REAR WINDOW DEFOGGER

CONTENTS

GENERAL

Using heating elements bonded to the rear window glass, the rear defogger will clear condensation, frost and light snow coverings from the rear window.

The horizontal grid lines and vertical bus bar lines printed and baked on inside surface of rear window glass comprise an electrical circuit. The electrically conductive lines are composed of a silver-ceramic material. When this material is baked on glass it becomes bonded to the glass and is highly resistant to abrasion.

The electrical current required to produce the heat in the grid is supplied through a relay and driver operated switch. When the switch is momentarily depressed, the relay senses a voltage change. This voltage change causes the relay to change state and complete a circuit to energize the relay. Once the relay energizes, the contacts close connecting the grid to battery power.

The power circuit to the grid is protected by the 30 amp Circuit Breaker #28 located in the fuse box. Power for the relay is protected by the 15 amp #19 fuse located in the fuse box. There is another fuse, #23, located in the fuse box that controls the power to the switch and the side mirrors.

To defog the rear window, momentarily depress the push button switch. An amber light above the push button switch will illuminate indicating that the defogger is operating.

If the ignition switch is ON the first activation of the defog/defrost feature will last for 10 minutes. Succeeding activations will last for 5 minutes unless the ignition switch is turned OFF; then it will recycle back to 10 minutes for the first activation.

To stop defogger operation, momentarily push the switch a second time.

CAUTION: Use care when washing the inside of the rear window to prevent damage to the defogger heating elements. Use a soft cloth and a mild washing solution. Wiping motions should be parallel to the heating elements. Also, keep all objects a safe distance from the window to prevent damaging the heating elements.

DIAGNOSIS

Refer to Group 8W - Wiring Diagrams for a complete circuit diagram.

REAR WINDOW DEFOGGER GRID TEST

It is possible, that a break may exist or occur in an individual grid line resulting in no current flow through the line. When a grid has an open circuit, the area of glass normally cleared by that grid remains fogged or iced unless, and/or until it is cleared by the adjacent grids.

With the engine running, push the rear window defogger switch to the ON position and release. The pilot lamp above the push button switch should light, indicating defogger operation.

Using a 12 volt DC voltmeter, contact the positive lead to the feed side vertical bus element on the inside surface of the glass. Contact the negative lead to the ground side bus element. Meter should read between 11 and 13 volts. Connect the negative lead of the voltmeter to a good ground; the meter reading should be constant.

Keep the negative lead connected to ground. Use the positive lead and carefully contact each grid at the approximate centerline of the window.

A voltage drop of one-half the full amount, approximately 6 volts, indicates a good grid or closed circuit.

A voltage drop of 12 volts at the centerline indicates a break in the grid between the positive voltmeter lead and the ground.

No voltage drop (0 volts) at the centerline indicates a break in the grid between the centerline and the voltage source or lead.

The exact location of the break can be pinpointed by moving the positive voltmeter lead to the left or right along the grid. An abrupt change in the voltage reading will be noticed. The break is at that point in the grid.

SWITCH TESTING

BATTERY, IGNITION & FUSES

- Check fuses #19, #23 and circuit breaker #28. Replace as required.
- If the fuses are not blown, check the battery side of fuse #28 for battery voltage. If battery voltage is not present replace the Maxi fuse located in the Power Distribution Center.
- Check the ignition side of fuse #19, for battery voltage. If battery voltage is not present check for an open from the ignition switch.

DEFOGGER SWITCH

Defogger switch connector separated from defogger switch.

(1) Using a jumper wire, apply 12 volts to terminal 1 of switch.

(2) Using another jumper wire connect terminal 3 of switch to ground.

The indicator should light. If not replace switch. If OK, proceed to next step.

(3) Remove jumper wires and connect an ohmmeter to terminals 2 and 3 of switch.

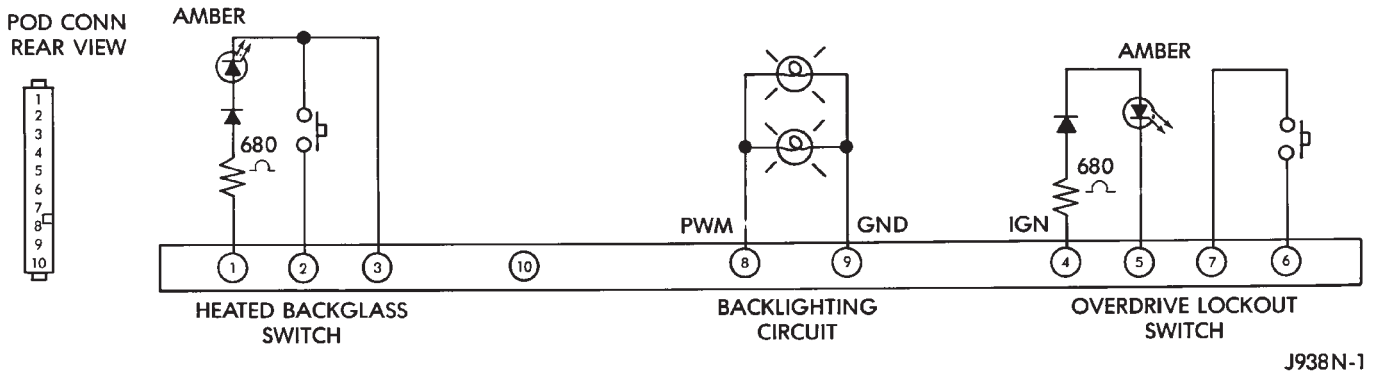
(4) Push the switch. Ohmmeter should read less than 1 ohm. If not replace switch. If OK, check for an open circuit between:

- terminal 1 and fuse #23
- terminal 3 and ground
- terminal 2 and terminal 3 of the relay.

REAR DEFOGGER RELAY

Defogger relay connector separated from defogger relay; turn ignition switch to RUN for voltage tests; turn ignition switch to OFF for resistance tests

- Measure voltage at relay connector terminal 5. The meter should read battery voltage. If not, repair open to fuse #19.
- Measure voltage at relay connector terminal 4. The meter should read battery voltage. If not, repair open to Circuit Breaker #28.



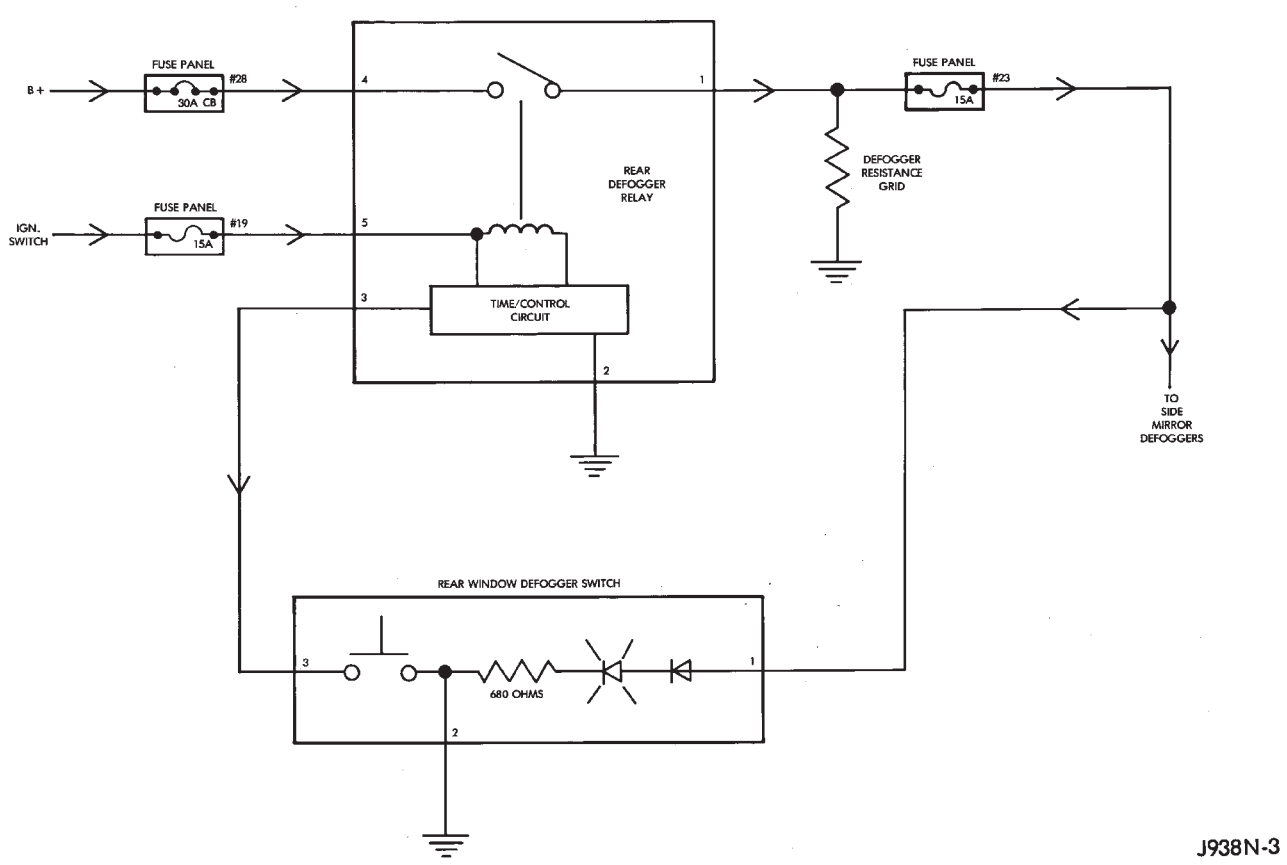
• Measure resistance between relay connector terminal 1 and Left Hand side (driver's side) of defogger grid. The meter should read zero ohms. If not, repair open between relay connector and Left Hand side of defogger grid.
• Measure resistance between relay connector terminal 2 and a clean chassis ground. The meter should read zero ohms. If not, repair open between relay connector and ground.
• Connect relay connector and measure voltage at terminal 3. The meter should read approximately 5 volts. If not, replace defogger relay.

DEFOGGER GRID

Turn defogger switch to ON; turn ignition switch to RUN for voltage tests; turn ignition switch to OFF for resistance tests

• Measure voltage at Right Hand side (passengers side) of Defogger Grid. The meter should read battery voltage. If not, repair open from defogger relay.
• Measure resistance for LH side of Defogger Grid to a clean chassis ground. The meter should read zero ohms. If not, repair open between RH side of Defogger Grid and ground.

REAR WINDOW DEFOGGER SYSTEM SCHEMATIC



SERVICE PROCEDURES

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REAR WINDOW DEFOGGER GRID REPAIR

Locate the broken or open grid.

Use the grid repair kit (available as a service part) by using the following procedure:

(1) Mark the location of the broken or open grid on the exterior surface of the glass using a suitable marking pencil.

(2) Lightly rub the area to be repaired (inside the rear window) using fine steel wool. Clean the area with alcohol.

(3) Attach two strips of masking tape to the inside surface of the rear window above and below the break in the grid (Fig. 1).

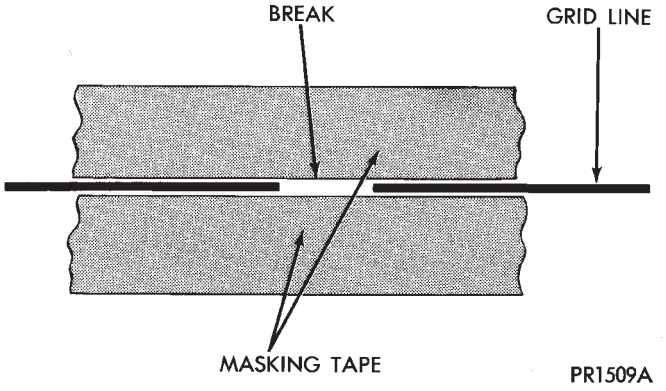

Fig. 1 Grid Line Repair (Typical)

(4) Remove package separator clamp and mix plastic conductive epoxy thoroughly. Fold in half and cut center corner to dispense epoxy.

(5) Apply conductive epoxy through slit in masking tape. Overlap both ends of the break.

(6) For a terminal or pigtail replacement, mask adjacent areas so epoxy can be extended onto line and buss bar. Apply a thin layer of epoxy to area where terminal was fastened and to adjacent line.

(7) Apply a thin layer of conductive epoxy on terminal and place terminal on desired location. To prevent terminal from moving while the epoxy is curing, it must be wedged or clamped.

(8) Carefully remove masking tape from grid line.

(9) Allow epoxy to cure 24 hours at room temperature or use heat gun with a 260°-371°C (500°-700°F) range for 15 minutes. Hold gun approximately 254mm (10 inches) from repaired area.

(10) After conductive epoxy is properly cured remove wedge from terminal and check out operation of rear window defogger. Do not attach connectors until curing is complete.

WARNING: REPAIR KIT MAY CAUSE SKIN OR EYE IRRITATION.

CONTAINS EPOXY RESIN AND AMINE TYPE HARDENER, HARMFUL IF SWALLOWED. AVOID CONTACT WITH SKIN AND EYES. FOR SKIN, WASH AFFECTED AREAS WITH SOAP AND WATER. DO NOT TAKE INTERNALLY. IF TAKEN INTERNALLY, INDUCE VOMITING; CALL A PHYSICIAN IMMEDIATELY. IF IN CONTACT WITH EYES, FLUSH WITH PLENTY OF WATER. USE WITH ADEQUATE VENTILATION. DO NOT USE NEAR FIRE OR FLAME. CONTENTS CONTAIN 3% FLAMMABLE SOLVENTS.

WARNING: KEEP OUT OF REACH OF CHILDREN.

REAR WINDOW DEFOGGER SWITCH REPLACEMENT

(1) Disconnect negative cable from the battery.

(2) Remove ash tray.

(3) Remove 6 screws holding center cluster bezel (Fig. 2).

(4) Remove center bezel.

(5) Remove 2 screws holding dash pad located behind top of center bezel.

(6) Gently pry defroster grille out of dash pad.

(7) Unplug sensors (if equipped) and set defroster grille aside.

(8) Remove 4 screws in defroster duct opening holding dash pad (Fig. 3).

(9) Remove 3 screws above Instrument Panel cluster holding dash pad (Fig. 4).

(10) Open glove box and remove 2 screws holding dash pad.

(11) Remove dash pad pulling up to unsnap end clips.

(12) With driver's door open remove 1 screw from the side of the lower trim panel (Fig. 5).

(13) Remove 4 screws holding the steering column cover (Fig. 6).

(14) Remove 1 screw from bottom of lower trim panel and pull panel off. There is also a clip holding the panel to the instrument panel.

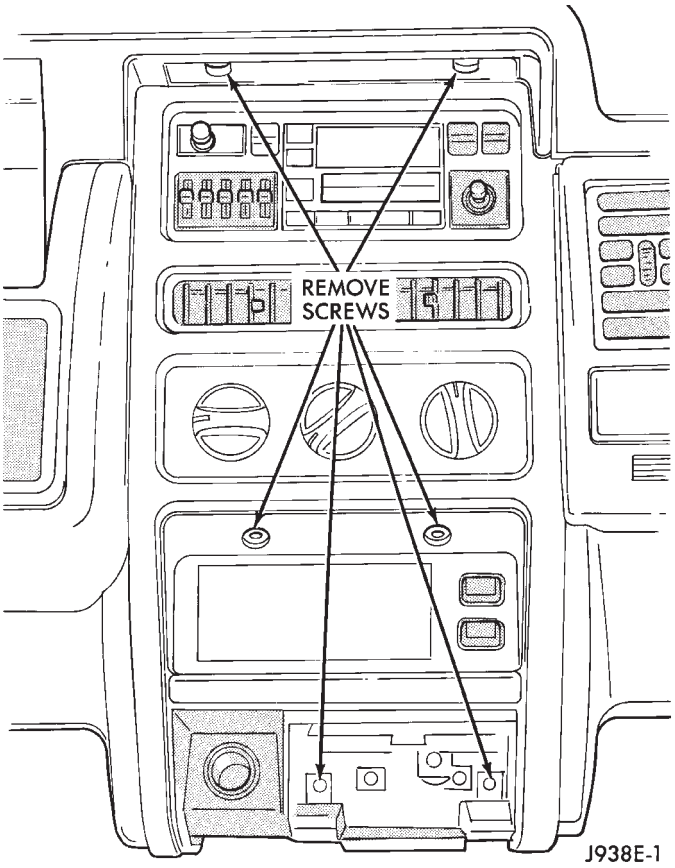

Fig. 2 Remove Center Bezel Screws

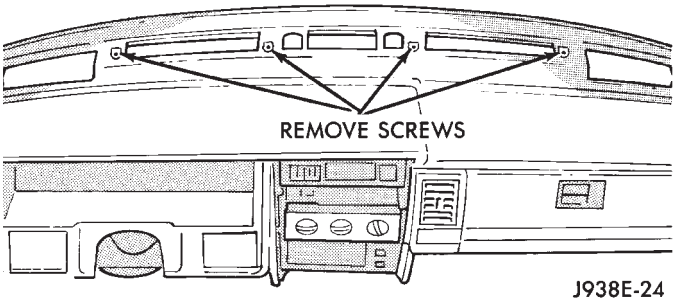

Fig. 3 Upper Dash Pad Attaching Screws

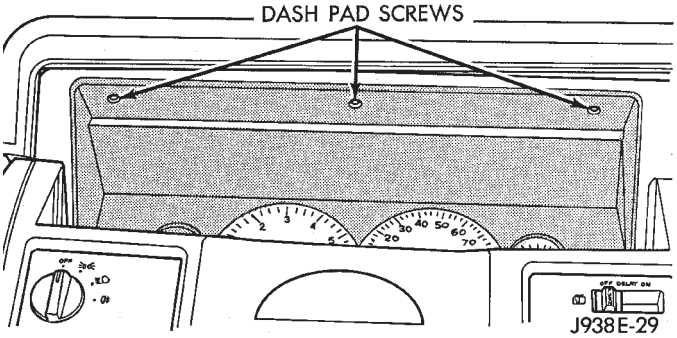

Fig. 4 Remove Screws Holding Dash Pad

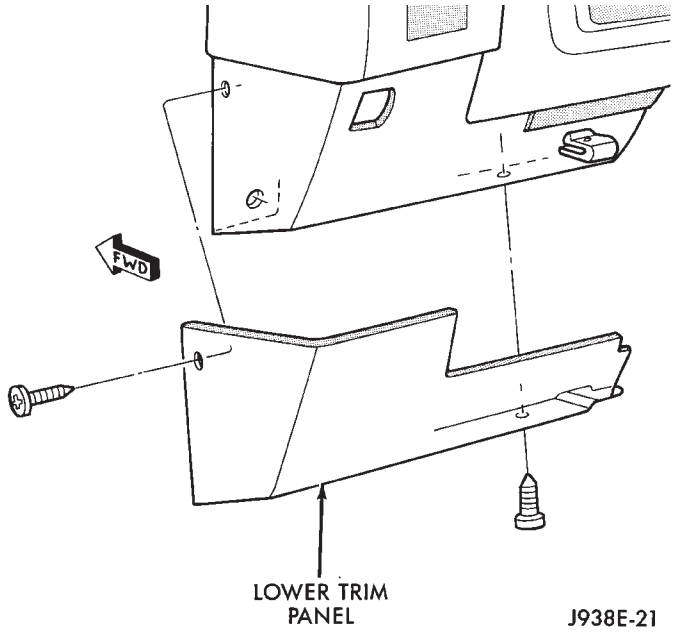

Fig. 5 Lower Trim Panel

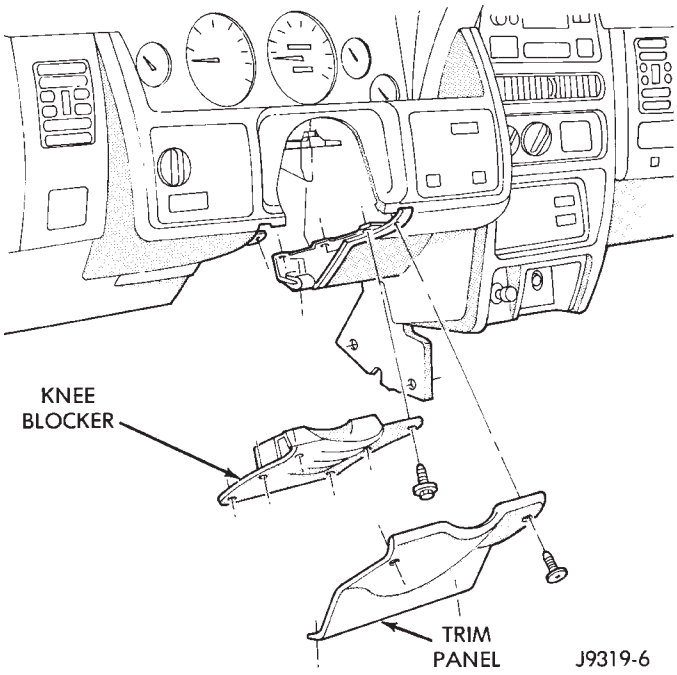

Fig. 6 Steering Column Cover And Knee Blocker

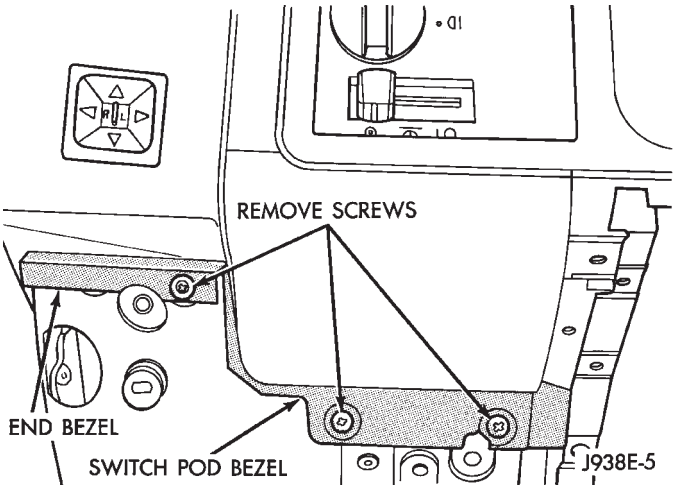

Fig. 7 Remove Screws Holding Bottom Of Bezels

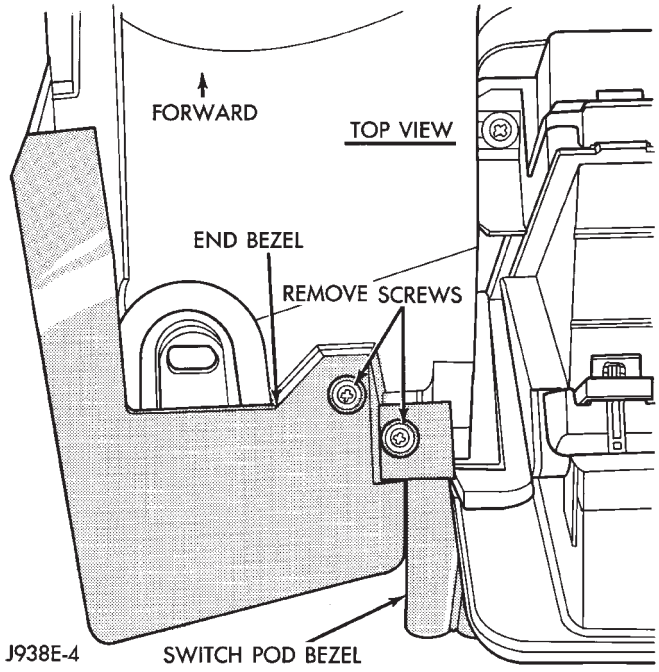

Fig. 8 Remove Screws Holding Top Of Bezels

(15) Remove 6 screws holding knee blocker.

(16) Remove steering column retaining nuts.

(17) Remove 3 screws holding bottom of bezels (Fig. 7).

(18) Remove 2 screws holding top of end and switch pod bezels (Fig. 8). The end bezel can now be removed.

(19) Remove 2 screws holding left side of switch pod bezel (Fig. 9).

(20) Remove 3 screws holding right hand side of switch pod bezel (Fig. 10).

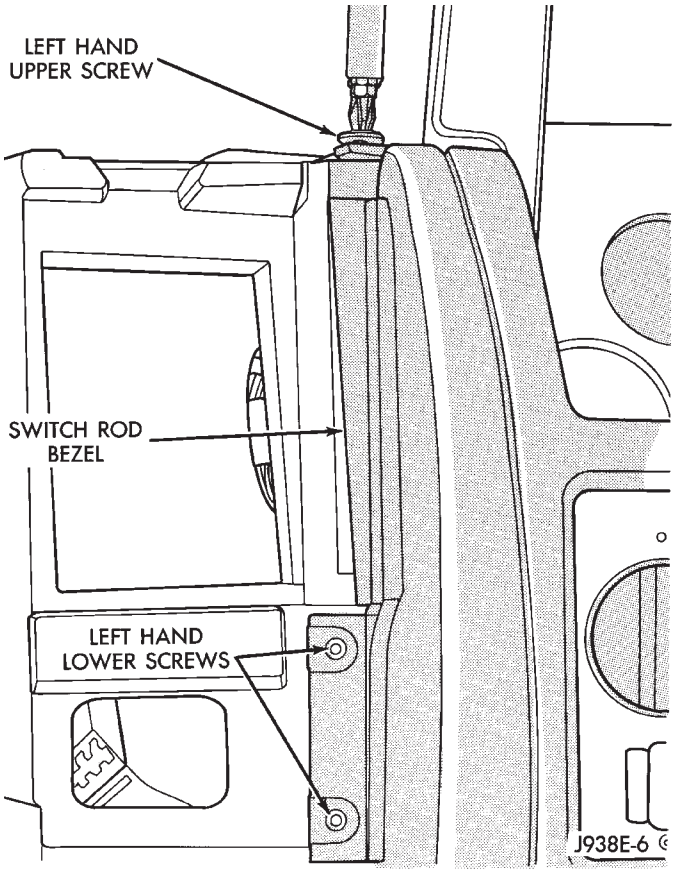

Fig. 9 Left Hand Switch Pod Bezel Screws

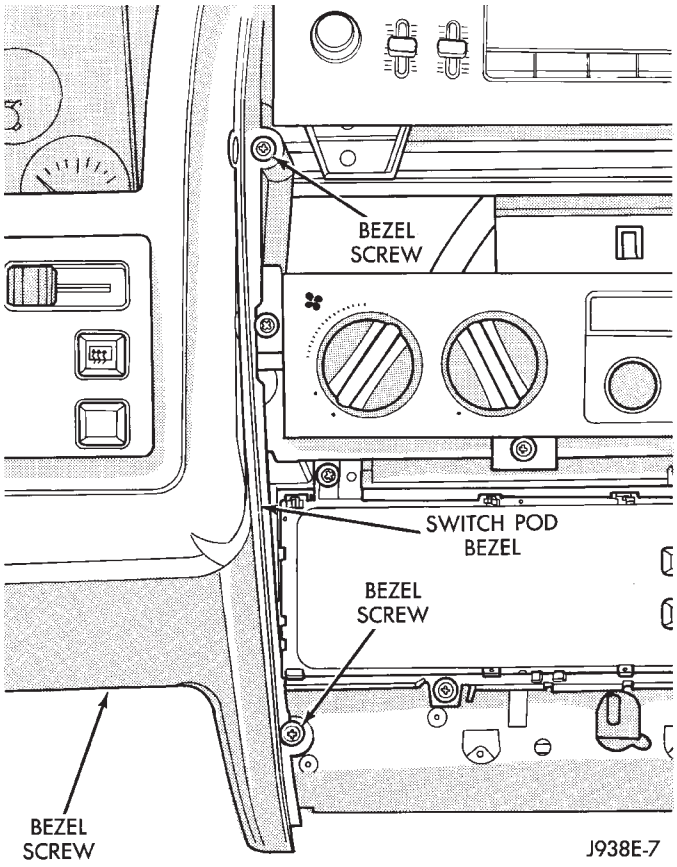

Fig. 10 Right Hand Switch Pod Bezel Screws

(21) Pull switch pod bezel out far enough to remove switch connectors. Disconnect connectors from each switch pod and remove bezel (Fig. 11).

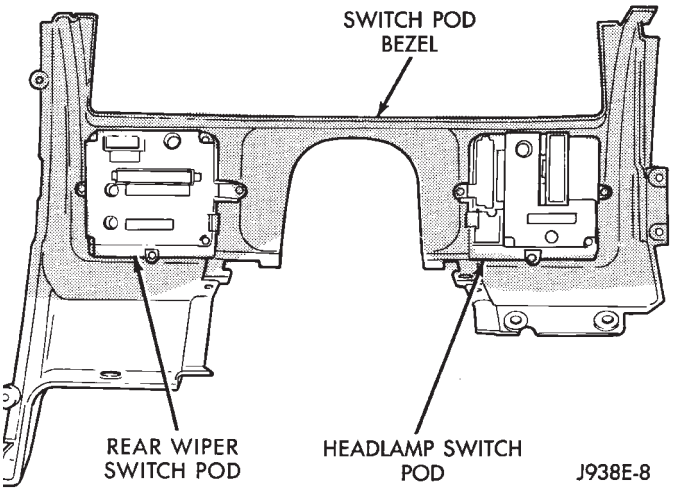

Fig. 11 Rear View of Switch Pod Bezel

(22) Remove required switch pod attaching screws and switch pod.

(23) Reverse the removal procedures to install a new switch pod. Tighten steering column retaining nuts to 105 in. lbs.

REAR DEFOGGER RELAY

(1) Open glove box and remove 3 screws holding relay center cover (Fig. 12).

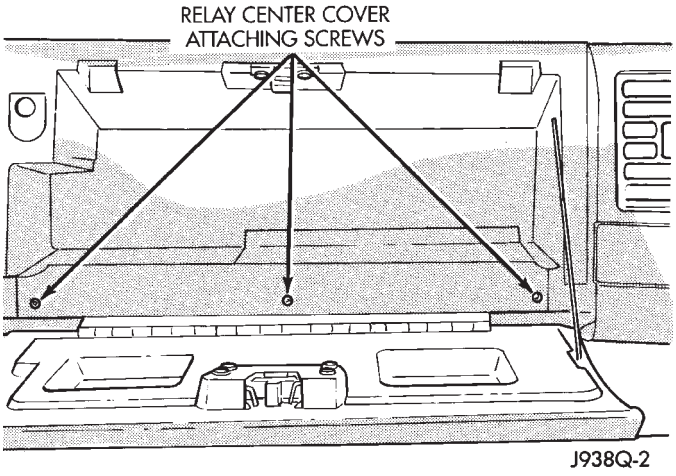

Fig. 12 Relay Center Cover

(2) Remove the RED relay from the relay center (Fig. 13).

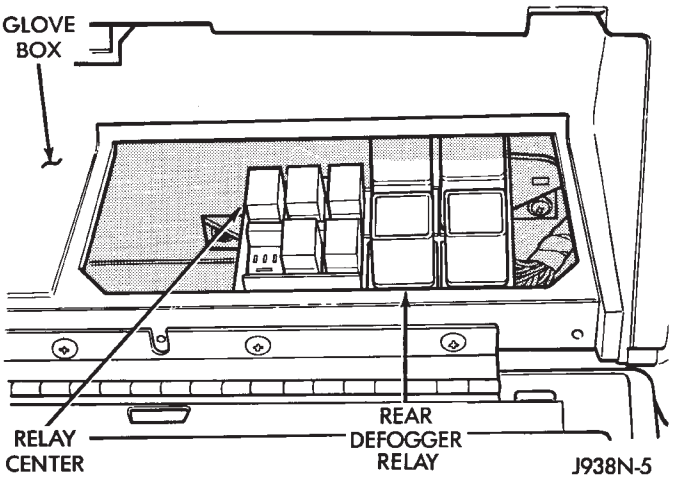

Fig. 13 Rear Defogger Relay