

ELECTRICALLY HEATED SYSTEMS

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GENERAL INFORMATION

INTRODUCTION

An electrically heated rear window defogger is standard factory-installed equipment on this model. Refer to 8W-48 - Rear Window Defogger in Group 8W - Wiring Diagrams for complete circuit descriptions and diagrams.

REAR WINDOW DEFOGGER SYSTEM

The rear window defogger system will only operate when the ignition switch is in the On position. When the defogger switch is in the On position, an electric heater grid on the rear window glass is energized. The electric heater grid produces heat to help clear the rear window glass of ice, snow, or fog.

The defogger system is controlled by a momentary switch in the rear window switch pod installed in the instrument panel lower bezel, which also includes the switch for the rear wiper and washer system. An amber indicator lamp in the switch pod will light to indicate when the defogger system is turned on. The rear window switch pod also contains the defogger system control circuitry including the timer logic and the defogger relay.

The defogger system will be automatically turned off after a programmed time interval of about ten minutes. After the initial time interval has expired, if the defogger switch is turned on again during the same ignition cycle, the defogger system will automatically turn off after about five minutes.

The defogger system will automatically shut off if the ignition switch is turned to the Off position, or it can be turned off manually by depressing the defogger switch a second time. Following are general descriptions of the major components in the defogger system. Refer to the owner's manual in the vehicle

glove box for more information on the features, use and operation of the defogger system.

DESCRIPTION AND OPERATION

REAR GLASS HEATING 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, electrical 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. Protection for the heated grid circuit is provided by a fuse in the Power Distribution Center (PDC).

The grid lines and bus bars are highly resistant to abrasion. However, it is possible for an open circuit 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 when cleaning the glass or removing foreign materials, decals, or stickers from the glass. 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 terminals.

DEFOGGER SWITCH

The rear window defogger switch is integral to the rear window switch pod, which includes the rear wiper and washer switches. The rear window switch pod is installed in the instrument panel lower bezel, which is located near the center of the lower instru-

## DESCRIPTION AND OPERATION (Continued)

ment panel, below the heater and air conditioner controls.

The rear window switch pod also contains the rear window defogger logic and timer circuitry, an amber defogger indicator lamp, the rear window defogger relay, and two switch illumination lamps. The indicator and illumination lamps in the switch pod use incandescent bulbs, which can be serviced.

The momentary-type rear window defogger switch provides a hard wired ground signal to the rear window defogger logic and timer circuitry, each time it is depressed. The rear window defogger timer and logic circuitry responds by energizing or de-energizing the rear window defogger relay and the amber defogger indicator lamp, which lights to indicate when the defogger system is turned On. Energizing the rear window defogger relay provides electrical current to the rear window defogger grid.

The rear window switch pod cannot be repaired. If any function of the switch pod except lighting is faulty or damaged, the entire switch pod must be replaced.

## DIAGNOSIS AND TESTING

## DEFOGGER SYSTEM

For circuit descriptions and diagrams, refer to 8W-48 - Rear Window Defogger in Group 8W - Wiring Diagrams. The operation of the electrically heated rear window defogger system can be confirmed in one of the following manners:

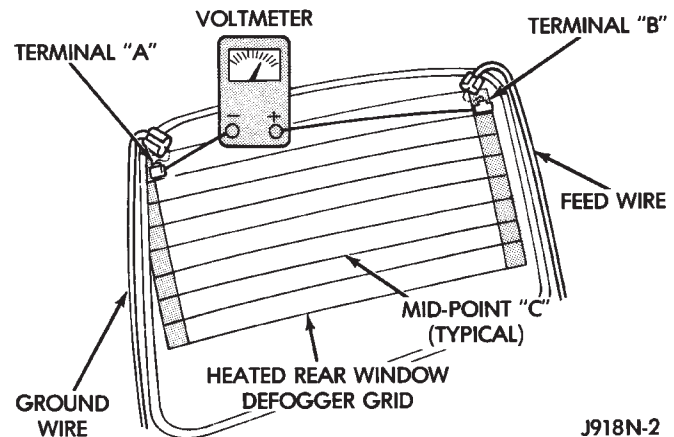
1. Turn the ignition switch to the On position. While monitoring the instrument panel voltmeter, set the defogger switch in the On position. When the defogger switch is turned On, a distinct voltmeter needle deflection should be noted.

2. Turn the ignition switch to the On position. Set the defogger switch in the On position. The rear window defogger operation can be checked by feeling the rear window or outside rear view mirror glass. A distinct difference in temperature between the grid lines and the adjacent clear glass or the mirror glass can be detected within three to four minutes of operation.

3. Using a 12-volt DC voltmeter, contact the rear glass heating grid terminal A (right side) with the negative lead, and terminal B (left side) with the positive lead (Fig. 1). The voltmeter should read battery voltage.

The above checks will confirm system operation. Illumination of the defogger switch indicator lamp means that there is electrical current available at the output of the rear window defogger logic and timer circuitry, but does not confirm that the electrical current is reaching the rear glass heating grid lines.

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



**Fig. 1 Rear Window Glass Grid Test**

- (1) Confirm that the ignition switch is in the On position.

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

- (3) Check the fuses in the Power Distribution Center (PDC) and in the junction block. The fuses must be tight in their receptacles and all electrical connections must be secure.

When the above steps have been completed and the rear glass heating grid is still inoperative, one or more of the following is faulty:

- Rear window switch pod
- 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 setting the defogger switch to the On position produces a severe voltmeter deflection, check for a short circuit between the rear window switch pod defogger relay output and the rear glass heating grid.

## REAR GLASS HEATING GRID

For circuit descriptions and diagrams, refer to 8W-48 - Rear Window Defogger in Group 8W - Wiring Diagrams. To detect breaks in the grid lines, the following procedure is required:

- (1) Turn the ignition switch to the On position. Set the defogger switch in the On position. The indicator lamp should light. If OK, go to Step 2. If not OK, see Defogger Switch in the Diagnosis and Testing section of this group.

- (2) Using a 12-volt DC voltmeter, contact the vertical bus bar on the right side of the vehicle with the negative lead. With the positive lead, contact the vertical bus bar on the left side of the vehicle. The voltmeter should read battery voltage. If OK, go to Step 3. If not OK, repair the open circuit to the defogger relay as required.

- (3) With the negative lead of the voltmeter, contact a good body ground point. The voltage reading should

## DIAGNOSIS AND TESTING (Continued)

not change. If OK, go to Step 4. If not OK, repair the circuit to ground as required.

(4) Connect the negative lead of the voltmeter to the right side bus bar and touch each grid line at midpoint C with the positive lead. A reading of approximately six volts indicates a line is good. A reading of zero volts indicates a break in the grid line between midpoint C and the left side bus bar. A reading of ten to fourteen volts indicates a break between midpoint C and the right side bus bar. Move the positive lead on the grid line towards the break and the voltage reading will change as soon as the break is crossed.

## DEFOGGER SWITCH

For circuit descriptions and diagrams, refer to 8W-48 - Rear Window Defogger in Group 8W - Wiring Diagrams.

**WARNING: ON VEHICLES EQUIPPED WITH AIRBAGS, REFER TO GROUP 8M - PASSIVE RESTRAINT SYSTEMS BEFORE ATTEMPTING ANY STEERING WHEEL, STEERING COLUMN, OR INSTRUMENT PANEL COMPONENT DIAGNOSIS OR SERVICE. FAILURE TO TAKE THE PROPER PRECAUTIONS COULD RESULT IN ACCIDENTAL AIRBAG DEPLOYMENT AND POSSIBLE PERSONAL INJURY.**

(1) Disconnect and isolate the battery negative cable. Remove the lower bezel from the instrument panel and unplug the rear window switch pod wire harness connector.

(2) Check for continuity between the ground circuit cavity of the rear window switch pod wire harness connector and a good ground. There should be continuity. If OK, go to Step 3. If not OK, repair the open circuit as required.

(3) Connect the battery negative cable. Check for battery voltage at the fused B(+) circuit cavity of the rear window switch pod wire harness connector. If OK, go to Step 4. If not OK, repair the circuit to the Power Distribution Center (PDC) fuse as required.

(4) Turn the ignition switch to the On position. Check for battery voltage at the fused ignition switch output (run) circuit cavity of the rear window switch pod wire harness connector. If OK, go to Step 5. If not OK, repair the circuit to the junction block fuse as required.

(5) Turn the ignition switch to the Off position. Disconnect and isolate the battery negative cable. Plug the wire harness connector into the rear window switch pod. Connect the battery negative cable. Turn the ignition switch to the On position. Back probe the rear window defogger relay output circuit cavity of the rear window switch pod wire harness connector. Depress and release the rear window

defogger switch. There should be battery voltage. Depress and release the rear window defogger switch again. There should be zero volts. If OK, go to Step 6. If not OK, replace the faulty rear window switch pod.

(6) Depress and release the rear window defogger switch. The rear window defogger indicator lamp should light. If the indicator lamp does not light, replace the bulb with a known good unit and test again. If the lamp is still inoperative, replace the faulty rear window switch pod.

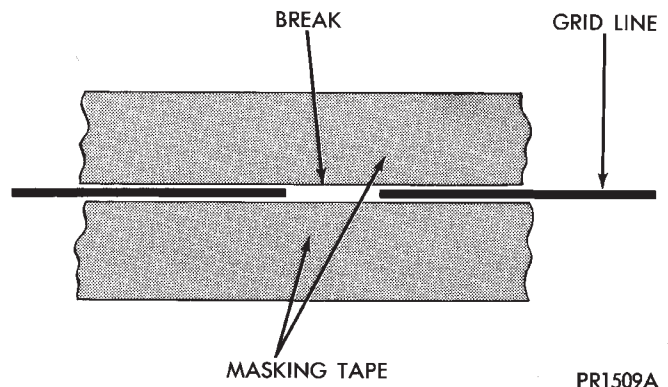
## SERVICE PROCEDURES

## REAR GLASS HEATING GRID REPAIR

Repair of the rear glass heating grid lines, bus bars, terminals or pigtail wires can be accomplished using a Mopar Rear Window Defogger Repair Kit (P/N 4267922) or equivalent.

**WARNING: MATERIALS CONTAINED IN THE REPAIR KIT MAY CAUSE SKIN OR EYE IRRITATION. THE KIT CONTAINS EPOXY RESIN AND AMINE TYPE HARDENER, WHICH ARE HARMFUL IF SWALLOWED. AVOID CONTACT WITH THE SKIN AND EYES. FOR SKIN CONTACT, WASH THE AFFECTED AREAS WITH SOAP AND WATER. FOR CONTACT WITH THE EYES, FLUSH WITH PLENTY OF WATER. DO NOT TAKE INTERNALLY. IF TAKEN INTERNALLY, INDUCE VOMITING AND CALL A PHYSICIAN IMMEDIATELY. USE WITH ADEQUATE VENTILATION. DO NOT USE NEAR FIRE OR FLAME. CONTAINS FLAMMABLE SOLVENTS. KEEP OUT OF THE REACH OF CHILDREN.**

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



**Fig. 2 Grid Line Repair - Typical**

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

## SERVICE PROCEDURES (Continued)

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

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

(5) Apply the epoxy through the slit in the masking tape or template. Overlap both ends of the break by at least 19 mm (0.75 in.).

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

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

(8) Carefully remove the masking tape or template.

**CAUTION:** Do not allow the glass surface to exceed 204° C (400° F) or the glass may fracture.

(9) Allow the epoxy to cure 24 hours at room temperature, or use a heat gun with a 260° to 371° C (500° to 700° F) range for fifteen minutes. Hold the heat gun approximately 25.4 cm (10 in.) from the repair.

(10) After the conductive epoxy is properly cured, remove the wedge or clamp from the terminal or pigtail wire. Do not attach the wire harness connectors until the curing process is complete.

(11) Check the operation of the rear window defogger glass heating grid.

## REMOVAL AND INSTALLATION

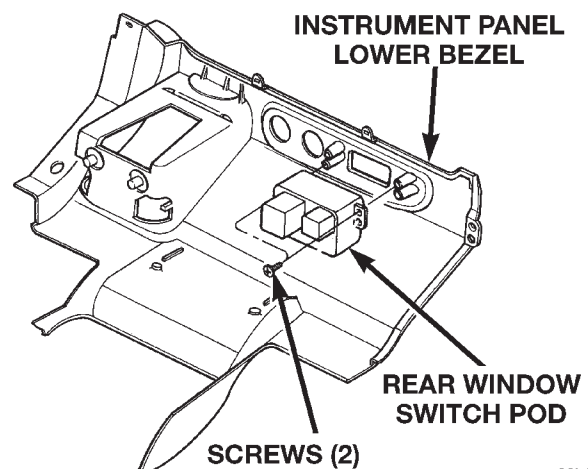
## DEFOGGER SWITCH

**WARNING: ON VEHICLES EQUIPPED WITH AIR-BAGS, REFER TO GROUP 8M - PASSIVE RESTRAINT SYSTEMS BEFORE ATTEMPTING ANY STEERING WHEEL, STEERING COLUMN, OR INSTRUMENT PANEL COMPONENT DIAGNOSIS OR SERVICE. FAILURE TO TAKE THE PROPER PRECAUTIONS COULD RESULT IN ACCIDENTAL AIR-BAG DEPLOYMENT AND POSSIBLE PERSONAL INJURY.**

(1) Disconnect and isolate the battery negative cable.

(2) Remove the lower bezel from the instrument panel. See Instrument Panel Lower Bezel in the Removal and Installation section of Group 8E - Instrument Panel Systems for the procedures.

(3) Remove the two screws that secure the rear window switch pod to the instrument panel lower bezel (Fig. 3).



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**Fig. 3 Rear Window Switch Pod Remove/Install**

(4) Remove the rear window switch pod from the instrument panel lower bezel.

(5) Reverse the removal procedures to install. Tighten the mounting screws to 2.2 N·m (20 in. lbs.).