

ELECTRICALLY HEATED SYSTEMS

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DESCRIPTION AND OPERATION

INTRODUCTION

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

Vehicles equipped with an electrically heated rear window defogger also have a 90 amp generator.

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 located in the A/C, heater or ATC control is used on all models (Fig. 1).

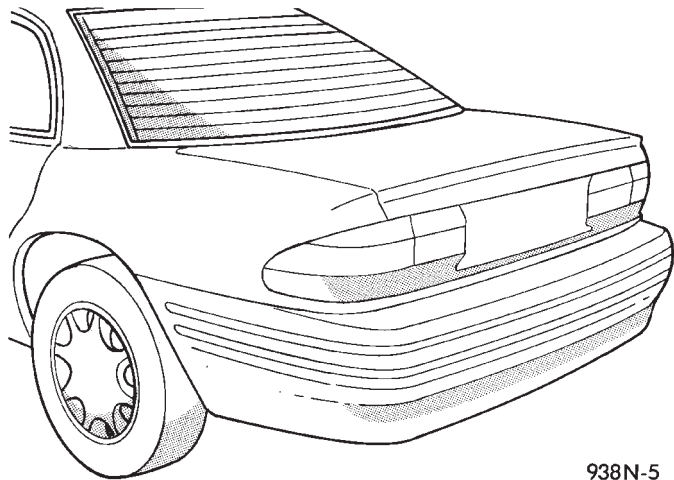


Fig. 1 Rear Window Defogger Typical

Vehicles with Rear Window Antenna refer to Group 8F, Audio Systems.

Circuit protection is provided by a fusible link, located in the charging circuit, 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.

HEATER-A/C ATC CONTROL SWITCH

The control switch and timer relay are integrated into the Heater-A/C or ATC controls (Fig. 2) and (Fig. 3). Actuating the switch energizes the circuit allowing current to flow through the grid lines for ten minutes. Upon initial actuation, 5 minutes with each subsequent actuation or until either the switch or ignition is turned off. An indicating lamp illuminates a lens inlaid in the control switch.

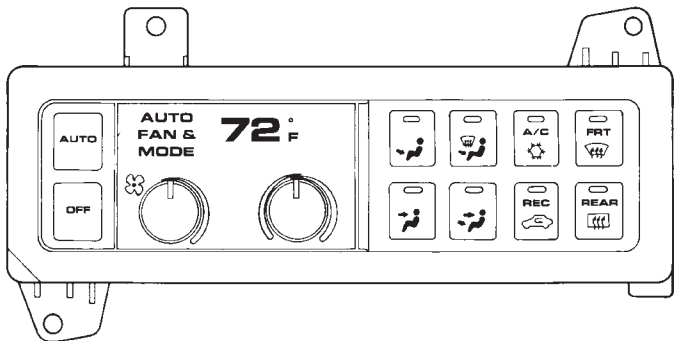


Fig. 2 ATC Control Switch

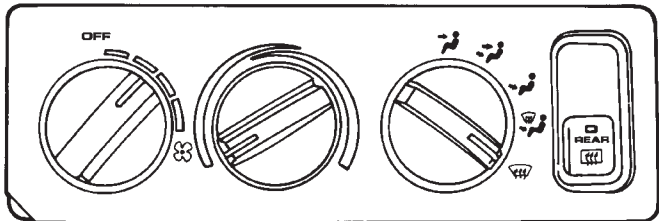


Fig. 3 Heater Control Switch

DIAGNOSIS AND TESTING

SERVICE PROCEDURES

Electrically Heated Rear window defogger operation can be checked in vehicle in the following manner:

- (1) Turn ignition ON.
- (2) Make sure defogger OFF.

Vehicle with Rear Window Antenna refer to Group 8F, Audio Systems.

(3) Using a ammeter on the battery. Turn the Defogger control switch ON, a distinct increase in amperage draw 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 in 3 to 4 minutes of operation.

(5) Using a DC voltmeter (Fig. 4) contact terminal B with the negative lead, and terminal A with the positive lead. The voltmeter should read 10-14 volts.

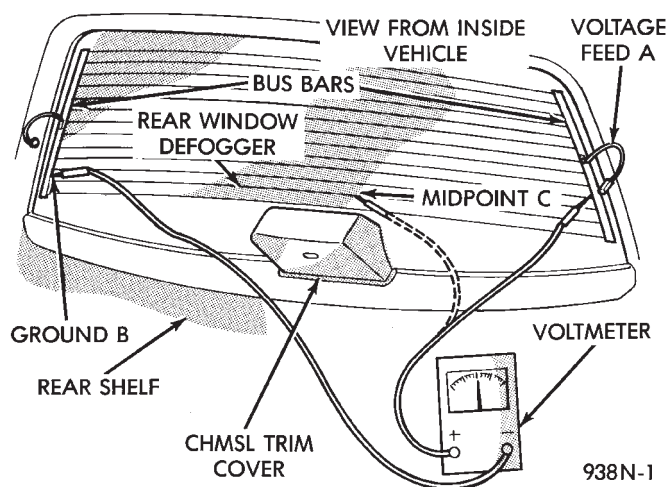


Fig. 4 Grid Line Test

(6) Step 3, Step 4 or Step 5 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.

(7) 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 fusible link and control circuit fuse is operational and all electrical connections are secure.

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

(a) Control switch or timer relay.

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

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

(10) If the system operation has been verified but indicator bulb does not light, service the A/C heater or ATC controls.

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

GRID TEST

The horizontal grid lines and vertical bus bar lines printed and fired on inside surface of rear window glass (Fig. 4) 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 the negative lead of voltmeter to the ground side. With positive lead of voltmeter, contact the battery feed side (Fig. 4). The voltmeter should read 10-14 volts. A lower voltage reading indicates a poor ground connection.

(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 the ground side 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 0 volts indicates a break in line between Mid-Point C and battery feed side. Reading of 10-14 volts indicates a break between Mid-Point C and ground side. Move toward break and voltage will change as soon as break is crossed (Fig. 4) and (Fig. 5).

CONTROL SWITCH AND TIMER RELAY TEST

Vehicles with ATC heater will have to be tested with scan tool (DRB). The Body Diagnostic Procedures Manual will have to be used.

Vehicles with manual Heater-A/C, the control switch and timer relay may be tested in the vehicle or on the bench.

DIAGNOSIS AND TESTING (Continued)

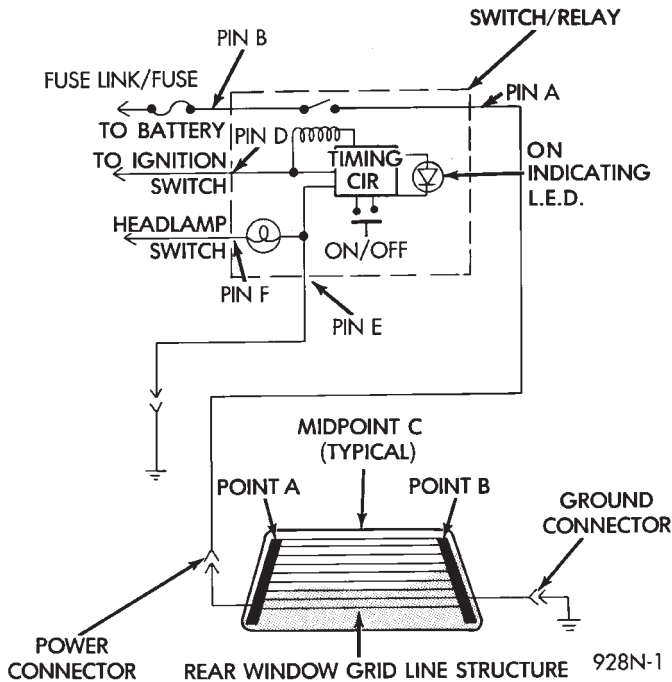


Fig. 5 Systems Electrical Circuit

IN-VEHICLE TESTING

(1) Remove the control switch from console and do not disconnect control switch (Fig. 6).

(2) Turn ignition ON. Turn defogger ON.

(3) Using a voltmeter, check at Pin 5 of the 13 Pin connector, and Pin 8 of the 10 Pin connector should have battery voltage. If OK, go to Step 4. If no voltage, trace circuit upstream of control panel from problem:

- Cut wire
- Blown fusible link
- Circuit breaker inoperative
- Bulkhead connector inoperative

Refer to Group 8W, Wiring Diagrams.

(4) Check for voltage at Pin 1 of the 10 Pin connector should have battery voltage. If no voltage at Pin 1 of the 10 Pin connector, replace control switch. If there is voltage turn defogger switch OFF. If voltage is still present, replace relay.

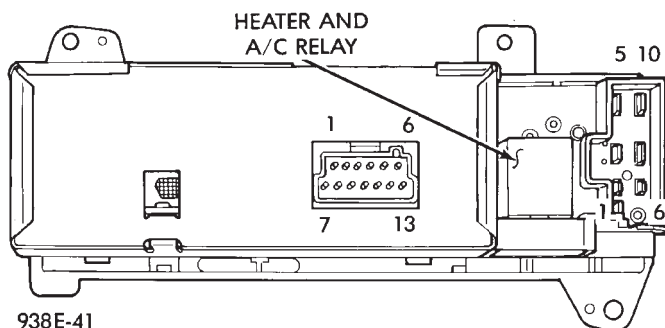


Fig. 6 Heater Control Switch Connectors

BENCH TESTING

(1) To bench test control switch and relay a 12 volt battery is needed.

(2) Using two jumper wires, connect both to a 12 volt supply and the other ends to, one to Pin 5 of the 13 Pin connector and the second to Pin 8 of the 10 Pin connector

(3) Connect a jump wire from ground to Pin 3 of the 13 Pin connector.

(4) Turn defogger switch to the ON position, check for voltage at Pin 1 of the 10 Pin connector should have battery voltage. If no voltage at Pin 1 of the 10 Pin connector, replace control switch. If there is voltage turn defogger switch OFF. If voltage is still present, replace relay.

SERVICE PROCEDURES

REPAIR GRID LINES, TERMINALS AND PIGTAILS

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. 7).

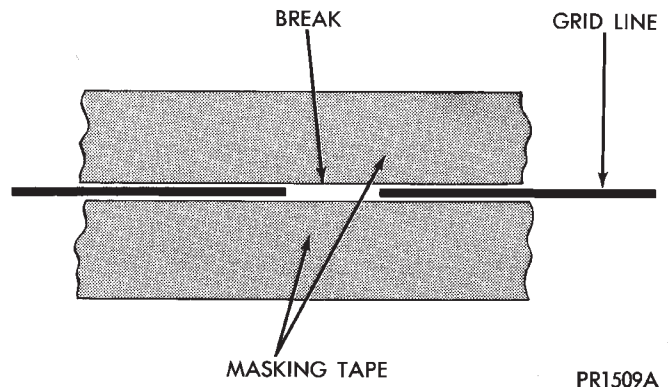


Fig. 7 Grid Line Repair

(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. 7).

(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.

SERVICE PROCEDURES (Continued)

(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°-371°C (500°-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.

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 INTER-

NALLY, 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.

REMOVAL AND INSTALLATION

HEATER-A/C ATC CONTROL

Refer to Group 8E, Instrument Panel and Systems for proper Removal and Installation procedures.

HEATER-A/C FAN RELAY

Refer to Group 8E, Instrument Panel and Systems for proper Removal and Installation procedures.