

# HEATER AND DEFROSTER

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## GENERAL

The blend-air type heater and defroster system is used on all model vehicles. The blend-air method of heating uses a constant flow system with engine coolant continuously flowing through the heater core. The temperature of the heated air entering the passenger compartment is controlled by regulating the quantity of air which flows through the heater core air passages, then blending it with a controlled amount of cool, fresh air which bypasses the heater core. System controls and operation are described in this section.

When servicing a malfunctioning heater system, refer to the Service Diagnosis Guide for a list of the possible causes and recommended service procedures.

## SYSTEM CONTROLS

### CJ Models

The heater and defroster controls consist of a fan control switch and three push-pull knobs and cable assemblies which are located on the instrument panel (fig. 13-1).

The air control knob operates a door in the fresh air intake duct, which controls the amount of air entering the heater housing through the heater-to-air deflector duct.

The defrost control knob operates a door in the heater housing which regulates heater and defroster operation by directing the flow of air through the defroster hose or floor outlet.

The temperature control knob adjusts the amount of airflow around the heater core and through the heater core air passages. This regulates the degree of heat entering the passenger compartment.

The fan control is a three-position control switch (OFF, LOW, and HIGH), which regulates the blower motor and airflow for heat, defrost, and fresh air ventilation.

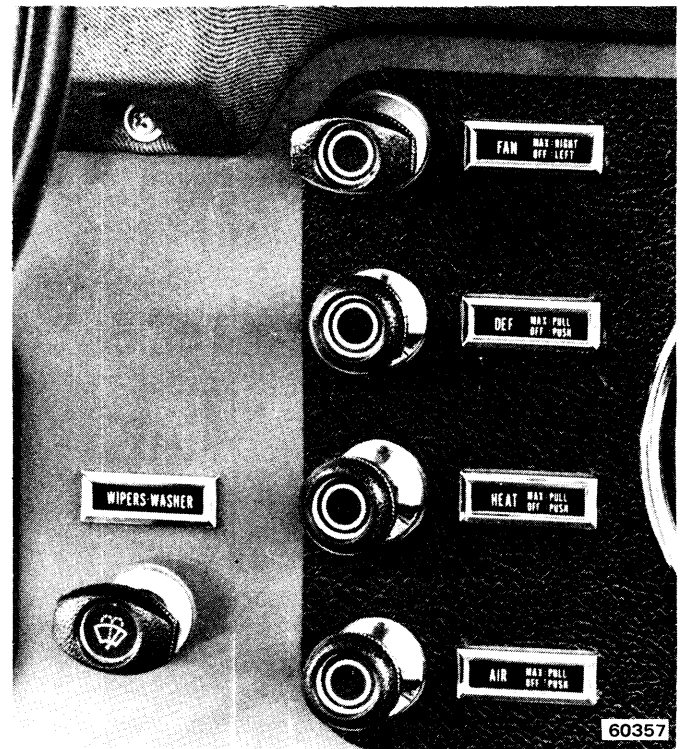


Fig. 13-1 Heater and Defroster Controls—CJ Models

### Cherokee-Wagoneer-Truck

The heater and defroster controls consists of a fan control switch, a vacuum control switch operated by three pushbuttons, and a slide temperature control lever (fig. 13-2).

The three pushbuttons manually operate the vacuum control switch which directs vacuum to two vacuum motors, controlling airflow and point of air distribution.

The temperature control lever adjusts the amount of airflow around the heater core and through the heater core air passages. This regulates the degree of heat entering the passenger compartment.

The fan control is a four-position control switch (OFF, LOW, MEDIUM, and HIGH), which regulates the blower motor and airflow for heat, defrost, and fresh air ventilation.

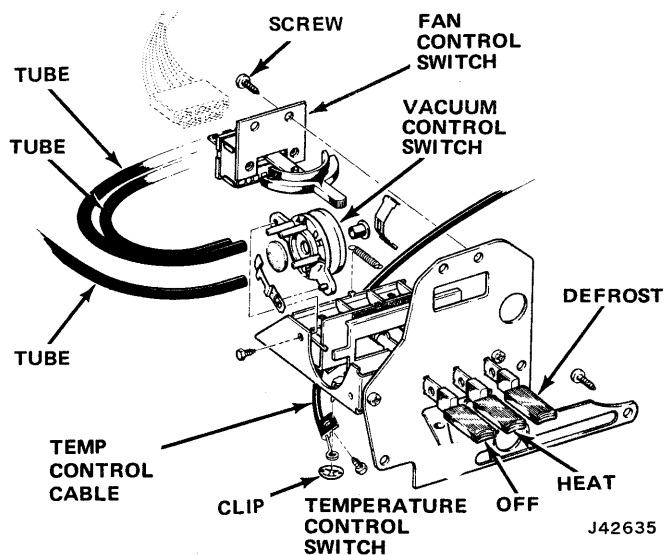


Fig. 13-2 Heater and Defroster Controls—Cherokee-Wagoneer-Truck

**HEATER AND DEFROSTER OPERATION**

The heater is part of the engine cooling system and depends on normal engine operating temperature and airflow through the cowl fresh air intake to heat the

interior of the vehicle. During heater operation, close the fresh air vents.

**CJ Models**

The air control knob operates a door in the fresh air intake duct which controls the amount of air entering the heater housing. When the knob is pushed in, no air will enter the passenger compartment. As the knob is pulled out, the door opens, allowing more airflow until the maximum flow is reached when the knob is pulled completely out. The air control knob must be at least partially out to operate the heater.

The temperature control knob operates the blend air door in the heater housing (fig. 13-3). At the full out position, all air is directed through the heater core, providing maximum heat flow. At the full in position, all air is directed around the heater core, providing unheated fresh air. Any in between position of the control allows a blend of cool, fresh outside air and heated air. The defrost control knob must be pushed in for the blended air to enter through the floor heat duct. When the defrost control knob is pulled out completely, all airflow will be directed through the defroster hose and onto the windshield. Any in between position of the

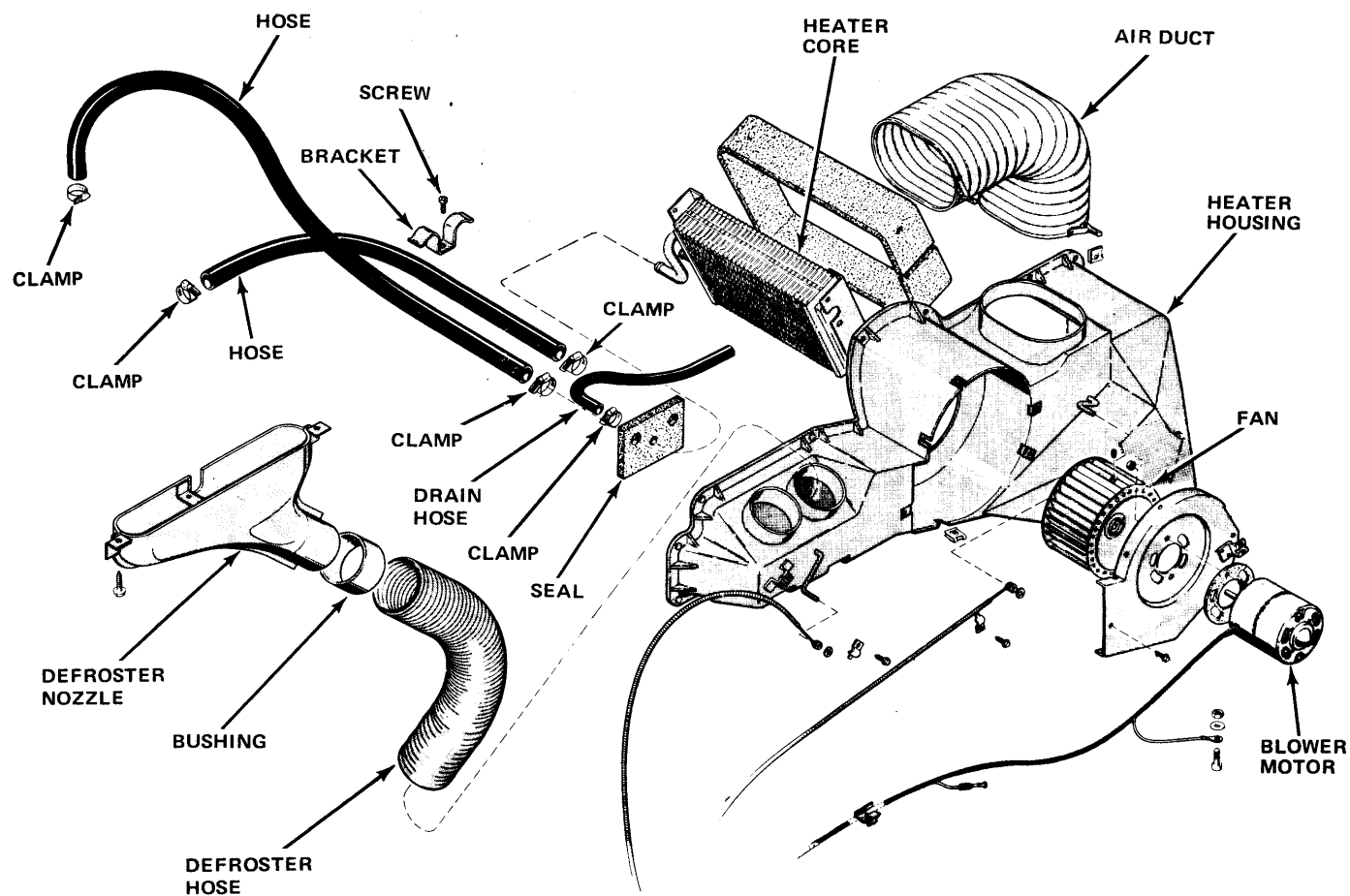


Fig. 13-3 Heater and Defroster—CJ Models

defrost control divides the airflow between the defroster hose and the floor heat duct.

If additional airflow is required, the blower motor should be operated at one of the two available speeds.

**Cherokee-Wagoneer-Truck**

The OFF, HEAT, and DEF buttons (fig. 13-2) on the heater control panel operate a vacuum control switch which controls two vacuum motors. When the OFF button is pressed, the vacuum switch shuts off vacuum to the air inlet door vacuum motor. A spring closes this door, preventing any outside air from entering the heater (fig. 13-4).

When the HEAT button is pressed, the air inlet door is opened by the air inlet vacuum motor and air will flow through the heat transition housing and out of the floor heat distributor.

When the DEF button is pressed, the vacuum switch directs vacuum to the defrost vacuum motor, which closes the door to the floor heat distributor. Airflow is then directed through the defroster hoses onto the windshield. The air inlet door remains open to allow airflow through the heat transition housing.

The TEMPERATURE control lever operates the blend air door in the heater core housing. At the full right position all air is directed through the heater core providing maximum heat flow. At the full left position all air is directed around the heater core providing unheated fresh air. The temperature control lever may be

placed in any in-between position to provide a blend of cool, fresh, outside air and heated air. However, either the HEAT or DEF button must be pressed before any air can enter the vehicle.

If additional airflow is required, the blower motor should be operated at one of the three available speeds.

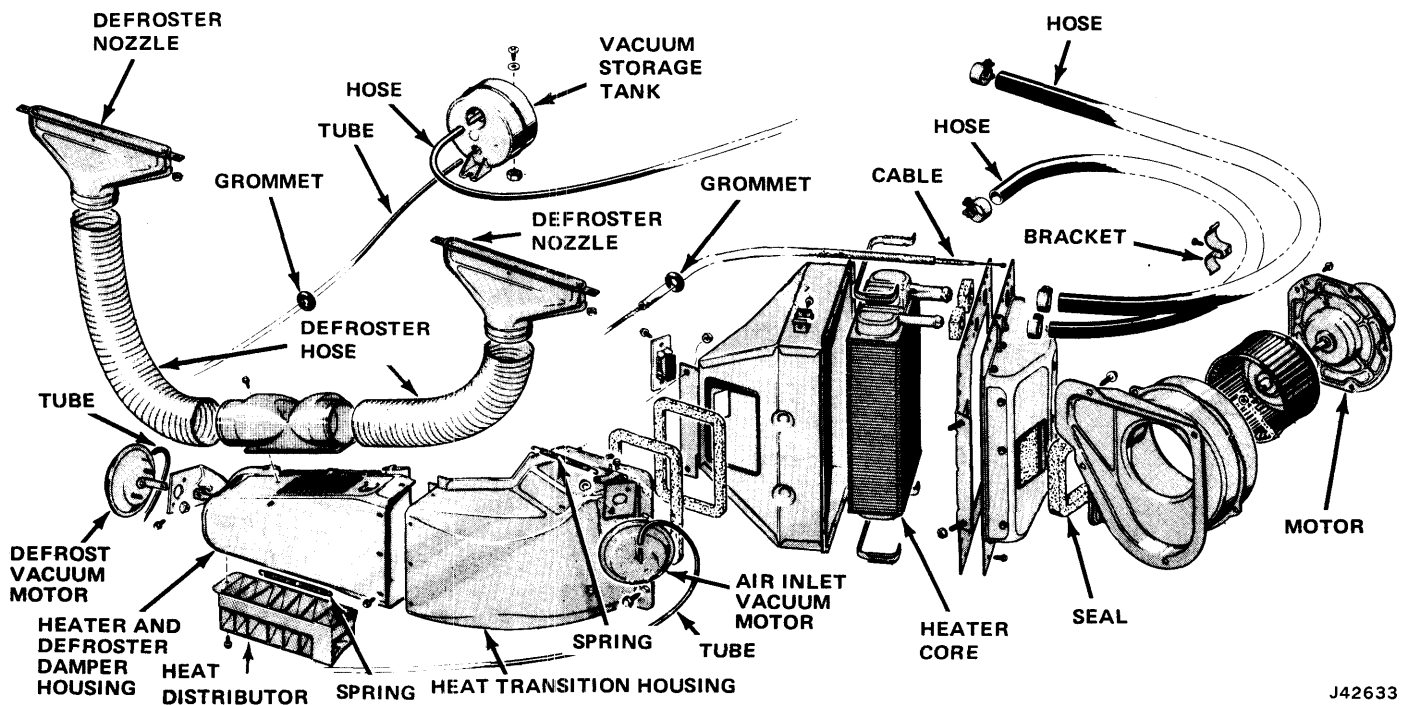
**FRESH AIR VENTILATION**

**CJ Models**

The fresh air ventilating system has one air intake duct which directs fresh outside air into the heater housing. The vent door is cable controlled by the AIR control knob on the heater and defroster control panel. When the knob is pulled out, fresh air enters the heater housing and is distributed through the floor outlet. When the knob is pushed in, no air will enter the vehicle. The air intake duct is equipped with a drainage hose (fig. 13-5) to prevent water from entering the vehicle through the heater housing.

**Cherokee—Wagoner—Truck**

The ventilating system has two fresh air vents, one in the right cowl trim panel and one in the left cowl trim panel (fig. 13-6). Both vents are cable controlled with the control knobs mounted on the instrument panel to the right and left of the steering column.



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**Fig. 13-4 Heater and Defroster—Cherokee-Wagoneer-Truck**

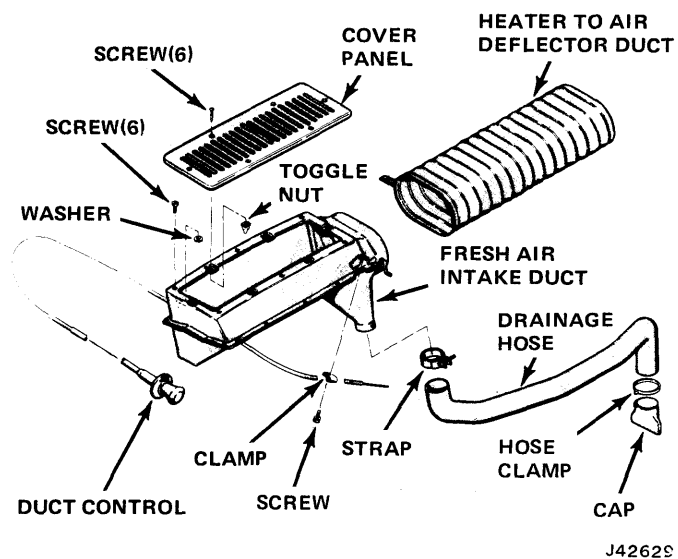


Fig. 13-5 Fresh Air Intake CJ Models

**FAN CONTROL SWITCH**

**CJ Models**

**Removal**

(1) Rotate knob until slot in neck of knob is visible. Insert a small bladed screwdriver in the slot and depress spring metal clip toward knob. This will relieve tension on the spring metal clip and allow knob to slide off shaft (fig. 13-7).

(2) Remove retaining nut and trim ring.

(3) Remove switch from instrument panel and disconnect wires.

**Installation**

(1) Connect wires and position switch in instrument panel.

(2) Install trim ring and retaining nut.

(3) Install control knob.

**Service Diagnosis**

Condition	Possible Cause	Correction
FAN MOTOR WILL NOT RUN AT ANY SPEED	(1) Blown fuse (2) Loose connection (3) Poor ground (4) Faulty switch (5) Faulty motor (6) Faulty resistor	(1) Replace fuse (2) Inspect and tighten (3) Clean and tighten (4) Replace switch (5) Replace motor (6) Replace resistor
FAN MOTOR RUNS AT ONE SPEED ONLY	(1) Faulty switch (2) Faulty resistor	(1) Replace switch (2) Replace resistor
FAN RUNS BUT DOES NOT CIRCULATE AIR	(1) Intake blocked (2) Fan not secured to motor shaft (3) Inlet door not opening (Cherokee, Wagoneer, Truck).	(1) Clean intake (2) Tighten securely (3) Replace defective vacuum motor, switch or hose.
HEATER WILL NOT HEAT	(1) Coolant does not reach proper temperature (2) Heater core blocked internally (3) Heater core air-bound (4) Blend-air door not in proper position	(1) Check and replace thermostat if necessary (2) Flush or replace core if necessary (3) Purge air from core (4) Adjust cable
WILL NOT DEFROST	(1) Vacuum motor not operating (Cke-Wag-Trk) (2) Vacuum control switch inoperative (Cke-Wag-Trk) (3) Control cable adjustment incorrect (CJ Models) (4) Defroster hose damaged	(1) Check for engine vacuum at vacuum motor (2) Check for engine vacuum at switch (3) Adjust control cable (4) Replace defroster hose

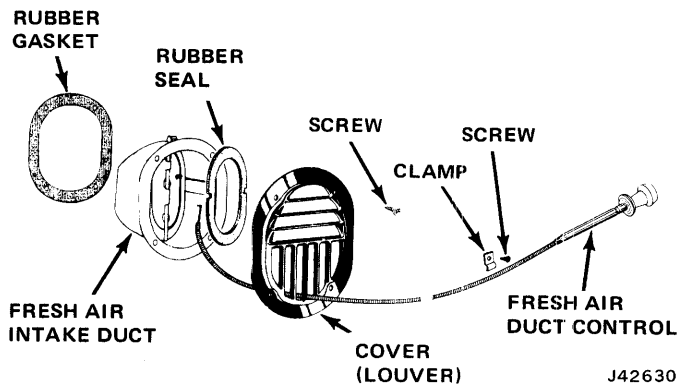


Fig. 13-6 Fresh Air Intake Duct and Control—  
Cherokee-Wagoneer-Truck

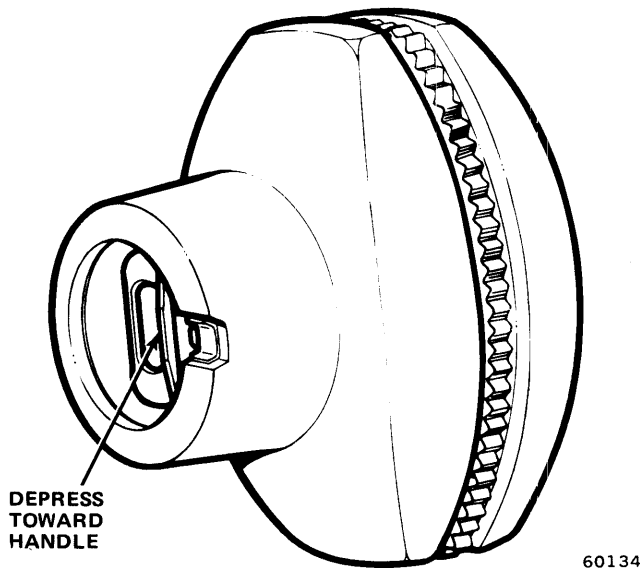


Fig. 13-7 Fan Control Knob Locking Feature

## HEATER CONTROL PANEL

### Cherokee-Wagoneer-Truck

#### Removal

- (1) Disconnect battery negative cable.
- (2) Remove instrument cluster retaining screws.
- (3) Disconnect speedometer cable.
- (4) Disconnect electrical connectors from cluster.
- (5) Disconnect vacuum hoses from vacuum control switch.

**NOTE:** Tag hoses according to their numbered location for ease of assembly.

- (6) Remove cluster lights.
- (7) Disconnect cable from temperature control lever.
- (8) Remove instrument cluster.

(9) Remove heater and defroster control attaching screws and remove control from cluster.

(10) Remove fan control switch attaching screws and remove switch.

#### Installation

- (1) Install fan control switch.
- (2) Install heater and defroster control to cluster.
- (3) Position instrument cluster in dash opening.
- (4) Install cluster lights.
- (5) Connect cable to temperature control lever.
- (6) Connect vacuum hoses.
  - (a) Number 1 on the vacuum control switch goes to the defroster vacuum motor.
  - (b) Number 3 on the vacuum control switch goes to the vacuum storage tank.
  - (c) Number 4 on the vacuum control switch goes to the air inlet door vacuum motor.
- (7) Connect cluster electrical connectors.
- (8) Connect speedometer cable.
- (9) Install cluster retaining screws.
- (10) Connect battery negative cable.
- (11) Check heater, defroster, and fan operation.

## CONTROL CABLE ADJUSTMENT

### CJ Models

- (1) Remove cable housing retaining clip screw.
- (2) Place control knob in OFF (full in) position.
- (3) Hold door tightly closed.
- (4) Install retaining clip screw.
- (5) Check control operation.

### Cherokee-Wagoneer-Truck

The blend-air door control cable is equipped with a turnbuckle to simplify adjustment. The turnbuckle is located under the instrument panel to the right of the steering column.

(1) Rotate turnbuckle counterclockwise to obtain complete closing of the blend-air door when the temperature control lever is in the far left COOL position.

(2) Check blend-air door operation by moving temperature control lever to the WARM position and back to the COOL position. Adjust cable if necessary.

## CONTROL CABLE REPLACEMENT

### CJ Models

- (1) Disconnect cable from door and housing.

**NOTE:** The control cables are retained on the backside of the instrument panel by plastic tabs. To disengage the cables from the instrument panel, press the plastic tabs together and pull out the cable.

- (2) Remove cable from instrument panel.

- (3) Remove cable-to-damper door
- (4) Route replacement cable through hole in instrument panel
- (5) Connect cable to door and housing.
- (6) Install cable to damper door.
- (7) Adjust cable and check operation.

### Cherokee-Wagoneer-Truck

- (1) Disconnect battery negative cable.
- (2) Remove instrument cluster retaining screws.
- (3) Disconnect speedometer cable.
- (4) Disconnect electrical connectors from cluster.
- (5) Disconnect vacuum hoses from vacuum control switch.

**NOTE:** Tag hoses according to their numbered location for ease of assembly.

- (6) Remove cluster lights.
- (7) Disconnect cable from temperature control lever.
- (8) Remove instrument cluster.
- (9) Disconnect cable from temperature control lever.
- (10) Disconnect cable from blend-air door.
- (11) Connect cable to blend-air door.
- (12) Route cable through dash panel and connect to temperature control lever.
- (13) Position instrument cluster in dash opening.
- (14) Install cluster lights.
- (15) Connect cable to temperature control lever.
- (16) Connect vacuum hoses.
  - (a) Number 1 on the vacuum control switch goes to the defroster vacuum motor.
  - (b) Number 3 on the vacuum control switch goes to the vacuum storage tank.
  - (c) Number 4 on the vacuum control switch goes to the air inlet door vacuum motor.
- (17) Connect cluster electrical connectors.
- (18) Connect speedometer cable.
- (19) Install cluster retaining screws.
- (20) Connect battery negative cable.
- (21) Check heater, defroster, and fan operation.
- (22) Adjust cable.
- (23) Check cable operation.

## HEATER CORE

### CJ Models

The heater housing assembly must be removed to gain access to the heater core.

#### Removal

- (1) Drain approximately two quarts of coolant from the radiator.
- (2) Disconnect battery cables and remove battery.
- (3) Remove battery box.

- (4) Disconnect heater hoses.
- (5) Disconnect damper door control cables.
- (6) Disconnect blower motor wire harness at switch and ground wire at instrument panel.
- (7) Remove glove box attaching screws and remove glove box.
- (8) Disconnect water drain hose and defroster hose.
- (9) Disconnect heater-to-air deflector duct at heater housing.
- (10) Remove nuts from heater housing studs in engine compartment.
- (11) Remove heater housing assembly.
- (12) Remove heater core from heater housing.

#### Installation

- (1) Install heater core in housing.
- (2) Position heater core housing and install attaching nuts.
- (3) Connect water drain hose and defroster hose.
- (4) Connect heater-to-air deflector duct at heater housing.
- (5) Position glove box and install attaching screws.
- (6) Connect blower motor wire harness at switch and ground wire at instrument panel.
- (7) Connect and adjust damper door control cables.
- (8) Connect heater hoses.
- (9) Install battery box.
- (10) Install battery and connect battery cables.
- (11) Replace coolant.
- (12) Check heater operation.

### Cherokee-Wagoneer-Truck

#### Removal

- (1) Drain approximately two quarts of coolant from radiator.
- (2) Disconnect temperature control cable from blend-air door.
- (3) Disconnect heater hoses at heater core.
- (4) Disconnect blower motor resistor wires.
- (5) Remove heater core housing to dash panel attaching nuts.
- (6) Remove heater core housing assembly.
- (7) Remove attaching screws holding housing halves together and separate housing.
- (8) Remove heater core to housing attaching screws and remove core.

#### Installation

- (1) Position heater core in housing and install attaching screws.
- (2) Seal and assemble two halves of heater core housing and install attaching screws.
- (3) Position heater core housing on dash panel and install attaching nuts.
- (4) Connect heater resistor wires.



