ELECTRICALLY HEATED SYSTEMS

CONTENTS

page

DESCRIPTION AND OPERATION
INTRODUCTION 1
REAR WINDOW DEFOGGER SWITCH 1
DIAGNOSIS AND TESTING
DEFOGGER SYSTEM 1
GRID LINES 2
REAR WINDOW DEFOGGER SWITCH 3
SERVICE PROCEDURES
GRID LINE AND TERMINAL REPAIR 3

DESCRIPTION AND OPERATION

INTRODUCTION

For proper operation of the Rear Window Defogger system refer to the Owner's Manual.

The system consists of a rear glass with two vertical bus bars and a series of electrically connected grid lines fired on the inside surface. A control switch and a timer relay combined into a single assembly is used on all models (Fig. 1).

Circuit protection is provided by a maxi fuse, located in the Power Distribution Center, for the heated grid circuit and by a fuse for the relay control circuit.

When the switch is turned to the ON position, current is directed to the rear defogger grid lines. The heated grid lines heat the rear glass to clear the surface of fog or frost.

CAUTION: Grid lines can be damaged or scraped off with sharp instruments, care should be taken in cleaning glass or removing foreign materials, decals or stickers. Normal glass cleaning solvents or hot water used with rags or toweling is recommended.

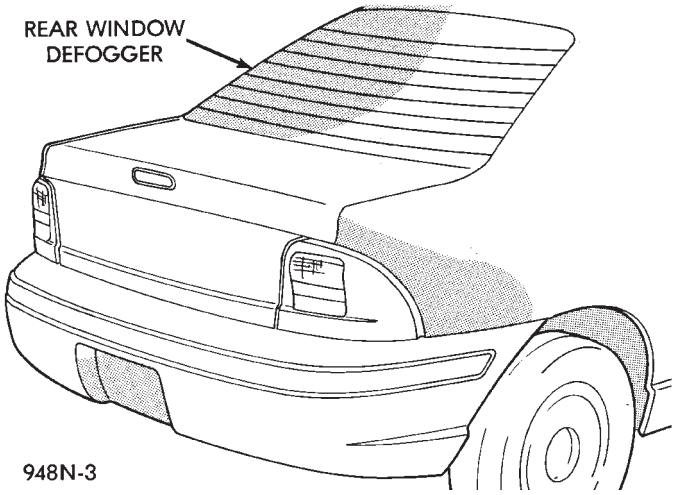

Fig. 1 Rear Window Defogger

NOTE: This group covers both Left-Hand Drive (LHD) and Right-Hand Drive (RHD) versions of this model. Whenever required and feasible, the RHD versions of affected vehicle components have been constructed as mirror-image of the LHD versions. While most of the illustrations used in this group represent only the LHD version, the diagnostic and service procedures outlined can generally be applied to either version. Exceptions to this rule have been clearly identified as LHD, RHD, or Export if a special illustration or procedure is required.

REAR WINDOW DEFOGGER SWITCH

The rear window defogger switch is a control switch and timer relay integrated into a single panel mounted assembly. Actuating the switch energizes the circuit which allows current to flow through the grid lines. Upon initial actuation for approximately eight to ten minutes, or until either the switch or ignition is turned off. An indicating lamp illuminates a lens inlaid in the control switch.

DIAGNOSIS AND TESTING

DEFOGGER SYSTEM

Electrically heated rear window defogger operation can be checked in vehicle in the following manner:

(1) Turn ignition switch to the ON position.

(2) Connect an ammeter in series with the battery. Push the defogger control switch to the ON position. A distinct increase in amperage draw should be noted.

(3) 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 in three to four minutes of operation.

(4) Using a DC voltmeter, connect negative lead to Point B, and the positive lead to Point A (Fig. 2). The voltmeter should read 10-14 volts.

DIAGNOSIS AND TESTING (Continued)

(5) Step 2, Step 3 or Step 4 above will confirm system operation. Indicator light illumination means that there is power available at the output of the relay only, and does not necessarily verify system operation.

(6) If turning the switch ON produced no distinct current draw on the ammeter the problem should be isolated in the following manner:

(a) Confirm the ignition switch is ON.

(b) Ensure that the heated rear glass feed wire is connected to the terminal or pigtail and that the ground wire is in fact grounded.

(c) Ensure that the maxi-fuse and control circuit fuse are OK and all electrical connections are secure.

(7) When the above steps have been completed and the system is still inoperative, one or more of the following is defective:

(a) Control switch/timer relay module.

(b) All rear window grid lines would have to be broken or one of the feed wires are not connected for the system to be inoperative.

(8) If turning the switch ON produces severe voltmeter deflection, the circuit should be closely checked for a shorting condition.

(9) If the system operation has been verified but indicator lamp does not light, replace the switch.

(10) For detailed wiring information, refer to group 8W, Wiring Diagrams.

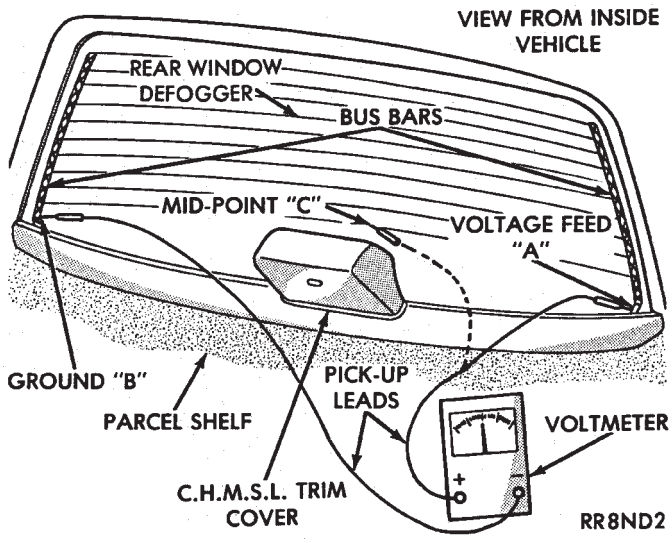

Fig. 2 Rear Glass Grid Line Test

GRID LINES

The horizontal grid lines and vertical bus bar lines printed and fired on inside surface of rear window glass (Fig. 2) comprise an electrical parallel circuit. The electrically conductive lines are composed of a silver-ceramic material which when fired on glass becomes bonded to the glass and is highly resistant to abrasion. It is possible, however, that a break may occur in an individual grid line resulting in no current flow through the line. To detect breaks in grid lines the following procedure is required:

(1) Turn ignition ON and turn control switch to ON. The indicator light should come on.

(2) Using a DC voltmeter with 0-15 volt range, contact terminal B with negative lead of voltmeter. With positive lead of voltmeter, contact terminal A (Fig. 2). The voltmeter should read 10-14 volts. A lower voltage reading indicates a poor connection in the feed or the ground circuit.

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

(4) Connect negative lead of voltmeter to terminal B and touch each grid line at Mid-Point with Positive lead. A reading of:

- Approximately 6 volts indicates the line is OK
- 0 volts indicates a break in line between Mid-Point C and terminal A
- 10-14 volts indicates a break between Mid-Point C and terminal B

Move the lead toward the break and voltage will change as soon as break is crossed. Refer to (Fig. 2) and (Fig. 3).

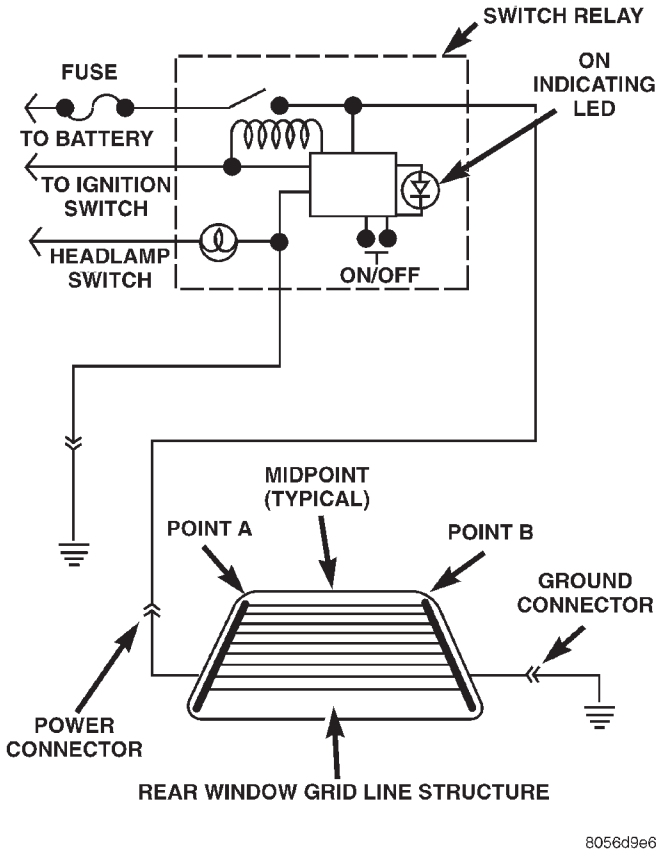

Fig. 3 Systems Electrical Circuit

DIAGNOSIS AND TESTING (Continued)

REAR WINDOW DEFOGGER SWITCH

The rear window defogger switch may be tested in-vehicle or bench tested. In vehicle testing is accomplished in the following manner:

(1) Remove the switch from the instrument panel but leave the switch connected, refer to Group 8E, Instrument Panel and Systems for removal procedures.

(2) Turn the ignition switch ON.

(3) Using a voltmeter, check for battery voltage at Pin 3 and Pin 4 (Fig. 3), (Fig. 4) and (Fig. 5).

(a) If OK, go to Step 4.

(b) If NOT OK, check fuse 8 in fuse block and the 30 Amp maxi fuse in the Power Distribution Center (PDC). If fuses are OK, check wiring circuit. Refer to Group 8W, Wiring Diagrams.

(4) Check Pin 5, with switch in the ON position there should be battery voltage and no voltage in the OFF position.

(a) If OK, go to Step 5.

(b) If NOT OK, no voltage in the ON position or voltage in the OFF position. Replace the switch/relay module.

(5) Press switch to ON position. The indicator lamp should come on and remain on for approximately 10 minutes. If the indicator lamp fails to light or no voltage is present for approximately 10 minutes. Replace Rear Window Defogger Switch.

(6) To bench test relay:

(a) Using a jumper wire connect a 12 volt batter supply, apply voltage to Pin 3 and 4. Ground Pin 2.

(b) Follow the above procedures except Step 2

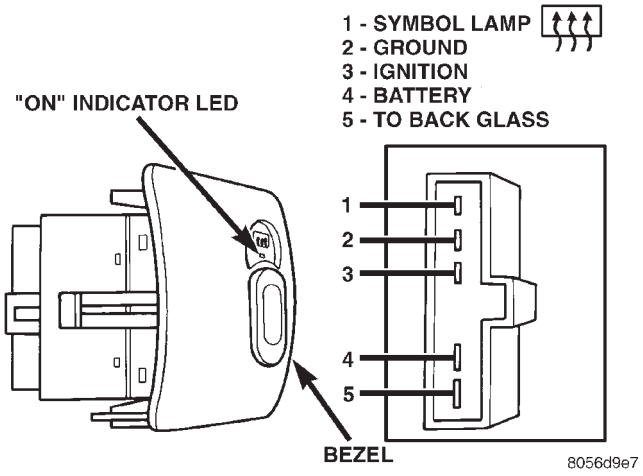

Fig. 4 Rear Window Defogger Switch

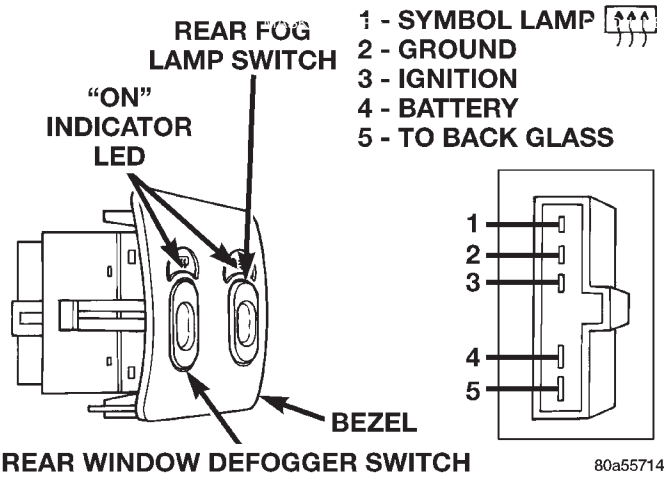

Fig. 5 Rear Window Defogger Switch - Export

SERVICE PROCEDURES

GRID LINE AND TERMINAL REPAIR

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 PERCENT FLAMMABLE SOLVENTS.

KEEP OUT OF REACH OF CHILDREN.

The repair of the grid lines or the terminal is possible using the Mopar ® Repair Package or equivalent.

(1) Mask repair area so conductive epoxy can be extended onto the line or the bus bar (Fig. 6).

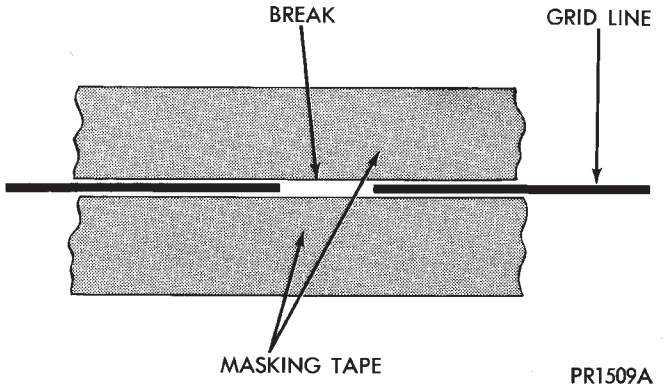

Fig. 6 Grid Line Repair

SERVICE PROCEDURES (Continued)

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

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

(4) For grid line, mark off area to be repaired with masking tape or a template (Fig. 6).

(5) Apply conductive epoxy through slit in masking tape. Overlap both ends of the break by 19 mm (3/4 inch).

(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 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.

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

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