ARTICLE BEGINNING

1999-2000 ACCESSORIES & EQUIPMENT
General Motors Rear Window Defoggers

Camaro & Firebird

DESCRIPTION & OPERATION

CAUTION: To prevent damaging heating element, DO NOT scrape or apply decals to inside of rear window.

Rear window defogger system uses a switch with an integral indicator light to control the rear defogger grid. A rear defogger timer/relay is used to control rear defogger cycle periods. Rear defogger switch and rear defogger timer relay are integral components of the Heating Ventilation Air Conditioning (HVAC) controller.

When rear defogger is first activated, defog cycle lasts 10 minutes. Each time rear defogger switch is activated after initial activation, defog cycle lasts 5 minutes. If ignition is turned off then back on, defog cycle resets to 10-minute cycle. Under some operating conditions, glass may not feel warm to the touch. Switch may need to be pressed for additional cycles depending on vehicle speed, outside window temperature, atmospheric pressure and number of passengers.

Voltage is applied at all times to rear defogger timer/relay from DEFOG/SEATS circuit breaker (30-amp). When ignition is turned on, voltage is applied to rear defogger switch and rear defogger timer/relay from HVAC fuse No. 6 (20-amp).

COMPONENT LOCATIONS

COMPONENT LOCATIONS

Component	Location
Heating Ventilation Air Conditioning (HVAC) Controller	Center Of Instrument Panel
Instrument Panel (I/P) Fuse Block	On Left End Of Instrument Panel
Rear Defogger Switch	On HVAC Controller

ON-VEHICLE SERVICE

GRID FILAMENT REPAIR

1) To repair grid, turn system off and disconnect negative battery cable. Gently clean area to be repaired with fine steel wool.

Wipe area clean with denatured alcohol. Be sure to clean 1/4" (6 mm) beyond each side of break.

2) With glass at room temperature of 70-90øF (20-32øC), position masking tape along both sides of grid line at damaged area. See Fig. 1. Apply grid repair material to grid and carefully remove masking tape. Holding heat gun 1" (25 mm) from repair area, apply heat at a minimum of 300øF (149øC) for 1-2 minutes.

3) If repair appears discolored, apply a coating of tincture of iodine. Allow iodine to dry for 30 seconds and carefully wipe off excess using lint-free cloth. Allow repair area to air dry for at least 24 hours. Test defogger operation to verify repair.

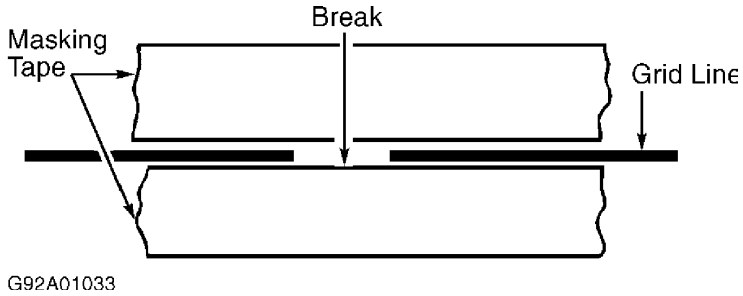

Fig. 1: Repairing Grid Line
Courtesy of General Motors Corp.

TROUBLE SHOOTING

DEFOGGER SYSTEM CHECK

1) Start engine. Press and release rear defogger switch once. Switch should return to resting position. System is on if rear window becomes warm and indicator light comes on. If some grid lines do not become warm, go to GRID FILAMENT TEST under COMPONENT TESTS. After about 10 minutes, system should automatically turn off.

2) Press rear defogger switch once and release. Switch should return to resting position. System should come on. After about 5 minutes, system should automatically turn off.

3) Press rear defogger switch once and release. Press switch a second time and release. Indicator and defogger grid should remain on until rear defogger switch is pressed second time. If defogger system does not operate as specified, diagnose by symptom. See appropriate test under SYSTEM TESTS.

SYSTEM TESTS

NOTE: Before testing, ensure fuses and circuit breakers are okay and ground connections are clean and tight. Leave electrical connectors attached and backprobe terminals unless specified otherwise. For identification of connectors and terminals, see WIRING DIAGRAMS.

REAR DEFOGGER ALWAYS ON

1) Attempt to turn rear defogger off. Turn ignition off. If rear defogger turns off, check for intermittent problem. see WIRING DIAGRAMS. If rear defogger remains on, go to next step.

2) Disconnect Heating Ventilation Air Conditioning (HVAC) controller Black 4-pin connector. See COMPONENT LOCATIONS. Remove HVAC controller as necessary for access to connector. See HEATING VENTILATION AIR CONDITIONING (HVAC) CONTROLLER under REMOVAL & INSTALLATION. Turn ignition on. If rear defogger is on, go to next step. If rear defogger is not on, go to step 4).

3) Repair short to battery voltage in Purple wire between rear defogger grid and HVAC controller Black 4-pin connector terminal "B". See Fig. 2. Retest system operation.

4) Replace HVAC controller. See HEATING VENTILATION AIR CONDITIONING (HVAC) CONTROLLER under REMOVAL & INSTALLATION. Retest system operation.

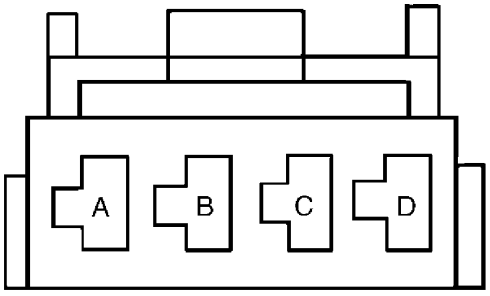

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Fig. 2: Identifying Heating Ventilation Air Conditioning (HVAC) Controller Black 4-Pin Connector Terminals
Courtesy of General Motors Corp.

REAR DEFOGGER INOPERATIVE

1) Turn ignition on. Turn rear defogger on. If rear defogger turns on, check for intermittent problem. see WIRING DIAGRAMS. If rear defogger does not turn on, go to next step.

2) If rear defogger grid and indicator light are both inoperative, go to next step. If rear defogger grid and indicator light are not both inoperative, go to step 4).

3) Turn ignition off. Connect test light (backprobe) between HVAC controller Black 4-pin connector terminals "A" (Orange wire) and "D" (Black wire). See Fig. 2. If test light illuminates, go to step 7). If test light does not illuminate, go to step 8).

4) If rear defogger grid operates but indicator light is inoperative, go to next step. If rear defogger grid is inoperative but indicator light operates, go to step 6).

5) Replace HVAC controller. See HEATING VENTILATION AIR CONDITIONING (HVAC) CONTROLLER under REMOVAL & INSTALLATION. Retest system operation.

6) Connect test light (backprobe) between ground and HVAC controller Black 4-pin connector terminal "B" (Orange wire). See Fig. 2. Turn rear defogger on. If test light illuminates, go to step

12). If test light does not illuminate, go to step 5).

7) Connect test light (backprobe) between HVAC controller Black 4-pin connector terminals "C" (Brown wire) and "D" (Black wire). Turn ignition on. If test light illuminates, go to step 17). If test light does not illuminate, go to step 11).

8) Connect test light (backprobe) between ground and HVAC controller Black 4-pin connector terminal "A" (Orange wire). If test light illuminates, go to next step. If test light does not illuminate, go to step 10).

9) Repair open or poor connection in Black wire between HVAC controller Black 4-pin connector terminal "D" and ground connection bolted to instrument panel mounting stud behind left kick panel. Retest system operation.

10) Repair open or poor connection in Orange wire between DEFOG/SEATS circuit breaker in instrument panel fuse block and HVAC controller Black 4-pin connector terminal "A". Retest system operation.

11) Repair open or poor connection in Brown wire between HVAC fuse No. 6 in instrument panel fuse block and HVAC controller Black 4-pin connector terminal "C". Retest system operation.

12) Connect test light (backprobe) between rear defogger grid connector control circuit (Purple wire) and rear defogger grid connector ground circuit (Black wire). If test light illuminates, go to next step. If test light does not illuminate, go to step 14).

13) Repair or replace rear defogger grid as necessary. See GRID FILAMENT TEST under COMPONENT TESTS.

14) Connect test light (backprobe) between rear defogger grid connector control circuit (Purple wire) and battery voltage. If test light illuminates, go to next step. If test light does not illuminate, go to step 16).

15) Repair open or poor connection in Purple wire between HVAC controller Black 4-pin connector terminal "B" and rear defogger grid. Retest system operation.

16) Repair open or poor connection in Black wire between rear defogger grid and ground connection bolted to roof, left of dome light. Retest system operation.

17) Check for short to ground in Purple wire between HVAC controller Black 4-pin connector terminal "B" and rear defogger grid. Repair as necessary and retest system operation. If Purple wire is okay, go to step 5).

COMPONENT TESTS

GRID FILAMENT TEST

1) Start engine. Turn defogger on (press and release rear defogger switch button once). Using grounded test light, lightly touch each grid line. If test light shows full brilliance at both ends of all grid lines, check for loose ground wire. Test light brilliance should gradually change as test light probe is moved from left to right side of grid.

2) Contact each grid line a few inches on either side of

glass center line to eliminate possibility of missing a break in grid line. If a problem on a grid line is detected, place test light probe on grid line at feed bus bar and move probe toward ground bus bar until light goes out, indicating a break in grid line continuity. See Fig. 3. If break exists in grid line, go to GRID FILAMENT REPAIR under ON-VEHICLE SERVICE.

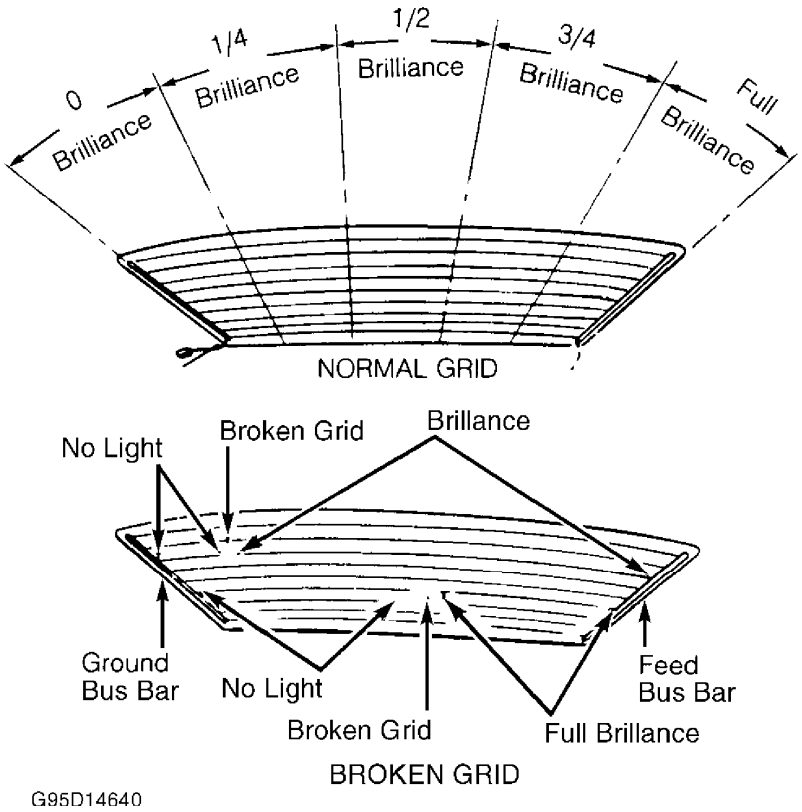

Fig. 3: Examining Grid Brilliance Test Patterns
Courtesy of General Motors Corp.

REMOVAL & INSTALLATION

HEATING VENTILATION AIR CONDITIONING (HVAC) CONTROLLER

NOTE: Rear defogger timer/relay and rear defogger switch are integral with HVAC controller, located in center of instrument panel.

Removal & Installation (Camaro)

1) Disconnect negative battery cable. Disable air bag. See appropriate AIR BAG RESTRAINT SYSTEMS article. Remove push-in retainers from left instrument panel hush panel. Unhook retaining tab on hush panel. Set hush panel aside.

2) Remove instrument panel knee bolster retaining screws. Pull instrument panel knee bolster away from instrument panel. Disconnect rear compartment lid release switch electrical connector.

Set instrument panel knee bolster aside.

3) Remove instrument panel knee bolster deflector retaining nuts. Remove instrument panel knee bolster deflector. Remove upper steering column retaining nuts. Lower steering column. Remove instrument panel cluster bezel retaining screws. Remove instrument panel cluster bezel.

4) Remove HVAC controller retaining screws. Pull HVAC controller straight out from instrument panel. Disconnect vacuum and electrical connections from HVAC controller. Disconnect temperature control cable from HVAC controller. Remove HVAC controller.

5) To install, reverse removal procedure. Tighten upper steering column retaining nuts to 18 ft. lbs. (25 N.m). Tighten instrument panel knee bolster deflector retaining nuts to 89 INCH lbs. (10 N.m).

Removal & Installation (Firebird)

1) Gently pull straight out on instrument panel cluster bezel to release fasteners. Disconnect foglight switch electrical connector. Set instrument panel cluster bezel aside. Remove HVAC controller retaining screws.

2) Pull HVAC controller straight out from instrument panel. Disconnect vacuum and electrical connections from HVAC controller. Disconnect temperature control cable from HVAC controller. Remove HVAC controller. To install, reverse removal procedure.

WIRING DIAGRAMS

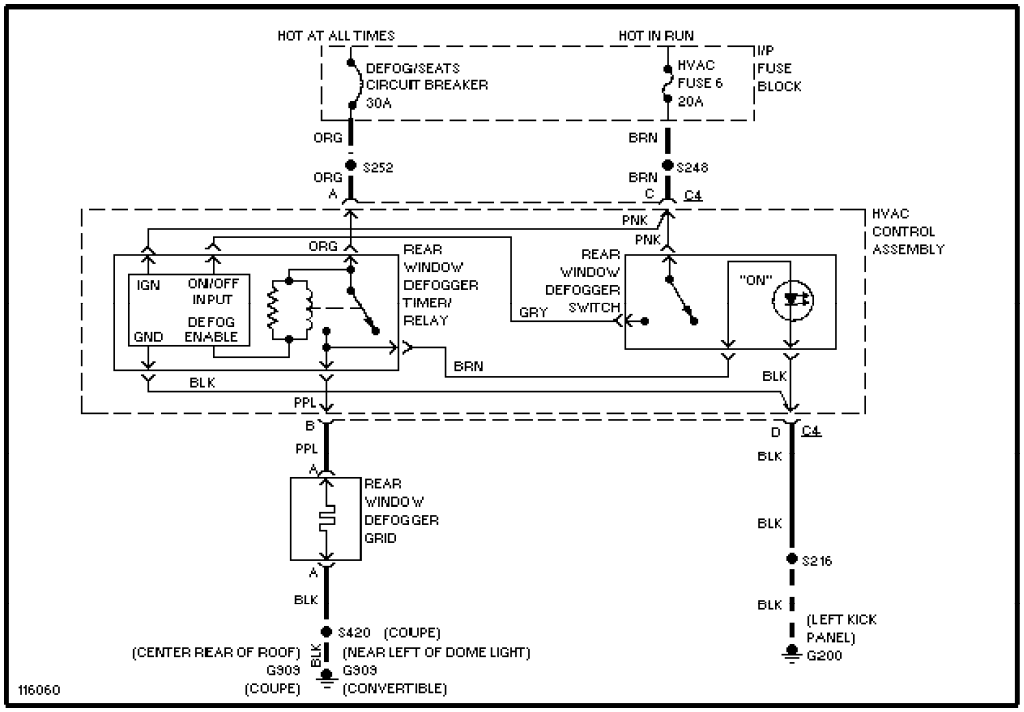

Fig. 4: Defogger System Wiring Diagram (Camaro & Firebird)

ABC123	Entire Article 2000 Chevrolet Camaro

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