SECTION 11-B
HEATER AND VENTILATION

CONTENTS OF SECTION 11-B

11-7 HEATER-DEFROSTER DESCRIPTION AND OPERATION

a. Description

The heater-defroster assembly which utilizes outside air entirely, is standard equipment on all series.

The heater system consists of the air inlet duct and blower assembly mounted on right front side of cowl, the heater core and case assembly located at the center of cowl, and the heater air distributor located under center of instrument panel.

Attached to the heater core case is the water temperature control valve which regulates the flow of water through the heater core. The heater temperature control valve controls the temperature of the heater air entering the passenger compartment by regulating the flow of hot water through the heater core. This flow of hot water is regulated automatically by the signal from a capillary tube coiled on the inner side of the heater core. As a result, for any selected setting of the heat range control, relatively constant heater air temperature will be maintained at all car speeds. Water flow through the heater on the V-8 engine when the temperature control valve is open, is from the rear of the intake manifold through the temperature control valve, into the top of heater core, through core, out of core at bottom and to suction side of water pump. See Figure 11-9.

Water flow through the heater on the V-6 engine, is from the right front side of the intake manifold, through the temperature control valve into the top of heater core, through core, out of core at bottom and to suction side of the water pump. See Figure 11-10.

Located in the right side of heater core case is the outside air valve which allows air to enter the case when in the open position and shuts off air flow when closed. See Figure 11-9. Positioned to the rear of the heater core case assembly and inside passenger compartment is the heater air distributor. See Figure 11-11.

The air distributor has fixed-vane outlets on both ends which dis-

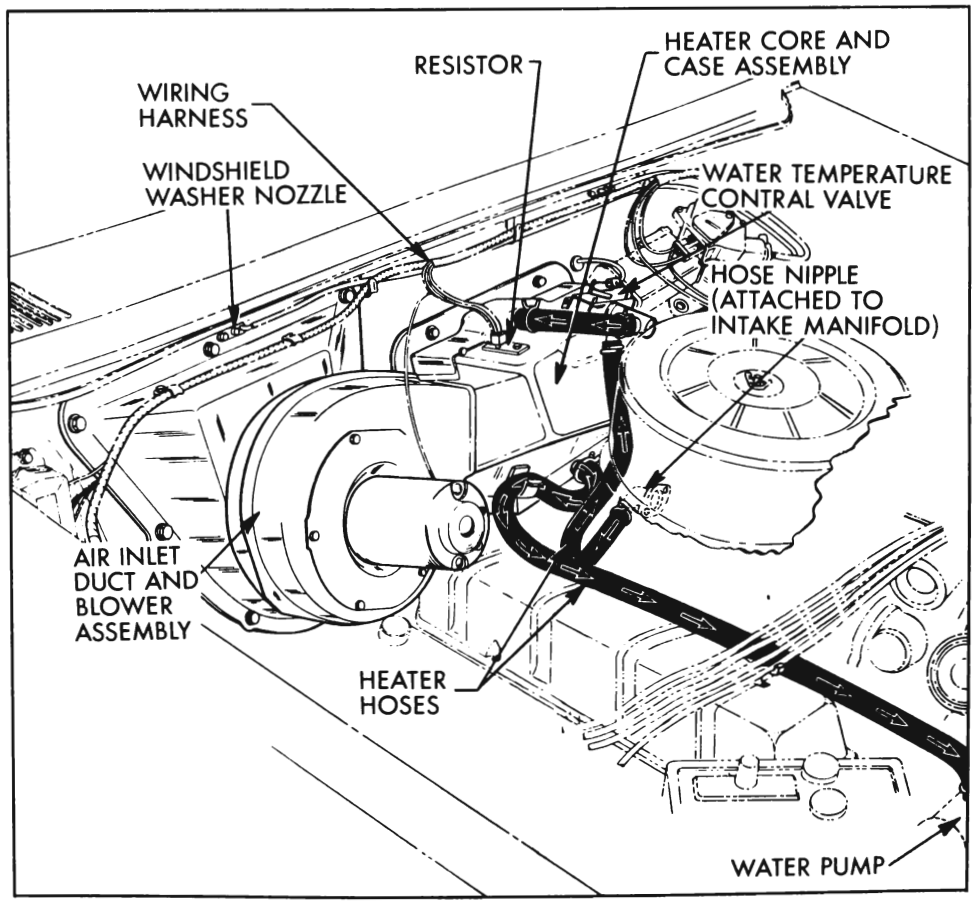

Figure 11-9—Heater Water Flow - V-8 Engine

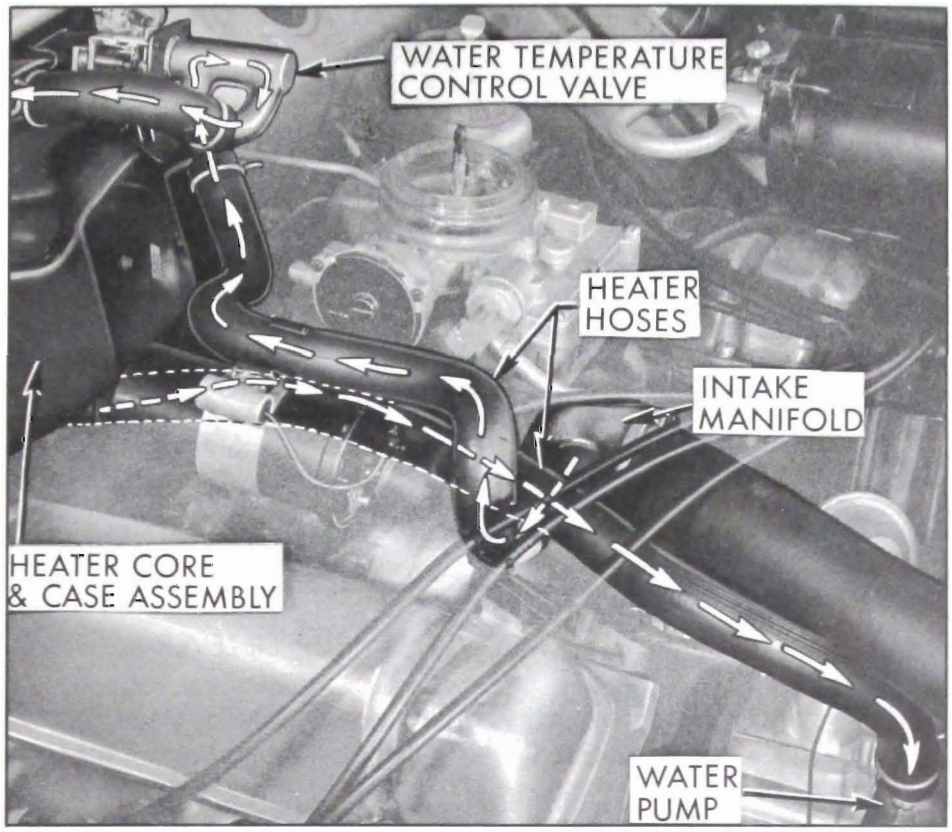

Figure 11-10—Heater Water Flow - V-6 Engine

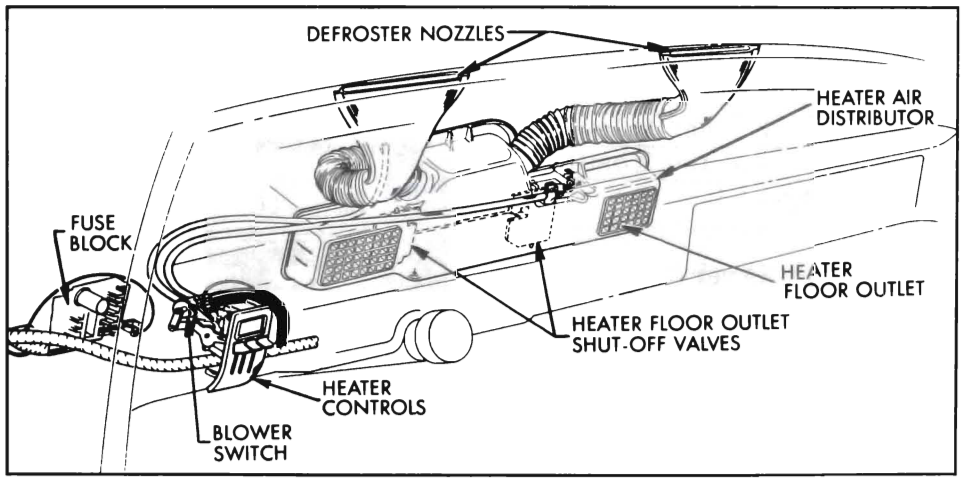

Figure 11-11—Heater Air Distributor

tribute air over the front and rear floors of the car. Also contained in the distributor are the defroster pipes which connect to the nozzles with hoses, and two valves which are used to shut off air flow to the floor outlets. Air flows through the defroster nozzles at all times, but very little air passes through them until the valves to floor outlets are closed, then all air is directed to the nozzles.

Air flow through the heater system when the outside air valve is open, is through the inlet grille forward of the windshield reveal molding, through air inlet and blower assembly, into heater core case and through core into heater air distributor. See Figure 11-12. The distributor directs air to the floor of car and to the defroster nozzles, the amount of each is controlled by position of the floor outlet valves.

Controls for the heater and defroster are located at the left side of instrument cluster and consist of three levers. See Figure 11-13.

The "Fan" lever controls the three-speed blower switch. In the up position, blower is off and as the lever is moved downward, a low, medium and high blower speeds are provided in that order.

The "Temp" lever controls the setting of the water temperature control valve by means of a bowden wire, from off in the up position to maximum heat in the down position.

The "Air" lever controls the opening of the outside air valve and the positioning of the two shut-off valves in the heater air distributor by means of two bowden wires and the lever mechanism on distributor. See Figure 11-12. The "Air" control lever has a center detent position. In the full up position the outside air valve is closed. When the lever is moved downward to the detent "on" position, the outside air valve is opened. The valves in the distributor are open as the moving of the "Air" lever from off to the detent has no effect on their position. The center detent position allows maximum air flow to the car floor. Moving the "Air" lever farther down from this detent closes the valves in the distributor and increases the air flow to the defroster nozzles. Maximum air flow for defrosting is obtained when lever is fully down.

All water heater hoses and fittings are 3/4" I.D. diameter.

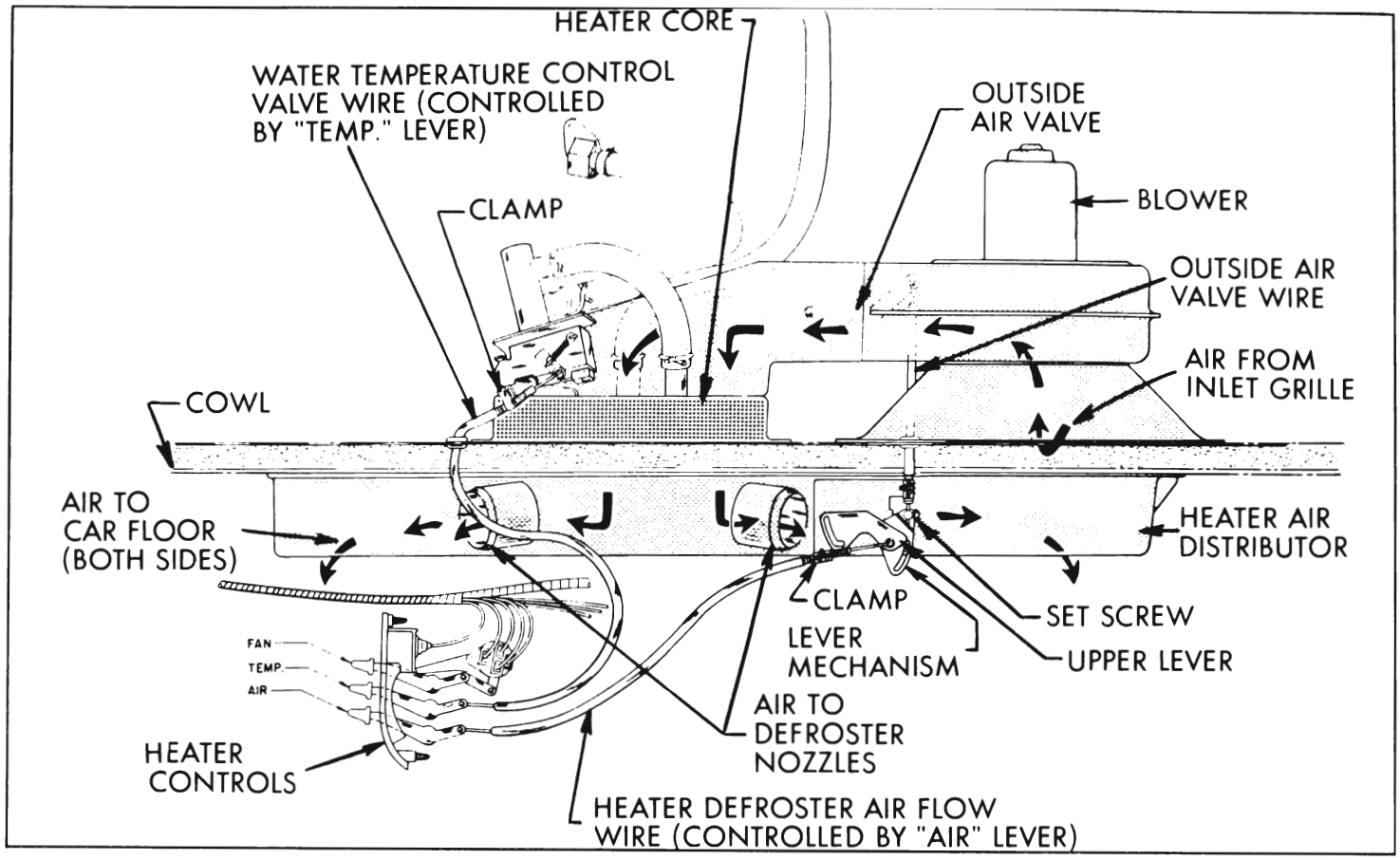

Figure 11-12—Heater Air Flow and Control Wires

A 168° F. thermostat is used as standard equipment on all jobs which provides ample heating capacity, particularly under idle conditions.

b. Operation of Controls

Operation of the heater and defroster is controlled by the three levers described in subparagraph a and shown in Figure 11-13.

1. "Air" Lever

To place either heater or defroster in operation, the "Air" lever must be moved down from off position. If floor heating is desired and defrosting is not, move "Air" lever down to center detent ("on") position. Any downward movement beyond the detent position increases air flow to defroster nozzles and decreases flow to floor. If maximum defrosting is desired, push "Air" lever to full down position.

NOTE: The operation of the "Temp" and "Fan" levers is dependent upon the position of the air lever.

2. "Temp" Lever

If heat is desired, the "Temp" lever is moved down from off position to control the heater core discharge air temperature. Maximum heat is obtained when the "Temp" lever is in the extreme down position.

3. "Fan" Lever

To turn blower on, move "Fan" lever down from "off" position.

There are three detent positions as the "Fan" lever is moved from off which provide a low, medium and high blower speed. Do not operate blower when "Air" lever is in the off position.

NOTE: Rammed air may be obtained when car is moving by

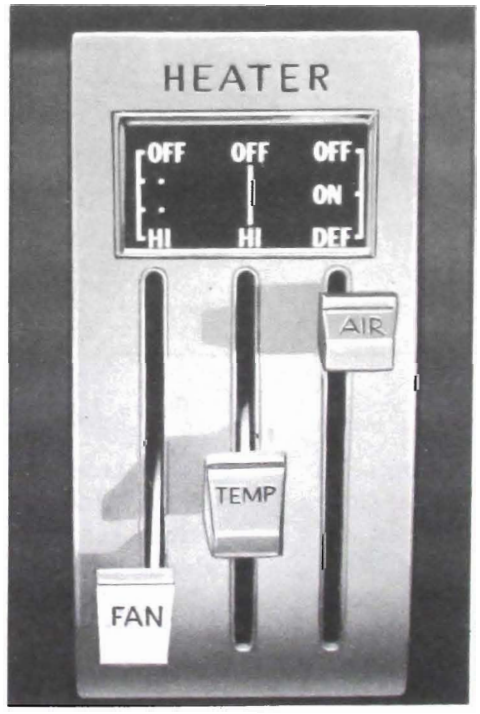

Figure 11-13—Heater-Defroster Controls

pushing "Air" lever down to "on" position.

11-8 HEATER-DEFROSTER SERVICE PROCEDURES

a. Adjustment of "Air" Lever Control Wire

This adjustment is necessary if the heater outside air valve is not completely closed when "Air" lever is in off position or if heater valves in distributor are not positioned to allow maximum air flow to defroster nozzles when "Air" lever is in defroster (full down) position.

1. Loosen clamp that retains the "Air" lever control wire cable and the set screw that retains the outside air wire to lever mechanism on heater air distributor. See Figure 11-12.

2. Place "Air" lever in full down (defrost) position.

3. Rotate upper lever on distributor to extreme clockwise (rearward) position and tighten clamp on wire sheath that goes to "Air" lever.

4. Place "Air lever 1/16" from off position.

5. Push lever mechanism on distributor to extreme forward position.

6. Completely close outside air valve by pushing control wire forward as far as possible.

7. Tighten set screw on wire to outside air valve.

b. Adjustment of "Temp" Lever Control Wire

This adjustment should be checked when insufficiently heated or slightly warmed air leaves heater outlets. Also, it should be checked if air leaving heater outlets is too hot for setting or cannot be controlled by "Temp" lever.

1. Loosen clamp that retains "Temp" control wire to heater core case. See Figure 11-12.

2. Rotate the operating lever on the temperature control valve to the extreme counterclockwise position.

3. Place "Temp" control lever 1/16" from the off position.

4. Tighten control wire retaining clamp.

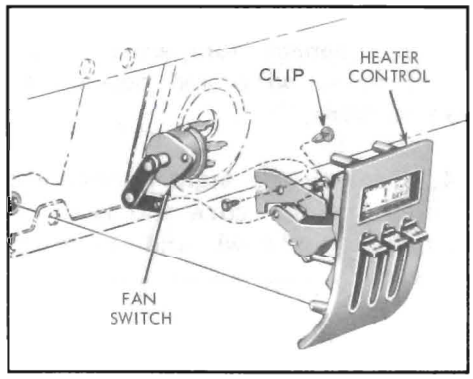

Figure 11-14—Heater Control

c. Removal and Installation of Heater-Defroster Control Assembly

1. Disconnect battery ground cable.

2. Remove "Temp" and "Air" lever control wires from levers. See Figure 11-14.

3. Unplug blower switch wiring connector from switch.

4. Remove the three nuts that attach control assembly to instrument panel and remove control.

5. Install control assembly by reversing removal procedure.

NOTE: Clamp the sheaths of the "Air" and "Temp" control wires flush with the edge of the clamp.

6. Check operation of control levers and adjust if necessary (subpars. a and b).

d. Removal and Installation of Heater Air Distributor

1. Disconnect the two control wires from the lever assembly on distributor. See Figure 11-15.

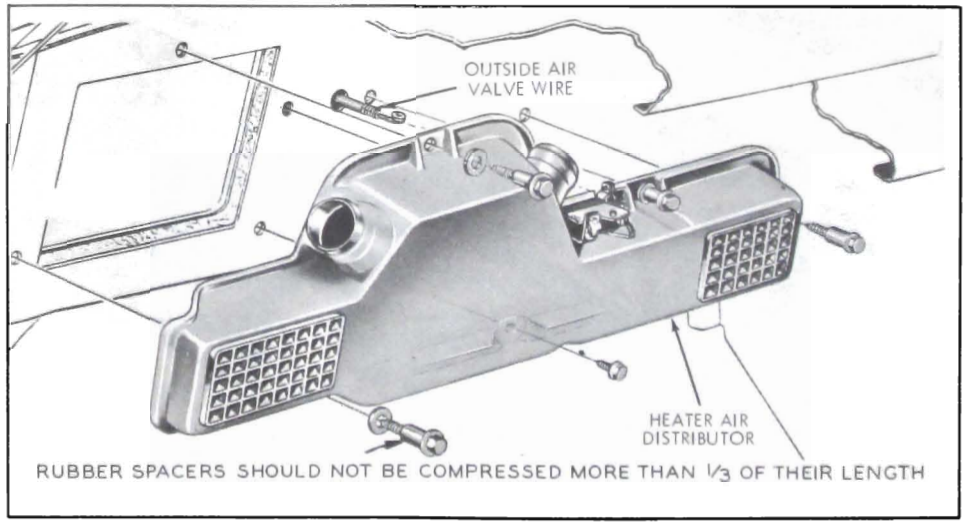

Figure 11-15—Heater Air Distributor Installation

2. Remove the five screws that retain distributor to cowl.

3. Remove defroster hoses.

4. Install control assembly by reversing removal procedure.

5. Adjust "Air" lever control wires (subpar. a).

e. Removal and Installation of Blower and Air Inlet Assembly

NOTE: If only blower motor is to be removed, all that is necessary is to remove the five motor to blower screws and unplug wire from motor.

1. Remove engine air cleaner.

2. Remove right windshield washer nozzle. See Figure 11-9.

3. Remove hose clip from blower housing.

4. Remove wires from clips on inlet and unplug wire from heater motor.

5. Remove the seven screws that attach assembly to cowl and remove assembly.

6. Install blower and inlet assembly by reversing removal procedure.

NOTE: Apply a bead of body sealer around outside edge of inlet assembly.

f. Removal and Installation of Heater Core and Temperature Control Valve

1. Drain radiator.

2. Remove inlet hose from temperature control valve and outlet hose from heater core. See Figure 11-17.

3. Disconnect temperature control valve wire and outside air valve wire.

4. Remove the eight screws that retain heater core and case assembly to cowl and remove assembly.

NOTE: It may be necessary to loosen blower and air inlet assembly.

5. Remove heater core and temperature control valve from case.

CAUTION: When handling temperature control valve capillary coil, valve must be in the on position or calibration of valve may be affected. Note position of coil on heater core before removing.

6. Install temperature control valve and heater and case assembly by reversing removal procedure. Apply a bead of body sealer around edge of case assembly. Adjust "Air" lever control wires after assembly is installed (subpar. a).

IMPORTANT: Position temperature control valve capillary coil in same place as removed coil was. Care must be used when installing assembly to prevent damaging or changing position of capillary coil.

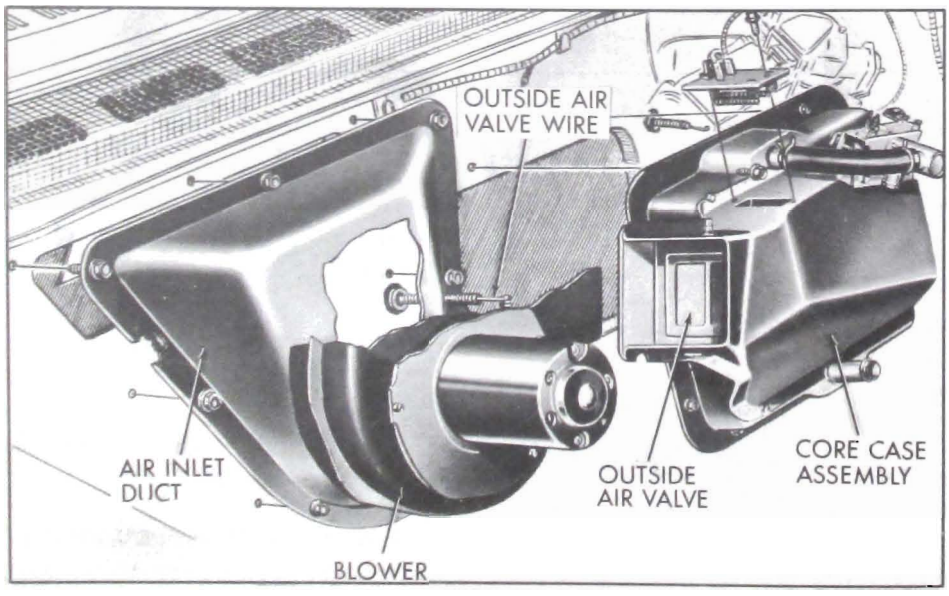

Figure 11-16—Blower and Air Inlet Assembly

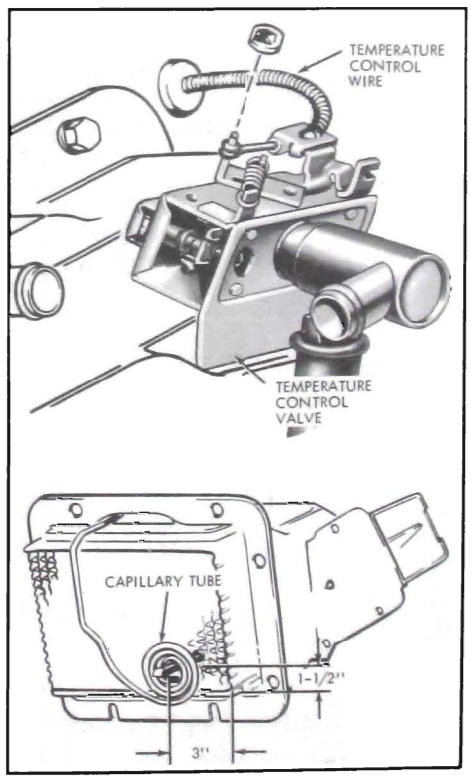

Figure 11-17—Temperature Control Valve

11-9 HEATER-DEFROSTER TROUBLE DIAGNOSIS

COMPLAINT AND CAUSE	CORRECTION
a. Insufficient Heating	
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 temperature control valve 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 control valve improperly adjusted.	7. Adjust "Temp" lever control wire.
8. Defective temperature control valve.	8. Replace.
9. Heater outside air valve not open.	9. Check operation of valve and adjustment of "Air" control lever wire.
10. Blower inoperative.	10. See subparagraph d.
11. Heater hose routed incorrectly.	11. See Figures 11-9 and 11-10.
b. Inadequate Defrosting	
1. Outside air valve not open.	1. Check operation of valve and adjustment of "Air" control lever.
2. Heater floor level shut-off valves in distributor not properly closing.	2. Check operation of valves and adjustment of "Air" control lever wire.
3. Air hose missing or disconnected.	3. Inspect and correct.
4. Obstructions in defroster outlets at windshield.	4. Remove obstruction.
5. Blower inoperative.	5. See subparagraph d.
6. Insulation inside air hose loose.	6. Remove air hoses and cement insulation securely.
c. Too Warm in Car	
1. Defective temperature control valve.	1. Replace.
2. Incorrect operation of controls.	2. Advise operator of correct operation of controls.
3. Loose "Temp" control wire.	3. Adjust wire.

11-9 HEATER-DEFROSTER TROUBLE DIAGNOSIS (Cont'd)

COMPLAINT AND CAUSE	CORRECTION
d. Blower Inoperative	
1. Blower fuse.	1. Replace 20-amp blower fuse on fuse block.
2. Defective motor.	2. Replace.
3. Open circuit.	3. Check wiring connections on blower switch and resistor. Locate open circuit and correct. See Figure 11-18.
4. Defective switch.	4. Replace.
e. Miscellaneous	
1. Control levers not lined up.	1. Adjust control wires.
2. Heater "gurgle."	2. Fill radiator to proper level. Fully open temperature control valve and run engine to clear air lock.
3. "Air" lever binding.	3. Check operation of lever mechanism on heater distributor, outside air valve and shut-off valves in distributor.

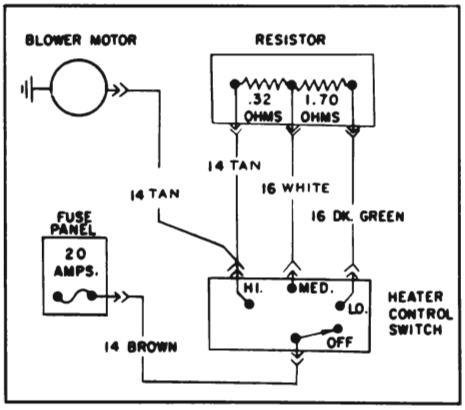

Figure 11-18—Heater Wiring Diagram

11-10 OUTSIDE AIR VENTILATION

a. Description

The outside air ventilation system is standard equipment on all series. The ventilation system consists of an air inlet in each cowl kick pad which allows outside air circulation, when the car is moving, directly to the passenger compartment. The vent controls are of the push-pull bowden wire type and are located on the lower edge of each end of the instrument panel. See Figure 11-19.

b. Air Flow

For outside air ventilation, the air flow is directed from the inlet grille forward of the windshield to the chambers on the sides of the cowl. From here the air enters the car through the inlets on the kick pads. Incoming air can be controlled at the inlets to provide maximum passenger comfort.

Water drawn through the air inlet grille is separated from the air stream in the cowl side chambers by baffles and by centrifugal force which throws the water toward the outer wall and allows drainage at the bottom of the chamber.

c. Control Wire Adjustment

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

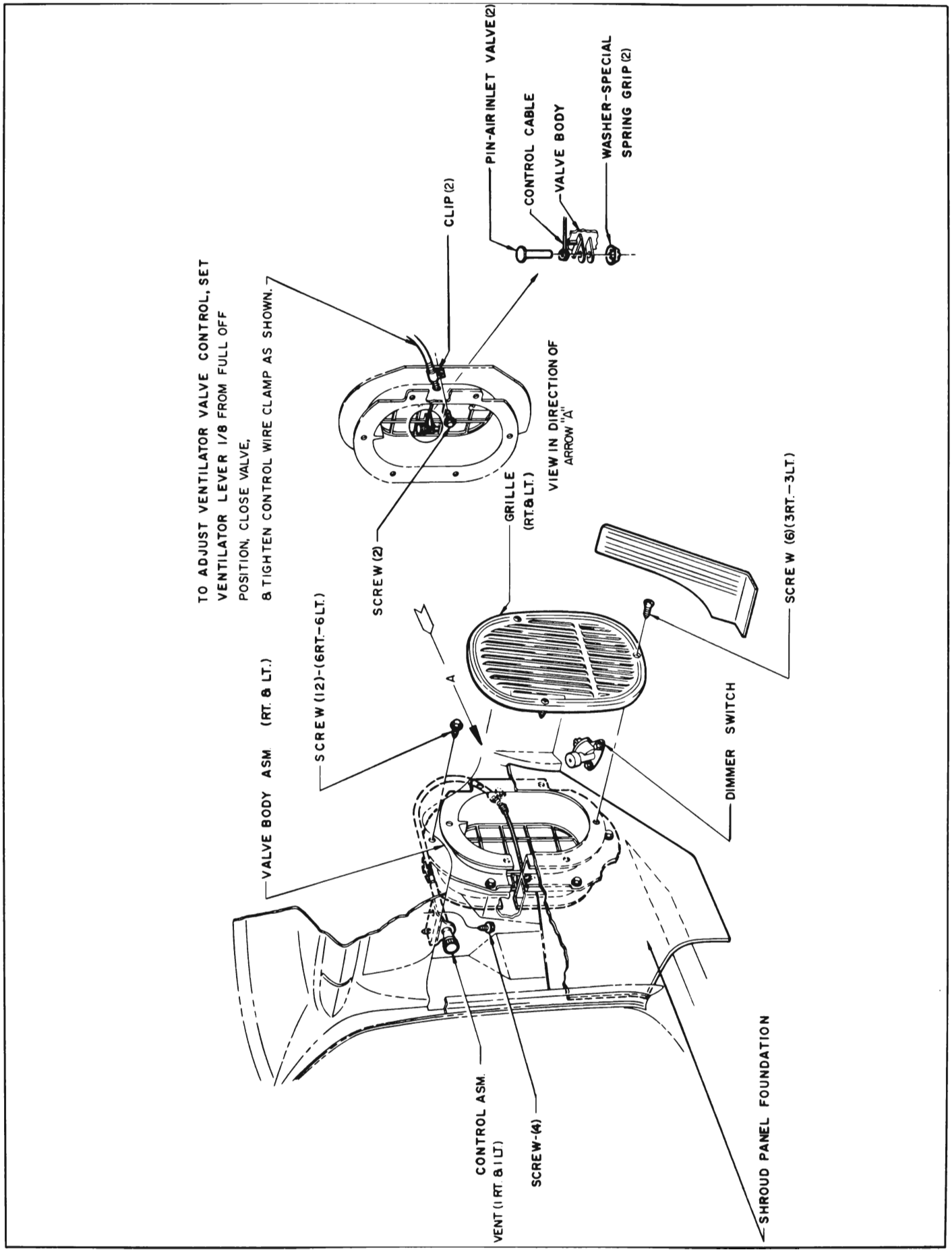

Figure 11-19—Outside Air Vent Assembly