

DEFOGGER - MIRROR & REAR WINDOW

1998 Pontiac Bonneville

1998 ACCESSORIES & EQUIPMENT
General Motors Corp. - Rear Window & Mirror Defogger
Pontiac; Bonneville

DESCRIPTION & OPERATION

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

Rear defogger switch signals Heating Ventilation Air Conditioning (HVAC) programmer or A/C-heater control assembly to provide a ground path for rear defogger relay coil. When rear defogger is energized, voltage is supplied to rear defogger grid and mirror defoggers (if equipped).

When rear defogger switch is pressed, solid state timer allows rear defogger grid and heated mirrors to operate for about 10 minutes. After initial activation, any time rear defogger switch is activated again, defogger system will operate for about 5 minutes. Timer will turn off if rear defogger switch is pressed during any 10- or 5-minute activation cycle.

ADJUSTMENTS

TEMPERATURE VALVE LINK

Except Dual Temperature Control

Pull valve link from retainer on programmer output crank. Start engine. Set temperature to 90°F (32°C). Wait 45 seconds for programmer motor to move output crank to its full hot position. Then move temperature valve to full hot position, and snap valve link into retainer on output crank.

Dual Temperature Control (Driver Temperature Valve Link)

Start engine. Set temperature to 90°F (32°C). Set passenger temperature control to full warm. If outside temperature is above 90°F (32°C), disconnect inside temperature sensor. Wait 45 seconds for air mix valve actuators to move to warm position. Gently pull driver temperature valve link toward programmer until valve hits stop. Push threaded portion of link into slot of driver temperature valve crank.

Dual Temperature Control (Passenger Temperature Valve Link)

Pull valve link from retainer on programmer output crank. Start engine. Set temperature to 90°F (32°C). Wait 45 seconds for programmer motor to move output crank to its full hot position. Move temperature valve to full hot position, and snap valve link into retainer on temperature valve.

TESTING

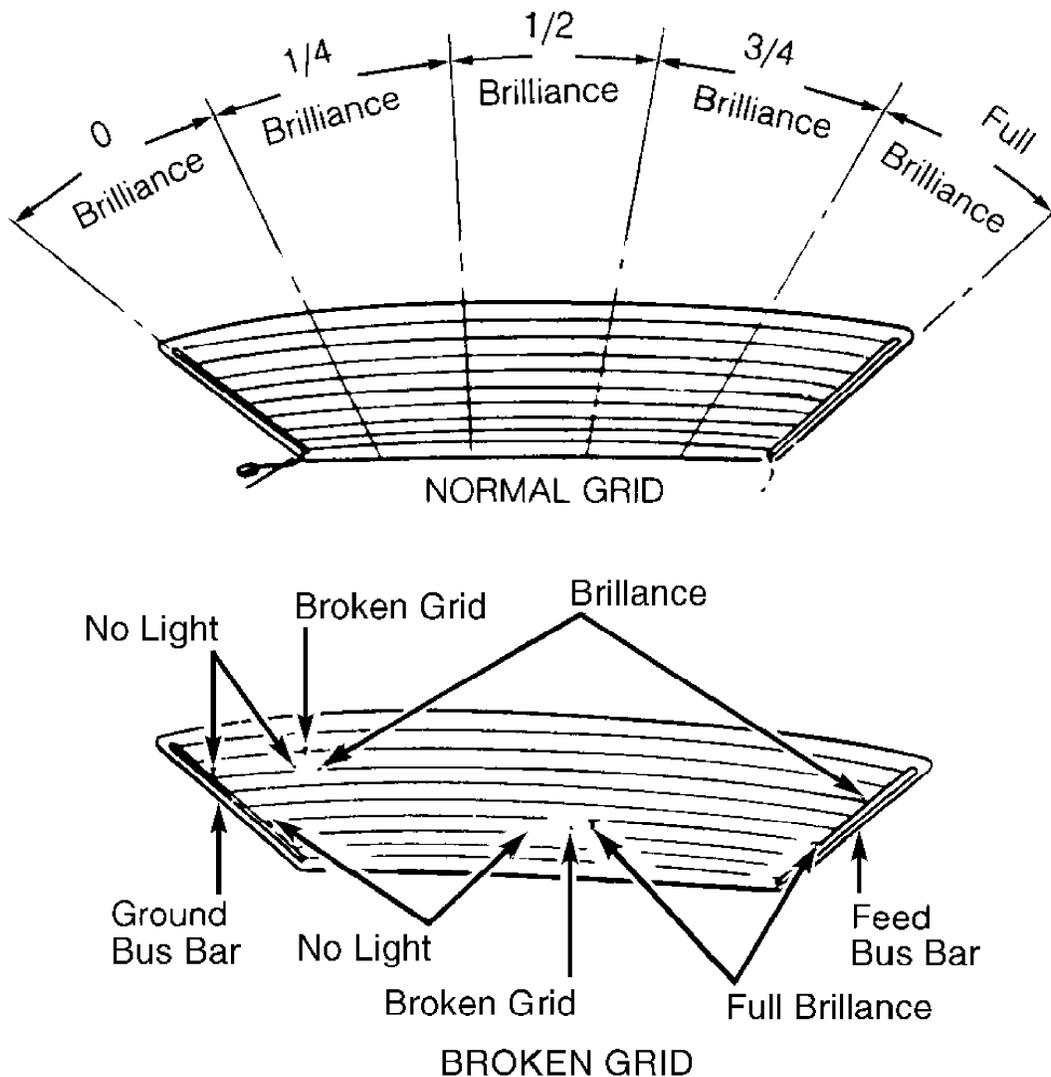
*** PLEASE READ THIS FIRST ***

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 references to connectors and terminals, see appropriate wiring diagram. See WIRING DIAGRAMS.

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. 1. If break exists in grid line, go to GRID FILAMENT REPAIR under ON-VEHICLE SERVICE.



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Fig. 1: Examining Grid Brilliance Test Patterns (Typical)
Courtesy of General Motors Corp.

DEFOGGER SYSTEM TESTS

System Check

1) Start engine. Turn defogger on (press and release rear defogger switch once). Switch should return to resting position. System should come on. System is on if rear window becomes warm, mirrors become warm (vehicles with mirror defoggers) and indicator light comes on. If some grid lines do not become warm, go to GRID FILAMENT TEST.

2) After about 10 minutes, system should automatically turn off. Turn defogger on again. System should come on. After about 5 minutes, system should automatically turn off. Turn defogger on again. System should come on and remain on until switch is pressed again.

Rear Defogger & Heated Mirror(s) On At All Times

1) Remove rear defogger relay from position "G" in right instrument panel power distribution center. Turn ignition on. Connect test light between rear defogger relay socket terminals No. 86 (Brown wire) and No. 85 (White wire). See WIRING DIAGRAMS. If test light illuminates, go to next step. If test light does not illuminate, go to step 4).

2) Connect test light between rear defogger relay socket terminal No. 87 (Purple wire) and ground. If test light illuminates, go to next step. If test light does not illuminate, go to step 6).

3) Check for proper contact at relay terminals. If contacts are okay, replace rear defogger relay. Recheck system operation.

4) Disconnect Heating Ventilation Air Conditioning (HVAC) programmer (behind right side of instrument panel) or A/C-heater control assembly (in center of instrument panel). Connect test light between rear defogger relay socket terminals No. 86 (Brown wire) and No. 85 (White wire). If test light illuminates, go to next step. If test light does not illuminate, go to step 7).

5) Check for proper contact at HVAC programmer or A/C-heater control assembly terminals. If contacts are okay, replace HVAC programmer or A/C-heater control assembly. See REMOVAL & INSTALLATION. Recheck system operation.

6) Repair short to voltage in circuit No. 293 (Purple wire). See WIRING DIAGRAMS. Recheck system operation.

7) Repair short to voltage in circuit No. 193 (White wire) between rear defogger relay and HVAC programmer or A/C-heater control assembly. Recheck system operation.

Rear Defogger Okay, Heated Mirror(s) Inoperative

1) Disconnect left or right heated mirror connector. Turn ignition on. Press rear defogger switch on. Connect test light between ground and heated mirror harness connector terminal "E" (Brown wire). If test light illuminates, go to next step. If test light does not illuminate, go to step 4).

2) Connect test light between heated mirror harness connector terminals "E" (Brown wire) and "B" (Black wire). If test light illuminates, go to next step. If test light does not illuminate, go to step 5).

3) Check for proper contacts at heated mirror connector. If contacts are okay, replace heated mirror. See MIRRORS - POWER article. Recheck system operation.

4) Check for open in circuit No. 293 (Purple wire) between rear defogger relay and instrument panel fuse block. Check for open in circuit No. 541 (Brown wire) between instrument panel fuse block and heated mirror. Repair as necessary. Recheck system operation.

5) Repair open in Black wire between heated mirror and ground. Recheck system operation.

Rear Defogger Inoperative (Except Vehicles W/Automatic A/C)

1) Remove rear defogger relay from position "G" in right instrument panel power distribution center. Turn ignition on. Connect

test light between rear defogger relay socket terminals No. 86 (Brown wire) and ground. If test light illuminates, go to next step. If test light does not illuminate, go to step 9).

2) Connect test light between rear defogger relay socket terminal No. 30 (Orange wire) and ground. If test light illuminates, go to next step. If test light does not illuminate, go to step 10).

3) Connect test light between rear defogger relay socket terminals No. 30 (Orange wire) and No. 87 (Purple wire). If test light illuminates, go to step 11). If test light does not illuminate, go to next step.

4) Disconnect rear defogger positive and negative feed bus connectors. Connect a jumper wire between rear defogger relay socket terminals No. 86 (Brown wire) and No. 85 (White wire). Connect test light between positive feed bus connector and ground. If test light illuminates, go to next step. If test light does not illuminate, go to step 7).

5) Connect test light between positive feed bus connector terminal "A" (Purple wire) and negative feed bus connector terminal "A" (Black wire). If test light illuminates, go to step 8). If test light does not illuminate, go to next step.

6) Check for open in circuit No. 1250 (Black wire) between rear defogger grid and connector C340. Check for proper contact at connector C340. Connector C340 is a 10-pin connector located in left front of passenger compartment, below door sill. Repair as necessary. Recheck system operation.

7) Repair open in circuit No. 293 (Purple wire). See WIRING DIAGRAMS. Recheck system operation.

8) Check for proper contact at rear defogger connectors. Repair as necessary. Recheck system operation.

9) Repair open in circuit No. 1141 (Brown wire) between rear defogger relay and instrument panel fuse block. Recheck system operation.

10) Repair open in circuit No. 1140 (Orange wire) between rear defogger relay and instrument panel fuse block. Recheck system operation.

11) Connect test light between rear defogger relay socket terminals No. 85 (White wire) and No. 86 (Brown wire). If test light illuminates, go to next step. If test light does not illuminate, go to step 14).

12) Disconnect Heating Ventilation Air Conditioning (HVAC) programmer (behind right side of instrument panel) or A/C-heater control assembly (in center of instrument panel). Connect test light between ground and White wire terminal of HVAC programmer or A/C-heater control assembly harness connector. If test light illuminates, go to next step. If test light does not illuminate, go to step 15).

13) Check for poor terminal contacts at HVAC programmer or A/C-heater control assembly. If contacts are okay, replace HVAC programmer or A/C-heater control assembly. See REMOVAL & INSTALLATION. Recheck system operation.

14) Check for proper contact at rear defogger relay terminals. If contacts are okay, replace rear defogger relay. Recheck system operation.

15) Repair open in circuit No. 193 (White wire) between rear defogger relay and HVAC programmer or A/C-heater control assembly. Recheck system operation.

Rear Defogger Inoperative (Vehicles W/Automatic Control Only)

1) Disconnect A/C-heater control assembly connectors C1 and C2. Connect test light between harness connector C2 terminal "H" (Brown wire) and ground. If test light illuminates, go to next step. If test light does not illuminate, go to step 8).

2) Connect test light between harness connector C1 terminal "C" (Orange wire) and ground. If test light illuminates, go to next

step. If test light does not illuminate, go to step 9).

3) Connect test light between harness connector C2 terminals "H" (Brown wire) and "F" (Black wire). If test light illuminates, go to next step. If test light does not illuminate, go to step 10).

4) Connect test light between connector C1 terminals "C" (Orange wire) and "D" (Purple wire). If test light illuminates, go to step 11). If test light does not illuminate, go to next step.

5) Disconnect rear defogger positive and negative feed bus connectors. Connect a jumper wire between connector C1 terminals "C" (Orange wire) and "D" (Purple wire). Connect test light between positive feed bus connector "A" (Purple wire) and ground. If test light illuminates, go to step 12). If test light does not light, go to next step.

6) Connect test light between positive feed bus connector terminal "A" (Purple wire) and negative feed bus connector terminal "A" (Black wire). If test light illuminates, go to step 13). If test light does not illuminate, go to next step.

7) Check for open in circuit No. 1250 (Black wire) between rear defogger grid and connector C340. Check for proper contact at connector C340. Connector C340 is a 10-pin connector located in left front of passenger compartment, below door sill. Repair as necessary. Recheck system operation.

8) Repair poor connection or open in circuit No. 41 (Brown wire) between A/C-heater control assembly and instrument panel fuse block. Recheck system operation.

9) Repair open in circuit No. 1140 (Orange wire) between A/C-heater control assembly and instrument panel fuse block. Recheck system operation.

10) Repair open in circuit No. 1250 (Black wire) between A/C-heater control assembly and ground. Recheck system operation.

11) Check for poor terminal contacts at A/C-heater control assembly. If contacts are okay, replace A/C-heater control assembly. See REMOVAL & INSTALLATION. Recheck system operation.

12) Repair open in circuit No. 293 (Purple wire). See WIRING DIAGRAMS. Recheck system operation.

13) Check for proper contact at rear defogger terminals. Repair as necessary. Recheck system operation.

Rear Defogger Grid Partially Inoperative

1) Turn ignition on. Press rear defogger switch on. Wait 5 minutes and feel rear window for warmth. If rear window is warm, go to next step. If window is not warm, go to step 3).

2) Connect test light to ground. Lightly touch test light lead to middle of each grid line. If test light glows dimly, go to next step. If test light does not glow dimly, go to step 4).

3) Check for open rear defogger connectors. Repair connectors as necessary and retest system. If system tests okay, no further testing is required.

4) Lightly move test light along open grid line from power bus (right side) to ground bus (left side). Open point in grid line is located when light goes out. Repair grid lines as necessary and retest system. See GRID FILAMENT REPAIR under ON-VEHICLE SERVICE. Recheck system operation.

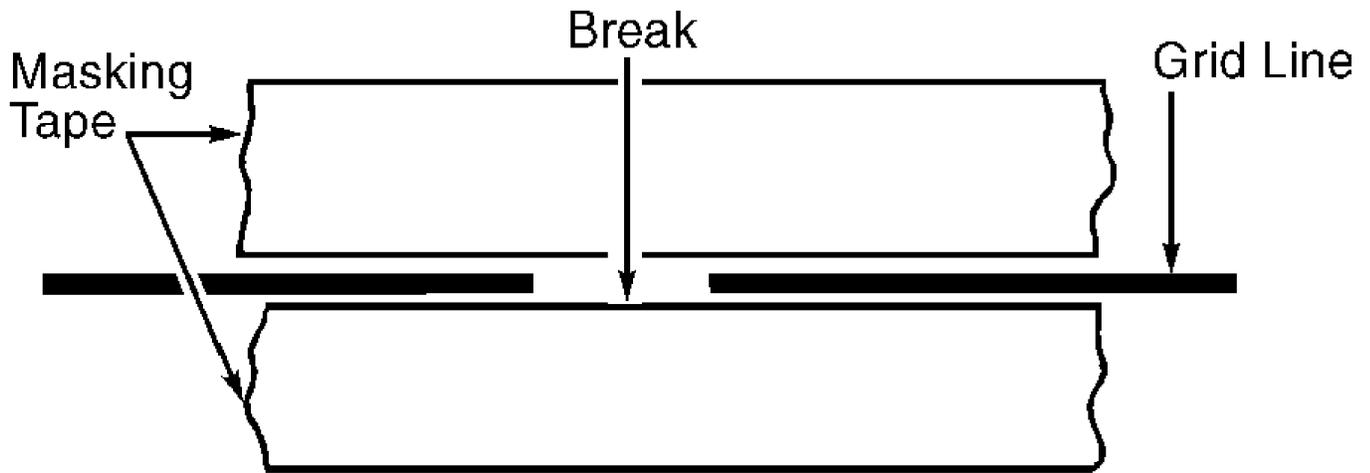
ON-VEHICLE SERVICE

GRID FILAMENT REPAIR

1) To repair grid, turn system off and disconnect negative battery cable. Gently clean area to be repaired with 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 70-90°F (20-32°C), position masking tape along both sides of grid line at damaged area. See Fig. 2. Apply grid repair material to grid and carefully remove masking tape. Holding heat gun 1-2" (25-50 mm) from repair area, apply heat at 500-700°F (260-370°C) for 2-3 minutes. If heat gun is not available, allow repair area to air dry for at least 24 hours.

3) Test defogger operation to verify repair. If repair appears discolored, apply a coating of tincture of iodine. Allow iodine to dry for 30 seconds and carefully wipe off excess.



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Fig. 2: Repairing Grid Line
Courtesy of General Motors Corp.

REMOVAL & INSTALLATION

* PLEASE READ THIS FIRST *

WARNING: Before servicing instrument panel components on vehicles with Supplemental Inflatable Restraint (SIR) system, disable SIR system. See **DISABLING & ACTIVATING AIR BAG SYSTEM** in **AIR BAG RESTRAINT SYSTEMS** article.

NOTE: For mirror removal and installation procedures, see **MIRRORS - POWER** article.

A/C-HEATER CONTROL ASSEMBLY

Removal & Installation

Disable Supplemental Inflatable Restraint (SIR) system. See **AIR BAG RESTRAINT SYSTEMS** article. Disconnect negative battery cable. Remove control panel trim plate. Remove A/C-heater control assembly screws. Pull out control assembly. Disconnect electrical connectors. Disconnect vacuum connectors, if necessary. To install, reverse removal procedure.

HVAC PROGRAMMER

Removal

1) Disable Supplemental Inflatable Restraint (SIR) system. See **AIR BAG RESTRAINT SYSTEMS** article. Disconnect negative battery cable. Disconnect Powertrain Control Module (PCM) from mounting bracket, and allow it to hang. Disconnect Heating Ventilation Air

Conditioning (HVAC) programmer vacuum and electrical connectors.

2) Reaching up through PCM bracket, disengage temperature valve link rod. Remove HVAC programmer screws. Disconnect temperature valve actuator connector. Remove HVAC programmer.

Installation

To install, reverse removal procedure. Tighten screws to 12 INCH lbs. (1.4 N.m). Connect electrical and vacuum connectors. Connect and adjust temperature valve link rod. See ADJUSTMENTS. To complete installation, reverse removal procedure.

WIRING DIAGRAMS

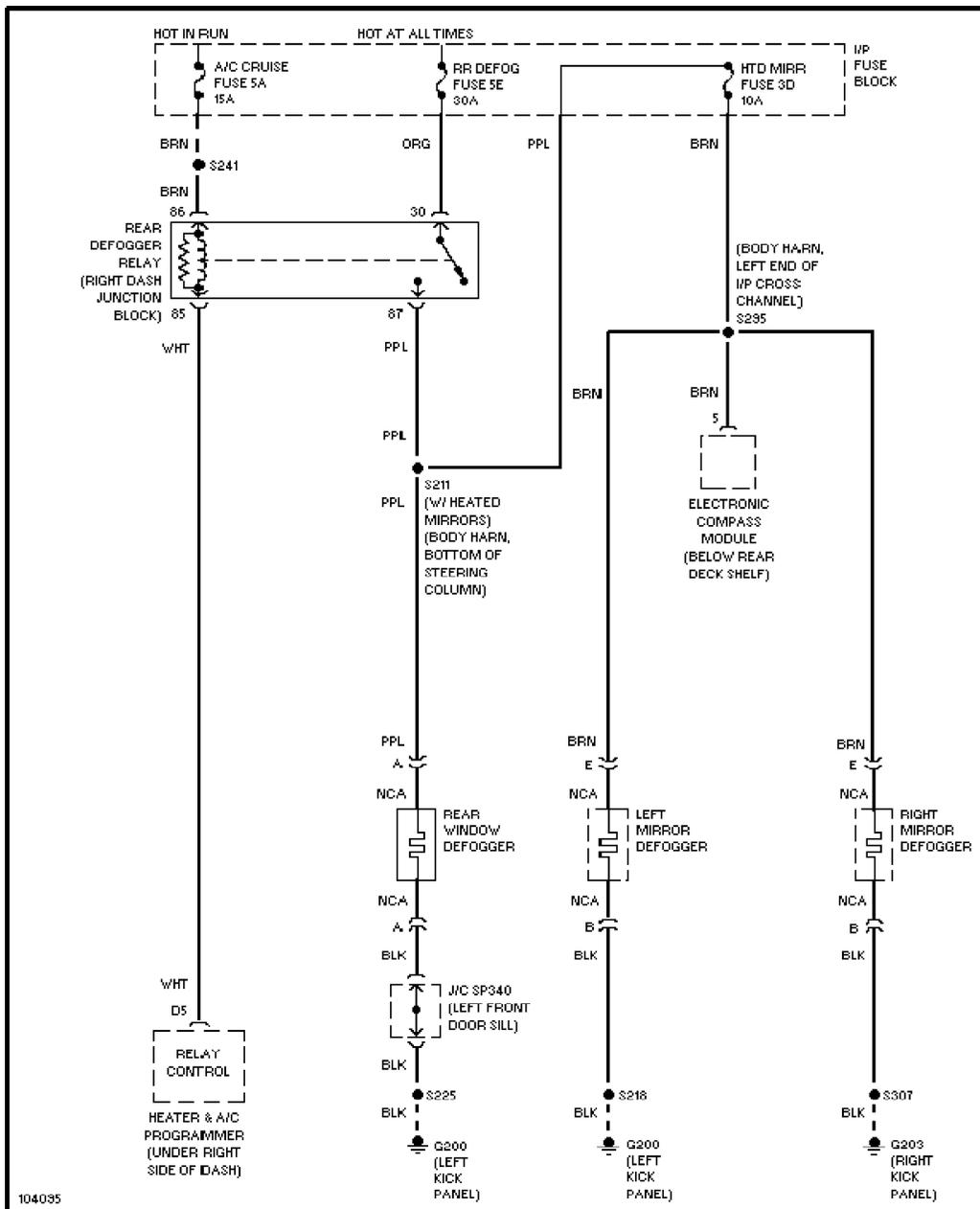


Fig. 3: Defogger System Wiring Diagram (Vehicles W/Automatic A/C)

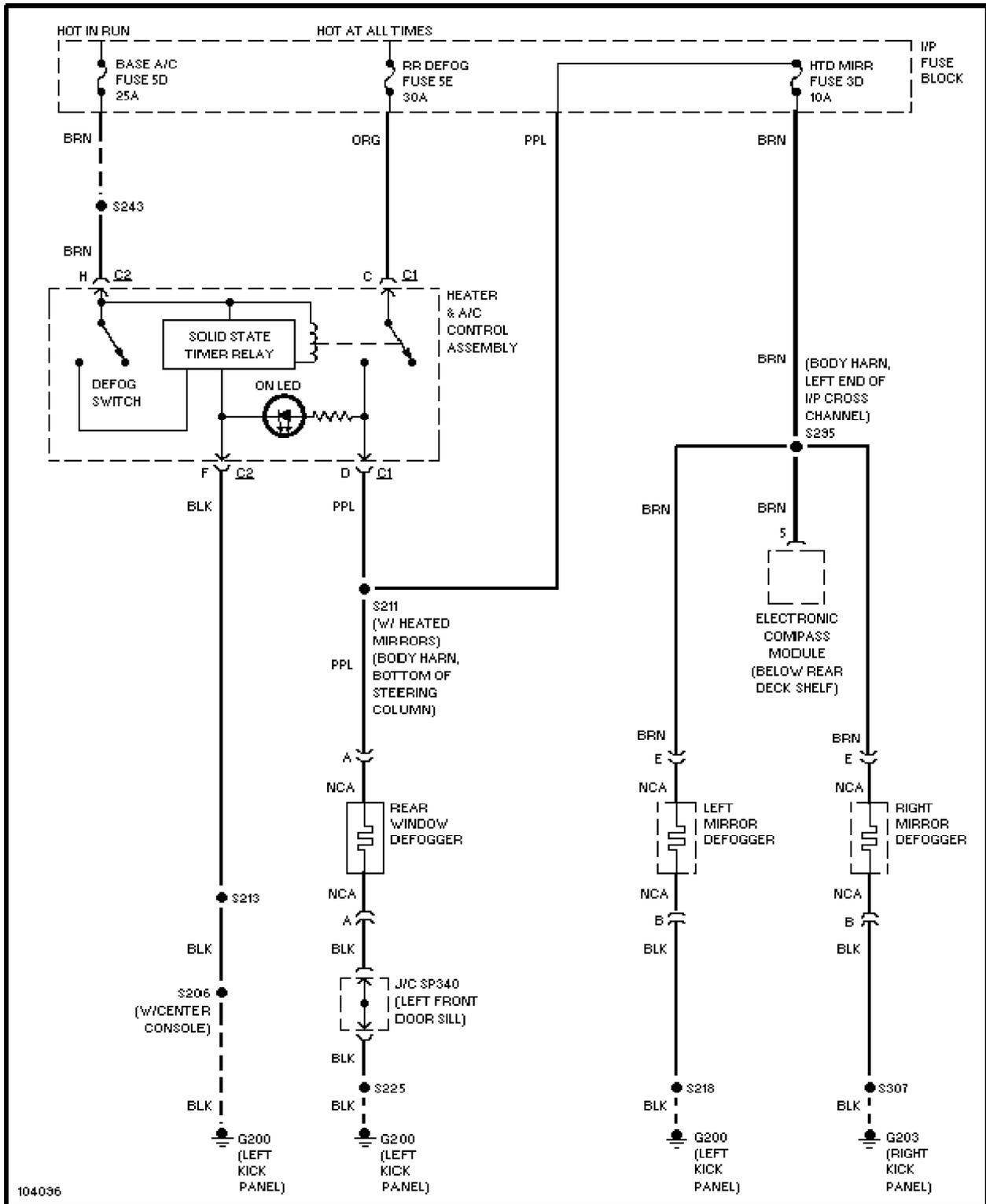


Fig. 4: Defogger System Wiring Diagram (Vehicles W/Manual A/C)