REAR WINDOW DEFOGGER

CONTENTS

GENERAL INFORMATION

The electrically-heated rear window defogger is an available option on XJ (Cherokee), and YJ (Wrangler) models equipped with the hardtop roof option. Following are general descriptions of the major components in the rear window defogger system. Refer to Group 8W - Wiring Diagrams for complete circuit descriptions and diagrams.

REAR WINDOW GLASS GRID

The heated rear window glass has two electrically-conductive vertical bus bars and a series of horizontal grid lines made of a silver-ceramic material, which is baked on and bonded to the inside surface of the glass. The grid lines and bus bars comprise a parallel electrical circuit.

When the rear window defogger switch is placed in the ON position, current is directed to the rear window grid lines through the bus bars. The grid lines heat the rear window to clear the surface of fog or snow. Circuit protection for the heated grid circuit is provided by fuse 18 (XJ) or fuse 6 (YJ) in the fuseblock module.

The grid lines and bus bars are highly resistant to abrasion. However, it is possible for an open to occur in an individual grid line resulting in no current flow through the line. The grid lines can be damaged or scraped off with sharp instruments. Care should be taken in cleaning the glass or removing foreign materials, decals or stickers. Normal glass cleaning solvents or hot water used with rags or toweling is recommended.

A repair kit is available to repair the grid lines and bus bars, or to reinstall the heated glass pigtail wires.

DEFOGGER SWITCH

The rear window defogger switch is mounted in the instrument panel left of the steering column for XJ, or right of the steering column for YJ. The switch circuit is protected by fuse 8 (XJ) or fuse 9 (YJ) in the fuseblock module. Actuating the switch energizes the relay and electronic timer. A light-emitting diode (LED) in the switch (XJ), or a indicator lamp in the switch (YJ), illuminates to indicate when the system is turned on. The defogger switch can not be repaired. If faulty, the switch must be replaced.

DEFOGGER RELAY/TIMER

The defogger relay/timer is located in the relay center on XJ models, or taped to the instrument panel wiring harness behind the parking brake pedal in the left cowl side area on YJ models. When the rear defogger switch is actuated, the rear defogger relay is energized. This causes current to flow through the grid circuit for approximately 10 minutes, or until the rear window defogger switch or ignition switch are turned off.

DIAGNOSIS

SYSTEM TESTS

Electrically-heated rear window defogger operation can be confirmed in the following manner:

(1) Turn the ignition switch to the ON position.

(2) Turn rear window defogger control switch ON.

(3) Monitor vehicle voltmeter. With the control switch ON, a distinct needle deflection should be noted.

(4) The rear window defogger operation can be checked by feeling the glass. A distinct difference in temperature between the grid lines and adjacent clear glass can be detected within 3 to 4 minutes of operation.

(5) Using a DC voltmeter, contact terminal A (Fig. 1) (passenger side) with the negative lead, and termi-

nal B (driver side) with the positive lead. The voltmeter should read 10-14 volts.

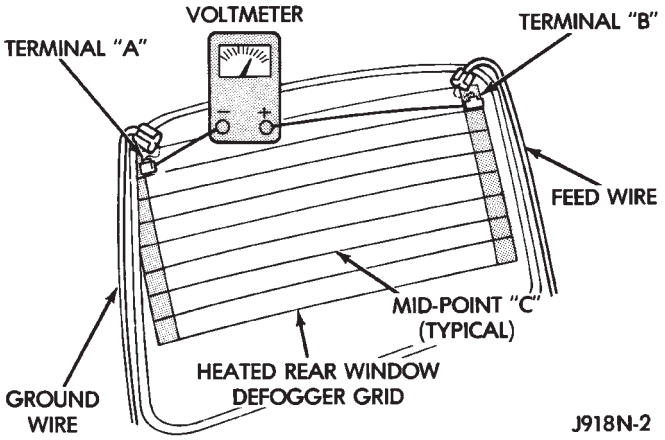


Fig. 1 Rear Window Glass Grid Test

Steps 3, 4 or 5 above will confirm system operation. Indicator light illumination means that there is power available at the output of the switch, but does not confirm that power is reaching the rear window grid lines.

If the rear window defogger does not operate, the problem should be isolated in the following manner:

(1) Confirm that ignition switch is in ON position.

(2) Ensure that the heated rear window feed and ground wires are connected to the glass. Confirm that the ground wire has continuity to ground.

(3) Check fuses 8 and 18 (XJ), or fuses 6 and 9 (YJ) in fuseblock module. Fuses must be tight in their receptacles and all electrical connections must be secure.

When the above steps have been completed and the system is still inoperative, one or more of the following is faulty:

- defogger switch
- relay/timer
- rear window grid lines (all grid lines would have to be broken or one of the feed wires disconnected for the entire system to be inoperative).

If turning the switch ON produces severe voltmeter deflection, check for a short circuit.

REAR WINDOW GLASS GRID

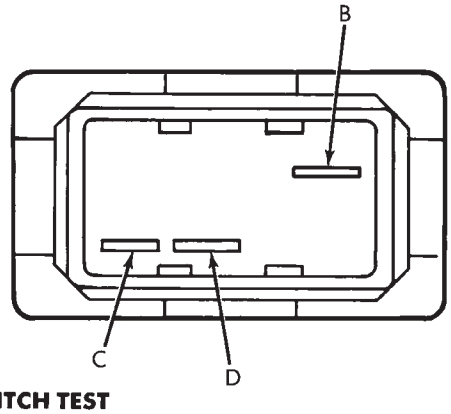
To detect breaks in grid lines, the following procedure is required:

(1) Turn ignition switch to the ON position. Turn rear defogger switch ON. The indicator lamp should light.

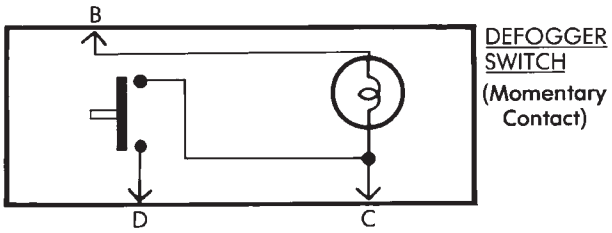
(2) Using a 12-volt DC voltmeter, contact vertical bus bar on passenger side of vehicle (point A of Fig. 1) with negative lead of voltmeter. With positive lead of voltmeter, contact vertical bus bar on driver side of vehicle (point B of Fig. 1). The voltmeter should read 10-14 volts.

(3) With negative lead of voltmeter, contact a good body ground point. The voltage reading should not change. A different reading indicates a poor ground connection.

(4) Connect negative lead of voltmeter to point A on passenger side bus bar and touch each grid line at mid-point with positive lead. A reading of approximately 6 volts indicates a line is good. A reading of zero volts indicates a break in the grid line between mid-point C and point B. A reading of 10-14 volts indicates a break between mid-point C and point A. Move toward break and voltage will change as soon as break is crossed.



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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DEFOGGER SWITCH

With defogger switch connector separated from defogger switch; turn ignition switch to ON for voltage tests, or turn ignition switch to OFF for resistance tests.

(1) Measure voltage at defogger switch connector terminal D. The meter should read approximately 5 volts momentarily. If OK, go to next step. If not OK, repair open from relay.

(2) Refer to switch diagram for resistance tests. If not OK, replace defogger switch.

DEFOGGER RELAY

With defogger relay connector separated from defogger relay; turn ignition switch to ON for voltage tests, or turn ignition switch to OFF for resistance tests.

(1) Measure voltage at relay connector terminal 4. The meter should read battery voltage. If OK, go to next step. If not OK, repair open from fuse 18 (XJ) or fuse 9 (YJ).

(2) Measure voltage at relay connector terminal 5. The meter should read battery voltage. If OK, go to next step. If not OK, repair open from fuse 8 (XJ), or fuse 6 (YJ).

(3) Measure resistance between relay connector terminal 1 and left side (driver's side) of defogger grid. The meter should read zero ohms. If OK, go to next step. If not OK, repair open between relay connector and left side of defogger grid.

(4) Measure resistance between relay connector terminal 2 and a clean chassis ground. The meter should read zero ohms. If OK, go to next step. If not OK, repair open between relay connector and ground.

(5) Connect relay connector and measure voltage at terminal 3. The meter should read approximately 5 volts. If not OK, replace defogger relay.

SERVICE PROCEDURES

REAR WINDOW GLASS GRID REPAIRS

The repair of grid lines, bus bars or pigtail wires can be accomplished using the MOPAR Rear Window Defogger Repair Kit (P/N 4267922) or equivalent.

WARNING: MATERIALS CONTAINED IN 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. KEEP OUT OF REACH OF CHILDREN.

(1) Mask repair area so that the conductive epoxy can be applied neatly. Extend epoxy application onto the grid line or the bus bar (Fig. 2) on either side of the break.

(2) Follow instructions in repair kit for preparing damaged area.

(3) Remove package separator clamp and mix two conductive epoxy components thoroughly within packaging. Fold package in half and cut center corner to dispense epoxy.

(4) For grid line, mask area to be repaired with masking tape or a template (Fig. 2).

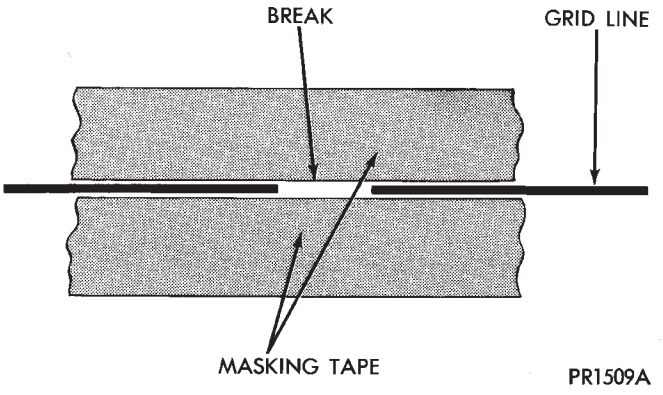

Fig. 2 Grid Line Repair (Typical)

(5) Apply epoxy through slit in masking tape or template. Overlap both ends of the break by at least 19mm (.75 in.).

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

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

(8) Carefully remove masking tape from grid line.

CAUTION: Do not allow the glass surface to exceed 400°F, glass may fracture.

(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 or clamp from terminal or pigtail and check operation of rear window defogger. Do not attach connectors until curing is complete.

DEFOGGER SWITCH REMOVE/INSTALL

XJ MODELS

(1) Remove the instrument cluster bezel. Refer to Group 8E - Instrument Panel and Gauges for procedure.

(2) Remove the switch housing panel.

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

(4) Reverse removal procedures to install.

YJ MODELS

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

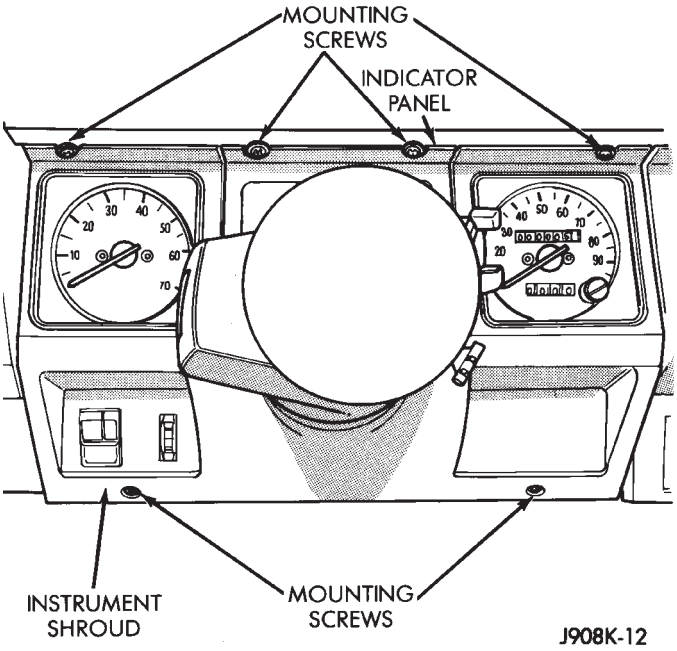

Fig. 3 Instrument Bezel Remove/Install—YJ

(2) Slide bezel 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) Reverse removal procedures to install.

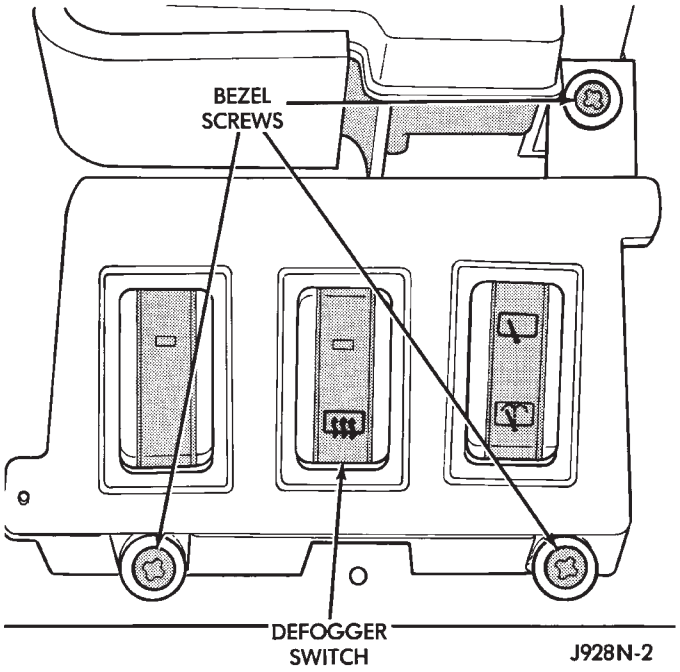

Fig. 4 Defogger Switch Remove/Install—YJ

DEFOGGER RELAY/TIMER REMOVE/INSTALL

XJ MODELS

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. 5).

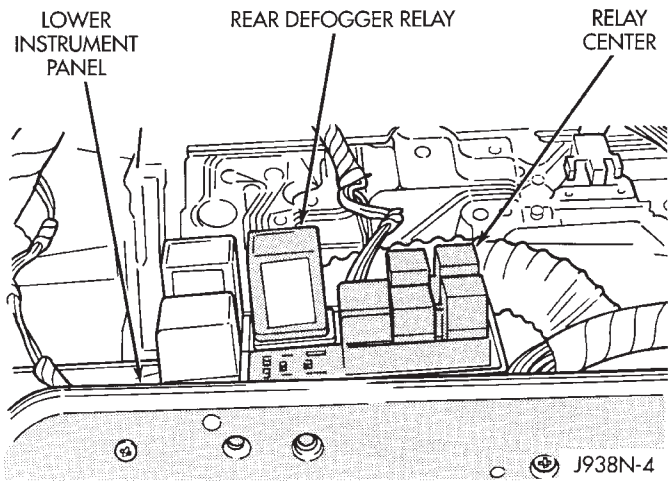

Fig. 5 Rear Defogger Relay—XJ

(2) Reverse removal procedures to install.

YJ MODELS

The rear defogger relay is located behind the parking brake pedal in the left cowl side area. Unplug relay from connector and replace with new relay. Be certain that relay is taped back into place on harness with plastic cover facing up and terminals facing down.