2001 ACCESSORIES & EQUIPMENT Rear Window & Mirror Defoggers - Corvette

## 2001 ACCESSORIES & EQUIPMENT

Rear Window & Mirror Defoggers - Corvette

# **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 and heated mirrors, located at bottom right corner of Heating Ventilation Air Conditioning (HVAC) controller. A solid state timer is used to control rear defogger cycle periods. When rear defogger switch is turned to ON position, HVAC controller sends a rear defogger on request to Body Control Module (BCM). BCM energizes relay coil by grounding rear defogger relay control circuit (White wire). When rear defogger relay is energized, battery voltage is supplied from RR DEFOG fuse (40-amp) through relay switch to rear defogger grid. Rear defogger switch and rear defogger timer are integral components of HVAC controller.

Left and right door modules supply heated mirrors with power and ground. When door modules receive message on serial data line indicating rear defogger is on, both door modules will activate corresponding mirror heat by applying voltage.

# **COMPONENT LOCATIONS**

# **COMPONENT LOCATIONS**

Component	Location
Body Control Module (BCM)	In Right Footwell, Mounted To Toe-Board, Behind
	Carpet
Data Link Connector (DLC)	Under Left Side Of Instrument Panel, Near Steering
	Column
Door Module	In Bottom Center Of Corresponding Door, Rear Of
	Speaker
Instrument Panel Fuse Black	In Right Footwell, Mounted To Toe-Board, Behind
	Carpet
Rear Defogger Relay	In Instrument Panel Fuse Block

# **ON-VEHICLE SERVICE**

GRID FILAMENT REPAIR

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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.

# NOTE: At least 24 hours are required for complete curing of repair. DO NOT disturb repair area during this time.

- 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. 1**. Using manufacturer's instructions, apply grid repair material to grid using fine-tip brush or small, plastic paddle. Carefully remove masking tape. Holding heat gun 1" (25 mm) from repair area, apply heat at a minimum of 200°F (93°F) for 2-3 minutes.
- 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 using lint-free cloth.

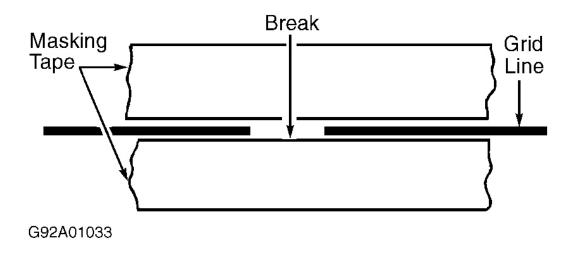


Fig. 1: Repairing Grid Line Courtesy of GENERAL MOTORS CORP.

# TROUBLE SHOOTING

Check system related fuses and replace as necessary. Visually inspect for broken or open wires. Check for a broken or partially broken wire inside insulation which could cause system malfunction but prove good in a continuity/voltage check with system disconnected. See

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<u>WIRING DIAGRAMS</u> . Repair as necessary. If no problem is found, perform <u>DEFOGGER</u> <u>DIAGNOSTIC SYSTEM CHECK</u> under SELF-DIAGNOSTIC SYSTEM.

# **SELF-DIAGNOSTIC SYSTEM**

## DEFOGGER DIAGNOSTIC SYSTEM CHECK

- Connect scan tool to Data Link Connector (DLC). See <u>COMPONENT LOCATIONS</u>. If scan tool powers up, go to next step. If scan tool does not power up, go to TEST A: SCAN TOOL DOES NOT POWER UP under SYSTEM TESTS in BODY CONTROL MODULES CORVETTE article.
- 2. Turn ignition on. Using scan tool, attempt to establish communication with Body Control Module (BCM) and Powertrain Control Module (PCM). If scan tool communicates with BCM and PCM, go to next step. If scan tool does not communicate with BCM and PCM, go to TEST B: SCAN TOOL DOES NOT COMMUNICATE WITH CLASS 2 DEVICE under SYSTEM TESTS in BODY CONTROL MODULES CORVETTE article.
- 3. Select display DTCs function for BCM and PCM. If scan tool displays any DTCs, go to next step. If scan tool does not display any DTCs, diagnose by symptom. See **SYSTEM TESTS**.
- 4. If scan tool displays any DTCs that begin with "U", go to TEST B: SCAN TOOL DOES NOT COMMUNICATE WITH CLASS 2 DEVICE under SYSTEM TESTS in BODY CONTROL MODULES CORVETTE article. If scan tool does not display any DTCs that begin with "U", go to next step.
- 5. If scan tool displays DTC B0605 or B1000, go to DIAGNOSTIC TESTS in BODY CONTROL MODULES CORVETTE article. If scan tool does not display DTC B0605 or B1000, go to next step.
- 6. If scan tool displays DTCs P0562, P0563, P1637, or P1638, perform appropriate test. See appropriate GENERATORS & REGULATORS article in STARTING & CHARGING SYSTEMS. If scan tool does not display DTCs P0562, P0563, P1637, or P1638, diagnose other DTCs. See **DIAGNOSTIC TROUBLE CODE DEFINITIONS**.

#### USING ON-BOARD DIAGNOSTICS

# **Retrieving & Clearing Diagnostic Trouble Codes**

Driver's Information Center (DIC) may be used to read and clear DTCs. To retrieve and clear DTCs using DIC, see USING ON-BOARD DIAGNOSTICS under SELF-DIAGNOSTIC SYSTEM in ANALOG INSTRUMENT PANELS - CORVETTE article.

#### DIAGNOSTIC TROUBLE CODE DEFINITIONS

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# DIAGNOSTIC TROUBLE CODE DEFINITIONS

DTC	Definition
<u>B0432</u>	Defogger Relay Control Circuit Voltage Low
<u>B0433</u>	Defogger Relay Control Circuit Voltage High

# **DIAGNOSTIC TESTS**

## DTC B0432: DEFOGGER RELAY CONTROL CIRCUIT VOLTAGE LOW

# **Description**

Body Control Module (BCM) monitors voltage level on control circuit of RR DEFOG relay. Voltage level should be near system voltage while RR DEFOG relay is de-energized. Voltage will be pulled low when BCM energizes RR DEFOG relay. BCM test control circuit of RR DEFOG relay while relay is de-energized.

#### **Code Enable Criteria**

For DTC to run, ignition must be on. DTC will set when BCM detects low voltage level on control circuit of RR DEFOG relay for 2 seconds. When DTC is set, rear window defogger will be disabled.

# **Diagnostic Procedures**

- If defogger diagnostic system check has been performed, go to next step. If defogger diagnostic system check has not been performed, go to <u>DEFOGGER DIAGNOSTIC</u> <u>SYSTEM CHECK</u> under SELF-DIAGNOSTIC SYSTEM. After performing defogger diagnostic system check, go to next step.
- 2. Turn ignition on. Using scan tool, select BCM output controls and REAR DEFOGER under miscellaneous test. Command RR DEFOG relay on and off. If a click is heard when relay is commanded on and off, problem may be intermittent. See INTERMITTENTS in BODY CONTROL MODULES CORVETTE article. If a click is not heard when relay is commanded on and off, go to next step.
- 3. Turn ignition off. Remove RR DEFOG relay No. 44 from instrument panel fuse block. Turn ignition on. Connect test light between RR DEFOG relay coil ignition 3 voltage terminal and ground. If test light illuminates, go to next step. If test light does not illuminate, go to step 10.
- 4. Connect test light between RR DEFOG relay control circuit and ignition 3 voltage terminal. Using scan tool, command RR DEFOG relay on and off. If test light turns on and off with each command, go to step 8. If test light does not turn on and off with each command, go to

- next step.
- 5. If test light remains illuminated with each command, go to step 7. If test light does not remain illuminated with each command, go to next step.
- 6. Check for open or high resistance in White wire between RR DEFOG relay and BCM connector C2 terminal C3. See <u>Fig. 2</u>. Repair as necessary. After repairs, go to step 13. If circuit is okay, go to step 9.
- 7. Check for short to ground in White wire between RR DEFOG relay and BCM connector C2 terminal C3. See <u>Fig. 2</u>. Repair as necessary. After repairs, go to step 13. If circuit is okay, go to step 9.
- 8. Check for poor connections at RR DEFOG relay. Repair as necessary. After repairs, go to step 13. If connections are okay, go to step 11.
- 9. Check for poor connections at BCM. Repair as necessary. After repairs, go to step 13. If connections are okay, go to step 12.
- 10. Repair open or high resistance in ignition 3 voltage circuit between RR DEFOG relay and HVAC fuse No. 18 (10-amp). After repairs, go to step 13.
- 11. Replace RR DEFOG relay. After repairs, go to step 13.
- 12. Replace BCM. See BODY CONTROL MODULE under REMOVAL & INSTALLATION in BODY CONTROL MODULES CORVETTE article. After repairs, go to next step.
- 13. Use scan tool to clear DTCs. Operate vehicle within conditions for setting DTC. See **CODE ENABLE CRITERIA**. If DTC resets, go to step 2. If DTC does not reset, system is okay at this time.

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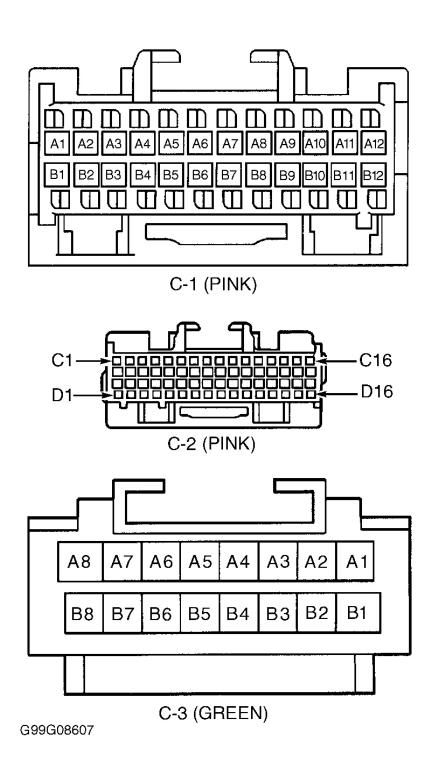


Fig. 2: Identifying Body Control Module Connectors & Terminals Courtesy of GENERAL MOTORS CORP.

DTC B0433: DEFOGGER RELAY CONTROL CIRCUIT VOLTAGE HIGH

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# **Description**

Body Control Module (BCM) monitors voltage level on control circuit of RR DEFOG relay. Voltage level should be near system voltage while RR DEFOG relay is de-energized. Voltage will be pulled low when BCM energizes RR DEFOG relay. BCM test control circuit of RR DEFOG relay while relay is de-energized.

#### Code Enable Criteria

For DTC to run, engine must be running. DTC will set when BCM detects high voltage level on control circuit of RR DEFOG relay for 2 seconds. When DTC is set, rear window defogger will be disabled.

## **Diagnostic Procedures**

- If defogger diagnostic system check has been performed, go to next step. If defogger diagnostic system check has not been performed, go to <u>DEFOGGER DIAGNOSTIC</u>
   <u>SYSTEM CHECK</u> under SELF-DIAGNOSTIC SYSTEM. After performing defogger diagnostic system check, go to next step.
- 2. Turn ignition on. Using scan tool, select BCM output controls and REAR DEFOGER under miscellaneous test. Command RR DEFOG relay on and off. RR DEFOG relay is located instrument panel fuse block. If a click is heard when relay is commanded on and off, problem may be intermittent. See INTERMITTENTS in BODY CONTROL MODULES CORVETTE article. If a click is not heard when relay is commanded on and off, go to next step.
- 3. Turn ignition off. Remove RR DEFOG relay No. 44 from instrument panel fuse block. Turn ignition on. Connect test light between RR DEFOG relay coil ignition 3 voltage terminal and ground. If test light illuminates, go to next step. If test light does not illuminate, go to step 10.
- 4. Connect test light between RR DEFOG relay control circuit and ignition 3 voltage circuit. Using scan tool, command RR DEFOG relay on and off. If test light turns on and off with each command, go to step 8. If test light does not turn on and off with each command, go to next step.
- 5. If test light remains illuminated with each command, go to step 7. If test light does not remain illuminated with each command, go to next step.
- 6. Check for short to voltage in White wire between RR DEFOG relay and BCM connector C2 terminal C3. See <u>Fig. 2</u>. Repair as necessary. After repairs, go to step 13. If circuit is okay, go to step 9.
- 7. Check for short to ground in White wire between RR DEFOG relay and BCM connector C2 terminal C3. See <u>Fig. 2</u>. Repair as necessary. After repairs, go to step 13. If circuit is

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- okay, go to step 9.
- 8. Check for poor connections at RR DEFOG relay. Repair as necessary. After repairs, go to step 13. If connections are okay, go to step 11.
- 9. Check for poor connections at BCM. Repair as necessary. After repairs, go to step 13. If connections are okay, go to step 12.
- 10. Repair open or high resistance in ignition 3 voltage circuit between RR DEFOG relay and HVAC fuse No. 18 (10-amp). After repairs, go to step 13.
- 11. Replace RR DEFOG relay. After repairs, go to step 13.
- 12. Replace BCM. See BODY CONTROL MODULE under REMOVAL & INSTALLATION in BODY CONTROL MODULES CORVETTE article. After repairs, go to next step.
- 13. Use scan tool to clear DTCs. Operate vehicle within conditions for setting DTC. See **CODE ENABLE CRITERIA**. If DTC resets, go to step 2. If DTC does not reset, system is okay at this time.

# **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 references to connectors and terminals, see appropriate wiring diagram. See <u>WIRING DIAGRAMS</u>.

# SYMPTOM TESTS

Symptom	Perform Test
Rear Defogger Inoperative (Automatic A/C)	<u>A</u>
Rear Defogger Inoperative (Manual A/C)	<u>B</u>
Defogger Indicator Always On	<u>C</u>
Heated Mirrors Inoperative	<u>D</u>

# TEST A: REAR DEFOGGER INOPERATIVE (MANUAL A/C)

- If defogger diagnostic system check has been performed, go to next step. If defogger diagnostic system check has not been performed, go to <u>DEFOGGER DIAGNOSTIC</u> <u>SYSTEM CHECK</u> under SELF-DIAGNOSTIC SYSTEM. After performing defogger diagnostic system check, go to next step.
- 2. Start engine and allow to idle. Depress rear defogger switch. If rear window defogger illuminates, go to next step. If rear window defogger does not illuminate, go to step 10.

- 3. Connect test light between ground and rear window defogger grid. If test light illuminates, go to next step. If test light does not illuminate, go to step 5.
- 4. Connect test light between left and right sides of rear window defogger grid. If test light illuminates, problem may be intermittent. See INTERMITTENTS in BODY CONTROL MODULES CORVETTE article. If test light does not illuminate, go to step 14.
- 5. Using scan tool, select BODY CONTROL MODULE data list and monitor HVAC REAR DEFOGGER SWITCH. If scan tool displays switch as ACTIVE, go to step 7. If scan tool does not display switch as ACTIVE, go to next step.
- 6. Turn ignition off. Locate BCM and disconnect connector C2. See <u>Fig. 3</u>. Turn ignition on. Connect test light between battery voltage and BCM connector C2 terminal C10 (Purple wire). See <u>Fig. 2</u>. Depress rear defogger switch. If test light illuminates, go to step 13. If test light does not illuminate, go to step 10.
- 7. Turn ignition off. Remove RR DEFOG relay No. 44 from instrument panel fuse block. Turn ignition on. Connect test light between ground and RR DEFOG relay battery voltage supply circuit from RR DEFOG fuse No. 48 (40-amp) located in instrument panel fuse block. If test light illuminates, go to next step. If test light does not illuminate, go to step 9.
- 8. Connect 40-amp fused jumper between RR DEFOG relay battery voltage supply circuit from RR DEFOG fuse No. 48 and supply circuit to rear defogger grid. Connect test light between ground and rear window defogger grid. If test light illuminates, go to step 12. If test light does not illuminate, go to step 16.
- 9. Check for open or high resistance in RR DEFOG relay battery voltage supply circuit between relay and RR DEFOG fuse No. 48. Repair as necessary. After repairs, go to step 20 . If circuit is okay, go to step 15 .
- 10. Check for open or short to voltage in Purple wire between BCM connector C2 terminal C10 and HVAC control module 12-pin connector C2 terminal "D". Repair as necessary. After repairs, go to step 20. If circuit is okay, go to next step.
- 11. Check for poor connections at HVAC control module. Repair as necessary. After repairs, go to step 20. If connections are okay, go to step 17.
- 12. Check for poor connections at RR DEFOG relay. Repair as necessary. After repairs, go to step 20 . If connections are okay, go to step 18 .
- 13. Check for poor connections at BCM. Repair as necessary. After repairs, go to step 20. If connections are okay, go to step 19.
- 14. Repair open or high resistance in Black wire between defogger grid and ground connection located above left rear wheelwell, inside vehicle. After repairs, go to step 20.
- 15. Repair short to ground in Purple or Black wire between RR DEFOG relay and rear window defogger grid. After repairs, go to step 20.
- 16. Repair open or high resistance in Purple or Black wire between RR DEFOG relay and rear

- window defogger grid. After repairs, go to step 20.
- 17. Replace HVAC control module. See <u>HVAC CONTROLLER</u> under REMOVAL & INSTALLATION. After repairs, go to step 20.
- 18. Replace RR DEFOG relay. After repairs, go to step 20.
- 19. Replace BCM. See BODY CONTROL MODULE under REMOVAL & INSTALLATION in BODY CONTROL MODULES CORVETTE article. After repairs, go to next step.
- 20. Recheck system operation to verify the repair. If system operates properly, repair is complete. If system does not operate properly, go to step 2.

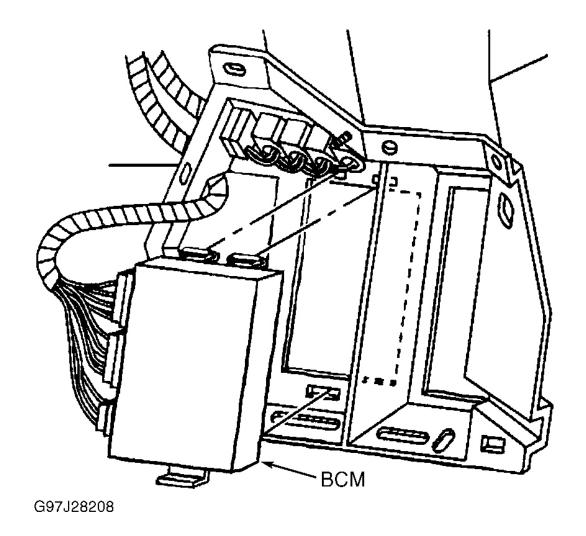


Fig. 3: Locating Body Control Module Courtesy of GENERAL MOTORS CORP.

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# TEST B: REAR DEFOGGER INOPERATIVE (AUTOMATIC A/C)

- If defogger diagnostic system check has been performed, go to next step. If defogger diagnostic system check has not been performed, go to <u>DEFOGGER DIAGNOSTIC</u>
   <u>SYSTEM CHECK</u> under SELF-DIAGNOSTIC SYSTEM. After performing defogger diagnostic system check, go to next step.
- 2. Start engine and allow to idle. Depress rear defogger switch. If rear window defogger illuminates, go to next step. If rear window defogger does not illuminate, go to step 8.
- 3. Connect test light between ground and rear window defogger grid. If test light illuminates, go to next step. If test light does not illuminate, go to step 5.
- 4. Connect test light between left and right sides of rear window defogger grid. If test light illuminates, problem may be intermittent. See INTERMITTENTS in BODY CONTROL MODULES CORVETTE article. If test light does not illuminate, go to step 10.
- 5. Turn ignition off. Remove RR DEFOG relay No. 44 from instrument panel fuse block. Turn ignition on. Connect test light between ground and RR DEFOG relay battery voltage supply circuit from RR DEFOG fuse No. 48 (40-amp) located in instrument panel fuse block. If test light illuminates, go to next step. If test light does not illuminate, go to step 7.
- 6. Connect 40-amp fused jumper between RR DEFOG relay battery voltage supply circuit from RR DEFOG fuse No. 48 and supply circuit to rear defogger grid. Connect test light between ground and rear window defogger grid. If test light illuminates, go to step 9. If test light does not illuminate, go to step 12.
- 7. Check for open or high resistance in RR DEFOG relay battery voltage supply circuit between relay and RR DEFOG fuse No. 48. Repair as necessary. After repairs, go to step 15. If circuit is okay, go to step 11.
- 8. Check for poor connections at HVAC control module. Repair as necessary. After repairs, go to step 15. If connections are okay, go to step 13.
- 9. Check for poor connections at RR DEFOG relay. Repair as necessary. After repairs, go to step 15. If connections are okay, go to step 14.
- 10. Repair open or high resistance in Black wire between defogger grid and ground connection located above left rear wheelwell, inside vehicle. After repairs, go to step 15.
- 11. Repair short to ground in Purple or Black wire between RR DEFOG relay and rear window defogger grid. After repairs, go to step 15.
- 12. Repair open or high resistance in Purple or Black wire between RR DEFOG relay and rear window defogger grid. After repairs, go to step 15.
- 13. Replace HVAC control module. See <u>HVAC CONTROLLER</u> under REMOVAL & INSTALLATION. After repairs, go to step 15.
- 14. Replace RR DEFOG relay. After repairs, go to next step.

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15. Recheck system operation to verify the repair. If system operates properly, repair is complete. If system does not operate properly, go to step 2.

## TEST C: DEFOGGER INDICATOR ALWAYS ON

- If defogger diagnostic system check has been performed, go to next step. If defogger diagnostic system check has not been performed, go to <u>DEFOGGER DIAGNOSTIC</u>
   <u>SYSTEM CHECK</u> under SELF-DIAGNOSTIC SYSTEM. After performing defogger diagnostic system check, go to next step.
- 2. Start engine and allow to idle. Depress rear defogger switch. If rear window defogger illuminates, problem may be intermittent. See INTERMITTENTS in BODY CONTROL MODULES CORVETTE article. If rear window defogger does not illuminate, go to next step.
- 3. Turn ignition off. Locate and disconnect Body Control Module (BCM) connector C2. See <u>Fig. 3</u>. Turn ignition on. Connect test light between battery voltage and BCM connector C2 terminal C10 (Purple wire). See <u>Fig. 2</u>. If test light illuminates, go to next step. If test light does not illuminate, go to step 5.
- 4. Check for short to ground in Purple wire between BCM connector C2 terminal C10 and HVAC control module 12-pin connector C2 terminal "D". Repair as necessary. After repairs, go to step 9. If circuit is okay, go to step 6.
- 5. Check for poor connections at BCM. Repair as necessary. After repairs, go to step 9. If connections are okay, go to step 7.
- 6. Check for poor connections at HVAC control module. Repair as necessary. After repairs, go to step 9. If connections are okay, go to step 8.
- 7. Replace BCM. See BODY CONTROL MODULE under REMOVAL & INSTALLATION in BODY CONTROL MODULES CORVETTE article. After repairs, go to step 9.
- 8. Replace HVAC control module. See <u>HVAC CONTROLLER</u> under REMOVAL & INSTALLATION. After repairs, go to next step.
- 9. Recheck system operation to verify the repair. If system operates properly, repair is complete. If system does not operate properly, go to step 2.

#### TEST D: HEATED MIRRORS INOPERATIVE

- If defogger diagnostic system check has been performed, go to next step. If defogger diagnostic system check has not been performed, go to <u>DEFOGGER DIAGNOSTIC</u> <u>SYSTEM CHECK</u> under SELF-DIAGNOSTIC SYSTEM. After performing doors diagnostic system check, go to next step.
- 2. Verify operation of heated mirrors by turning ignition on and pressing rear window

- defogger button on A/C-heater control panel. If heated mirrors operate properly, diagnose intermittent condition. See INTERMITTENTS in BODY CONTROL MODULES CORVETTE article. If heated mirrors do not operate properly, go to next step.
- 3. Verify operation of rear window defogger by turning ignition on and pressing rear window defogger button on A/C-heater control panel. If rear window defogger operates properly, go to next step. If rear window defogger does not operate properly, see <a href="#">TEST A: REAR</a>
  <a href="#">DEFOGGER INOPERATIVE (MANUAL A/C)</a> or <a href="#">TEST B: REAR DEFOGGER</a>
  <a href="#">INOPERATIVE (AUTOMATIC A/C)</a>.</a>
- 4. Turn ignition off. Disconnect inoperative heated mirror connector. See **POWER**MIRROR ASSEMBLY under REMOVAL & INSTALLATION. Turn ignition on. Using test light connected to ground, probe power mirror connector C1 terminal "E" (Orange wire). See **Fig. 4**. Press rear window defogger button on A/C-heater control panel to turn heated mirrors on. If test light illuminates, go to next step. If test light does not illuminate, go to step 6.
- 5. Connect test light between power mirror connector C1 terminals "B" (Black wire) and "E" (Orange wire). Press rear window defogger button on A/C-heater control panel to turn heated mirrors on. If test light illuminates, go to step 8. If test light does not illuminate, go to step 7.
- 6. Check for open in Orange wire between power mirror connector C1 terminal "E" and corresponding door module connector C3 terminal "B". Repair as necessary. After repairs, go to step 12. If circuit is okay, go to step 9.
- 7. Check for open in Black wire between power mirror connector C1 terminal "B" and corresponding door module connector C3 terminal "F". Repair as necessary. After repairs, go to step 12. If circuit is okay, go to step 9.
- 8. Check for poor connections at suspect mirror. Repair as necessary. After repairs, go to step 12. If connections are okay, go to step 10.
- 9. Check for poor connections at suspect door module. Repair as necessary. After repairs, go to step 12. If connections are okay, go to step 11.
- 10. Replace suspect mirror. See <u>POWER MIRROR ASSEMBLY</u> under REMOVAL & INSTALLATION. After repairs, go to step 12.
- 11. Replace suspect door module. See **<u>DOOR MODULE</u>** under REMOVAL & INSTALLATION. After repairs, go to next step.
- 12. Recheck system operation to verify the repair. If system operates properly, repair is complete. If system does not operate properly, go to step 2.

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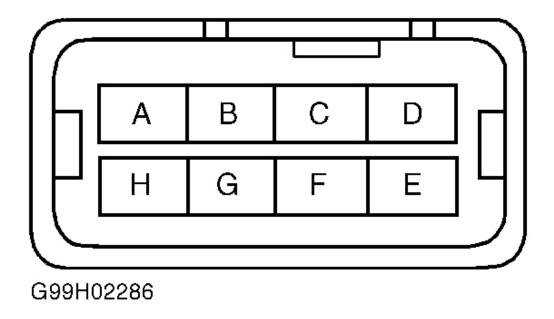


Fig. 4: Identifying Power Mirror Connector C1 Terminals

# **COMPONENT TESTS**

#### GRID FILAMENT TEST

- 1. Start engine. Turn rear defogger on (press and release rear defogger switch button once). Using grounded test light, lightly touch each grid line. Test light brilliance should gradually decrease as test light probe is moved from left to right side of grid. If test light shows full brilliance at both ends of all grid lines, check for loose ground wire.
- 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 <u>Fig. 5</u>. If break exists in grid line, go to **GRID FILAMENT REPAIR** under ON-VEHICLE SERVICE.

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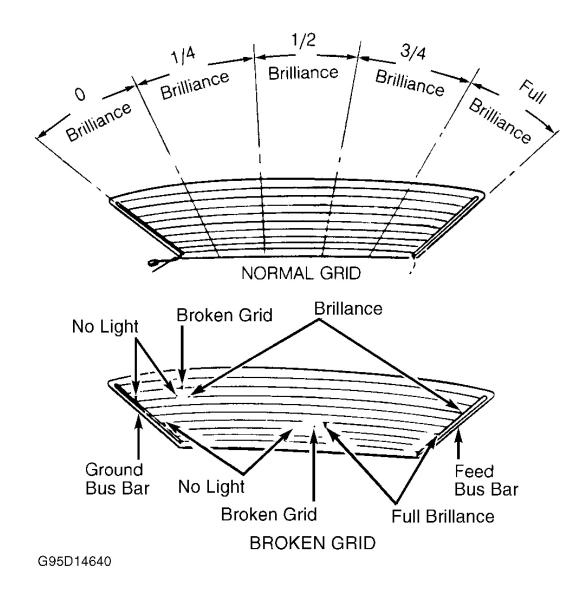


Fig. 5: Examining Grid Brilliance Test Patterns Courtesy of GENERAL MOTORS CORP.

# **REMOVAL & INSTALLATION**

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

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#### Removal & Installation

CAUTION: Lower door panel retainers are 2-piece. Male fastener is attached to door panel and female retainer is attached to door. To avoid breaking door panel fasteners, pry between male fastener and female retainer.

- 1. Remove appropriate door panel to gain access to door module. See **DOOR PANEL**.
- 2. Remove door module mounting screws. See <u>Fig. 6</u>. Disconnect door module electrical connectors and remove door module from door. To install, reverse removal procedure. Tighten door module mounting screws to 27 INCH lbs. (3 N.m).

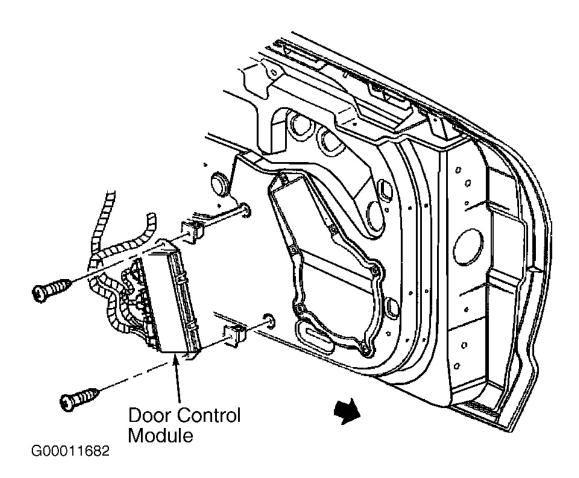


Fig. 6: Removing Door Control Module Courtesy of GENERAL MOTORS CORP.

DOOR PANEL

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#### Removal & Installation

- 1. Lower appropriate door window. Pull inside door handle open to access openings to bezel locking tabs. Insert a flat bladed screwdriver in lower opening and tip screwdriver up while pulling on bezel, releasing lower locking tab. Repeat for top of bezel. Grasp bezel firmly and pull to release rear locking tabs and remove bezel.
- 2. Remove pull handle plug for access to 2 door panel screws. Remove 2 screws from behind pull handle plug. Pry lower door panel fasteners loose from door. For better sight access to fasteners, start by first prying out fastener at rear of trim panel (approximately 2 in. up from trim panel seam). Lift door panel up and off upper retainers. Disconnect electrical connectors from door panel. To install, reverse removal procedure.

## **HVAC CONTROLLER**

#### Removal & Installation

- 1. On models equipped with manual A/C system, disengage kick-up panel upper latches at right footwell area. Open kick-up panel. Lift kick-up panel up from multi-use relay bracket. Set kick-up panel aside. Remove cover from instrument panel electrical center. Remove HVAC CON mini-fuse from instrument panel electrical center.
- 2. On all models, disconnect negative battery cable. Apply parking brake. Place shift lever in second gear (automatic) or forth gear (manual). On convertible models, open folding top stowage compartment lid. Remove 2 lower retaining screws from either side of stowage compartment lid extension panel. Remove 2 upper retaining screws from top of stowage compartment lid extension panel. Lift stowage compartment lid extension panel upward from bracket.
- 3. On all models, open console door. Gently pull up on rear of electronic traction control/ride control switch to release retaining clips. Disconnect electrical connector from switch. Disconnect LED connector from wiring harness. Remove electronic traction control/ride control switch.
- 4. Using flat-bladed tool, carefully remove console retaining nut covers. Remove retaining nuts at rear of console. Remove retaining nuts at front of console and instrument panel accessory trim plate. Lift rear of console up slightly and pull rearward to release front of console from under instrument panel accessory trim plate.
- 5. Disconnect accessory plug electrical connector. Unscrew accessory plug retainer. Remove accessory plug housing from console. Disconnect electrical connectors from fuel door release and rear lift window release switch. Turn console over. Remove fuel door release switch and rear lift window release switch from console by releasing switch tabs using small flat-bladed tool. Remove console from vehicle. See **Fig. 7**.
- 6. On models equipped with manual transmission, grasp shift control boot and apply light

- pressure in toward shift control lever to release shift boot retaining tabs from instrument panel accessory trim plate.
- 7. On all models, open cigar lighter door and remove ashtray. Gently pry at side edge of instrument panel accessory trim plate grille with flat-bladed screwdriver to release locking tab. Remove instrument panel accessory trim plate grille. Remove instrument panel accessory trim plate retaining screws from next to cigar lighter and behind ashtray. Remove instrument panel accessory trim plate retaining screw from instrument panel accessory trim plate grille opening.
- 8. Grasp sides of instrument panel accessory trim plate near curve at base. Pull rearward on instrument panel accessory trim plate to release locking tabs. See **Fig. 8**. Lift rear of instrument panel accessory trim plate to clear driveline tunnel studs. Disconnect electrical connector from cigar lighter.
- 9. On models equipped with manual transmission, rotate shift control boot and reposition one end down into shifter opening of instrument panel accessory trim plate. On all models, lift instrument panel accessory trim plate over shifter to remove.
- 10. Remove HVAC controller mounting screws. See <u>Fig. 9</u>. Slide HVAC controller out from instrument panel to access electrical and vacuum harnesses. Disconnect electrical and vacuum harnesses. Remove HVAC controller.
- 11. To install, reverse removal procedure. Tighten fasteners to specification. See **TORQUE SPECIFICATIONS**.

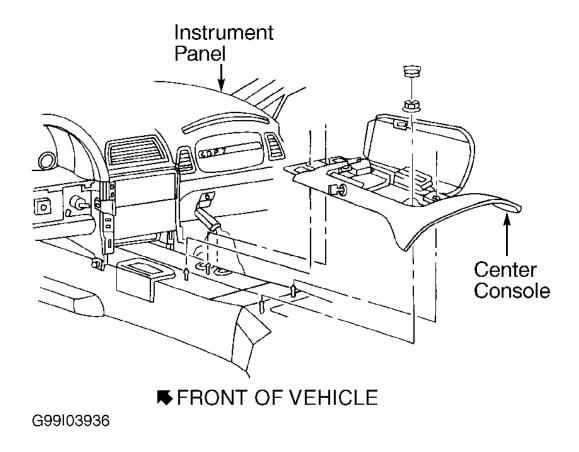


Fig. 7: Removing Center Console
Courtesy of GENERAL MOTORS CORP.

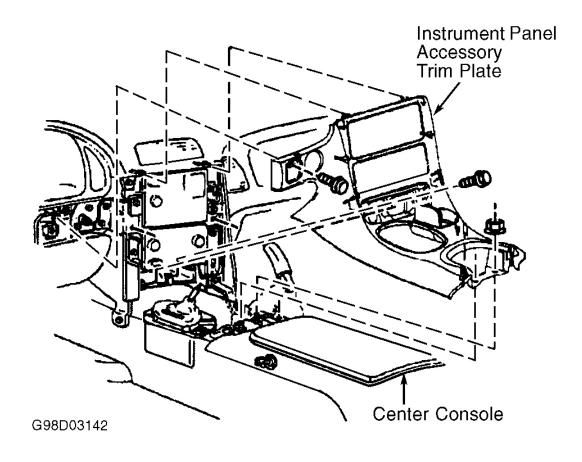


Fig. 8: Removing Instrument Panel Accessory Trim Plate Courtesy of GENERAL MOTORS CORP.

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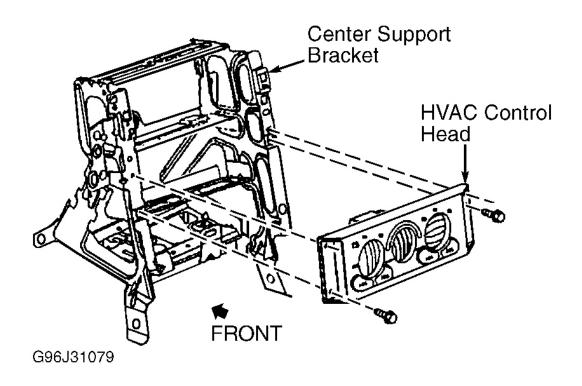


Fig. 9: Removing HVAC Control Head & Center Support Bracket Courtesy of GENERAL MOTORS CORP.

## POWER MIRROR ASSEMBLY

Removal & Installation

CAUTION: Lower door panel retainers are 2-piece. Male fastener is attached to door panel and female retainer is attached to door. To avoid breaking door panel fasteners, pry between male fastener and female retainer.

- 1. Remove appropriate door panel to gain access to power mirror mounting and connectors. See **DOOR PANEL** .
- 2. Remove door speaker assembly. Remove mirror nut access plugs. Disconnect mirror wiring harness from retainers. Remove nuts from mirror studs. Remove mirror along with harness and gasket. If power mirror glass is to be replaced, see <a href="POWER MIRROR">POWER MIRROR</a>
  <a href="FACE/GLASS">FACE/GLASS</a>.</a>
- 3. To install, reverse removal procedure. Tighten door speaker screws to 22 INCH lbs. (2.5

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N.m). Tighten power mirror nuts to 89 INCH lbs. (10 N.m).

#### POWER MIRROR FACE/GLASS

#### Removal & Installation

- 1. Tilt mirror face to allow access to grasp glass case firmly, and pull case from mirror body. Disconnect electrical connectors from case, if necessary. To install, place a little White lithium grease on motor pivot and on tip of jack screws. Align jack screws and motor pivot 90 degrees to mirror head. Reconnect electrical connectors. Align case to mirror motor.
- 2. Using palm of gloved hand, press firmly on center of glass until case snaps onto motor. If installing right mirror, rotate glass case down and press firmly on lower side snapping case to lower jack screw. If installing left mirror, rotate glass case up and press firmly on upper side snapping case to upper jack screw. Jackscrews will make a clicking noise when properly seated. For both mirrors, rotate glass case and press firmly on outer side snapping case to outer jack screw.

# TORQUE SPECIFICATIONS

# TORQUE SPECIFICATIONS

Application	INCH Lbs. (N.m)
Console Retaining Nuts	89 (10)
HVAC Controller Mounting Screws	17 (1.9)
Instrument Panel Accessory Trim Plate Retaining Screws	17 (1.9)
Stowage Compartment Lid Extension Panel Retaining Screws	35 (4)

# **WIRING DIAGRAMS**

Fig. 10: Defogger System Wiring Diagram (Corvette)