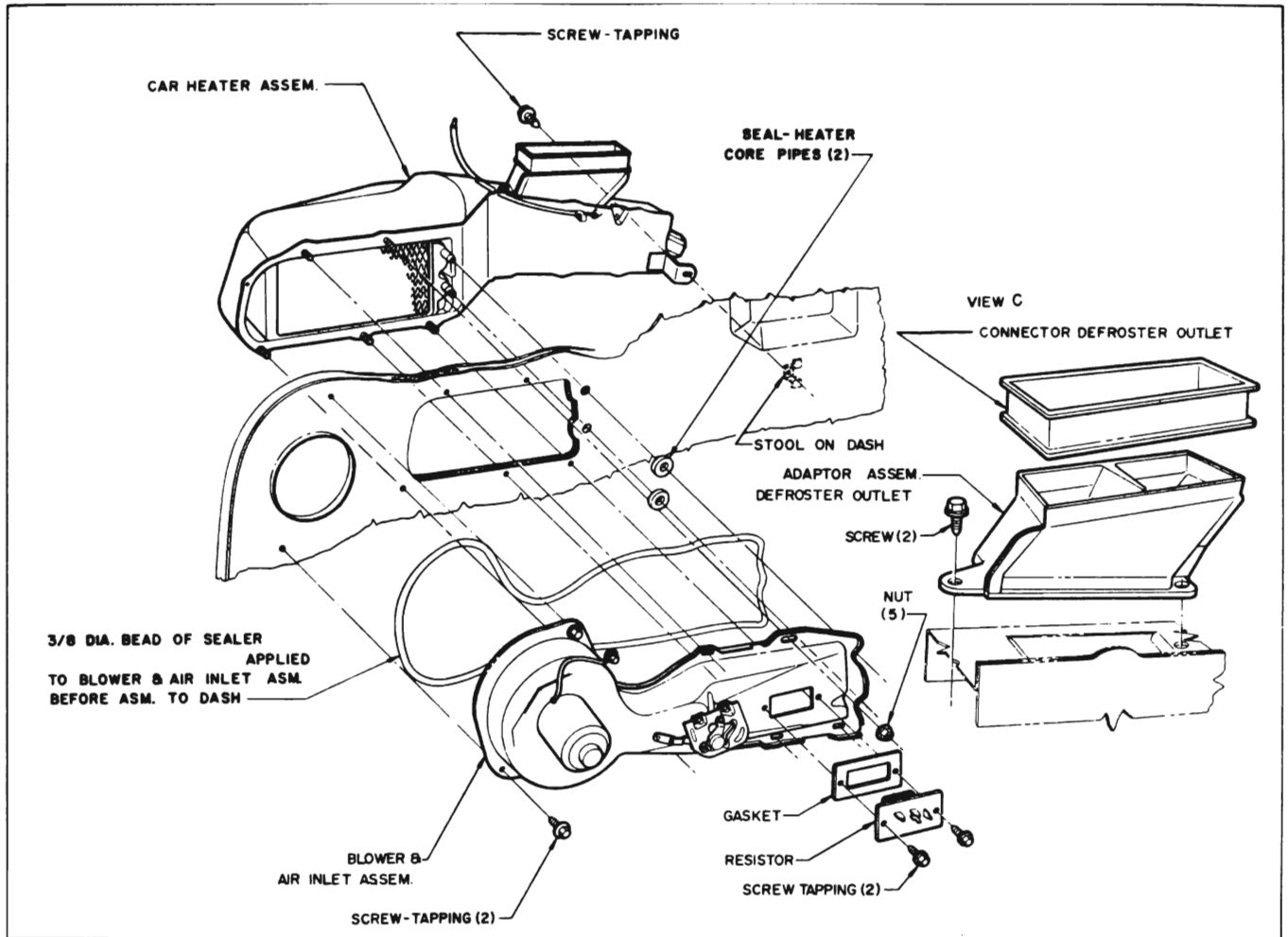


Figure 11-38—Heater Installation—4400-4600-4800 Series

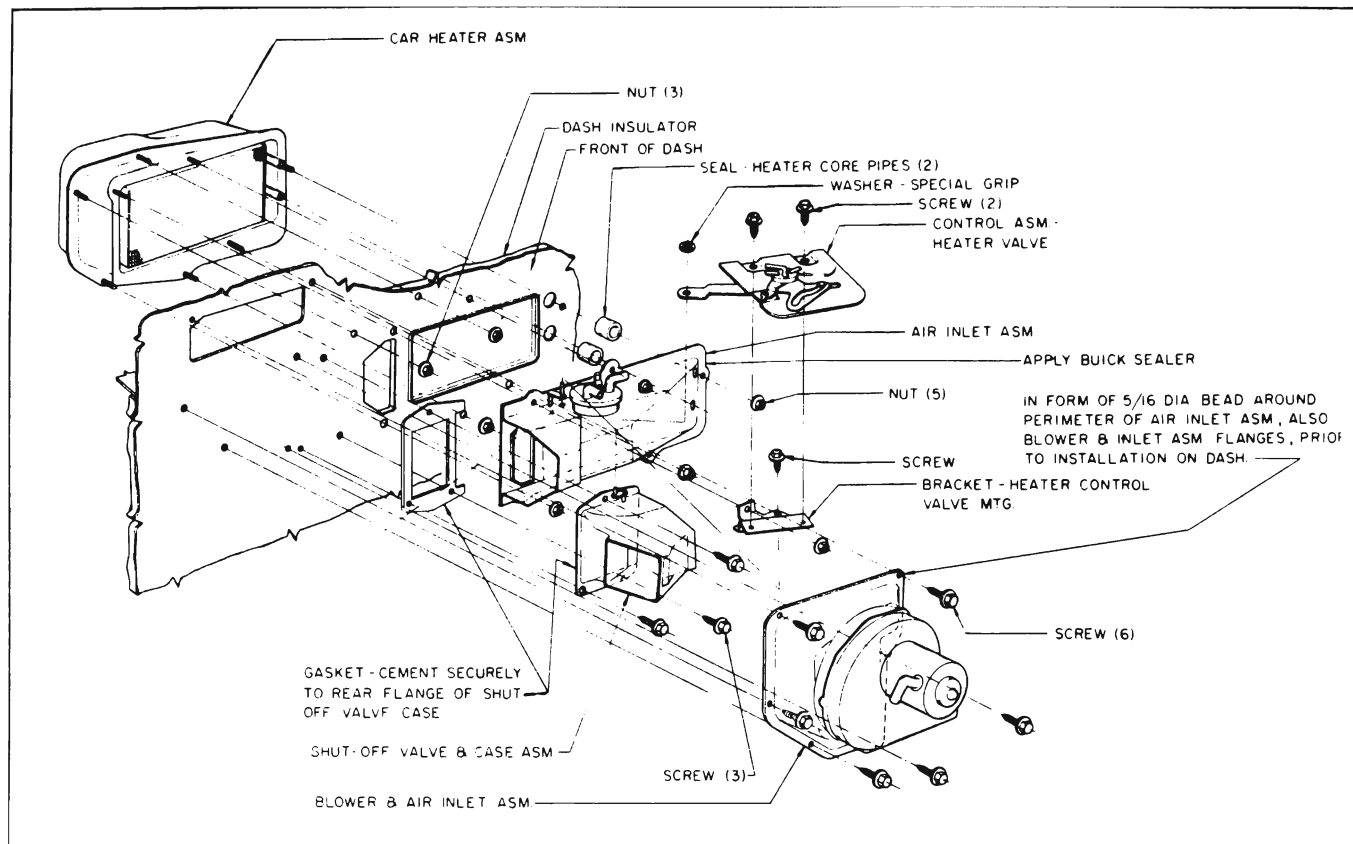
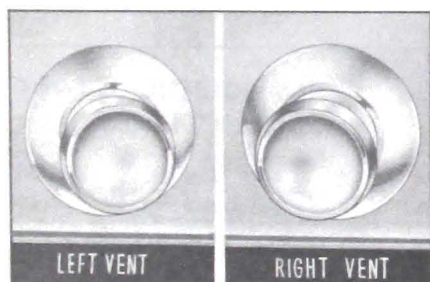
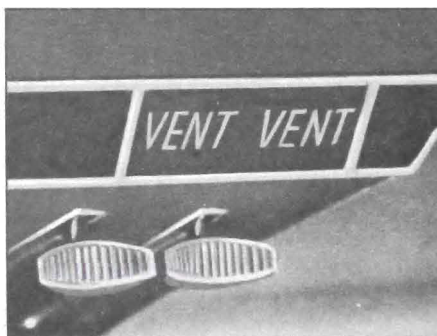


Figure 11-39—Heater Installation—4700 Series

Figure 11-40—Vent Controls—
4400-4600-4800 SeriesFigure 11-41—Vent Controls—
4700 Series