

HEATER SYSTEM

ALL SERIES

CONTENTS

| Subject | Page No. |
|--|----------|
| DESCRIPTION AND OPERATION | |
| Description of System | 9A-2 |
| Operation of Controls | 9A-3 |
| DIAGNOSIS: | |
| Heater-Defroster Trouble Diagnosis | 9A-4 |
| MAINTENANCE AND ADJUSTMENTS: | |
| Adjustment of Temperature Selector Lever and Temperature Door | 9A-5 |
| MAJOR REPAIR: | |
| Removal and Installation of Heater Control Assembly "A" Series | |
| | 9A-5 |
| Removal and Installation of Heater Control Assembly "B-C-E" Series | |
| | 9A-5 |
| Removal and Installation of Blower Motor or Blower Motor and Air Inlet Assembly - "A" Series | |
| | 9A-6 |
| Removal and Installation of Blower Motor or Blower Motor and Air Inlet Assembly - "B-C-E" Series | |
| | 9A-6 |
| Removal and Installation of Heater Assembly or Heater Core "A" - Series | |
| | 9A-7 |
| Removal and Installation of Heater Assembly or Heater Core - "B-C-E" Series | |
| | 9A-7 |
| SPECIFICATIONS: | |
| General Specifications | 9A-7 |

DESCRIPTION AND OPERATION

DESCRIPTION OF SYSTEM

The heater system is an air mix type system in which outside air is heated and then mixed in varying amounts with cooler outside air to attain the desired air temperature. The system consists basically of three parts: (1) the blower and air inlet assembly, (2) the heater assembly and (3) the heater control assembly. The operation of the system is as follows:

1. Blower and Air inlet Assembly - The blower and air inlet assembly draws outside air through the outside air inlet grille located forward of the windshield

reveal molding and channels the air into the heater assembly.

The operation of the blower motor is controlled by a FAN switch on the heater control. The motor is connected in series with the three position FAN switch and also the blower resistor assembly. See Figure 9A- 9. A 25 amp fuse, located in the fuse block, is in series between the blower motor and the battery.

To insure adequate ventilation of the passenger compartment, the heater blower fan is on continuously, after engine coolant temperature reaches approximately 140 degrees F, and when the FAN switch is in the LO position. The fan will blow air from the

purge opening under the passenger side of dash at whatever fan speed is selected, as long as the selector lever is in the OFF position. When the selector lever is in the HEAT position and the blower switch is in the LO position, the blower fan will not come on before the engine coolant temperature reaches approximately 140 degrees F. However, if the blower switch is in the MEDIUM or HI position, the blower fan will run immediately, regardless of engine coolant temperature.

Engine coolant temperature is sensed by a thermal switch, which is installed in the right (passenger side) cylinder head. When the coolant temperature reaches approximately 140 degrees F, the switch closes and allows current to flow to the blower motor.

2. Heater Assembly - The heater assembly houses the heater core and the doors necessary to control mixing and channeling of the air. Air entering the heater assembly divides into two channels: (1) through the heater core and (2) through a by-pass around the heater core. The ratio of the mixture of heated to unheated air is controlled by the temperature door. A purge inlet door initiates the air flow through the heater assembly. A defroster door controls the amount of air directed through the defroster outlets. The defroster door may be positioned to direct nearly all air to the defroster outlet or nearly all air to the floor outlet and may be varied to provide intermediate proportions as desired.

The heater core, located in the heater assembly, has water flowing through it at all times. The water flow begins at the front of the intake manifold and flows to the lower (inlet) port of the heater core, thru the heater core, out the upper (outlet) port of the heater core and to the suction port of the water pump. See Figure 9A-18.

The heater assembly has fixed vane outlets to distribute air evenly throughout the passenger compartment.

3. Heater Control Assembly - The heater control assembly (see Figure 9A-1) consists of three controls, namely the TEMPERATURE lever, SELECTOR lever and FAN switch.

OPERATION OF CONTROLS

The TEMPERATURE lever is connected by a con-

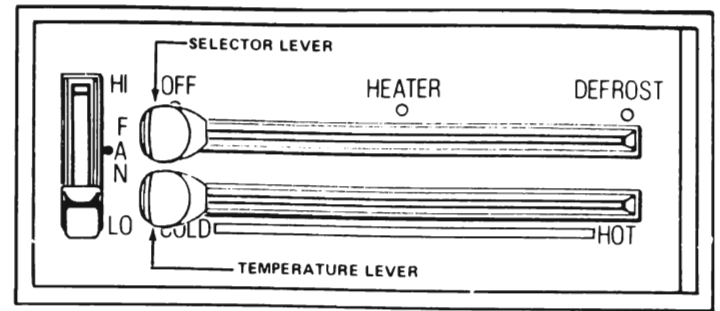


Figure 9A-1 Instrument Panel Control Assembly

trol 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.

The SELECTOR lever of the heater control assembly regulates the positioning of two doors: the diverter air door and the defroster door. The SELECTOR lever has three positions: OFF, HTR and DEFROST. Positioning of the SELECTOR lever to the "OFF" position closes the diverter door and the defroster door. When the door is closed, all air is blocked from passing through the heater assembly and is emitted from the diverter opening under dash on the right side of car. When the SELECTOR lever is moved to the HTR position the air door is fully opened. Air is permitted to pass through the heater assembly and is directed to the floor of the car. Moving of the SELECTOR lever to DEFROST position, opens the defroster door and directs the air to the defroster outlets.

The FAN switch operates a three 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 positioned fully downward, the blower motor is in LO. Movement of the switch upward provides LO, MEDIUM and HI blower speeds.

DIAGNOSIS

| Condition | Possible Cause and Correction | | | | | | | | | | | | | | | | |
|--------------------------|--|---------------|---------------|---|----|---|-------------|---------------|---------------|---|-------------|---------------|-------------|---|-------------|-------------|---------------|
| Blower motor inoperative | <ol style="list-style-type: none"> 1. Look for burned, broken, or incorrect fuse. 2. Look for loose connectors or broken wires. 3. Visually inspect the resistor assembly. Look for broken or melted coils. Test with ohmmeter or test lite for continuity between connections. 4. Test for defective blower switch with an ohmmeter or test lite for continuity. <table border="1"> <thead> <tr> <th>Terminal</th> <th>Lo</th> <th>M</th> <th>HI</th> </tr> </thead> <tbody> <tr> <td>B</td> <td>No Conn.</td> <td>Conn. To M</td> <td>Conn. To H</td> </tr> <tr> <td>M</td> <td>No Conn.</td> <td>Conn. To B</td> <td>No Conn.</td> </tr> <tr> <td>H</td> <td>No Conn.</td> <td>No Conn.</td> <td>Conn. To B</td> </tr> </tbody> </table> <ol style="list-style-type: none"> 5. Test for a defective thermal delay switch with an ohmmeter or test lite. Switch will show no continuity "cold" and continuity when switch reaches approximately 140 degrees F. or when closes. | Terminal | Lo | M | HI | B | No Conn. | Conn. To M | Conn. To H | M | No Conn. | Conn. To B | No Conn. | H | No Conn. | No Conn. | Conn. To B |
| Terminal | Lo | M | HI | | | | | | | | | | | | | | |
| B | No Conn. | Conn. To M | Conn. To H | | | | | | | | | | | | | | |
| M | No Conn. | Conn. To B | No Conn. | | | | | | | | | | | | | | |
| H | No Conn. | No Conn. | Conn. To B | | | | | | | | | | | | | | |
| Insufficient heating | <ol style="list-style-type: none"> 1. Test for correct adjustment of temperature door by listening for the door to hit stop in heater at the hot end of travel of temperature lever on dash. Should have 1/16 to 1/8 inch spring back of temp lever in HOT position. 2. Feel for air leaks around the sealing edges of components. 3. Test engine thermostat for opening too soon, stuck open, or held open by foreign material. 4. Visually inspect radiator coolant level and add if necessary. 5. Visually inspect the flow control valve on the 455 Cu. In. engines, for a possible dislodged diaphragm. The valve is located in the heater core to heater hose on the intake manifold. The 350 Cu. In. engines are not equipped with a flow control valve. 6. Feel for air leaks through dash, around doors, windows, around purge openings, etc. | | | | | | | | | | | | | | | | |
| Inadequate defrosting | <ol style="list-style-type: none"> 1. Visually inspect for proper connection of Bowden cable to defroster and heater. 2. Feel for air leaks around the sealed components. 3. Visually inspect the coolant level in radiator. Add coolant if necessary. 4. Inspect for position of defroster ducts and instrument panel openings. Defroster ducts have locating alignment slots on top to ensure duct opening to instrument panel opening. | | | | | | | | | | | | | | | | |

MAINTENANCE AND ADJUSTMENTS

ADJUSTMENT OF TEMPERATURE SELECTOR LEVER AND TEMPERATURE DOOR

The temp control cable should be adjusted so that 1/16 to 1/8 inch springback is obtained at hot end of lever travel. To adjust, move the temperature lever to the "HOT" position and rotate the control cable adjuster nut until 1/16 to 1/8 inch springback is obtained at hot end of lever travel.

MAJOR REPAIR

REMOVAL AND INSTALLATION OF HEATER CONTROL ASSEMBLY - A SERIES

1. Remove instruments trim plate by pulling rearward and unsnapping from instrument panel. See Figure 9A-2.

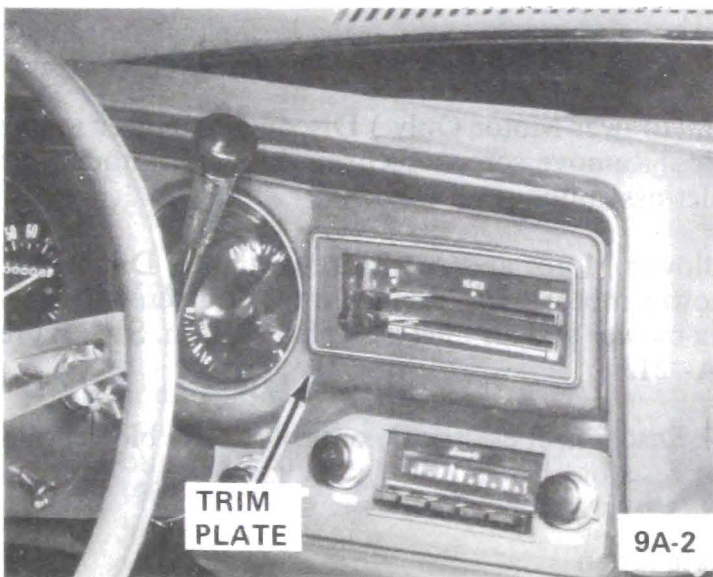


Figure 9A-2 Trim Plate Location

2. Remove 4 heater control attaching screws. See Figure 9A-3.

3. Pull control out from instrument panel and disconnect electrical wiring and 2 Bowden cables. See Figure 9A-4.

4. Turn heater control over and disconnect 1 control cable and ground wire. See Figure 9A-5.

5. Install in reverse of removal procedures making sure cables are attached on the correct levers. See Figure 9A-11 for color reference of the cables.

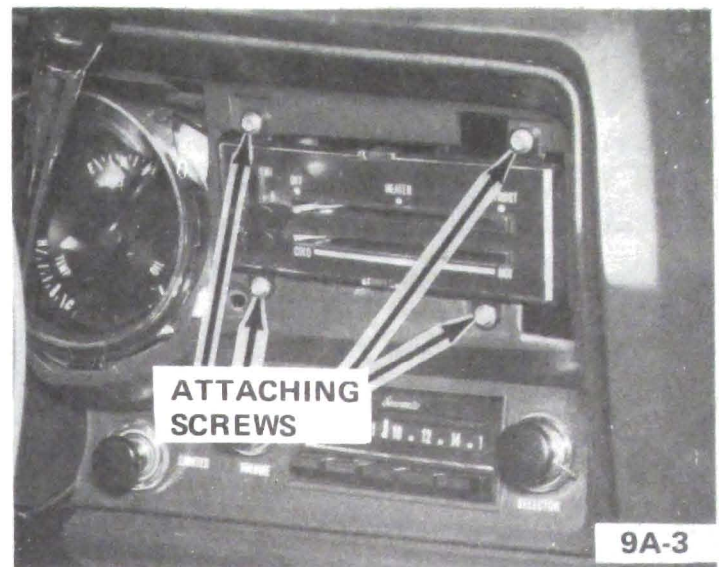


Figure 9A-3 Heater Control Attaching Screws

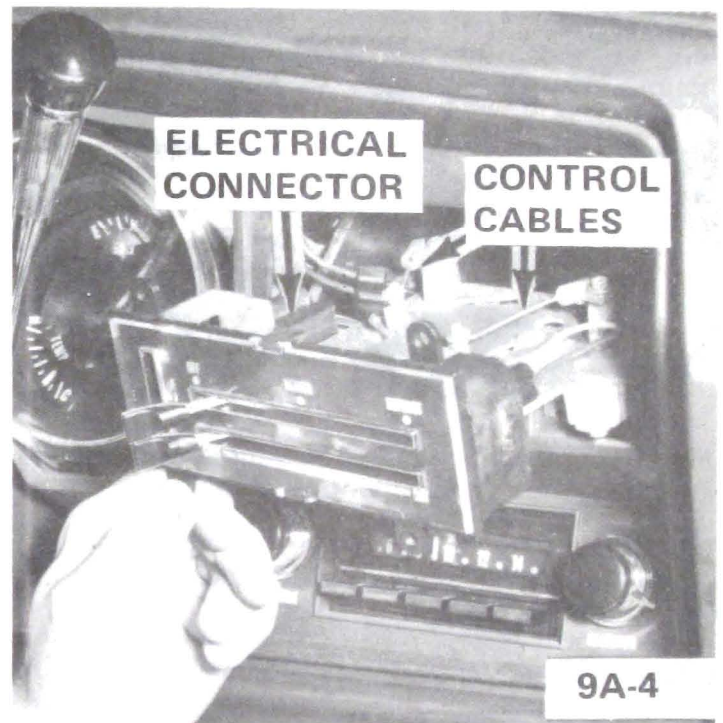


Figure 9A-4 Location of Control Cables

REMOVAL AND INSTALLATION OF HEATER CONTROL ASSEMBLY B-C-E SERIES

Removal

1. Disconnect battery.
2. Remove head light switch.
3. Remove dash trim.
4. Remove 2 see-lights from trim plate.
5. Remove 4 screws from control face.
6. Remove 1 screw from under dash which connects heater control to instrument panel forward support.

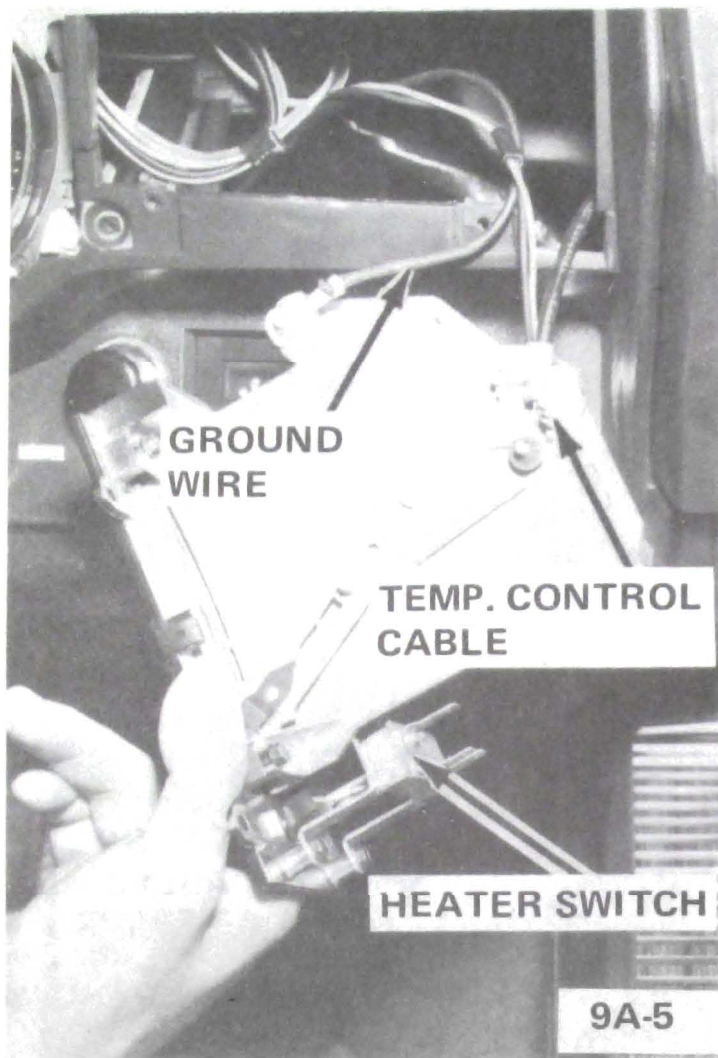


Figure 9A-5 Location of Temperature Control Cable and Ground Wire

7. Disconnect vacuum, electrical connectors, and Bowden wires.

8. Remove control assembly.

Installation

1. Install control assembly.

2. Connect bowden wires, electrical connectors, and vacuum connectors.

3. Install heater control to instrument panel forward support, securing with 1 screw.

4. Install 4 screws into control face.

5. Install 2 see-lights into trim plate.

6. Install lower dash trim.

7. Install headlight switch.

8. Adjust temperature control lever as necessary.

9. Connect battery.

REMOVAL AND INSTALLATION OF BLOWER MOTOR OR BLOWER MOTOR AND AIR INLET ASSEMBLY - A SERIES

1. (Blower motor only) Disconnect blower motor wire. Remove screws securing blower motor to air inlet assembly.

2. (Blower motor and air inlet assembly) Disconnect blower motor wire. Remove 2 nuts and 3 screws securing blower motor and air inlet assembly to dash.

3. Install in reverse of removal sealing along mating surface, between dash and air inlet assembly.

REMOVAL AND INSTALLATION OF BLOWER MOTOR OR BLOWER MOTOR AND AIR INLET ASSEMBLY - B-C-E SERIES

Removal

1. Support hood and loosen hood hinge from extension and plate assembly.

2. Remove extension and plate assembly.

3. (Blower Motor Only) Disconnect blower motor wire. Remove screws securing blower motor to air inlet assembly.

(Blower Motor and Air Inlet Assembly) Disconnect blower motor wire. Remove nuts and screws securing blower and air inlet assembly to dash. See Figure 9A- 21.

4. Disconnect electrical connector from blower motor resistor.

Installation

1. Connect electrical connector to blower motor resistor.

2. (Blower Motor and Air Inlet Assembly) Install 4 nuts and 2 screws, securing blower and air inlet assembly to dash. Connect blower motor wire. See Figure 9A-21.

(Blower Motor Only) Install screws, securing blower motor to air inlet assembly.

3. Install extension and plate assembly.

4. Install extension and plate assembly and tighten hood hinge.

5. Seal along mating surfaces between dash and air inlet assembly.

REMOVAL AND INSTALLATION OF HEATER ASSEMBLY OR HEATER CORE - A SERIES

1. Drain radiator and disconnect heater inlet and outlet hoses at dash. See Figure 9A-13.
2. Disconnect control cables from door levers. See Figure 9A-11.
3. Remove screw securing defroster outlet to heater assembly.
4. Remove 4 nuts securing heater assembly to dash.

REMOVAL AND INSTALLATION OF HEATER ASSEMBLY OR HEATER CORE - B-C-E SERIES**Removal**

1. Drain radiator and disconnect heater inlet and outlet hoses at dash. See Figure 9A-18.
2. Disconnect control wires from defroster door and vacuum hose diverter door actuator diaphragm and control cable from temperature door lever.
3. Remove 4 nuts securing heater assembly to dash. See Figure 9A-21.

SPECIFICATIONS

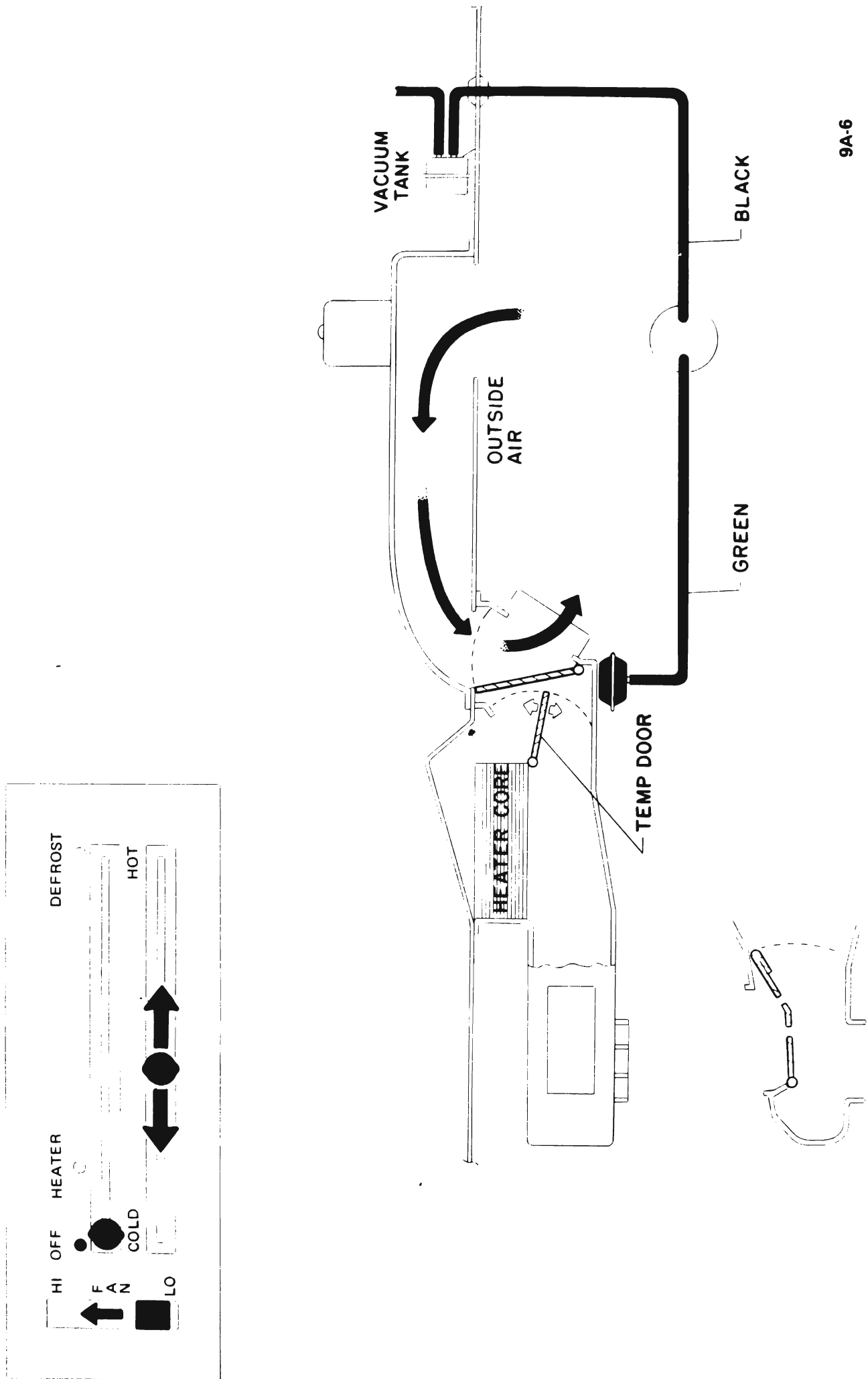
| | |
|--|----------------------|
| Recommended Coolant | Ethylene-Glycol Base |
| Thermostat Opening Temperature | 190 |
| Cooling System Capacity With Heater (Quarts) | |
| 350 A Series | 16.5 |
| 350 B Series | 16.2 |
| 455 All Series | 19.7 |
| Blower Motor Type | 12 VDC |
| Blower Motor Fan | Squirrel Cage |

4. Remove screw securing defroster outlet tab to heater assembly.

5. Work heater assembly rearward until studs clear dash and remove heater assembly.

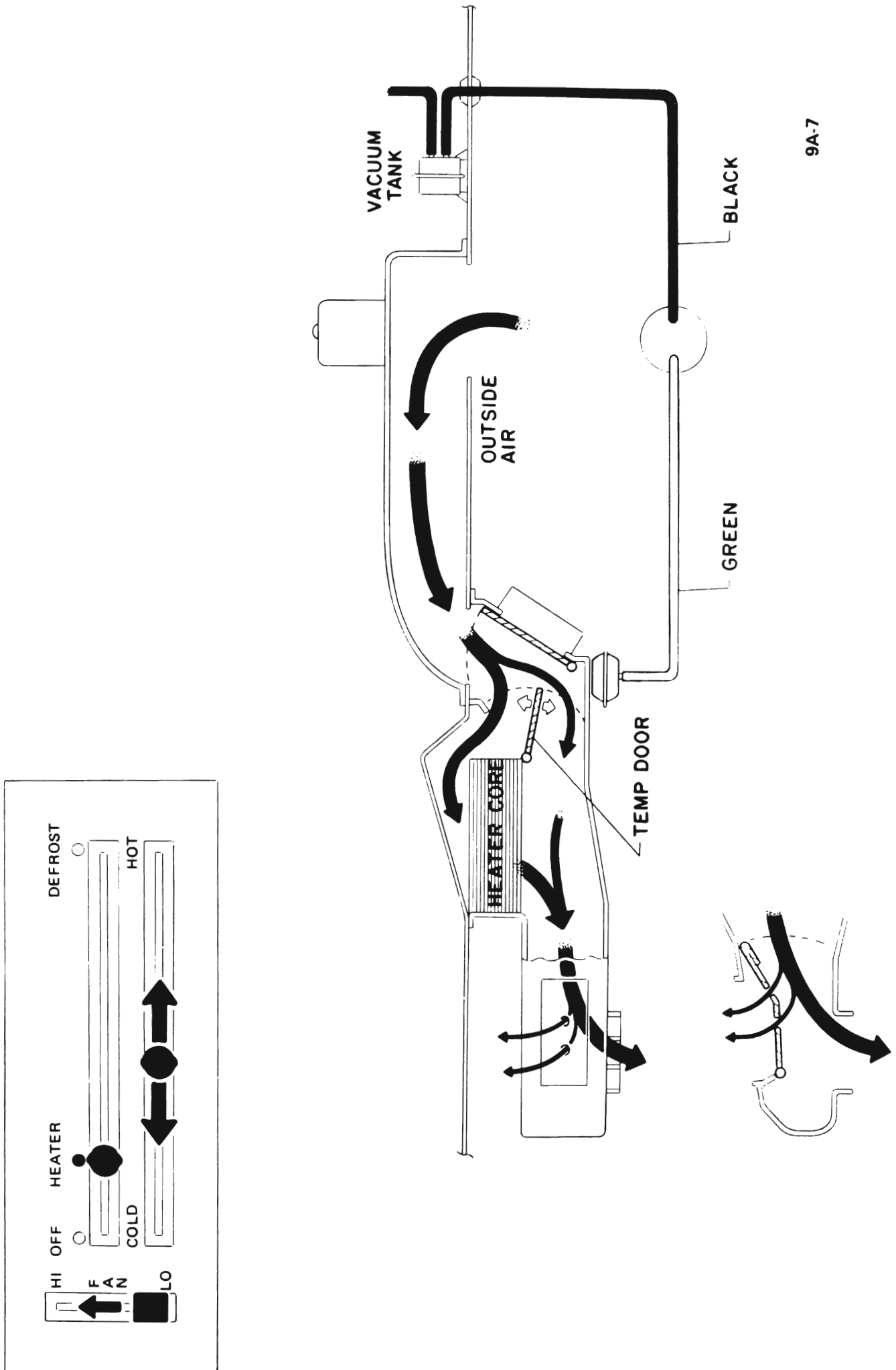
Installation

1. Install heater assembly into dash.
2. Install heater assembly to dash, securing with 4 nuts. See Figure 9A-21.
3. Install defroster outlet tab to heater assembly, securing with a screw.
4. Install control cable to temperature door lever.
5. Install control wires from defroster door and vacuum hose diverter door actuator diaphragm.
6. Connect inlet and outlet hoses at dash and refill radiator. See Figure 9A-18.
7. Seal along mating surfaces between dash and heater assembly.
8. Adjust temperature control cable as necessary.



9A-6

Figure 9A-6 Heater System Air Flow - Off - B-C-E Series



9A-7

Figure 9A-7 Heater System Air Flow - Heat - B-C-E Series

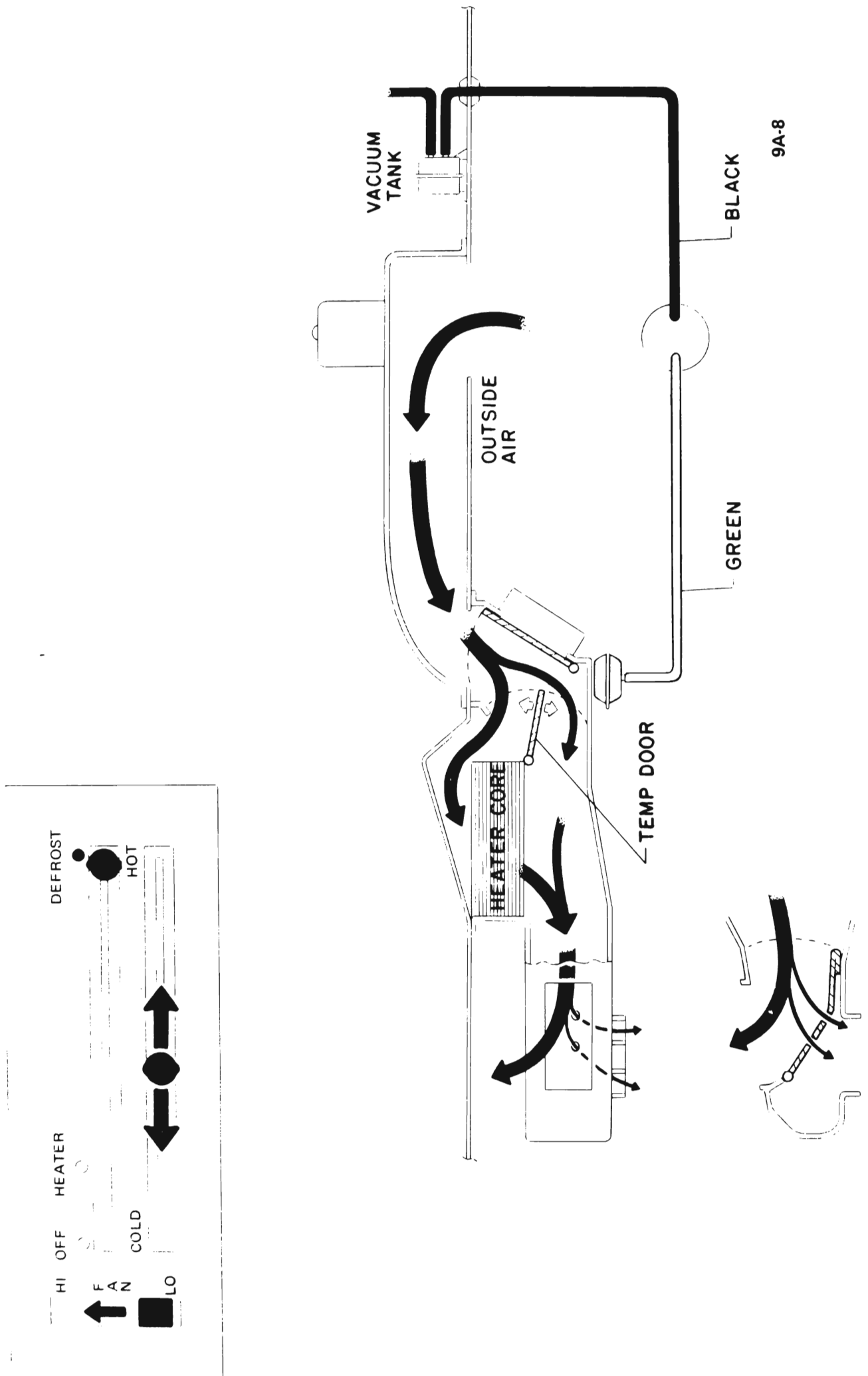


Figure 9A-8 Heater System Air Flow - Defrost - B-C-E Series

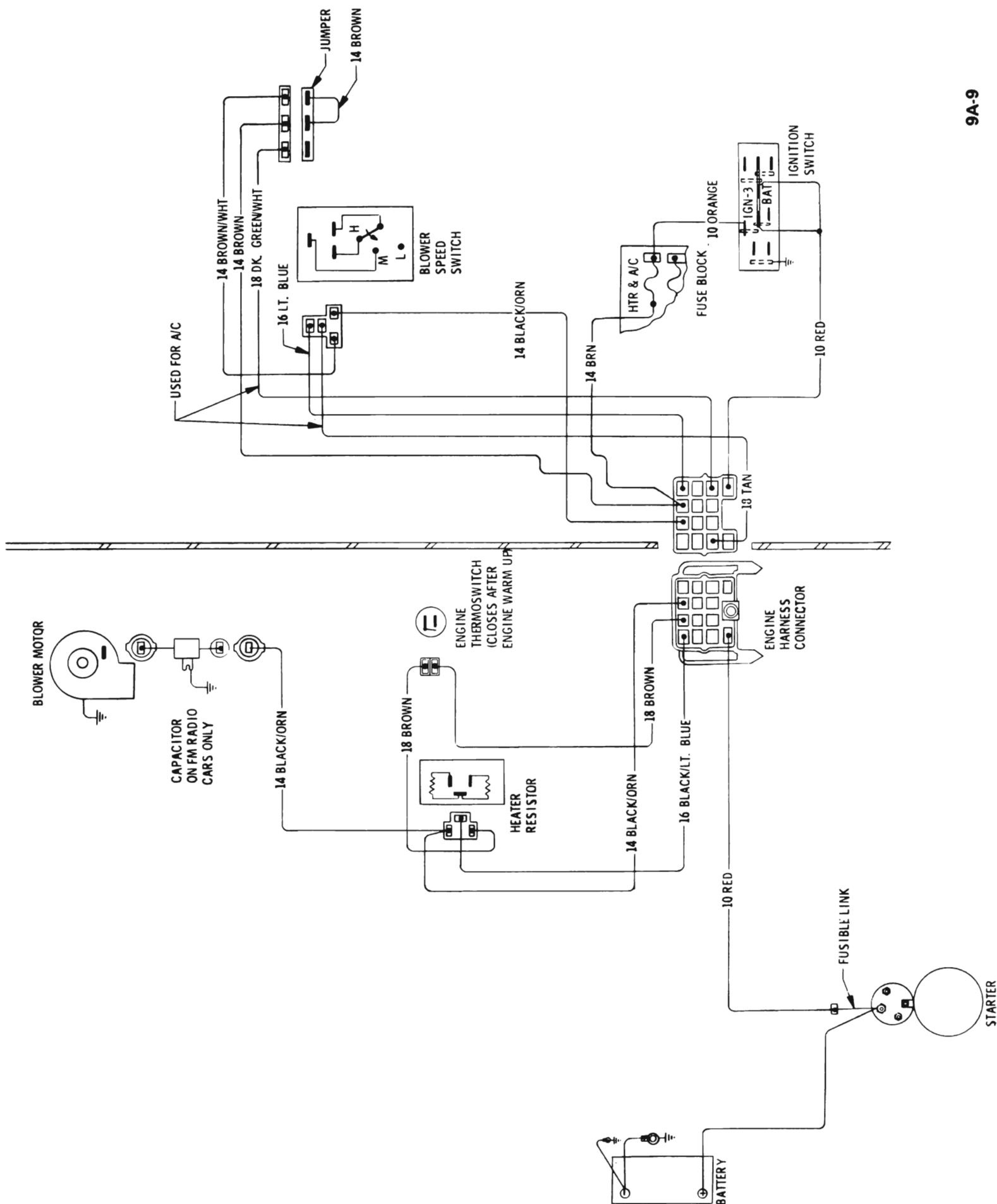
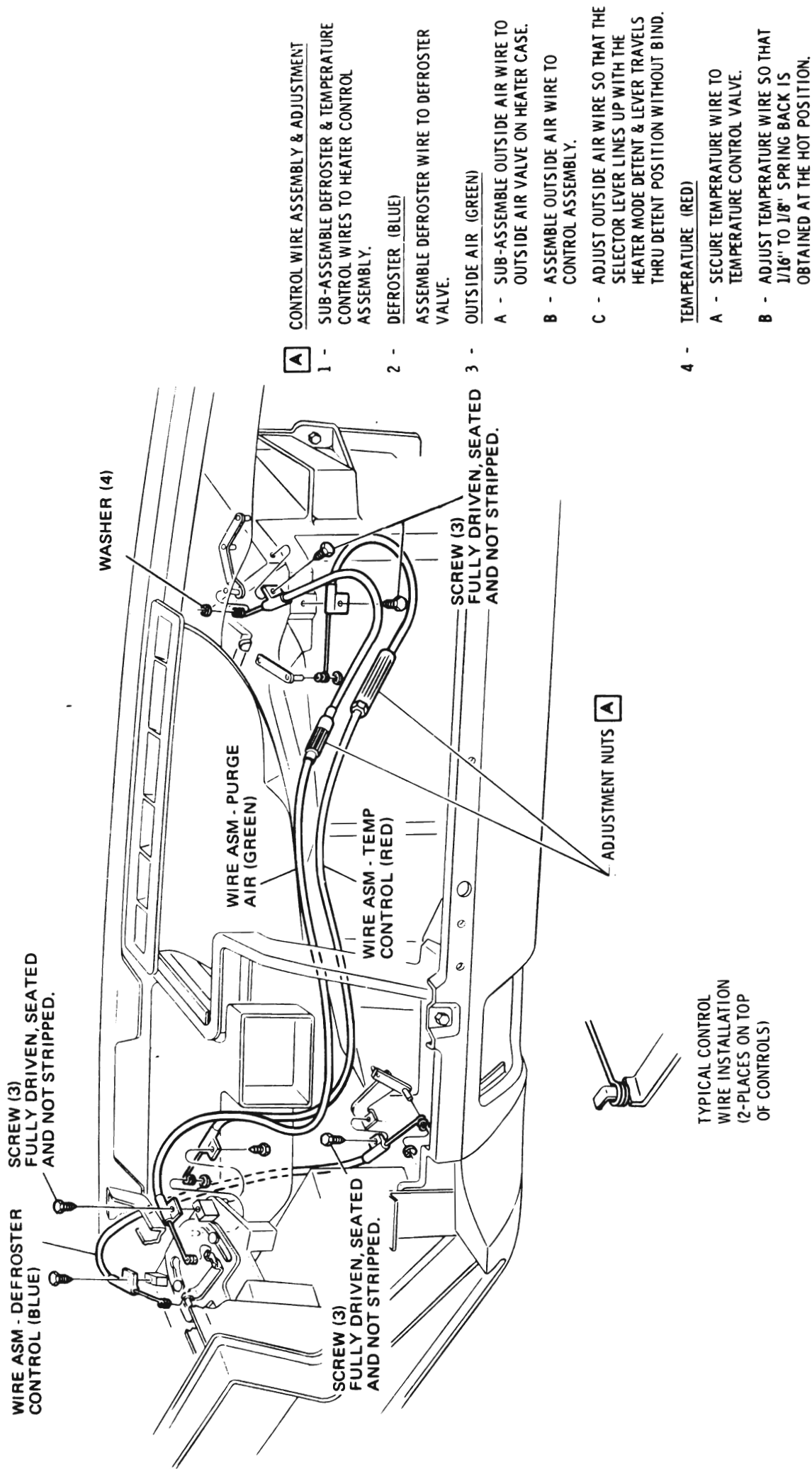


Figure 9A-10 Heater - Wiring Circuit Diagram - All Series



- A** CONTROL WIRE ASSEMBLY & ADJUSTMENT
- 1 - SUB-ASSEMBLE DEFROSTER & TEMPERATURE CONTROL WIRES TO HEATER CONTROL ASSEMBLY.
 - 2 - DEFROSTER (BLUE)
 - ASSEMBLE DEFROSTER WIRE TO DEFROSTER VALVE.
 - 3 - OUTSIDE AIR (GREEN)
 - A - SUB-ASSEMBLE OUTSIDE AIR WIRE TO OUTSIDE AIR VALVE ON HEATER CASE.
 - B - ASSEMBLE OUTSIDE AIR WIRE TO CONTROL ASSEMBLY.
 - C - ADJUST OUTSIDE AIR WIRE SO THAT THE SELECTOR LEVER LINES UP WITH THE HEATER MODE DETENT & LEVER TRAVELS THRU DETENT POSITION WITHOUT BIND.
 - 4 - TEMPERATURE (RED)
 - A - SECURE TEMPERATURE WIRE TO TEMPERATURE CONTROL VALVE.
 - B - ADJUST TEMPERATURE WIRE SO THAT 1/16" TO 1/8" SPRING BACK IS OBTAINED AT THE HOT POSITION.

CONTROLS MUST BE 100% INSPECTED FOR CORRECT OPERATION & FREE MOVEMENT.

Figure 9A-11 Heater Control Cables - A Series

9A-11

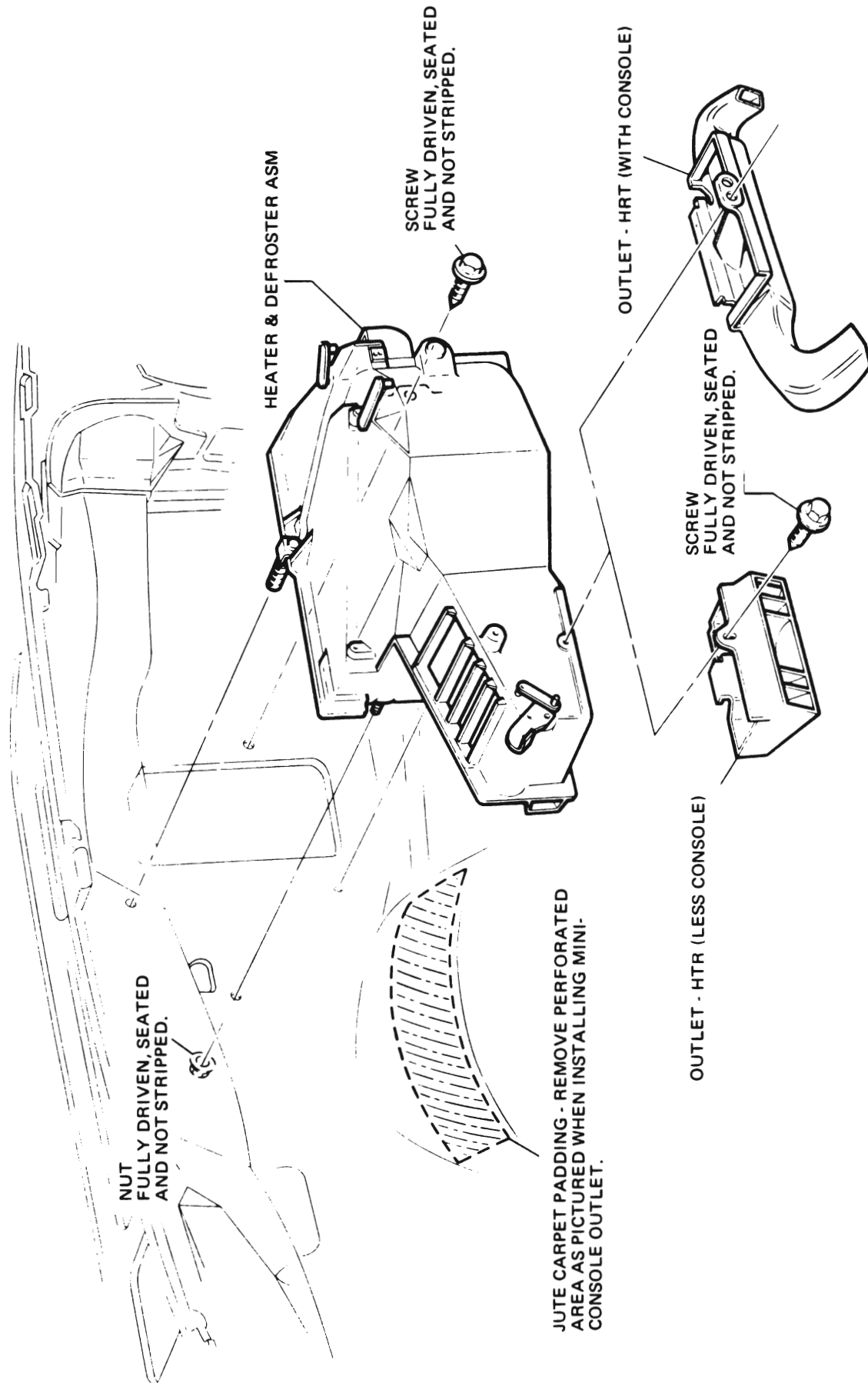
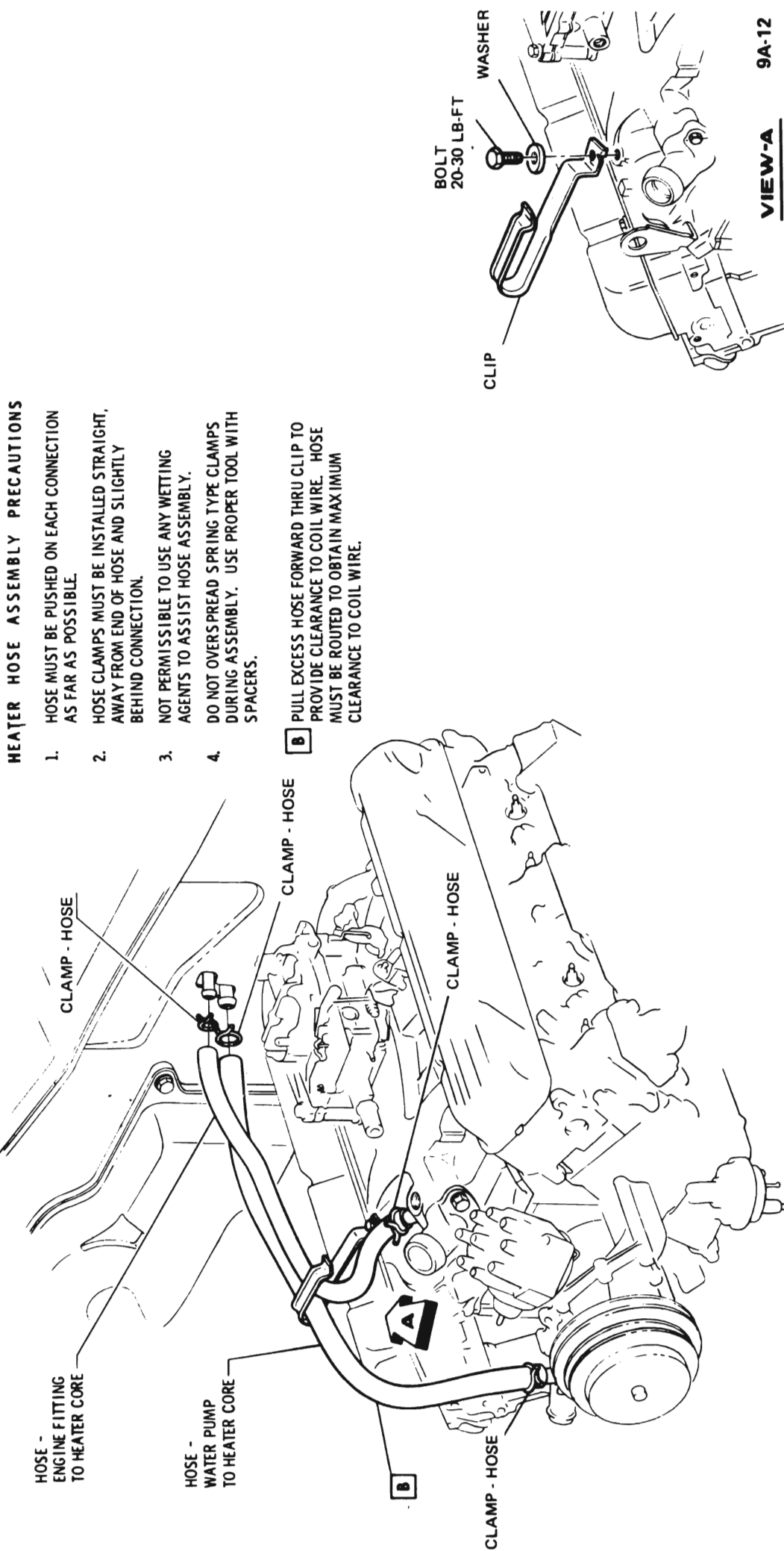


Figure 9A-12 Heater and Defroster Assembly - Center Outlet - A Series



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 CONNECTION.
 3. NOT PERMISSIBLE TO USE ANY WETTING AGENTS TO ASSIST HOSE ASSEMBLY.
 4. DO NOT OVERSPREAD SPRING TYPE CLAMPS DURING ASSEMBLY. USE PROPER TOOL WITH SPACERS.
- B** PULL EXCESS HOSE FORWARD THRU CLIP TO PROVIDE CLEARANCE TO COIL WIRE. HOSE MUST BE ROUTED TO OBTAIN MAXIMUM CLEARANCE TO COIL WIRE.

9A-12

VIEW-A

Figure 9A-13 Heater Hoses - A Series

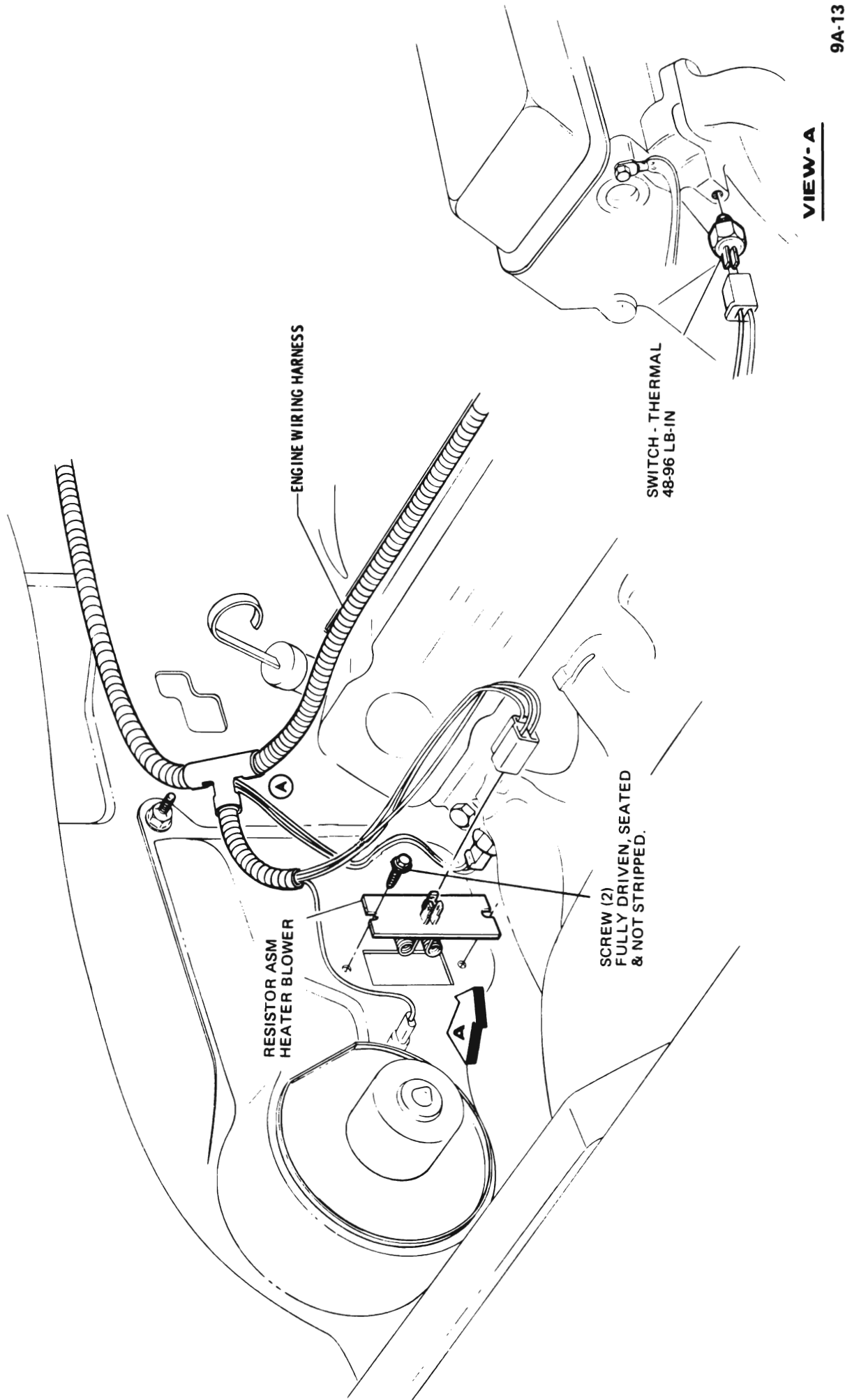
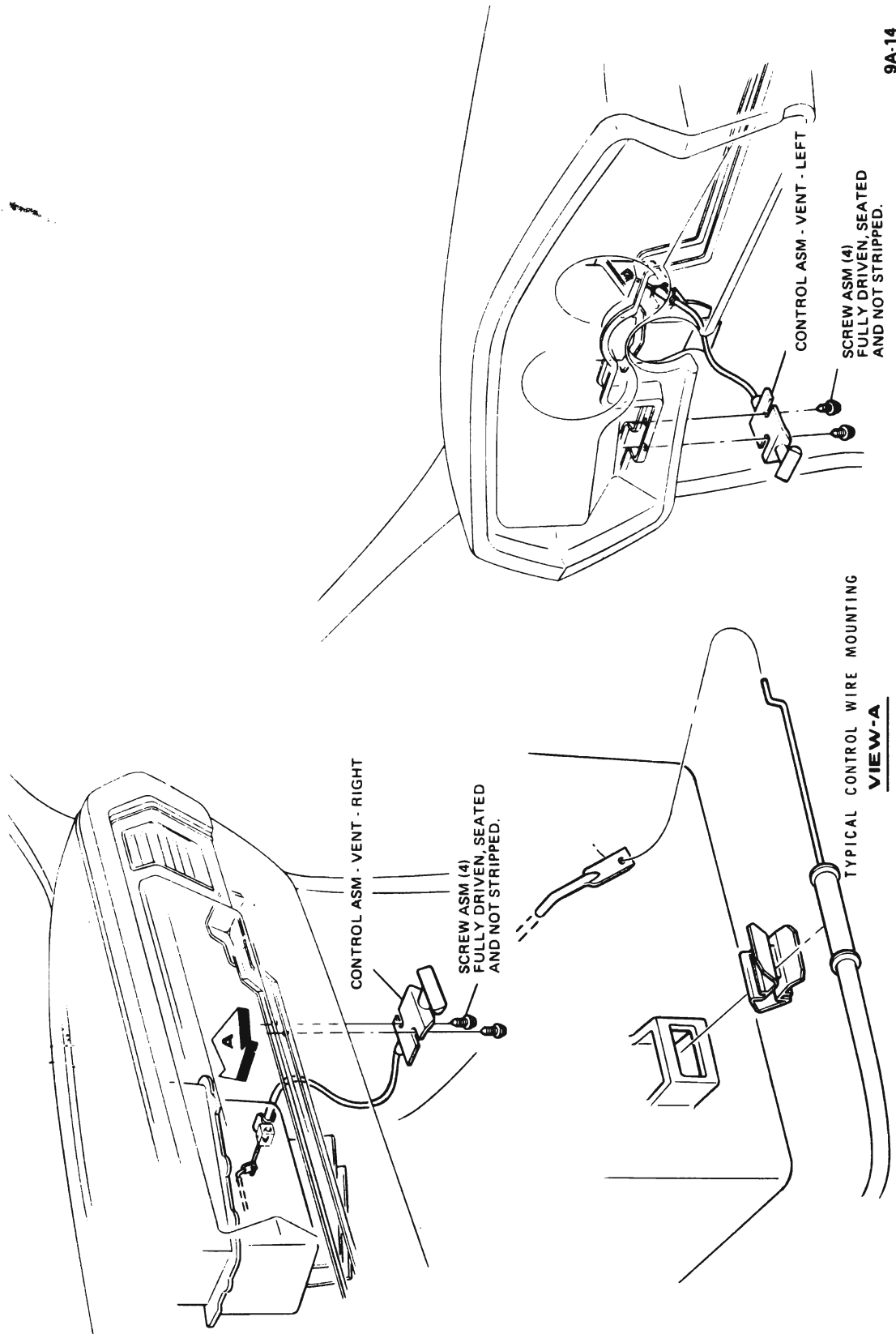


Figure 9A-14 Blower Resistor and Thermal Switch - Heater - A Series



9A-14

Figure 9A-15 Side Vent Controls - A Series

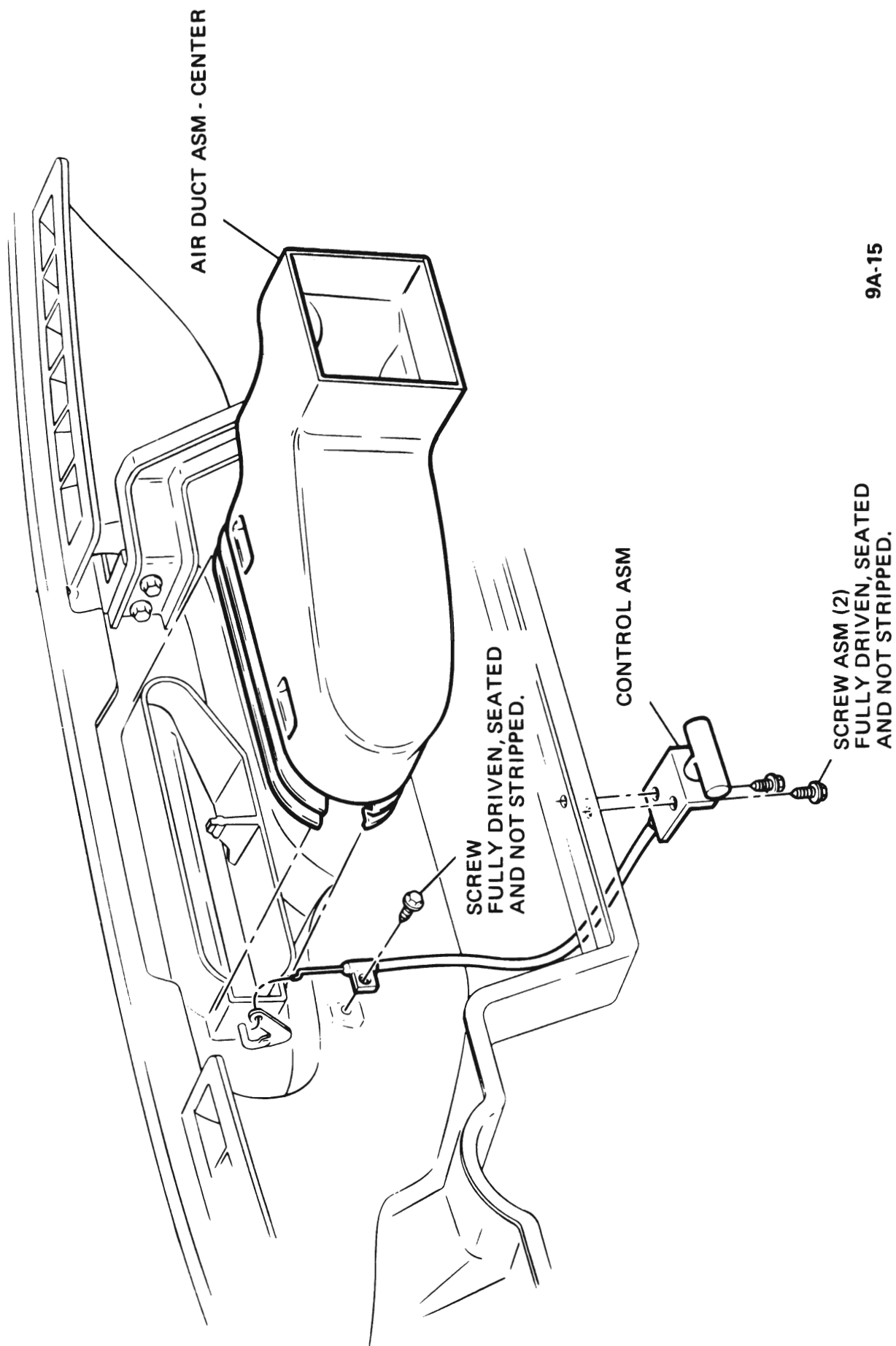
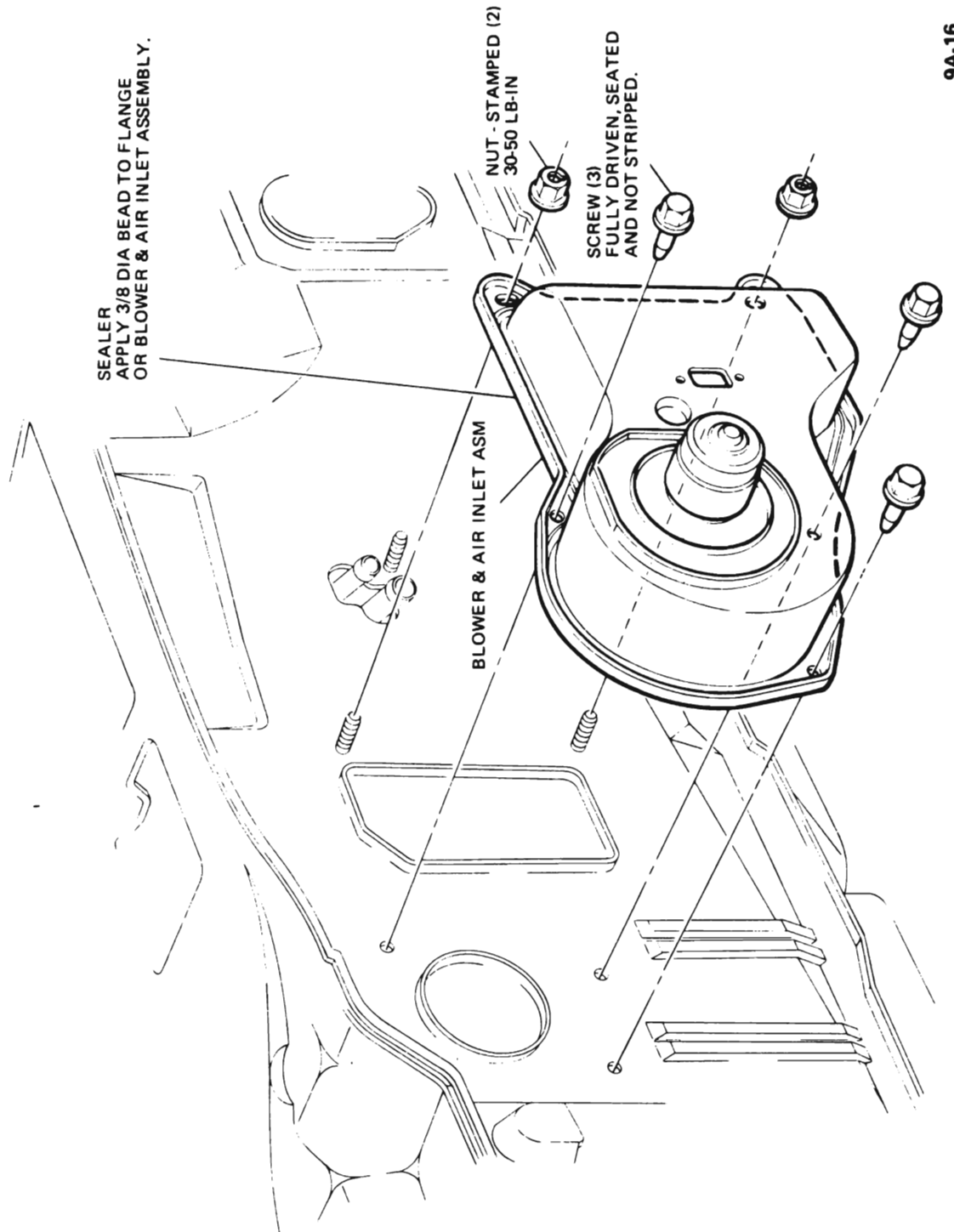


Figure 9A-16 Center Vent Control And Air Duct Assembly - A Series



9A-16

ALL UNIT SEALS TO DASH, DUCTS, ETC. MUST BE CHECKED FOR AIR LEAKS AFTER ASSEMBLY USING HIGH BLOWER. AIR LEAKS MUST BE SEALED.

Figure 9A-17 Blower and Air Inlet Assembly - A Series

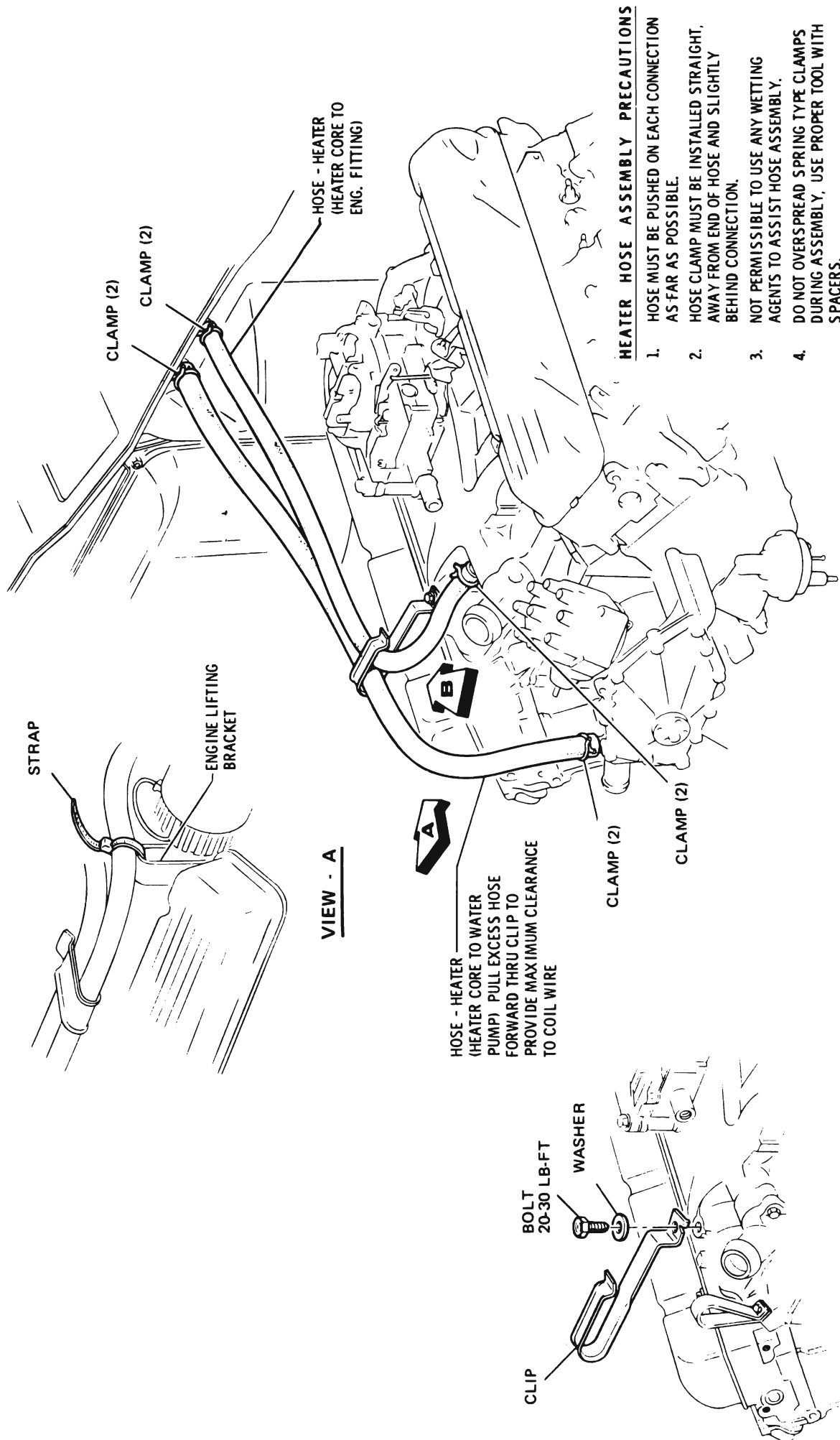
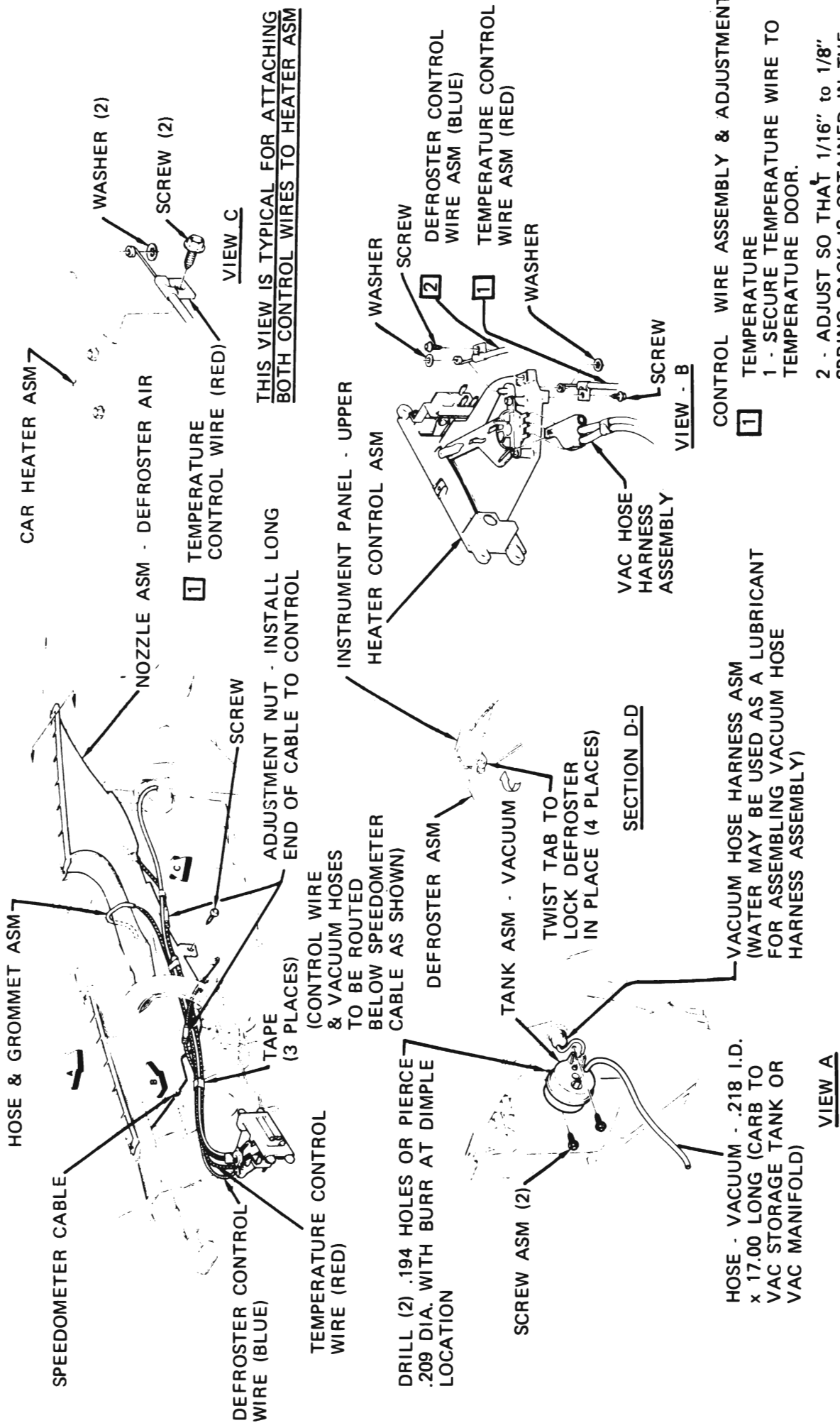
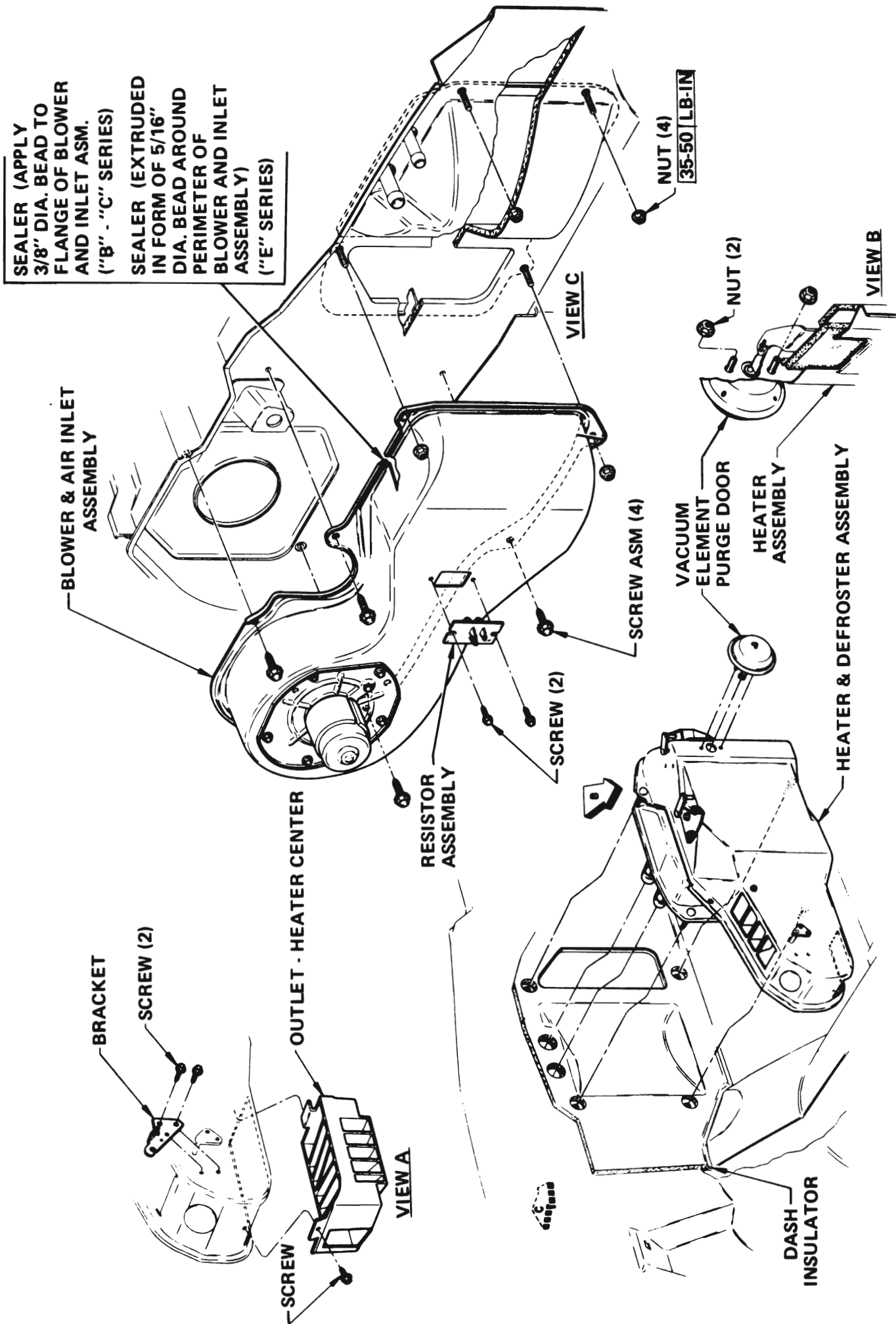


Figure 9A-18 Heater Hoses - B-C-E Series



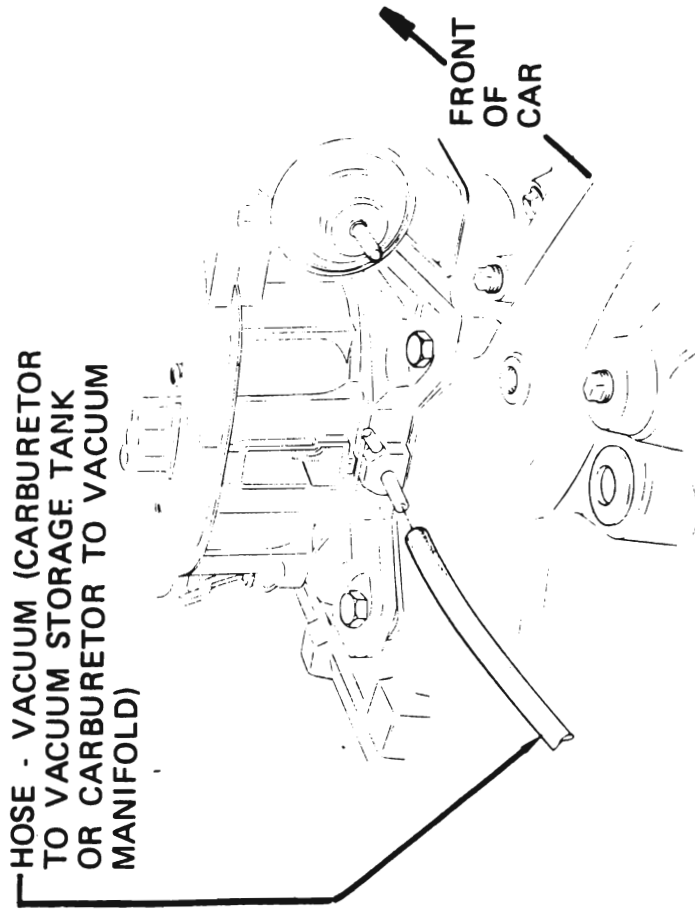
9A-18

Figure 9A-20 Heater and Defroster Vacuum Harness and Control Wires - B-C-E Series

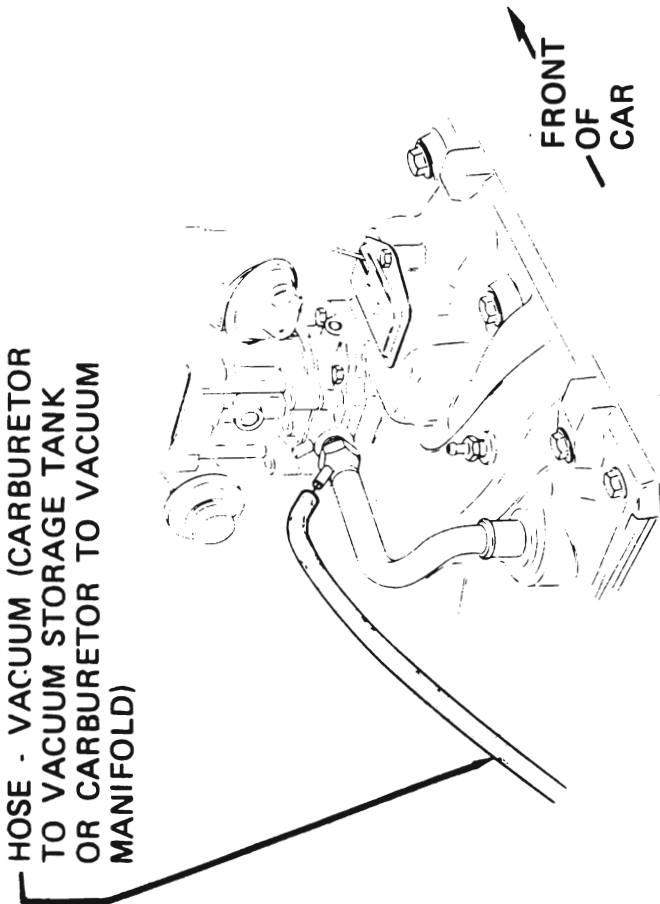


9A-19

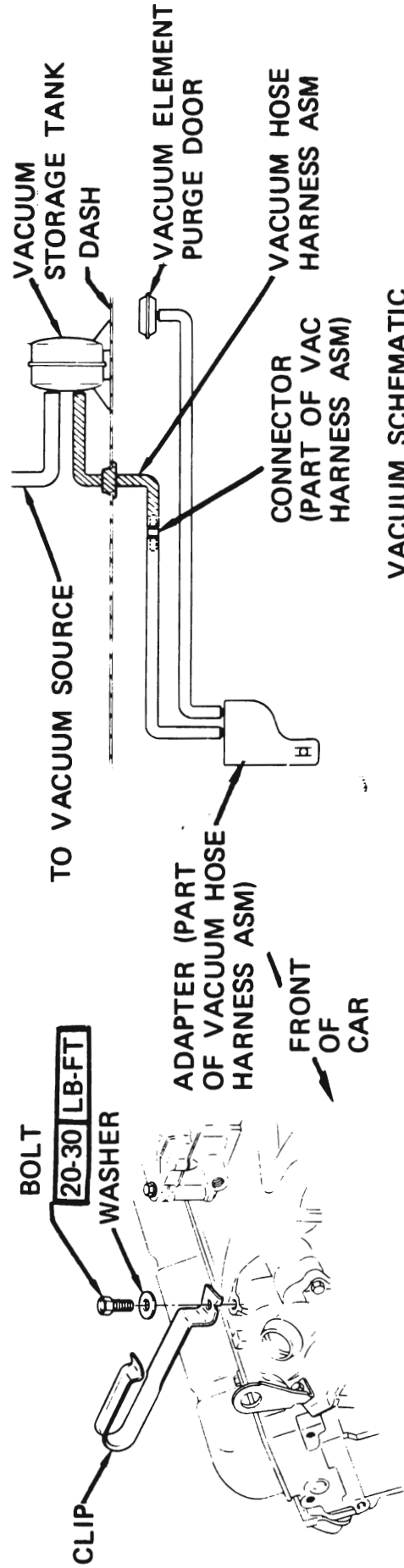
Figure 9A-21 Heater and Defroster Dash Units - B-C-E Series



4 BARREL CARBURETOR

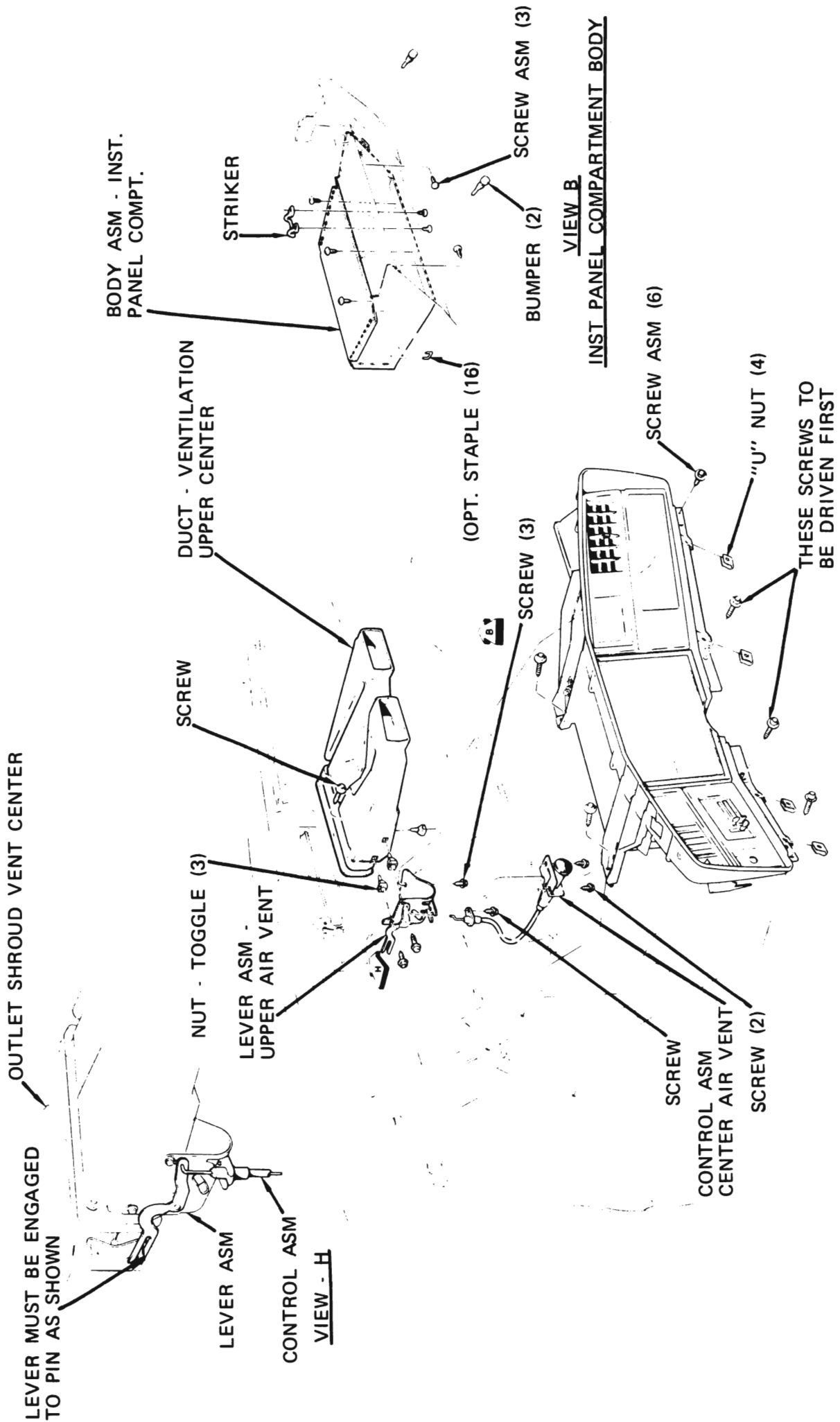


2 BARREL CARBURETOR



VACUUM SCHEMATIC

Figure 9A-22 Heater Hose - Vacuum - Installation - B-C-E Series



9A-21

Figure 9A-23 Upper Ventilation Center Duct - B-C-E Series

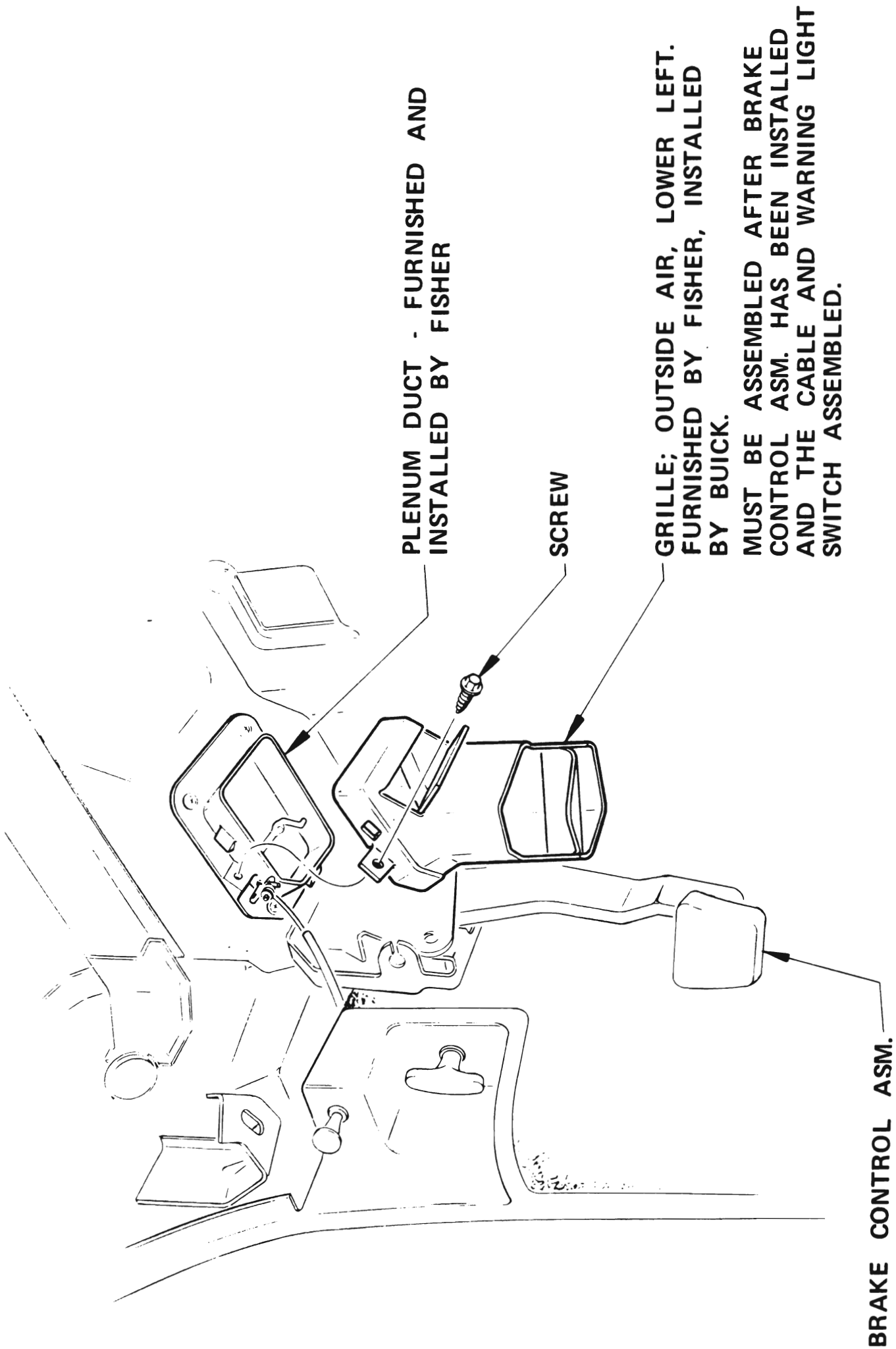


Figure 9A-24 Instrument Panel - Grille - Outside Air - Lower Left - B-C-E Series