HEATER SYSTEM

ALL SERIES

CONTENTS

DESCRIPTION AND OPERATION

BASIC DESCRIPTION OF SYSTEM OPERATION - H SERIES

The heater systems blower motor is designed to operate whenever the ignition switch is turned on. There is no OFF position on the switch; it will operate at either "Lo", "Med", or "Hi" depending on the fan switch setting. The blower motor is connected in series with the fan switch and also the blower motor resistor assembly.

Heater Position - H Series

The blower motor will operate at either "Lo", "Med", or "Hi" depending on the fan switch setting whenever the ignition switch is turned on.

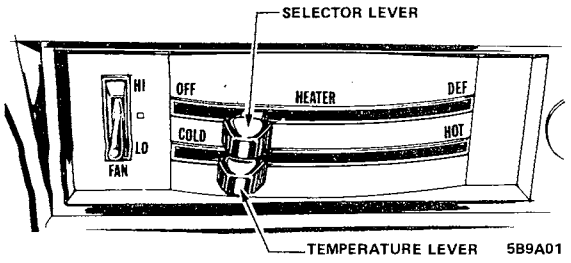


Figure 9A-1 - Heater Control - H Series

Air is distributed through the heater outlet with some air out of the defroster outlets.

Defroster Position (Def) - H Series

The blower motor will operate at either "Lo", "Med", or "Hi" depending on the fan switch setting whenever the ignition switch is turned on.

Air is dstributed through the defroster outlets with some air out the heater outlet.

DESCRIPTION OF SYSTEM - X SERIES

The X Series heater and defroster system provides rapid warm-up and even distribution of warm air to all parts of

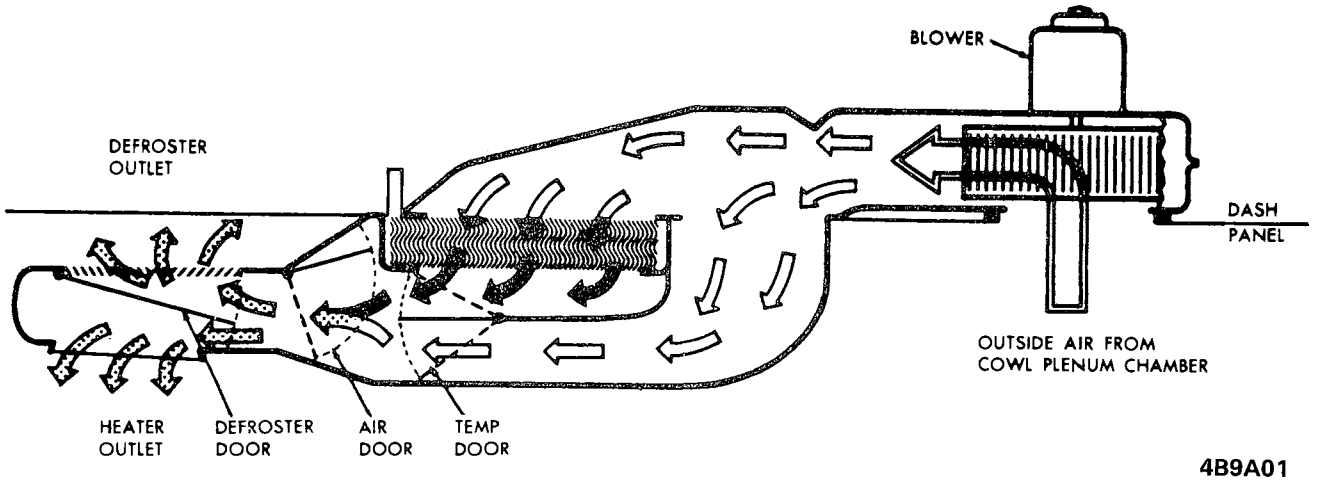


Figure 9A-2 Typical Heater Air Flow X-Series

the car. Air entering the system is taken through an opening at the rear of the hood, providing air with a minimum of dust, foreign material and undesirable fumes. This air passes through the plenum chamber into the heater blower motor and air inlet duct. The use of outside air provides constant and rapidly changing air inside the car, eliminating a smoke filled interior to keep occupants comfortable.

The driver has fingertip control of the temperature of warmed air entering the car. When heated air is desired, the blower forces air taken from the blower and air inlet duct across the heater core and through an air distribution system to air outlets inside the passenger compartment. See Figure 9A-2.

The design of the heater and defroster system, its doors and controls permits a method of obtaining two different levels of forced air flow for heating.

Heater systems are composed of the same basic components although they may differ slightly in design and capacity. Hot water is supplied to the heater core by the engine water pump through a heater hose. Air flow in the system is initiated in the plenum chamber where outside air is picked up by the blower motor and directed through the air inlet duct to the heater case. There, depending on the control panel setting, air is directed either through or around the heater core to the outlets. Here again, depending on control panel settings, air is directed primarily out the heater outlet to the front floor area or up through the defroster duct to the windshield area.

The doors which control air flow in the system are moved mechanically by Bowden cables. Three doors are utilized. A temperature door, an air door and a defroster door.

Should the system fail to satisfy, proper operation should be reviewed with the owner. This will determine whether the system is defective or being operated incorrectly.

AIR DISTRIBUTION - X SERIES

Heated air enters the interior of the car and is distributed by a center outlet under the heaterduct which dispenses air over the front floor area and to the rear passenger compartment.

Air is directed to the windshield through a duct running upward from the heater case.

OPERATION OF CONTROLS - X SERIES

The heater control is of the vertical slide lever design. Three levers transmit motion via Bowden cables to the air, defrost and temperature doors.

AIR FAN LEVER - X SERIES

The air-fan lever has two functions; blower speed control and air inlet control. Moving the lever half way from OFF toward ON opens the air inlet door to allow outside air to enter the heater system. Further movement of the AIR-FAN lever actuates the blower motor at low speed. Medium and high blower speeds are achieved by further movement of the lever when more volume of air flow is desiged.

DEFROST LEVER - X SERIES

The defrost lever controls the position of the defroster door in the heater case. In the OFF position almost all air flow is directed to the floor from the heater outlet at the bottom of the heater case (a small amount of air is distributedted from the defroster oumlets toward the windshield). In the DEFROST position the air distribution is reversed from that in the OFF position. Moving the lever to any desired point between OFF and DEFROST will divide air flow between the floor and windshield accordingly.

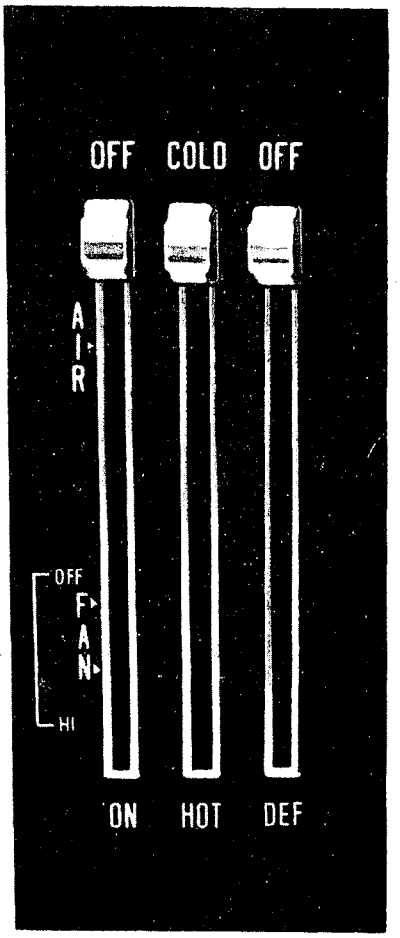


Figure 9A-3 Heater Control Panel - X Series

TEMPERATURE LEVER - X SERIES

The temperature lever regulates output temperature of the heater by varying the position of the temperature door. With the temperature lever in full HOT, all output air from the heater system is air which has passed through the heater core. Moving the temperature lever will introduce more air which has by-passed the heater core until the temperature lever reaches full COLD and all output air flow is air which has by-passed the core. This air flow should be very close to outside air temperature.

VENTILATION - X SERIES

Two lower fresh air vents, one located in each kick pad, are controlled by separate knobs located on each kick pad. Positioning the vent knobs between FULL FORWARD and FULL OUT provides ventilation by allowing regulated amounts of outside air to enter the car through the

vent. Operating the vent knob (pulling out or pushing in on knob) drives a cable which in turn positions a door inside the vent to regulate air intake.

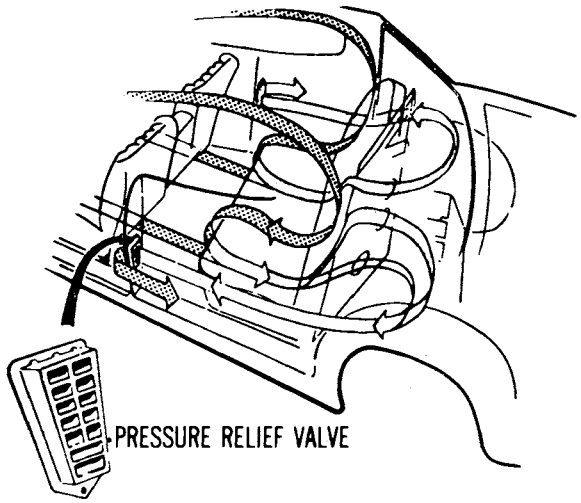


Figure 9A-4 Ventilation Air Flow

DESCRIPTION OF SYSTEM - A-B-C-E SERIES

The A-B-C-E Series 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. 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 thermo- switch, which is installed in the left (driver 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.

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-5) consists of three controls, namely the TEMPERATURE lever, SELECTOR lever and FAN switch.

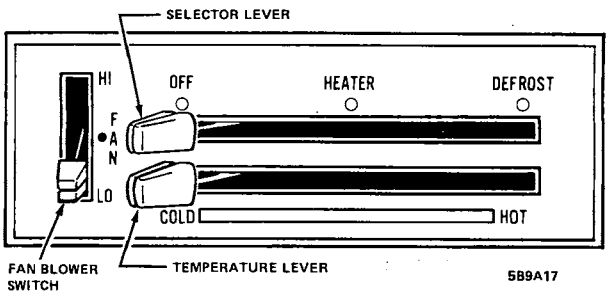


Figure 9A-5 Instrument Panel Control Assembly - A Series

OPERATION OF CONTROLS A-B-C-E SERIES

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.

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

HEATER SYSTEM DIAGNOSIS — H SERIES

TROUBLE	CAUSE AND CORRECTION
Temperature of heater air at outlets too low to heat up passenger compartment.	Check radiator cap for proper sealing–replace if necessary. Check for proper engine coolant level. If level is down, correct cause of coolant loss and refill radiator. Check for dirt in engine thermostat. In cold ambients, inlet heater hose will be hot and outlet hose cold if the thermostat is stuck open. Inspect for kinks in heater or radiator hoses–relieve kink or replace hose. Check that TEMPERATURE lever operates temperature door full extent of travel–adjust as required. Heater core partially plugged due to sediment in cooling system–backflush heater core as necessary.
Temperature of heater air at outlets adequate but the car will not build up sufficient heat.	Check for body leaks such as: (1) floor side kick pad ventilators partially open, (2) leaking grommets in dash, (3) leaking welded seams along rocker panel and windshield, (4) leaks through access holes and screw holes, (5) leaking rubber molding around doors and windows, (6) leaks between sealing edge of blower and air inlet assembly dash, and between sealing edge of heater assembly and dash.
Inadequate defrosting action.	Check that AIR-DEFROST lever completely opens defroster door in DEF position. Check for air leak in ducting between defroster outlet on heater assembly and defroster duct under instrument panel–seal area as necessary. Check position of bottom of nozzle to heater locating tab. Insure that temperature and outside air doors open fully. Check position of defroster nozzle openings relative to instrument panel openings.
Inadequate circulation of heated air through car.	Inspect floor carpet to insure that carpet lies flat under front seat and does not obstruct air flow under seat, and also inspect around outlet ducts to insure that carpet is well fastened to floor to prevent cupping of air flow–correct as necessary. Check heater air outlet for correct installation.

Trouble	Cause and Correction
Erratic heater operation.	Partially plugged heater core–backflush core as necessary. Sediment in heater lines and radiator causing engine thermostat to stick open–flush system and clean or replace thermostat as necessary. Check for kinked heater hoses–relieve kinks or replace hoses. Check coolant level. Check operation of all bowden cables and doors.
Hard operating or broken controls.	Check for loose bowden cable tab screws or misadjusted bowden cables correct as required. Check for sticking heater system door(s)–lubricate as required using a silicone spray or equivalent.

HEATER-DEFROSTER TROUBLE DIAGNOSIS - X SERIES

Cause	Correction
Slow warming in car.	Incorrect operation of controls. Advise owner of proper operation of heater controls and cowl vents. Low coolant level. Check control cable and blower operation.
Objectionable engine or exhaust fumes in car.	Check for proper seal between engine compartment and plenum. Check for proper sealing between air inlet duct assembly and dash. Locate and seal any other air leaks.
Cold drafts on floor.	Check operation and adjustment of vent cables. Advise owner of proper operation of heater system. Advise owner to use blower to force air to rear seat area. Check to be sure front floor mat is under floor mat retainer at dash.
Insufficient heat to rear seat.	Obstruction on floor, possibly wrinkled or torn deadener between front seat and floor.
Low engine coolant level - drop in heater air temperature at all blower speeds.	Advise owner to use "Hi" blower speed. Check radiator and cooling system for leaks, correct and fill to proper level. Run engine to clear any air lock. Then cap radiator.
Failure of engine cooling system to warm up. Check coolant level.	Check engine thermostat and radiator cap, replace if required.
Kinked heater hoses.	Remove kink or replace hose.
Foreign material obstructing water flow through heater core.	Remove foreign material if possible, otherwise, replace core; can usually be heard as squishing noise at core.

Cause	Correction
Temperature door improperly adjusted.	Adjust cable.
Air doors do not operate.	Check installation and/or adjustment of air control cable.

INADEQUATE REMOVAL OF FOG OR ICE

Defroster door does not open fully.	Check cable operation.
Air door does not open.	Check installation and/or adjustment of air or air-defrost cable.
Temperature door does not open.	Check and adjust temperature control cable if necessary.
Obstructions in defroster outlets at windshield.	Remove obstruction. Look for and repair loose instrument panel pad cover at defroster outlets.
Dinged defroster outlets.	Reshape outlet flange with pliers. The outlet should have a uniform opening.
Inoperative blower motor.	Check heater fuse and wiring. Replace motor if necessary.
Inoperative blower motor switch.	Check connectors, switch and wiring. Replace switch if necessary.

TOO WARM IN CAR

Temperature door improperly adjusted.	Adjust temperature control cable.
Incorrect operation of controls.	Advise owner of proper operation of heater system.

BLOWER INOPERATIVE

Blown fuse.	Replace fuse.
Inoperative motor.	Replace motor.
Open circuit.	Repair circuit between ignition switch, blower switch and blower motor.
Inoperative blower motor switch.	Replace defective switch.
Shorted or open blower resistor.	Replace resistor.

MISCELLANEOUS

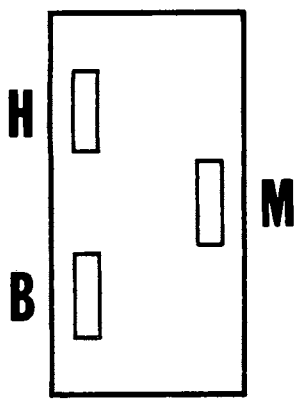
Cause	Correction
Blown fuses caused by short in electrical system.	Locate and repair short.
Front floor mat wet under heater caused by improperly sealed windshield or leaking heater core.	Reseal windshield, or lead-in from antenna. Repair or replace heater core. Check for proper seal to dash and for leak at hose connection on heater core. Hose leaking into the heater case is often misdiagnosed as a leaking core.
Heater "Gurgle"	Check engine coolant level in radiator. Check for obstruction in core and/or hoses.

HEATER-DEFROSTER TROUBLE DIAGNOSIS - A-B-C-E SERIES

Condition	Possible Cause and Correction
Blower motor inoperative	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 malfunctioned blower switch with an ohmeter or test lite for continuity.

Terminal	Lo	M	HI
	No	Conn.	Conn.
B	Conn.	To M	To H
	No	Conn.	No
M	Conn.	To B	Conn.
	No	No	Conn.
H	Conn.	Conn.	To B

5. Test for a malfunctioned engine thermo-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.



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Insufficient heating	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.

Cause	Correction
	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	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

AIR-DEFROST DOOR CABLE ADJUSTMENT - H SERIES

The air-defrost door cable is not adjustable; however, if the door does not position properly, proceed as follows:

1. Remove the floor outlet duct.

2. Place the upper control lever at "HEATER". The air-defrost door should be parallel with the front and rear sides of the duct.

3. Adjust the door by loosening the two screws on top of the distributor duct and repositioning the door. Tighten the screws.

4. Check operation of the door. In the "DEF" position, the door should seal at the rearward side of the duct and have a 1/8 to 1/4" gap at the forward side. Readjust if necessary.

5. Reinstall the floor outlet duct.

TEMPERATURE DOOR CABLE ADJUSTMENT - H SERIES

The temperature door cable is not adjustable; however if the door does not position properly, proceed as follows:

1. Place the lower control lever at "COLD".

2. Adjust the door by loosening the screws on top of the distributor duct. Position the door so that it seals at the forward side of the duct. Tighten the screws.

3. Recheck door operation. If it does not seal at the forward side of the duct, (temperature lever at "COLD"), readjustment is necessary.

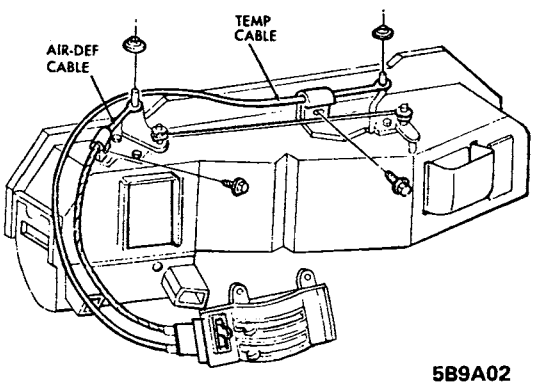


Figure 9A-6 - Bowden Cable Attachment - H Series

HEATER CABLE ADJUSTMENT - X SERIES

The heater cables do not have adjustable turnbuckles. Cable adjustment is in the positioning of the cable attaching bracket at the heater case.

1. Connect cable at heater control.

2. Set control lever to the closed (full up) position.

3. Move corresponding heater case door to the OFF (full closed) position.

4. Attach cable wire to heater case door lever and tighten cable attaching bracket screws.

5. Check for proper cable operation.

ADJUSTMENT OF TEMPERATURE SELECTOR LEVER AND TEMPERATURE DOOR A-B-C-E SERIES

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 BLOWER MOTOR - H SERIES

1. Disconnect the battery ground cable.
2. Disconnect the blower motor lead wire.
3. Scribe the blower motor flange to case position.
4. Remove the blower to case attaching screws and remove the blower wheel and motor assembly. Pry the flange gently if the sealer acts as an adhesive.
5. Remove the blower wheel retaining nut and separate the motor and wheel.
6. To install, reverse steps 1-5, lining up the scribe marks on the motor flange and case which were made at removal. Assemble the blower wheel to the motor with the open end of the blower away from the motor. Replace sealer at the motor flange if necessary.

REMOVAL AND INSTALLATION OF HEATER CORE - H SERIES

1. Disconnect the battery ground cable.
2. Disconnect the blower motor lead wire.
3. Place a pan under the vehicle. Disconnect the heater hoses at the core connections and secure the ends of the hoses in a raised position.

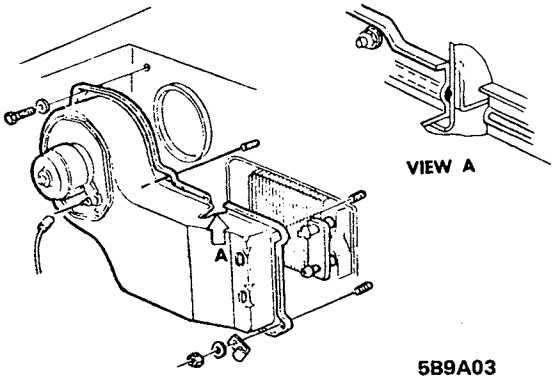


Figure 9A-7 - Blower Motor - Blower Inlet and Core - H Series

4. Remove the blower inlet to dash panel screws and nuts and remove the blower inlet, blower motor and wheel as an assembly.
5. Remove the core retaining strap screws and remove the core from the vehicle.
6. To install, reverse steps 1-5. Be sure that the blower inlet sealer is intact, replace if necessary.

REMOVAL AND INSTALLATION OF HEATER HOSES - H SERIES

Heater hoses are routed from the water pump and inlet manifold to the core inlet and outlet pipes. Hoses are attached at each end with screw type clamps.

Replacement

The heater core can be easily damaged in the area of the core tube attachment seams whenever undue force is exerted on them. Whenever the heater core hoses do not readily come off the tubes, the hoses should be cut just forward of the core tubes. The portion of the hose remaining on the core tube should then be split longitudinally. Once the hoses have been split, they can be removed from the tubes without damage to the core.

REMOVAL AND INSTALLATION OF AIR DISTRIBUTOR DUCT ASSEMBLY - H SERIES

1. Remove the core as outlined under "Removal and Installation of Heater Core."
2. Remove the floor outlet to distributor duct screw and slide the floor outlet to the left and out of the vehicle.
3. Remove the defroster duct to distributor duct screw.
4. Disconnect the resistor wiring harness.
5. Pry off the air-defrost and temperature door cable retaining clips and remove the cable attaching screws.
6. Pull rearward on the distributor duct until the mounting studs clear the dash panel and remove the distributor duct from the vehicle.
7. To install, reverse steps 1-6.

REMOVAL AND INSTALLATION OF DEFROSTER DUCT - H SERIES

1. Disconnect the battery ground cable.
2. Remove the steering column to toe pan screws. Remove the two steering column bracket to instrument panel stud nuts and carefully lower the column.
3. Remove the instrument panel bezel.
4. Remove the instrument cluster attaching screws and pull the cluster rearward far enough to gain access to the defroster duct attaching rivets.
5. Pry the nut off each defroster duct to plenum panel rivet.
6. Remove the defroster duct to distributor duct screw and lift the defroster duct up out of the vehicle.
7. To install, reverse steps 1-6.

REMOVAL AND INSTALLATION OF CONTROL ASSEMBLY - H SERIES

1. Disconnect the battery ground cable.

2. Remove the instrument panel bezel.

3. Remove the control to instrument panel screws. Push the control forward and then lower the control far enough to disconnect the bowden cables and electrical leads. Be careful not to kink the bowden cables.

4. Pry off the bowden cable retaining clips, remove the cable attaching screws and disconnect the cables from the control assembly.

5. Disconnect the blower switch lead and remove the control assembly.

6. To install, reverse steps 1-5.

REMOVAL AND INSTALLATION OF BLOWER SWITCH - H SERIES

1. Follow steps 1-3 of Removal and Installation of Control Assembly.

2. Disconnect the blower switch electrical connector.

3. Remove the blower switch attaching screws and remove the switch assembly.

4. To install, reverse steps 1-3.

REMOVAL AND INSTALLATION OF BOWDEN CABLES - H SERIES

1. Follow steps 1-4 of Removal and Installation of Control Assembly.

2. Pry off the bowden cable retaining clip (distributor end), remove the cable retaining screw and remove the cable.

3. To install, reverse steps 1 and 2 above.

Before installing the control assembly to the instrument panel, check cable operation to assure freedom of travel and proper door operation.

REMOVAL AND INSTALLATION OF RESISTOR ASSEMBLY - H SERIES

1. Disconnect wire at resistor unit.

2. Remove two screws to distributor duct and remove resistor unit.

3. To install new unit, reverse removal procedure.

REMOVAL AND INSTALLATION OF HEATER CABLES (ALL) - X SERIES

1. Remove radio.

2. If replacing defrost cable, remove ash tray and bracket for access to cable attachment at control.

3. Remove retaining screw and nut and disconnect cable at heater case.

4. If replacing temperature cable, remove screw and clip used to route cable along heater case.

5. Remove retaining screw and nut and disconnect cable at control and remove cable.

6. Repair cable or construct new cable of equal length using parts from Bowden Cable Repair Kit. Use cable housing from original cable if possible. In most instances, only the wire portion of the cable will require replacement.

7. To replace cable, reverse removal procedure. Check adjustment when connecting cable at heater case.

REMOVAL AND INSTALLATION OF HEATER CONTROL PANEL - X SERIES

1. Disconnect battery.

2. Remove radio.

3. Remove (3) heater control to instrument panel attaching screws and lower heater control assembly from instrument panel.

4. Disconnect heater control cables from control panel.

5. Disconnect electrical connectors and remove control panel.

6. To replace, reverse removal procedure.

REMOVAL AND INSTALLATION OF FAN SWITCH - X SERIES

1. Disconnect battery.

2. Remove radio.

3. Remove heater control to instrument panel attaching screws and lower heater control from instrument panel.

4. Disconnect electrical connector from switch.

5. Remove switch retaining screws and remove switch.

6. To replace, reverse removal procedure.

REMOVAL AND INSTALLATION OF BLOWER MOTOR RESISTOR - X SERIES

1. Remove glove compartment and door.

2. Remove 2 screws securing resistor assembly on top of heater case.

3. To replace, reverse removal procedure.

REMOVAL AND INSTALLATION OF DEFROSTER NOZZLE - X SERIES

1. Remove heater core and case assembly.

2. Remove 2 upper defroster nozzle attaching screws.

3. Remove lower attaching screw and washer and remove defroster nozzle.

4. To replace, reverse removal procedures and follow heater core replacement in "Heater Core Removal and Installation."

REMOVAL AND INSTALLATION OF BLOWER MOTOR AND/OR IMPELLER - X SERIES

1. Disconnect Battery.

2. Raise car.

3. Remove all fender skirt attaching bolts except those attaching skirt to radiator support.

4. Pull out and down on skirt and place wooden block between skirt and fender to allow clearance for blower motor removal.

5. Disconnect blower motor electrical connections.

6. Remove attaching screws and remove blower motor.

7. Remove blower impeller retaining nut and separate motor from impeller.

8. To replace, reverse removal procedure.

REMOVAL AND INSTALLATION OF BLOWER AND AIR INLET DUCT - X SERIES

1. Remove blower motor assembly.

2. Through opening between fender and skirt, remove air inlet duct attaching screws and nuts.

3. Remove air inlet duct and clean excess sealer from dash sealing surface.

4. To replace, reverse removal procedure. Reseal air inlet duct when replacing.

REMOVAL AND INSTALLATION OF HEATER CORE - X SERIES

1. Disconnect battery.

2. Drain radiator.

3. Disconnect heater hoses at core connections and plug core tubes to prevent spilling coolant when removing core and case assembly.

4. Remove retaining nuts from core case studs on engine side of dash.

5. Remove glove compartment and door.

6. From inside vehicle, drill out lower right hand heater case stud with 1/4 inch drill.

7. Pull core and case assembly from dash.

8. Disconnect heater cables and blower motor resistor connector from heater case and remove core and case assembly from car.

9. Remove core tube seal and core retaining strips and remove core.

10. Install replacement core. Be sure core to case sealer is intact before installing core. Use new sealer if necessary.

11. Install core retaining strips and core tube seal.

12. Replace drilled out heater case stud with new screw and stamped (pull) nut.

13. Inside car, insert heater case studs through holes in cowl and air inlet duct. Install case to dash mounting nuts. It may be necessary to first insert coolant tubes through the dash followed by the studs.

14. Connect heater cables and blower resistor connector. Check cable operation and adjust if necessary.

15. Connect heater hoses, being careful to install them in their proper locations.

16. Refill radiator and connect battery.

REMOVAL AND INSTALLATION OF HEATER CASE - X SERIES

1. Perform steps 1 through 9 of heater core removal and installation procedure.

2. Transfer cable brackets, heater outlet and blower motor resistor to new heater case.

3. Install heater core. Be sure core to case sealer is intact before installing core. Use new sealer if necessary.

4. Perform steps 11 through 16 of heater core removal and installation procedure.

REMOVAL AND INSTALLATION OF LOWER VENT DOOR - X SERIES

1. Remove parking brake ratchet assembly if working on left side.

2. Remove forward door sill plate screw.

3. Remove 5 kick pad screws.

4. Disconnect cable and remove ventilator door from kick pad.

5. To replace, reverse removal procedure.

REMOVAL AND INSTALLATION OF LOWER VENT CABLE - X SERIES

1. Perform steps 1 through 4 of removal and installation of vent door procedure.

2. Disconnect cable from door and remove cable.

3. To replace, reverse removal procedure.

REMOVAL AND INSTALLATION OF HEATER CONTROL ASSEMBLY – A SERIES

1. Remove instruments trim plate by pulling rearward and unsnapping from instrument panel.

2. Remove 4 heater control attaching screws.

3. Pull control out from instrument panel and disconnect electrical wiring and 2 Bowden cables.

4. Turn heater control over and disconnect 1 control cable and ground wire.

5. Install in reverse of removal procedures making sure cables are attached on the correct levers.

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 HEATER ASSEMBLY OR HEATER CORE - A SERIES

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

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

Removal

1. Disconnect the battery.
2. Remove the left lower instrument panel trim by carefully prying and pulling the trim out.
3. Remove 3 screws from the control face.
4. Disconnect vacuum, electrical connectors and bowden wire.
5. Remove control assembly.
6. To install, reverse removal procedures.
7. Adjust control cable so that 1/16 to 1/8 inch springback is obtained in the "Hot" position.

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 E series only.
2. Remove extension and plate assembly E series only.
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 and electrical connector from blower motor resistor. Remove nuts and screws securing blower and air inlet assembly to dash.

Installation

1. (Blower Motor and Air Inlet Assembly) Install 4 nuts and 2 screws, securing blower and air inlet assembly to dash. Connect blower motor wire and resistor connector.
2. Connect electrical connector to blower motor resistor.

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

3. Install extension and plate assembly E series only.
4. Install extension and plate assembly and tighten hood hinge E series only.
5. Seal along mating surfaces between dash and air inlet assembly.

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.
2. Disconnect control wires from defroster door and vacuum hose diverter door acutator diaphragm and control cable from temperature door lever.
3. Remove 4 nuts securing heater assembly to dash.
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.
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.
7. Seal along mating surfaces between dash and heater assembly.
8. Adjust temperature control cable as necessary.

SPECIFICATIONS

Recommended Coolant	Ethylene-Glycol Base
Thermostat Opening Temperature	190
Cooling System Capacity With Heater (Quarts)	
231 H Series	13.3
231 X Series	16.5
250 X Series	16.3
260 X Series	22.4
350 X Series	17.9
231 A Series	15.3
350 A Series	16.9
350 B Series	16.9
455 All Series	19.6
Blower Motor Type	12 VDC
Blower Motor Fan	Squirrel Cage

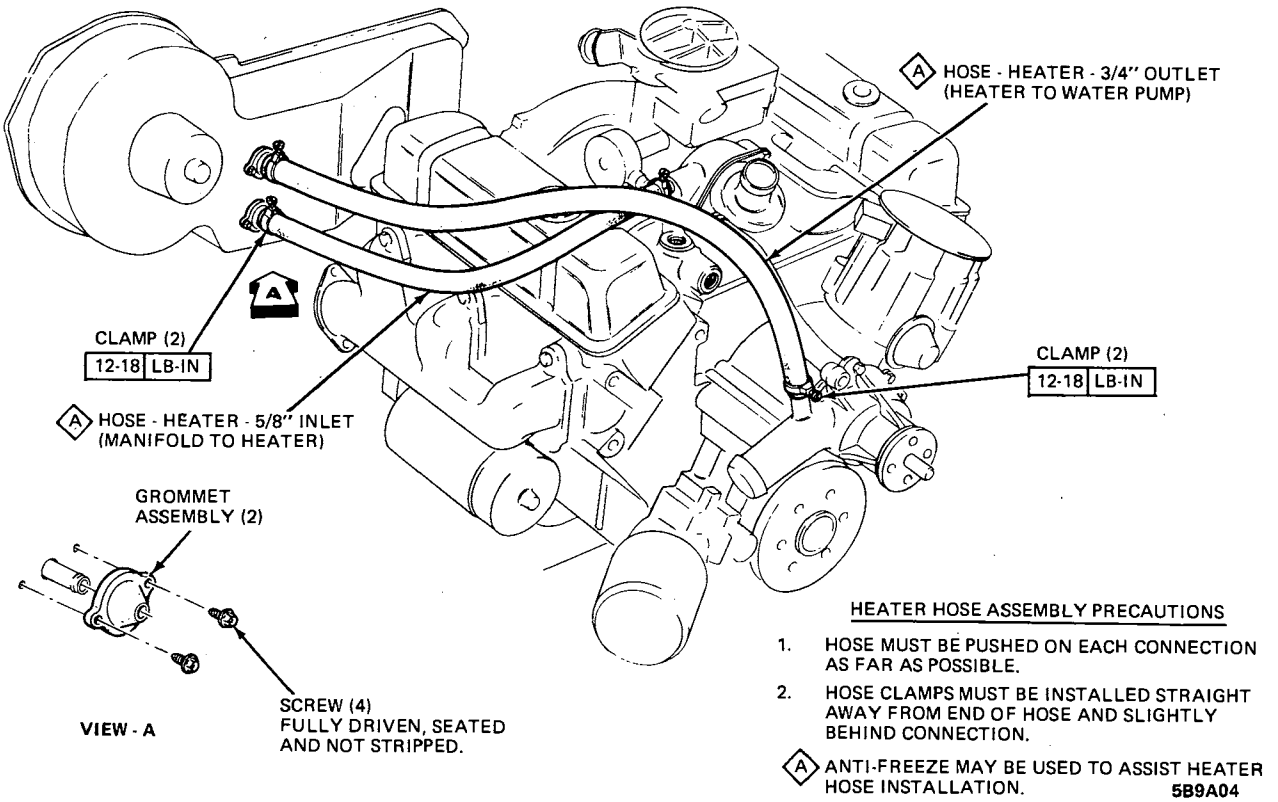


Figure 9A-8 - Heater Hoses - V-6 Engine - H Series

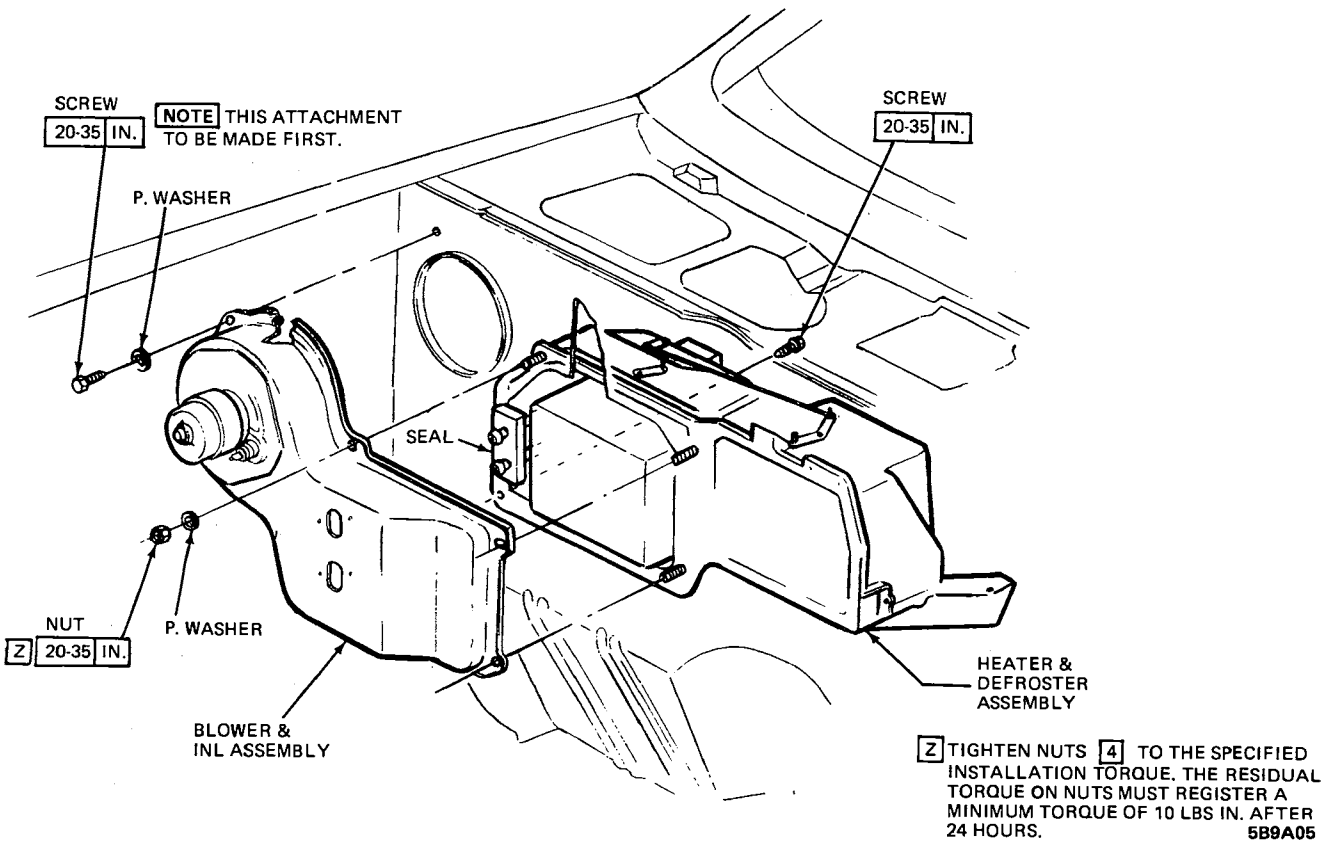


Figure 9A-10 - Blower and Heater and Defroster Assembly - H Series

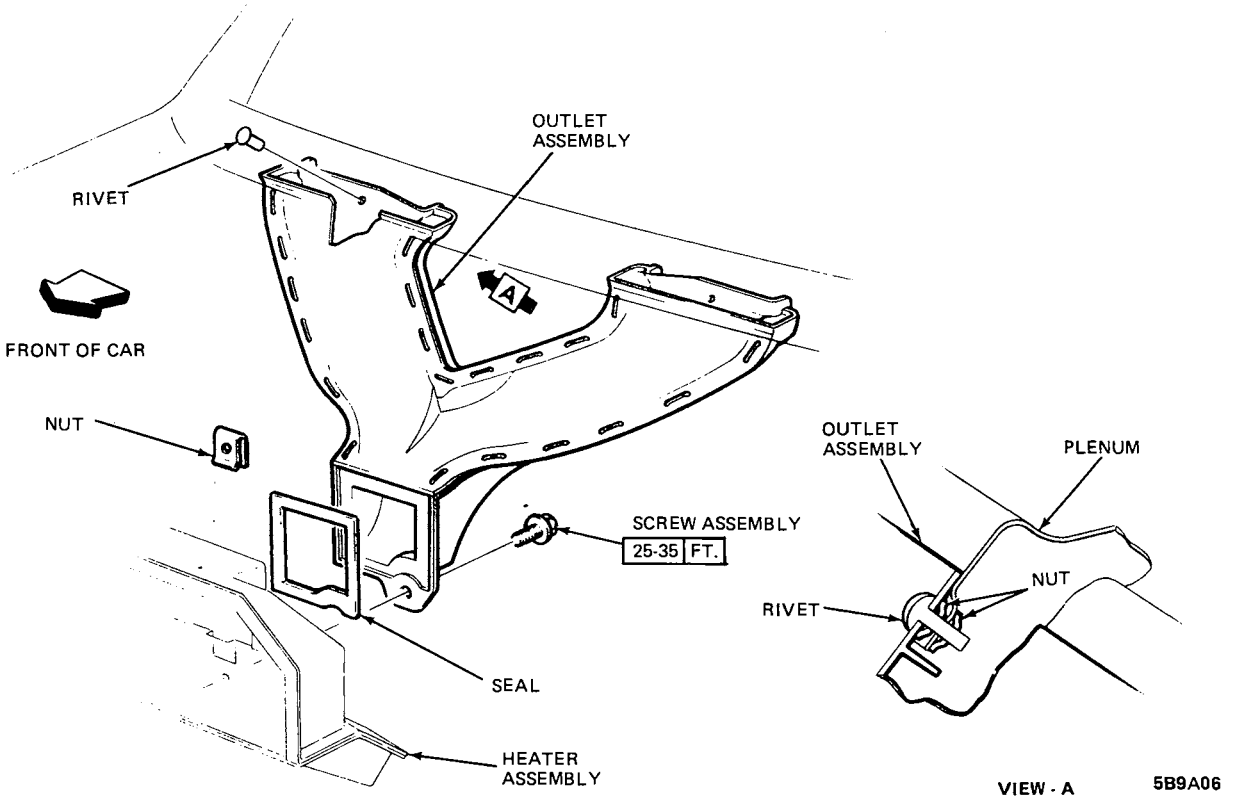


Figure 9A-11 - Defroster Outlet Assembly - H Series

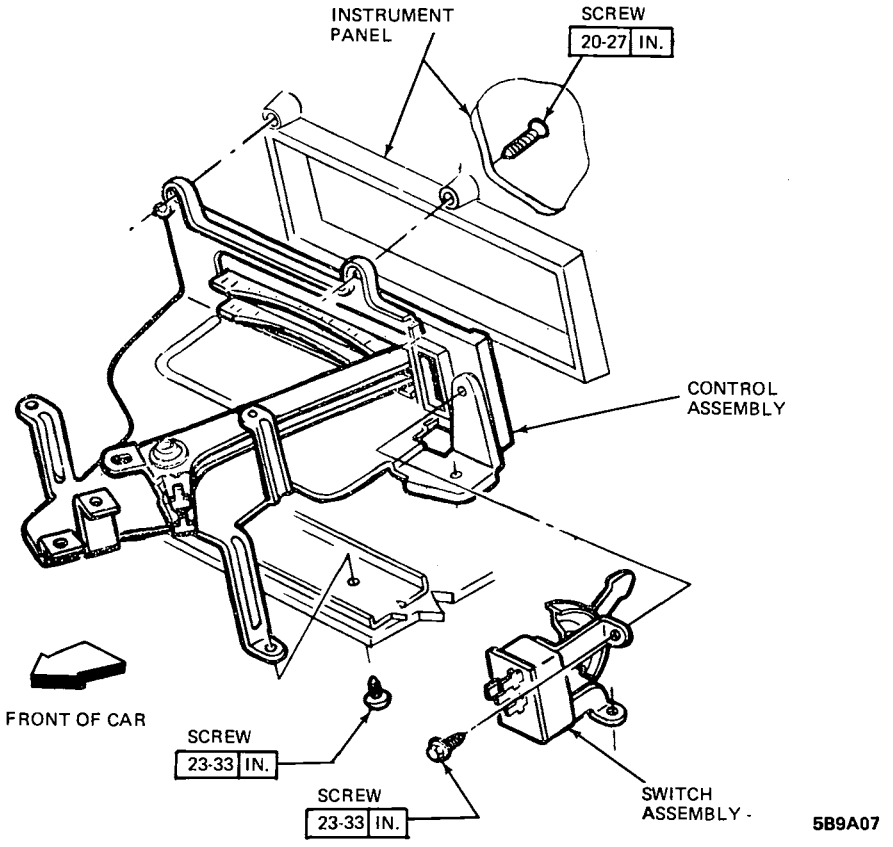


Figure 9A-12 - Instrument Panel Control - H Series

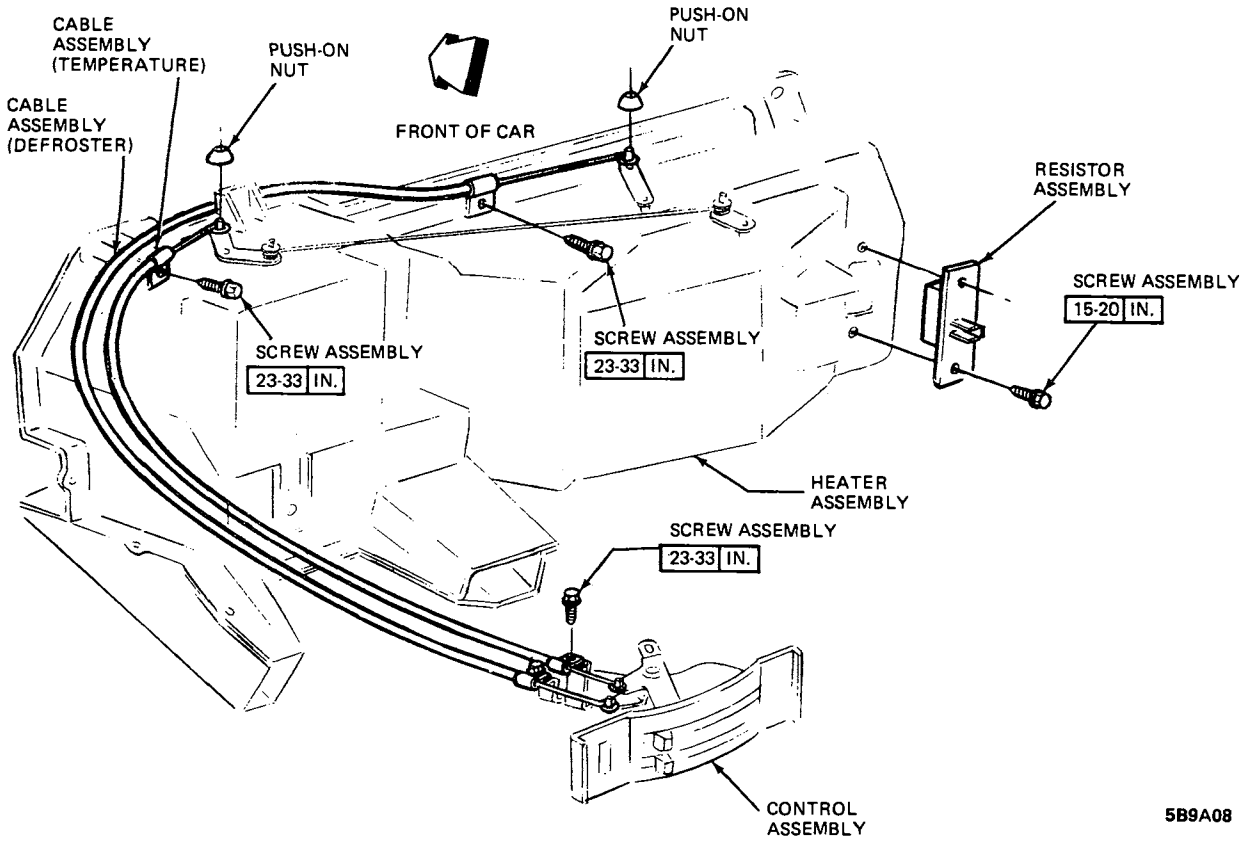


Figure 9A-13 - Control Cables and Resistor - H Series

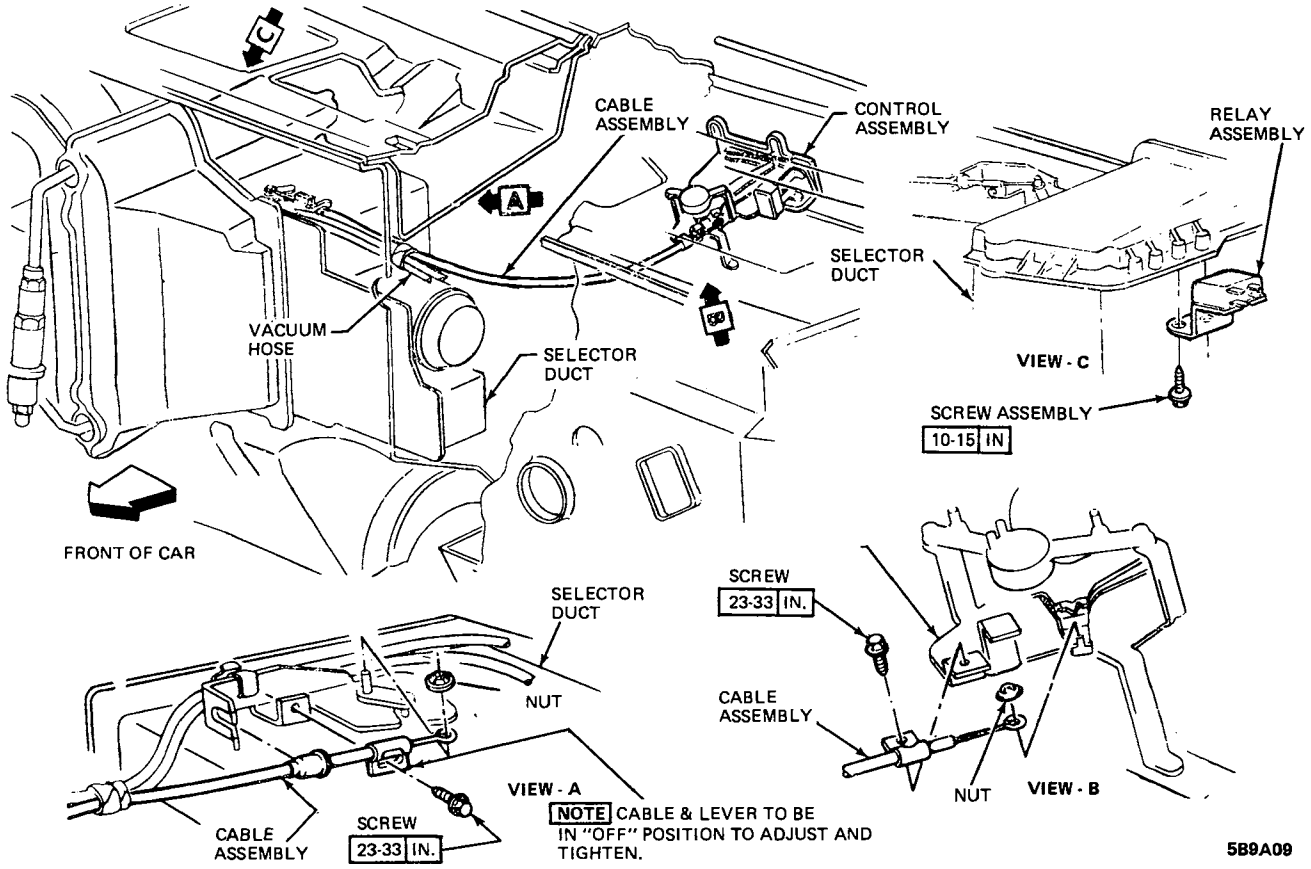


Figure 9A-14 - Control Cable Routing - H Series

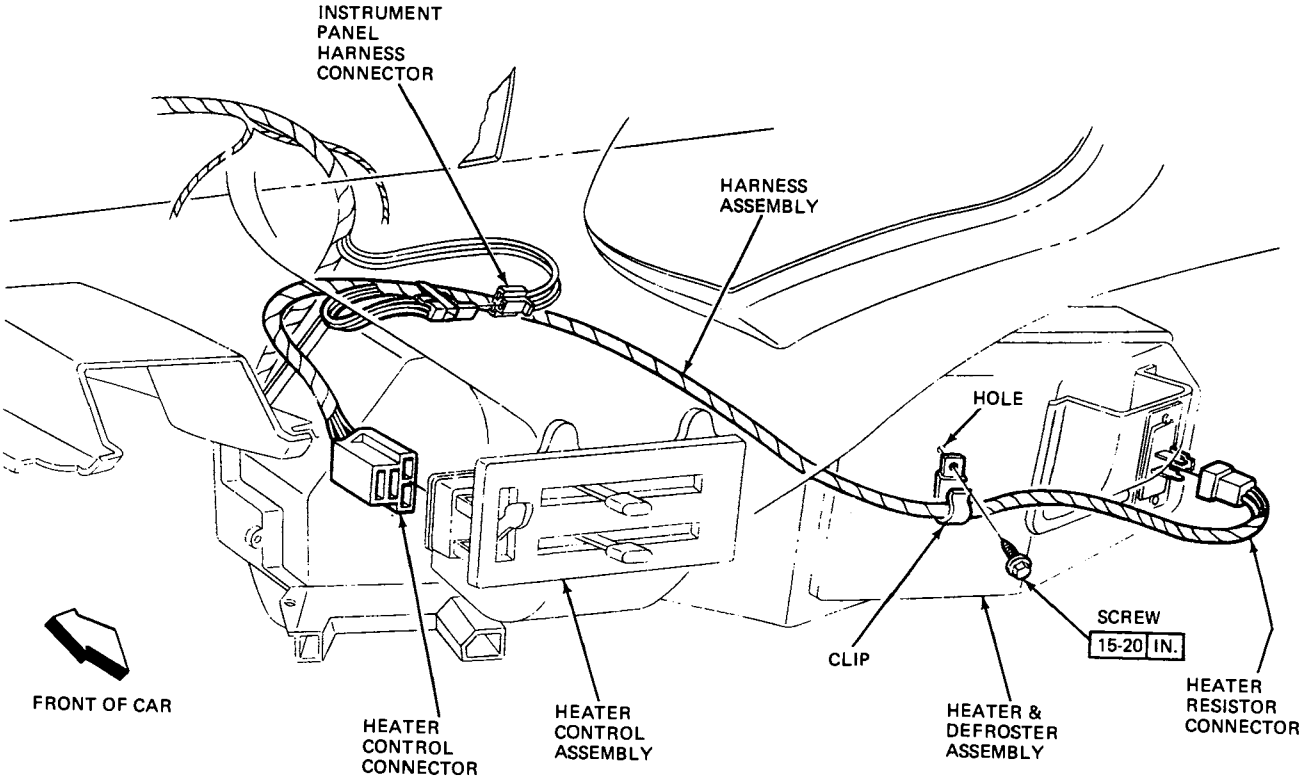


Figure 9A-15 - Heater Wiring - H Series

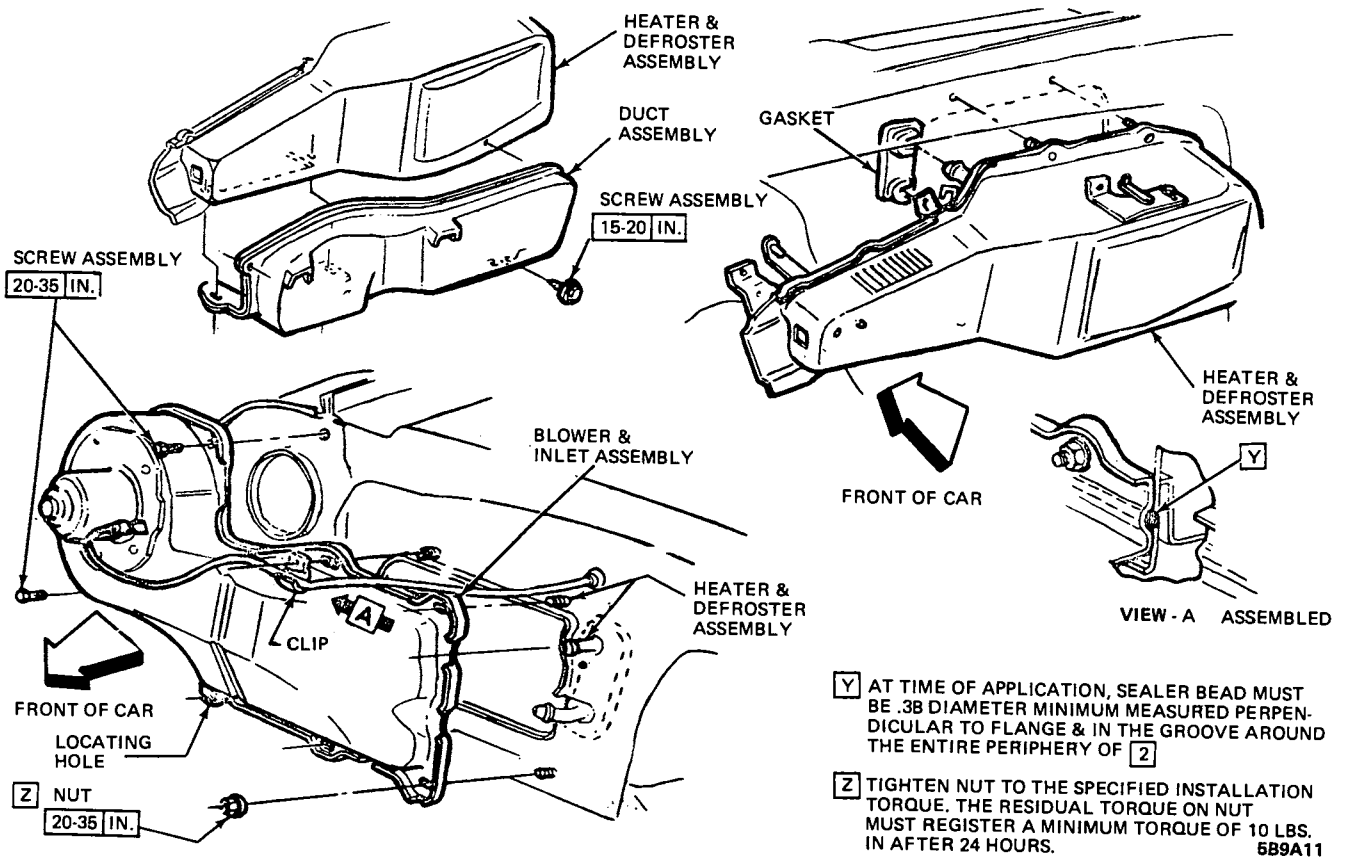


Figure 9A-16 - Heater and Defroster -

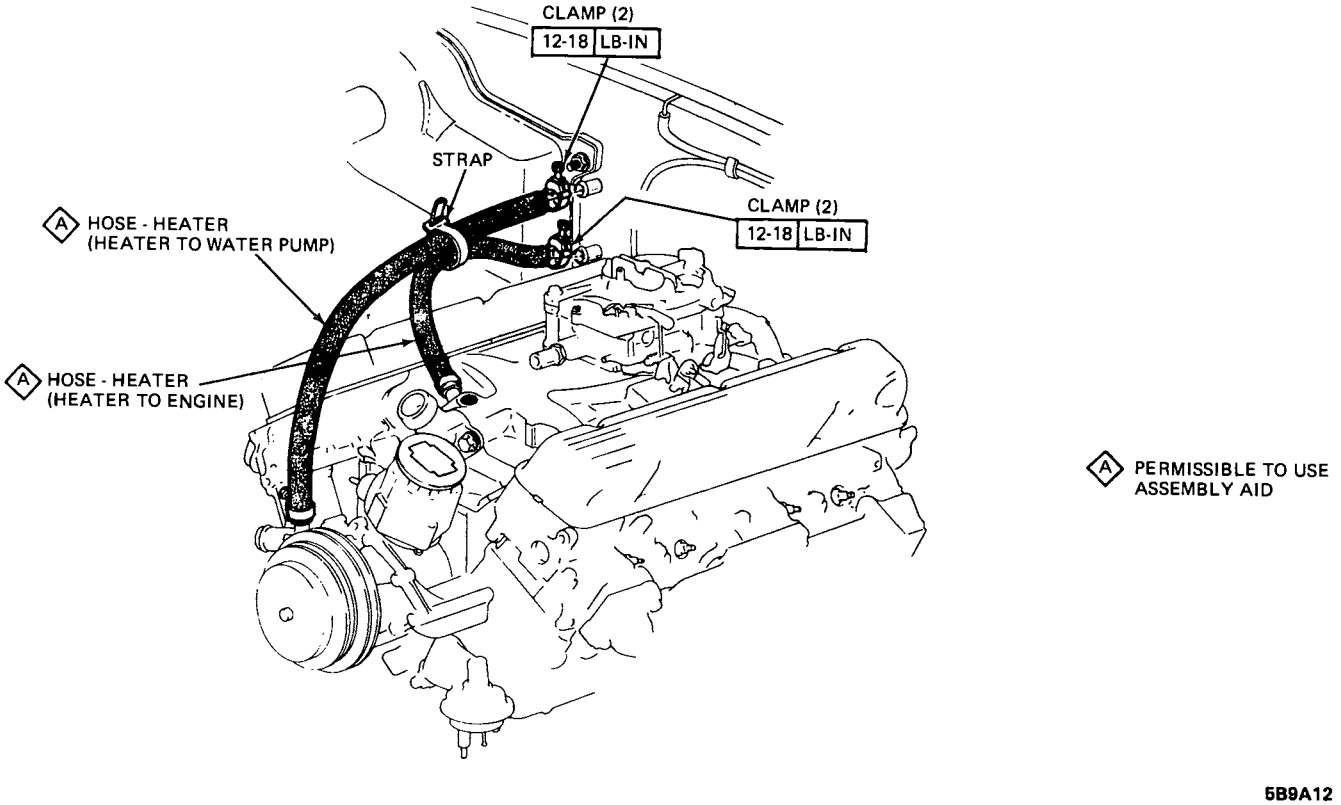


Figure 9A-17 - Heater Hoses - 350 V8 - X Series

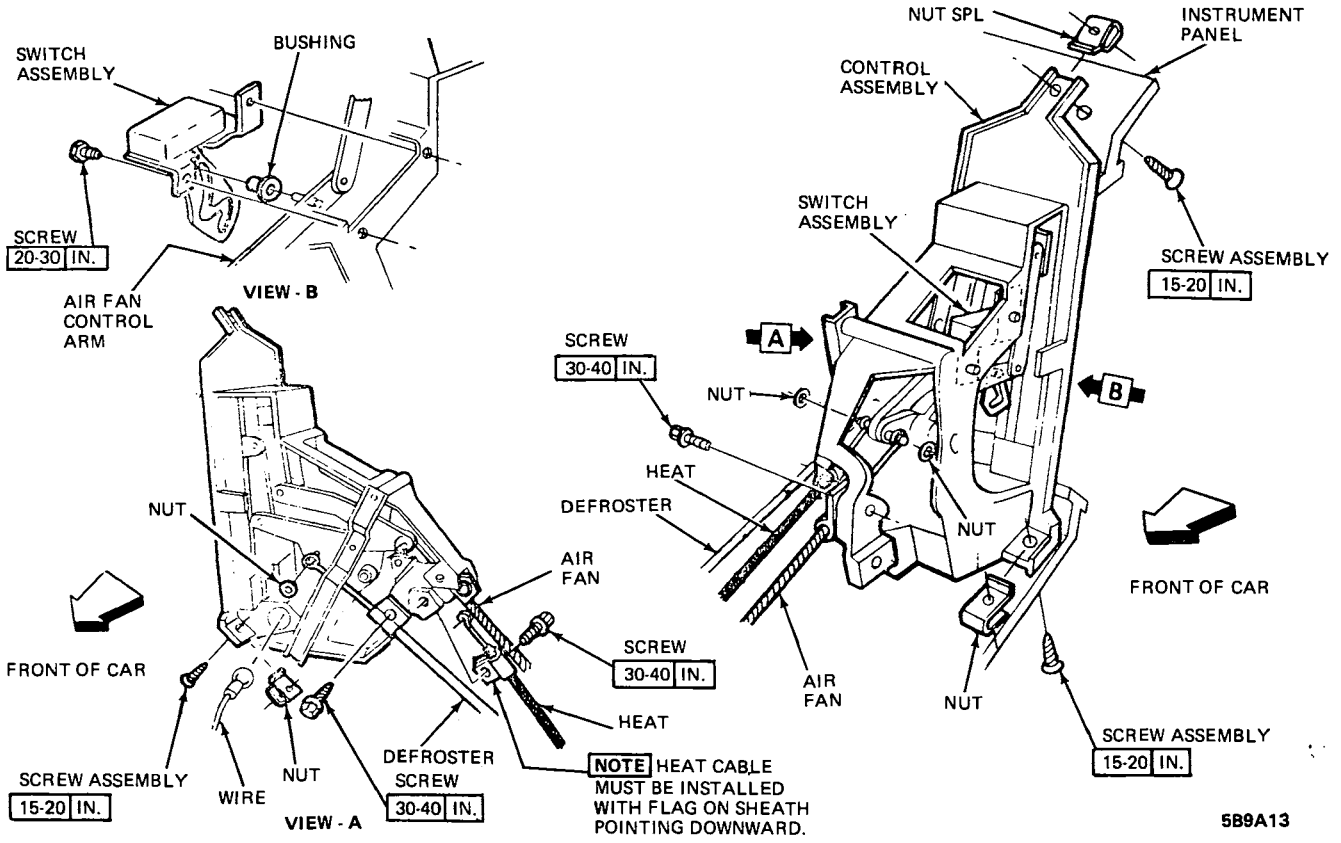


Figure 9A-18 - Instrument Panel Heater Control Assembly - X Series

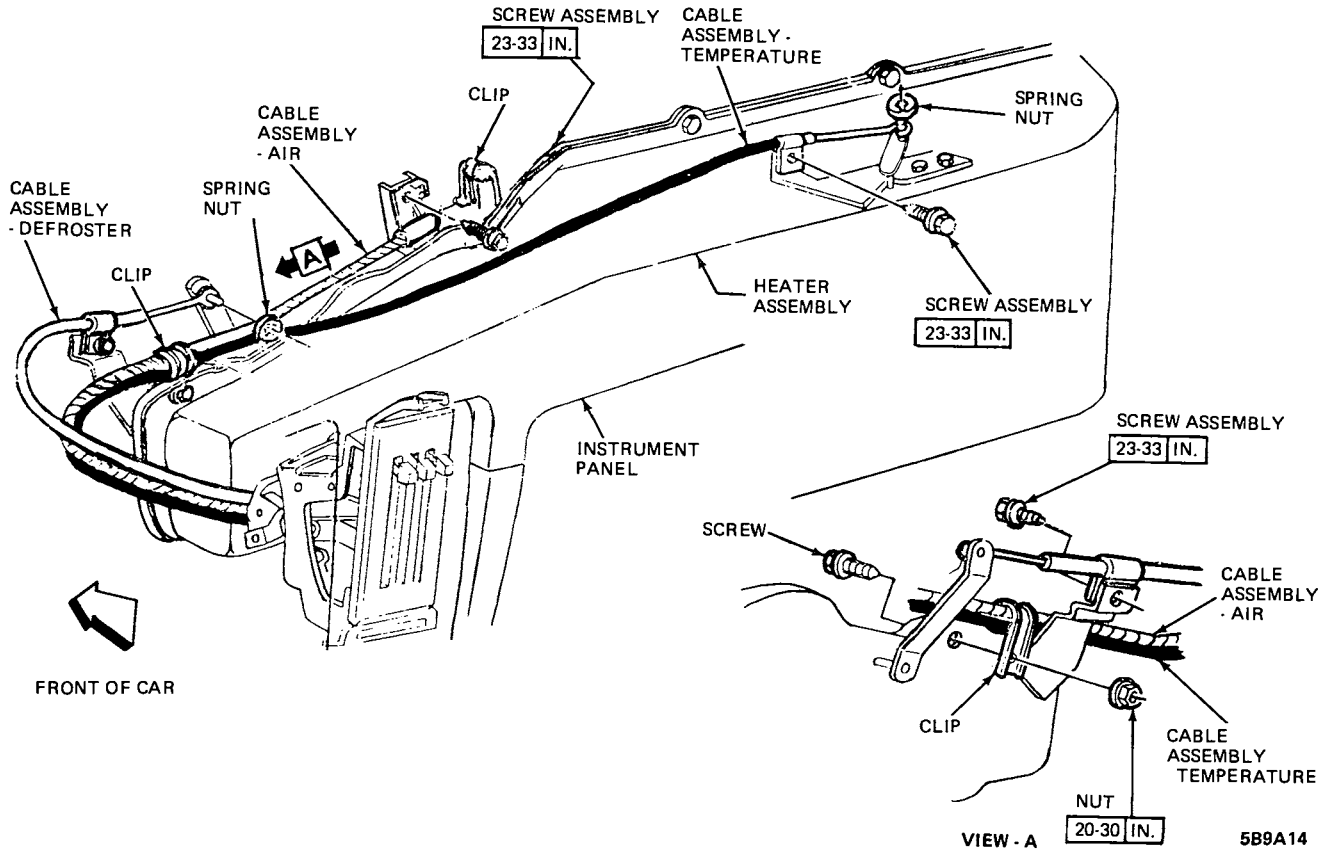


Figure 9A-19 - Heater Control Cables - X Series

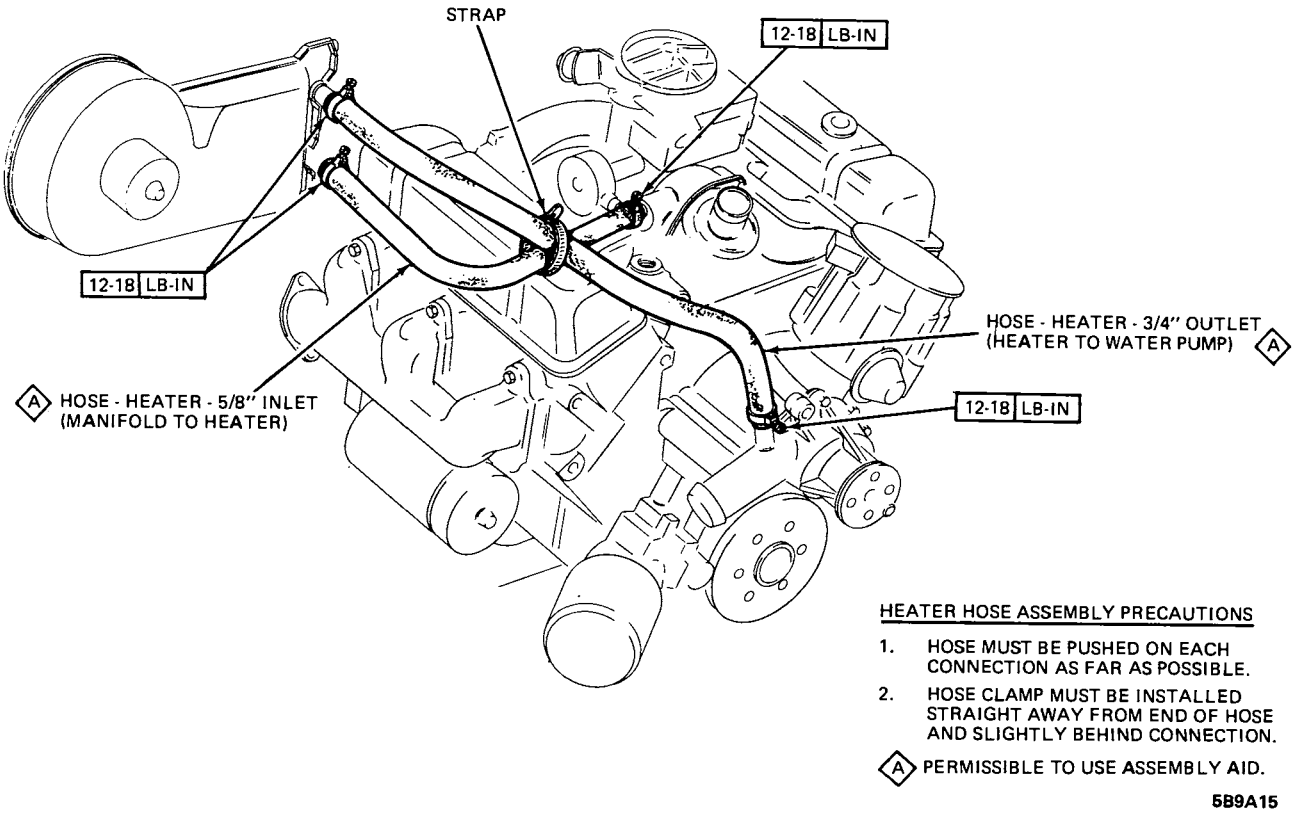


Figure 9A-20 - Heater Hoses - 231 V-6 - X Series

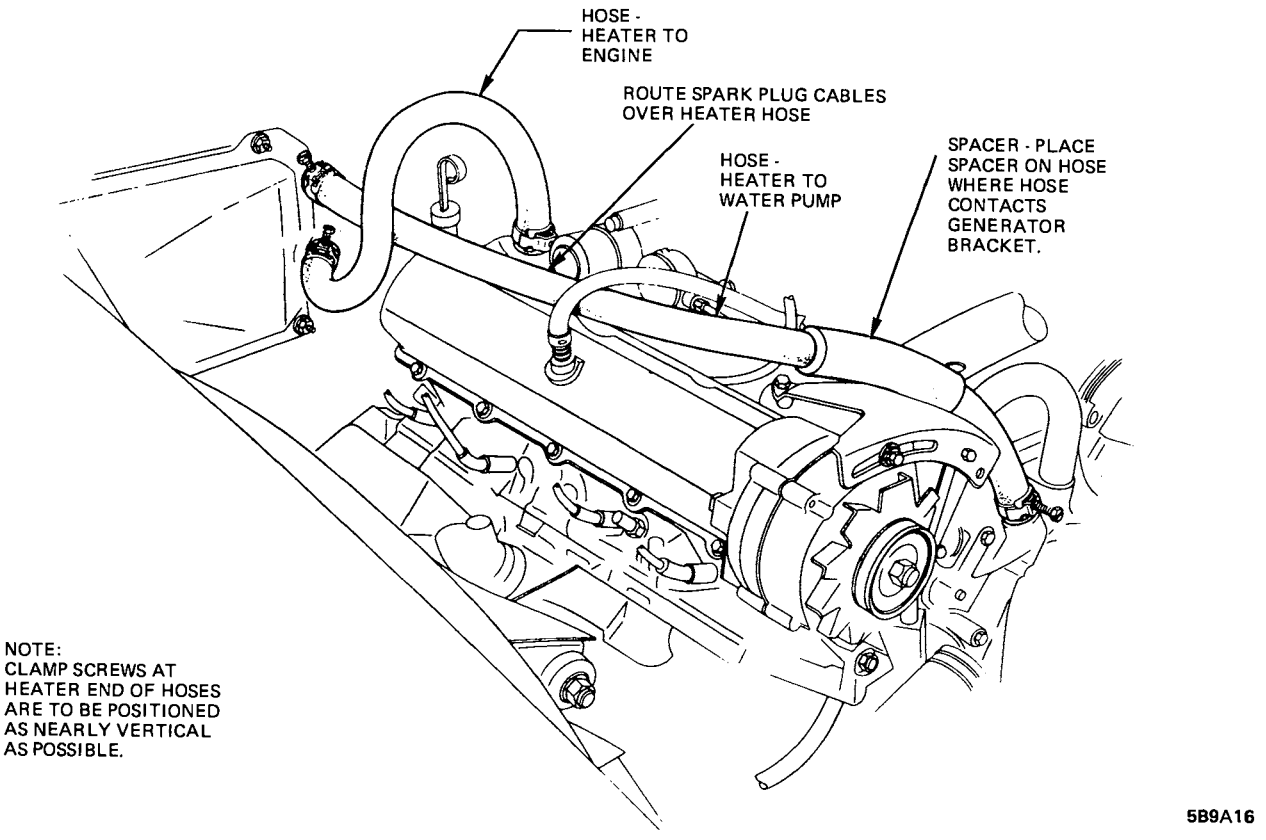


Figure 9A-21 - Heater Hoses - 260 V-8 - X Series

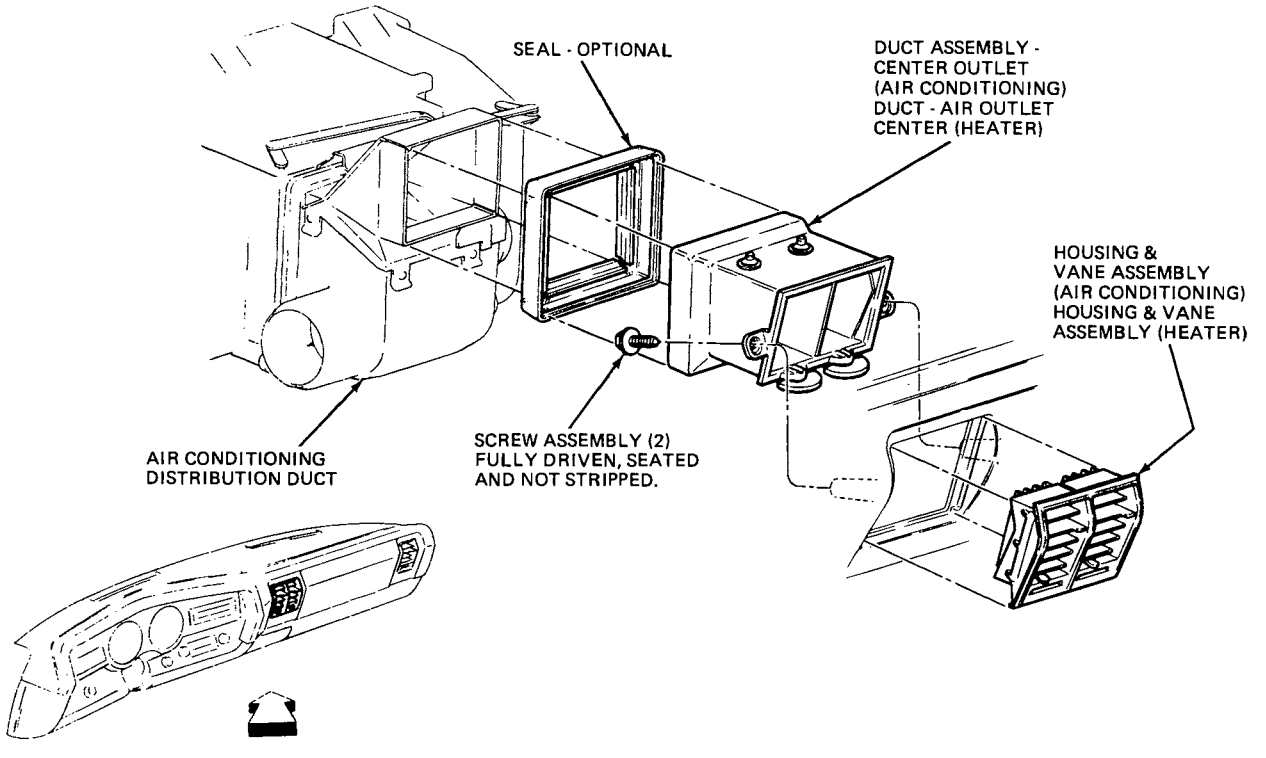


Figure 9A-22 - Center Outlet - A Series

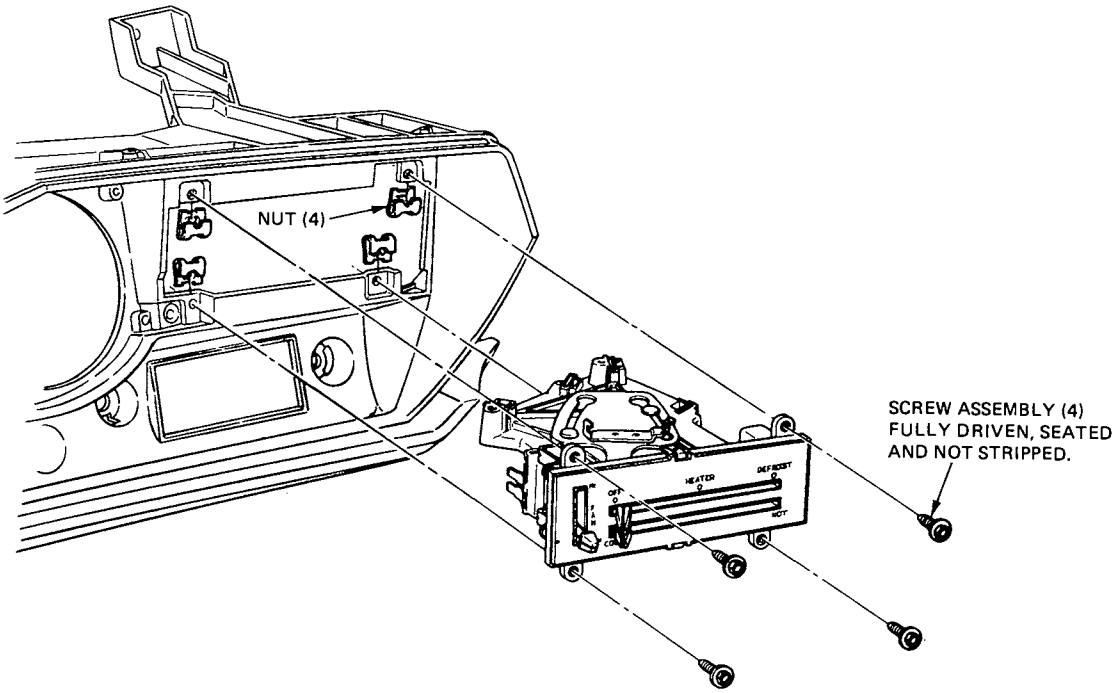
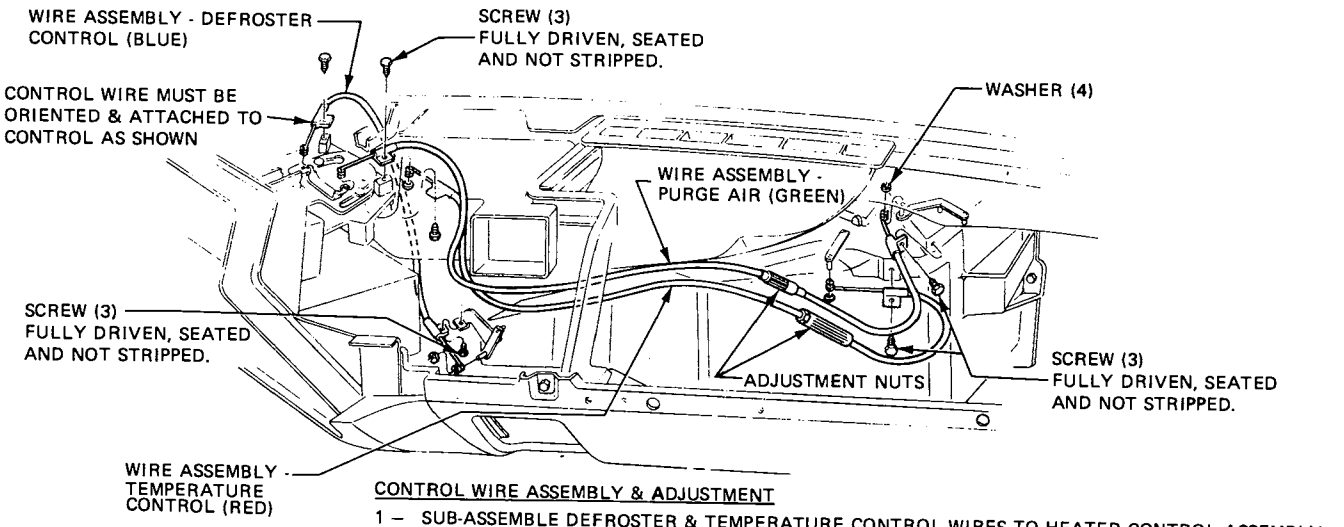


Figure 9A-23 - Instrument Panel Control Assembly - A Series



TYPICAL CONTROL WIRE INSTALLATION (2-PLACES ON TOP OF CONTROLS)

CONTROL WIRE ASSEMBLY & ADJUSTMENT

1 – SUB-ASSEMBLE DEFROSTER & TEMPERATURE CONTROL WIRES TO HEATER CONTROL ASSEMBLY.

2 – DEFROSTER (BLUE)
ASSEMBLE DEFROSTER WIRE TO DEFROSTER VALVE.

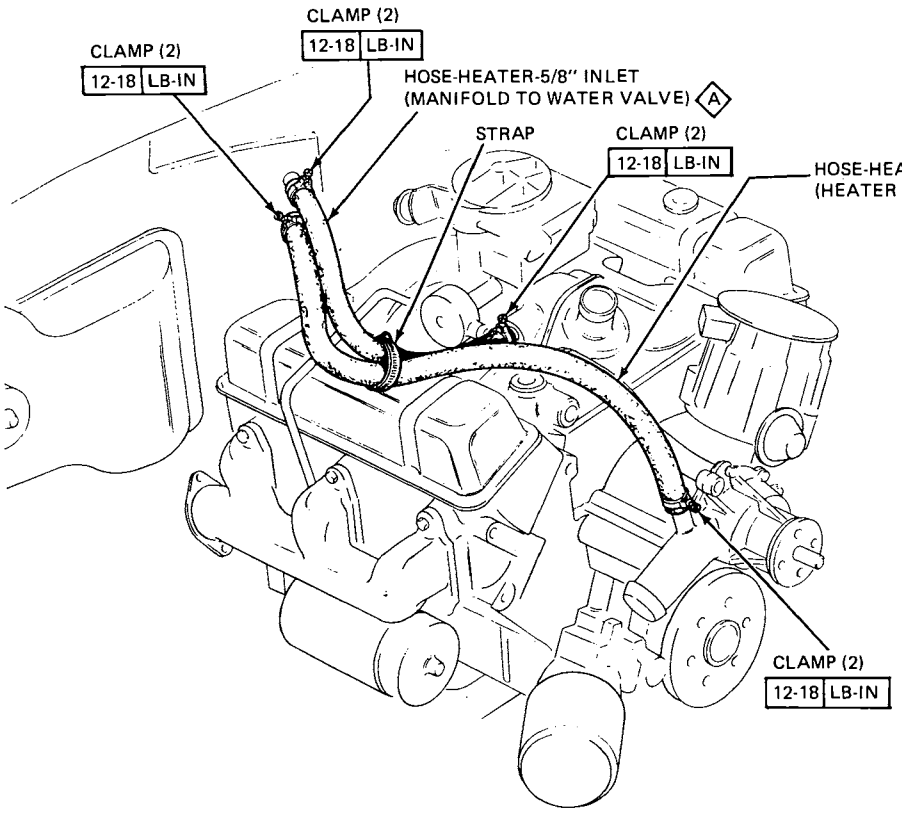
3 – OUTSIDE AIR (GREEN)
- A – SUB-ASSEMBLE OUTSIDE AIR WIRE TO OUTSIDE AIR VALVE ON HEATER CASE.
- B – ASSEMBLE OUTSIDE AIR WIRE TO CONTROL ASSEMBLY.
- C – ADJUST OUTSIDE AIR WIRE SO THAT THE SELECTOR LEVER LINES UP WITH THE HEATER MODE DETENT & LEVER TRAVELS THRU DETENT POSITION WITHOUT BIND.

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.

5B9A20

Figure 9A-24 - Cables - Heater Control - A Series

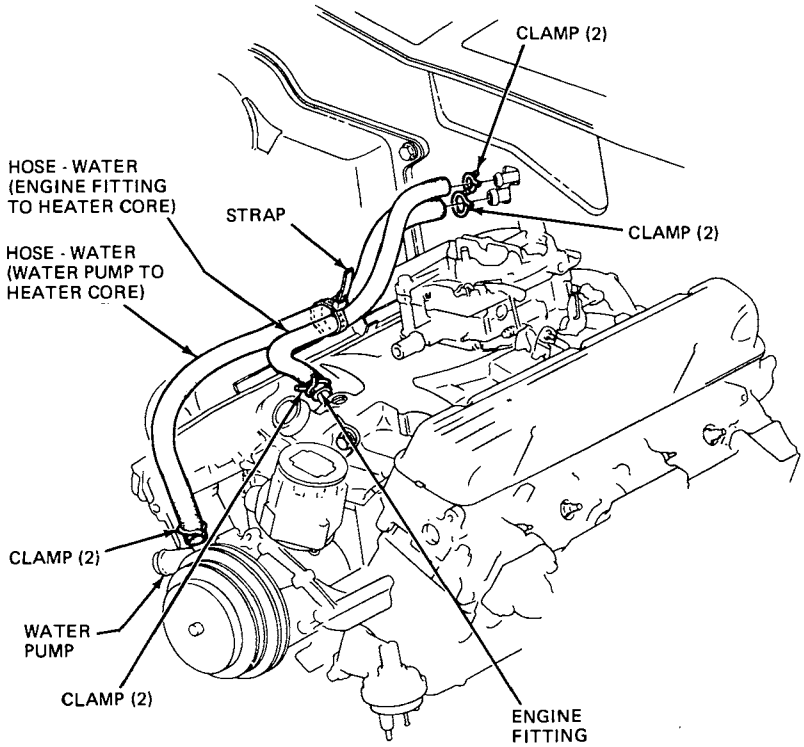


HEATER HOSE ASSEMBLY PRECAUTIONS

1. HOSE MUST BE PUSHED ON EACH CONNECTION AS FAR AS POSSIBLE.
2. HOSE CLAMP MUST BE INSTALLED STRAIGHT AWAY FROM END OF HOSE AND SLIGHTLY BEHIND CONNECTION.
3. DO NOT OVERSPREAD SPRING TYPE CLAMPS DURING ASSEMBLY, USE PROPER TOOL WITH SPACERS.

A PERMISSIBLE TO USE ASSEMBLY AID. 5B0A22

Figure 9A-25 - Heater Hoses - 231 V-6 - 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. PERMISSIBLE TO USE ASSEMBLY AID.
4. DO NOT OVERSPREAD SPRING TYPE CLAMPS DURING ASSEMBLY. 5B9A21

Figure 9A-26 - Heater Hoses - 350 - 455 V-8 - A-B-C-E Series

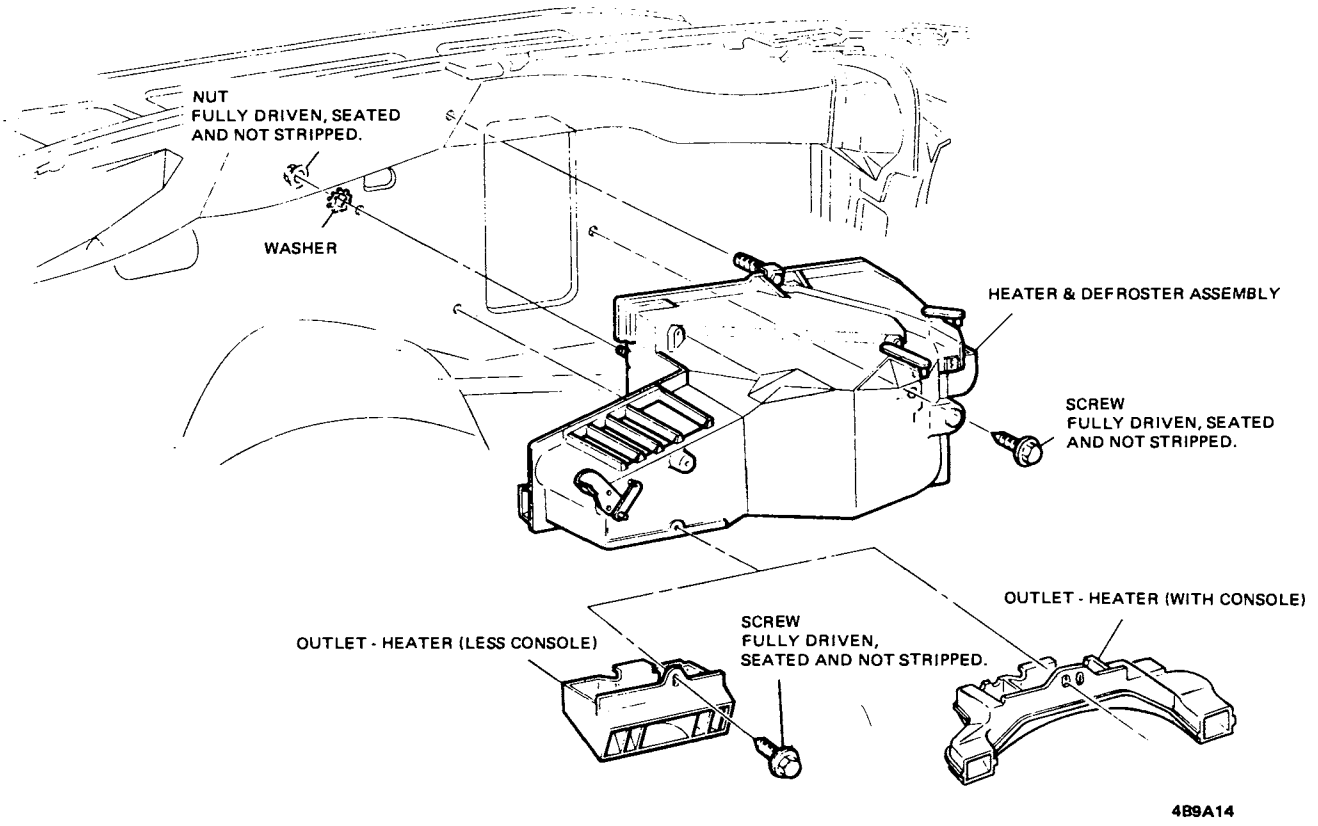


Figure 9A-27 - Heater and Defroster Assembly - Center Outlet - A Series

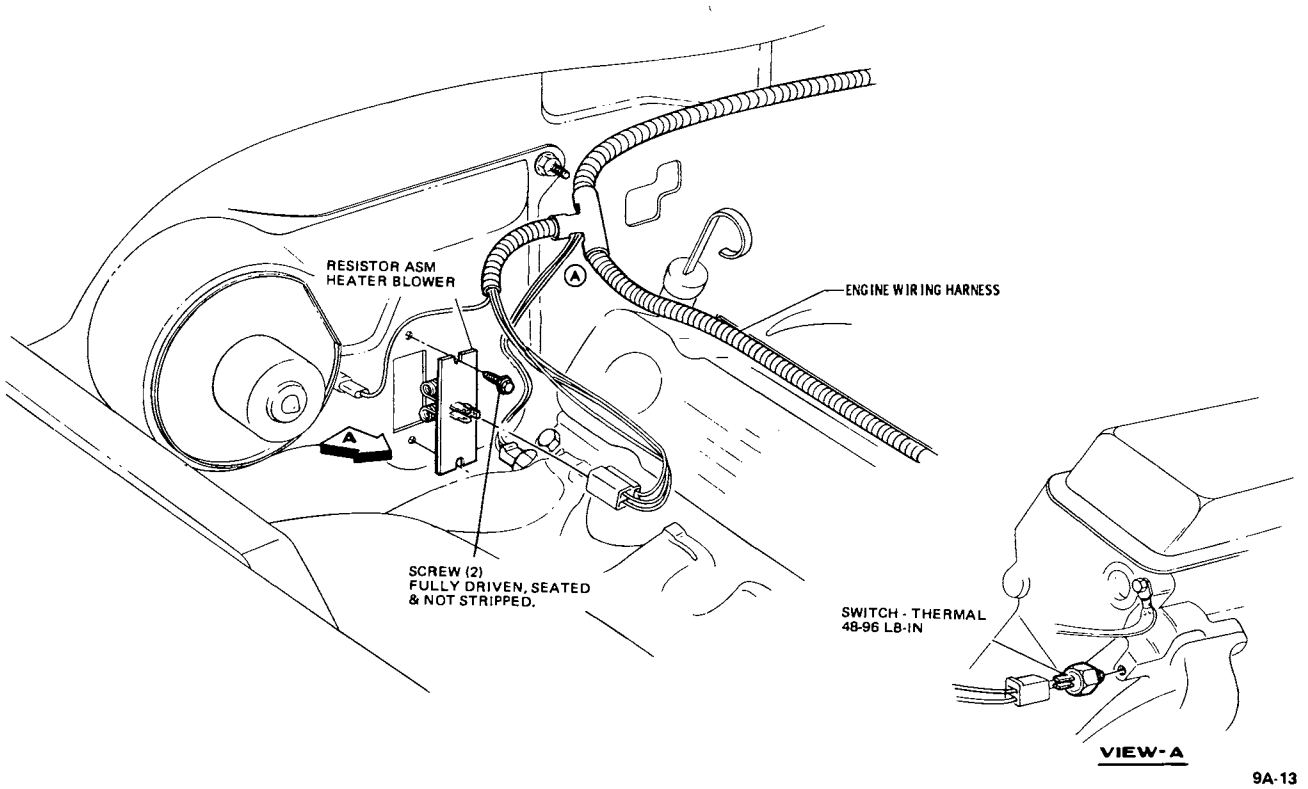


Figure 9A-28 - Blower Resistor and Thermal Switch - Heater - A Series

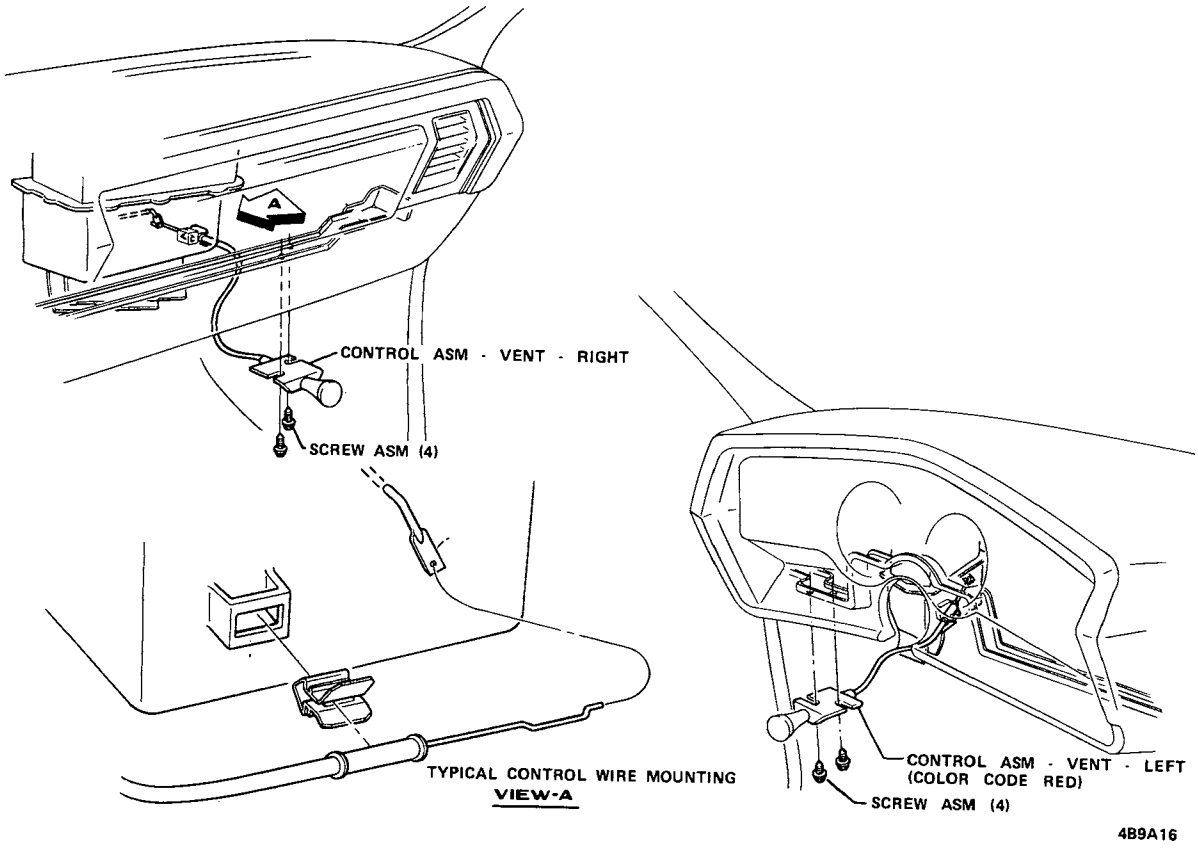


Figure 9A-30 - Side Vent Controls - A Series

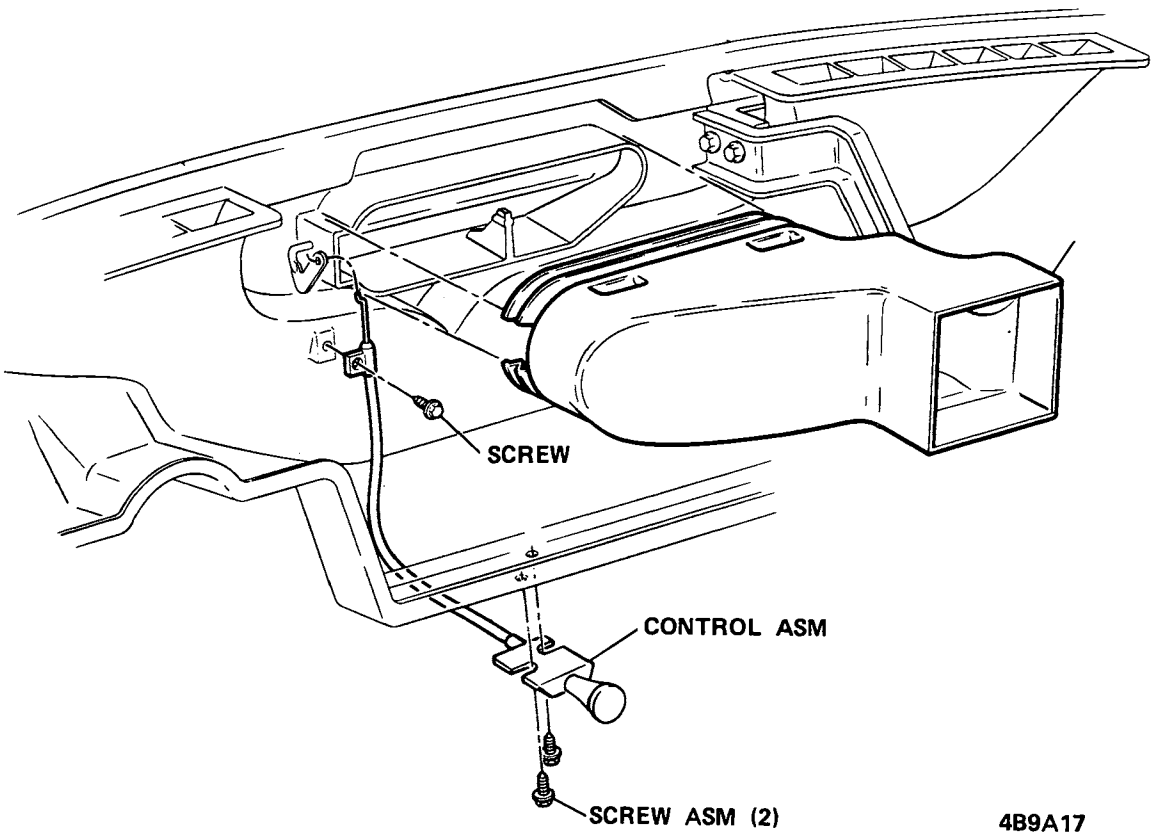


Figure 9A-31 - Center Vent Control and Air Duct Assembly - A Series

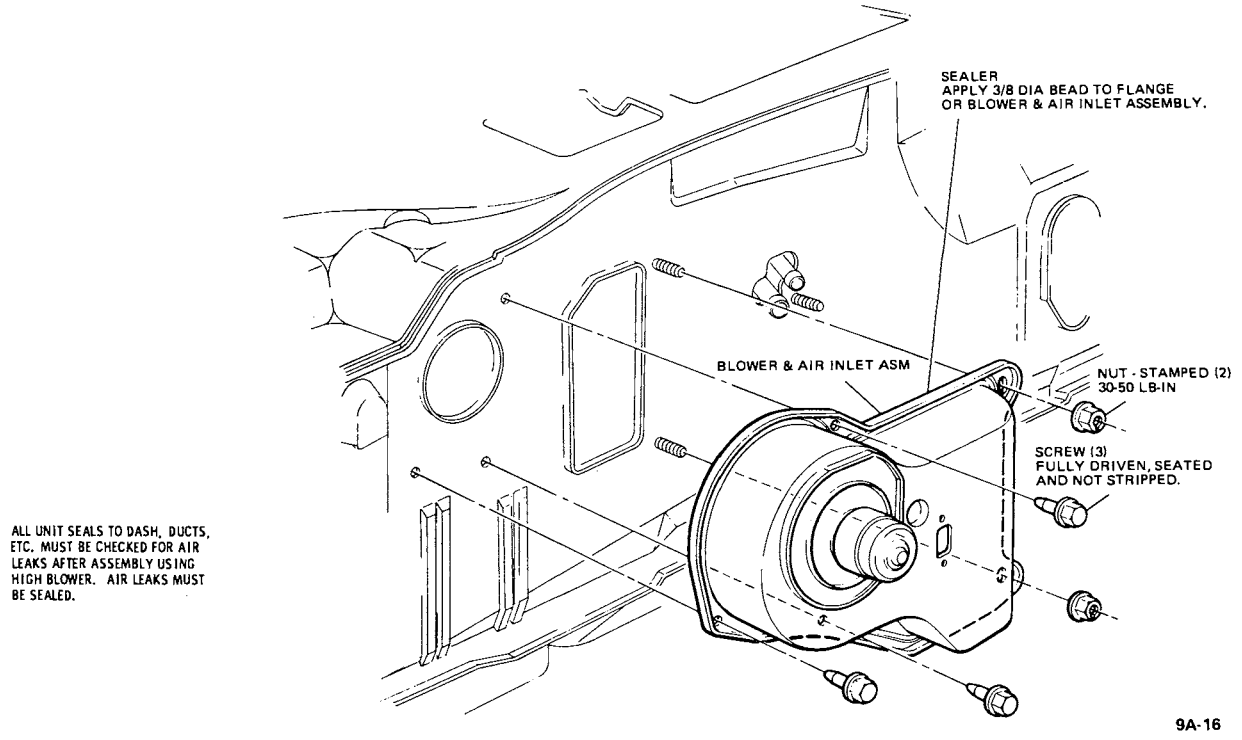


Figure 9A-32 - Blower and Air Inlet Assembly - A Series

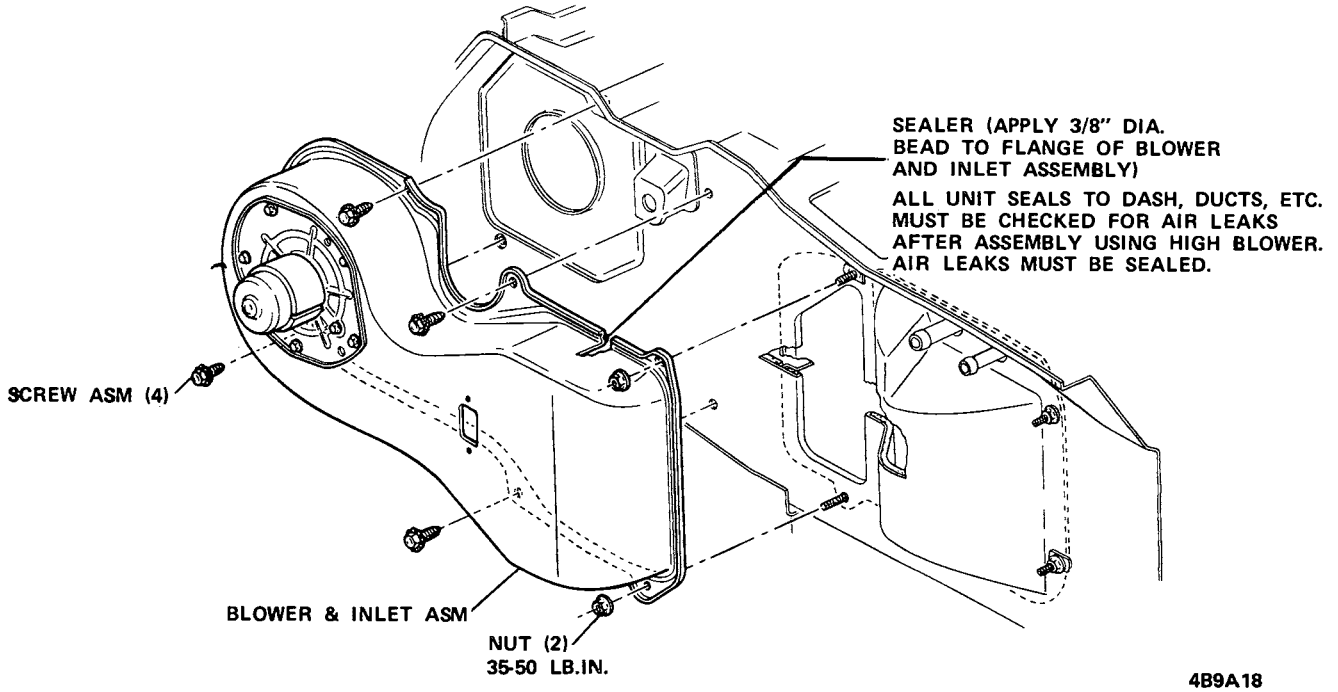


Figure 9A-33 - Blower and Inlet Assembly - B-C-E Series

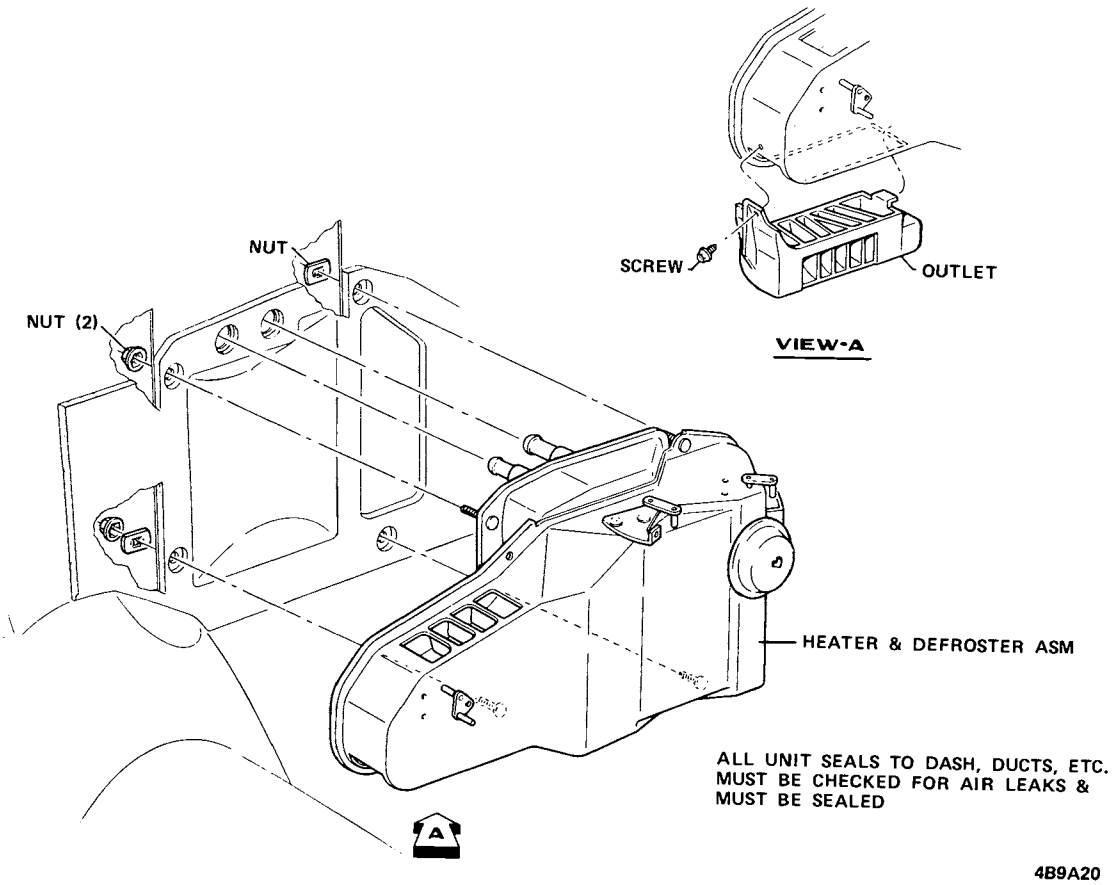


Figure 9A-34 - Heater and Defroster Assembly - Center Outlet - B-C-E Series

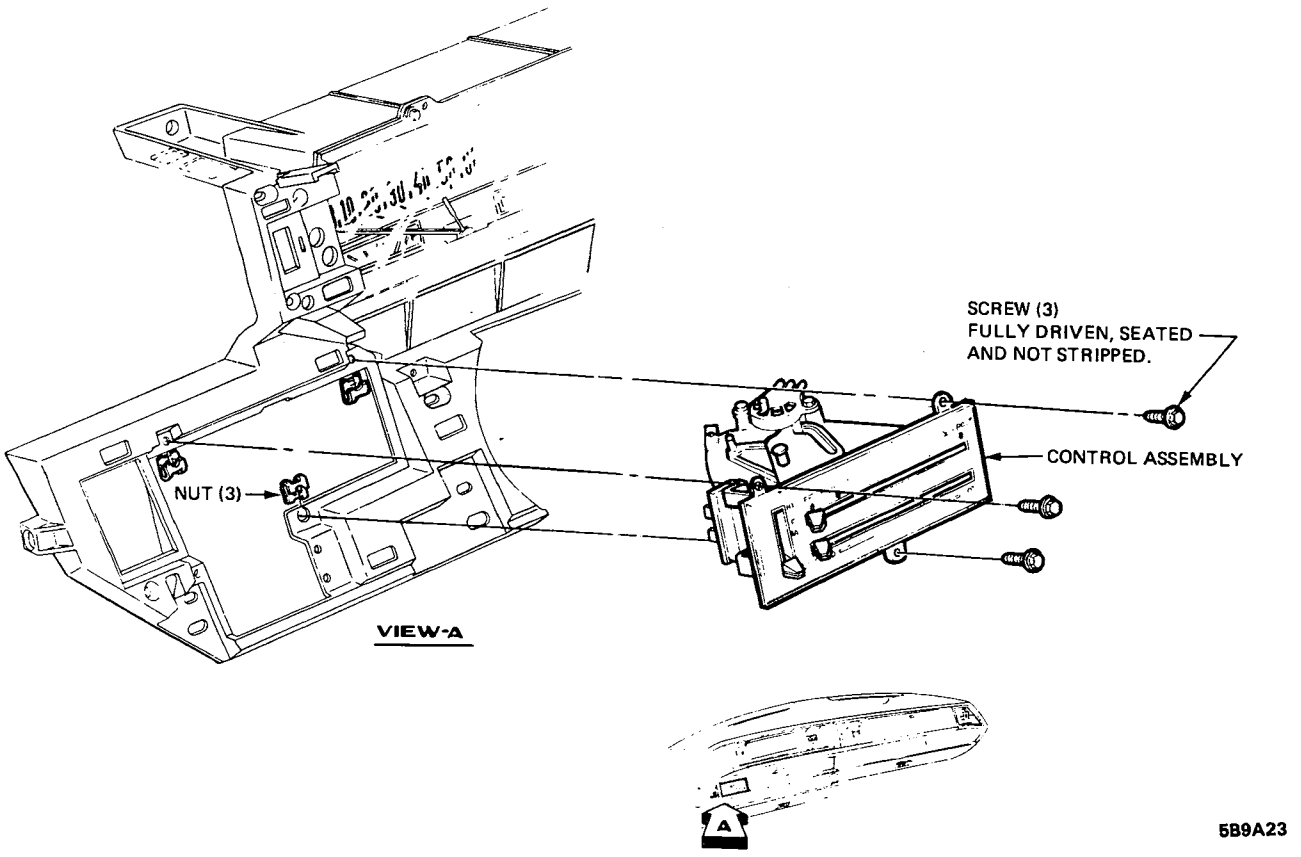


Figure 9A-35 - Instrument Panel Control - B-C-E Series

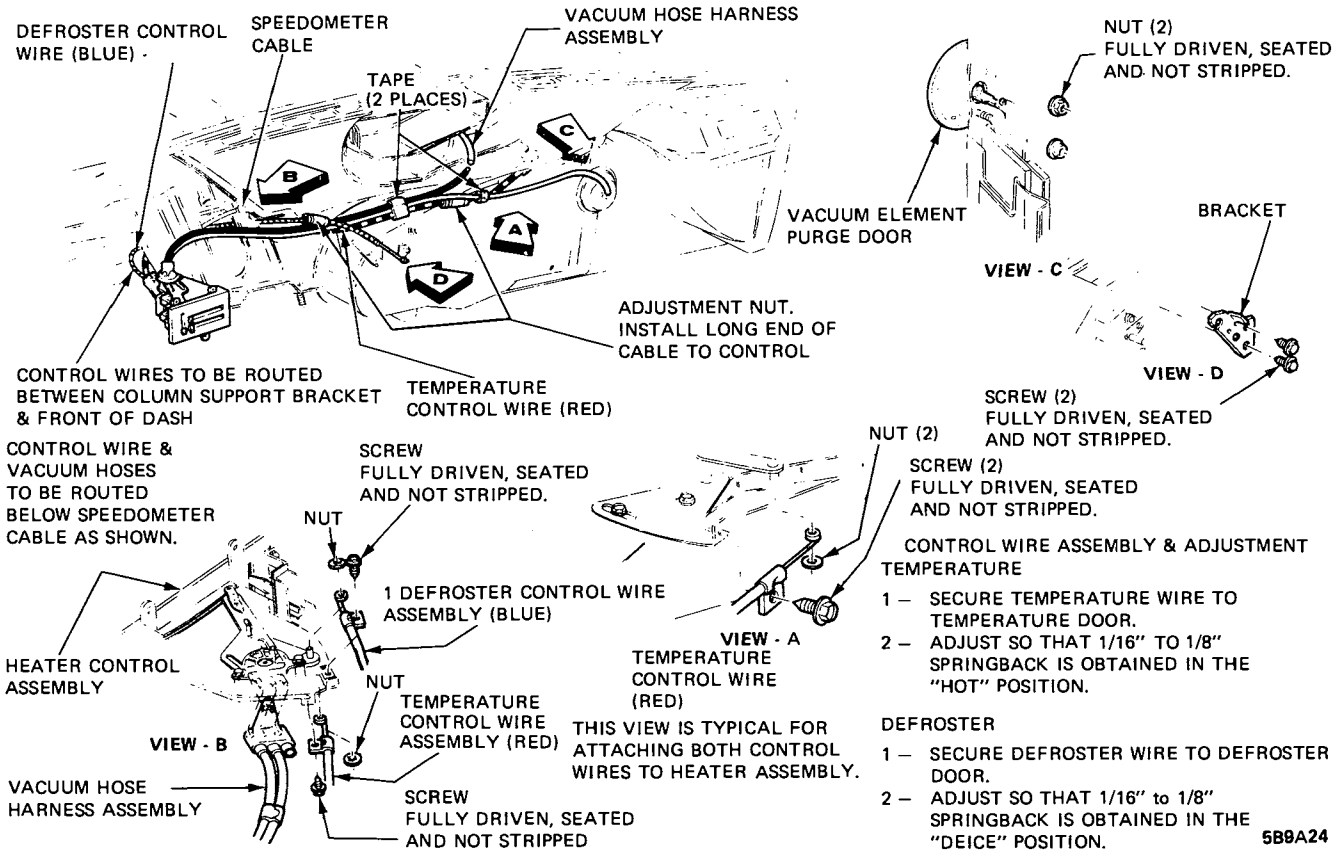


Figure 9A-36 - Control Cables - Vacuum Harness Routing - B-C-E Series

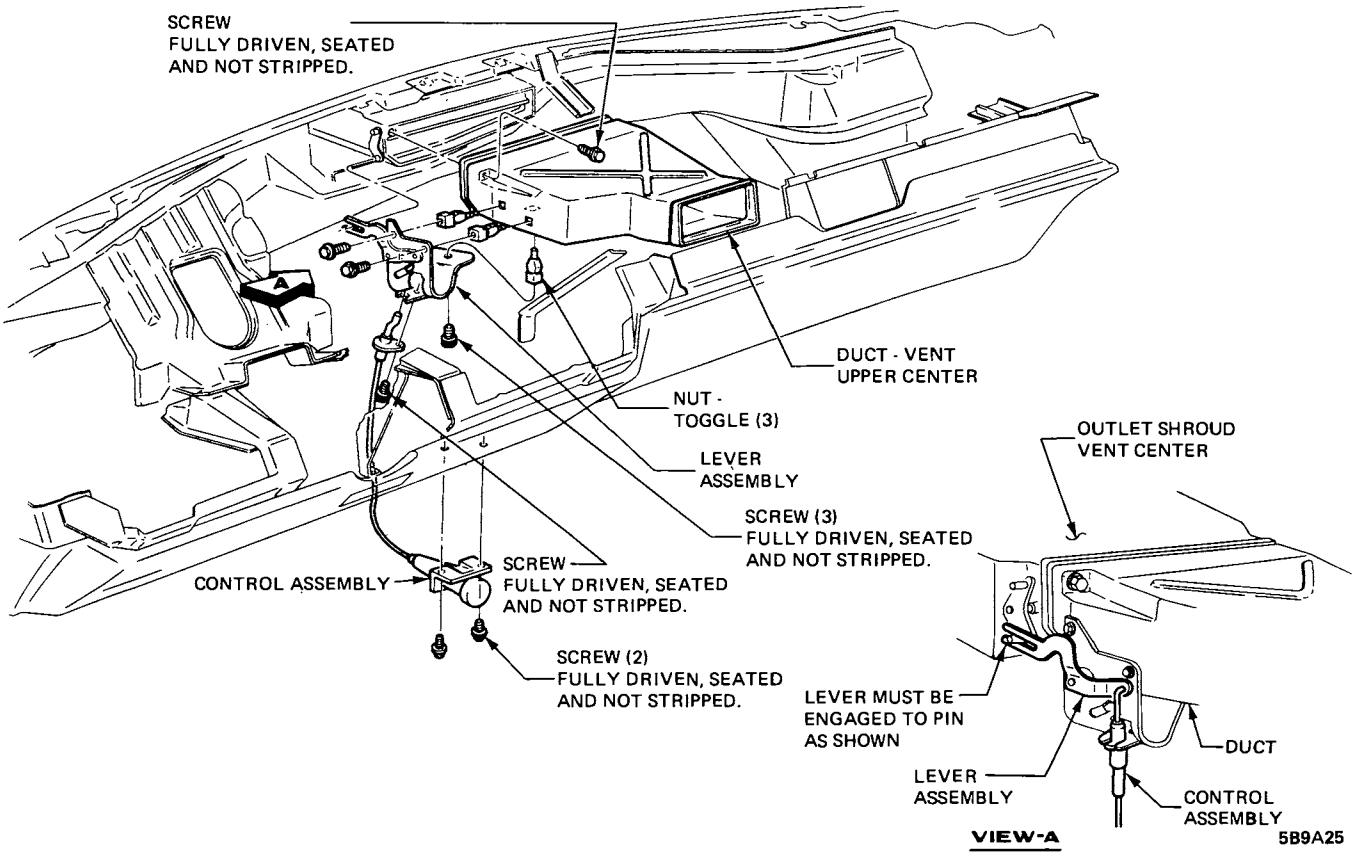


Figure 9A-37 - Center Duct Assembly - B-C-E Series

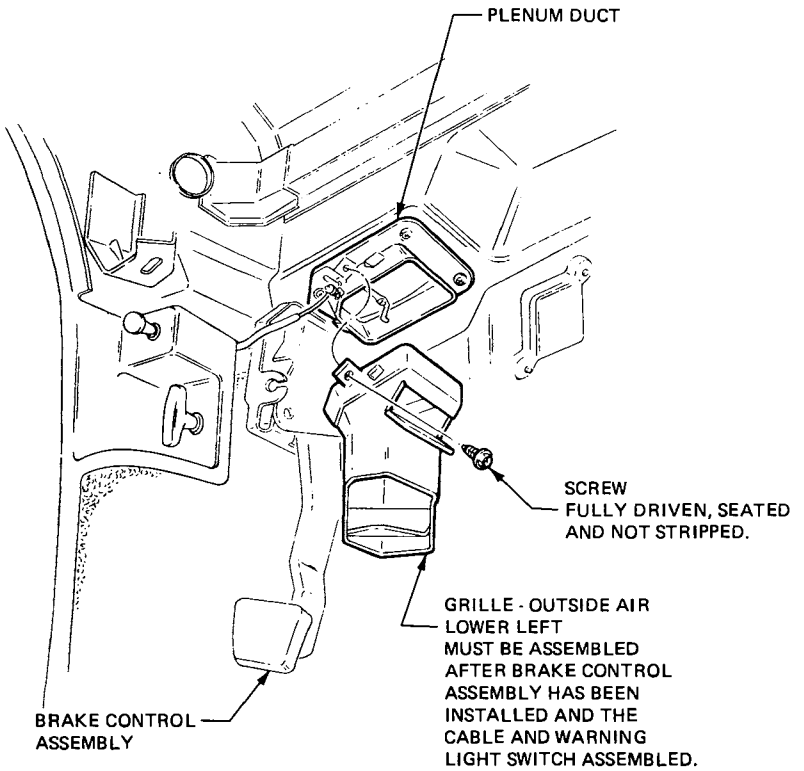


Figure 9A-38 - Outside Air Grille - Lower Left - B-C-E Series