REAR WINDOW DEFOGGER

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GENERAL

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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 the rear window glass, comprise an electrical circuit. The electrically conductive lines are composed of a silver-ceramic material which when baked on glass 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.

On the XJ, the power circuit to the grid is protected by the 25 amp, #18 fuse in the fuse box. Power for fuse #18 comes from the power distribution center, fuse #F10. Power for the relay is protected by the 20 amp, #8 fuse located in the fuse box.

On the YJ, the grid is protected by a 25 amp #6 fuse, located in the fuse box. Power for the relay is protected by 15 amp #9 fuse, located in the fuse box.

To defog the rear window, momentarily depress the rocker switch. A light on the rocker 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.

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 until it is cleared by the adjacent grids.

With the engine running at idle, push the rear window defogger switch to the ON position and release. The pilot lamp in the rocker 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 positive voltmeter lead to the left or right along grid. An abrupt change in the voltage reading will be noticed. The break is at that point in the grid.

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).

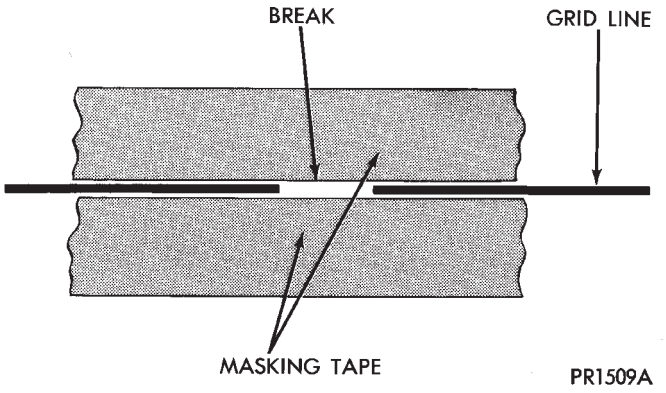


Fig. 1 Grid Line Repair (Typical)

(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.

SWITCH TESTING

DIAGNOSIS

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

BATTERY, IGNITION & FUSES

- Check fuses #6 and #9 (YJ), or #8 and #18 fuse (XJ). Replace as required.
- If the fuses are not blown check the battery side of #18 fuse (XJ) or fuse #6 (YJ) 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 #9 (YJ), fuse #8 (XJ) for battery voltage. If battery voltage is not present check for an open from the ignition switch.

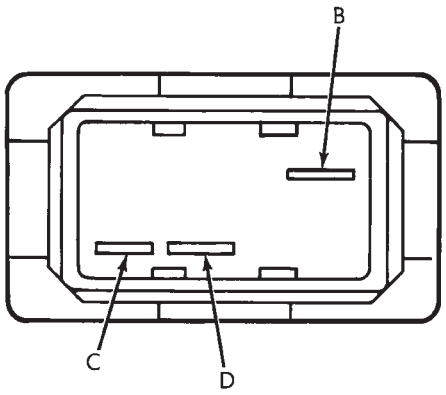
DEFOGGER SWITCH

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

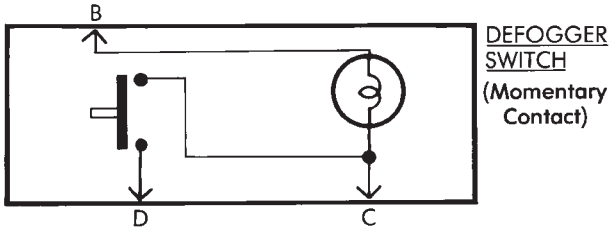
- Measure voltage at defogger switch connector terminal D. The meter should read approximately 5 volts momentarily. If not, repair open from relay.
- Refer to switch diagram for resistance tests. If values do not match, replace defogger switch.

DEFOGGER RELAY

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



SWITCH DIAGRAM



SWITCH TEST

SWITCH POSITION	TERMINALS	ZERO OHMS
On/Off	B and D	Almost zero ohms (bulb filament) with switch button depressed
On/Off	D and C	
At Rest (Neutral)	B and C	Almost zero ohms (bulb filament)

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• Measure voltage at relay connector terminal 4. The meter should read battery voltage. If not, repair open to fuse #18 (XJ), or fuse #9 (YJ).
• Measure voltage at relay connector terminal 5. The meter should read battery voltage. If not, repair open from #8 fuse XJ, or fuse #6 YJ.
• Measure resistance between relay connector terminal 1 and left side (driver's side) of defogger grid. The meter should read zero ohms. If not, repair open between relay connector and left 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.

INDICATOR LAMP

Refer to switch diagram for resistance tests. If values do not match, replace defogger switch.

DEFOGGER GRID

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

• Measure voltage at left side (driver's side) of defogger grid. The meter should read battery voltage. If not, repair open from defogger relay.
• Measure resistance for right side of defogger grid to a clean chassis ground. The meter should read zero ohms. If not, repair open between right side of defogger grid and ground.

XJ

REAR WINDOW DEFOGGER SWITCH REPLACEMENT

(1) Remove the instrument panel bezel; see 8E-Instrument Panel and Gauges section for the procedure.

(2) Remove the switch housing panel.

(3) Unplug the switch connector. Slightly depress the switch mounting tabs and remove the switch.

REAR DEFOGGER RELAY

The rear defogger relay is in the relay center. The relay center is located on the lower instrument panel trim cover just right of the steering column.

(1) Remove the rear defogger relay (red) from the relay center (Fig. 2).

(2) To install the relay, reverse the removal procedures.

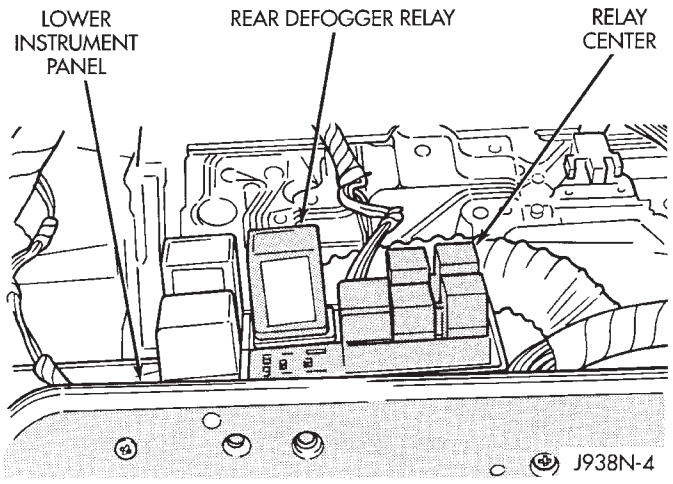

Fig. 2 Rear Defogger Relay Location—XJ

YJ

REAR WINDOW DEFOGGER SWITCH REPLACEMENT

(1) Remove 6 shroud screws (Fig. 3).

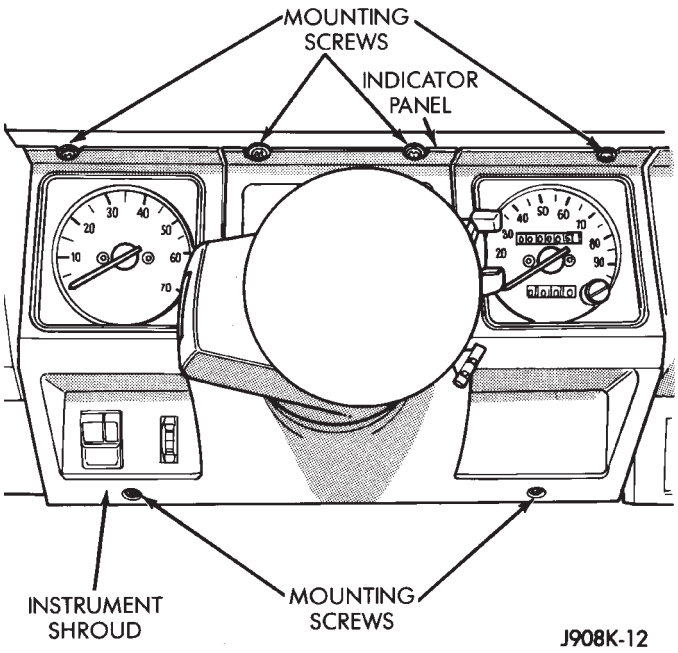

Fig. 3 Instrument Shroud Removal/Installation—YJ

(2) Slide shroud toward the steering wheel.

(3) Remove 3 screws (Fig. 4).

(4) Unplug the connector from the defogger switch.

(5) Squeeze the ends of the switch to release the plastic retaining fingers and push outward.

(6) To install, depress the rear window defogger switch into the bezel until the retaining fingers lock behind the bezel.

(7) Plug the connector on the switch.

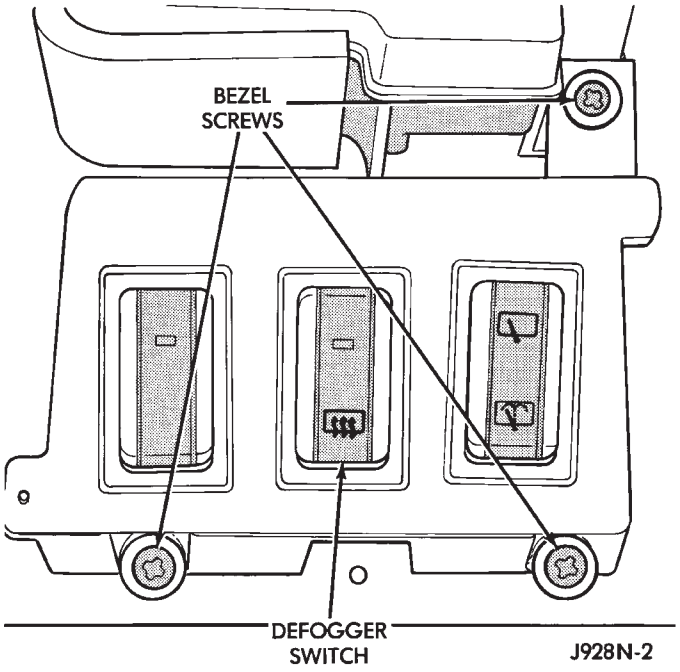

Fig. 4 Defogger Switch—YJ

(8) Install the bezel with 3 screws.

(9) Install the shroud with 6 screws.

REAR DEFOGGER RELAY

The rear defogger relay is in the relay center. The relay center is located on the lower instrument panel trim cover just right of the steering column.

(1) Remove the rear defogger relay (red) from the relay center (Fig. 2).

(2) To install the relay, reverse the removal procedures.