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

DESCRIPTION & OPERATION

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

Rear window defogger system uses an instrument panel mounted switch with an integral indicator light to control the rear defogger grid and heated mirrors. A solid state timer is used to control rear defogger cycle periods. Rear defogger switch and rear defogger timer are integral components of the A/C-heater control head.

TESTING

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.

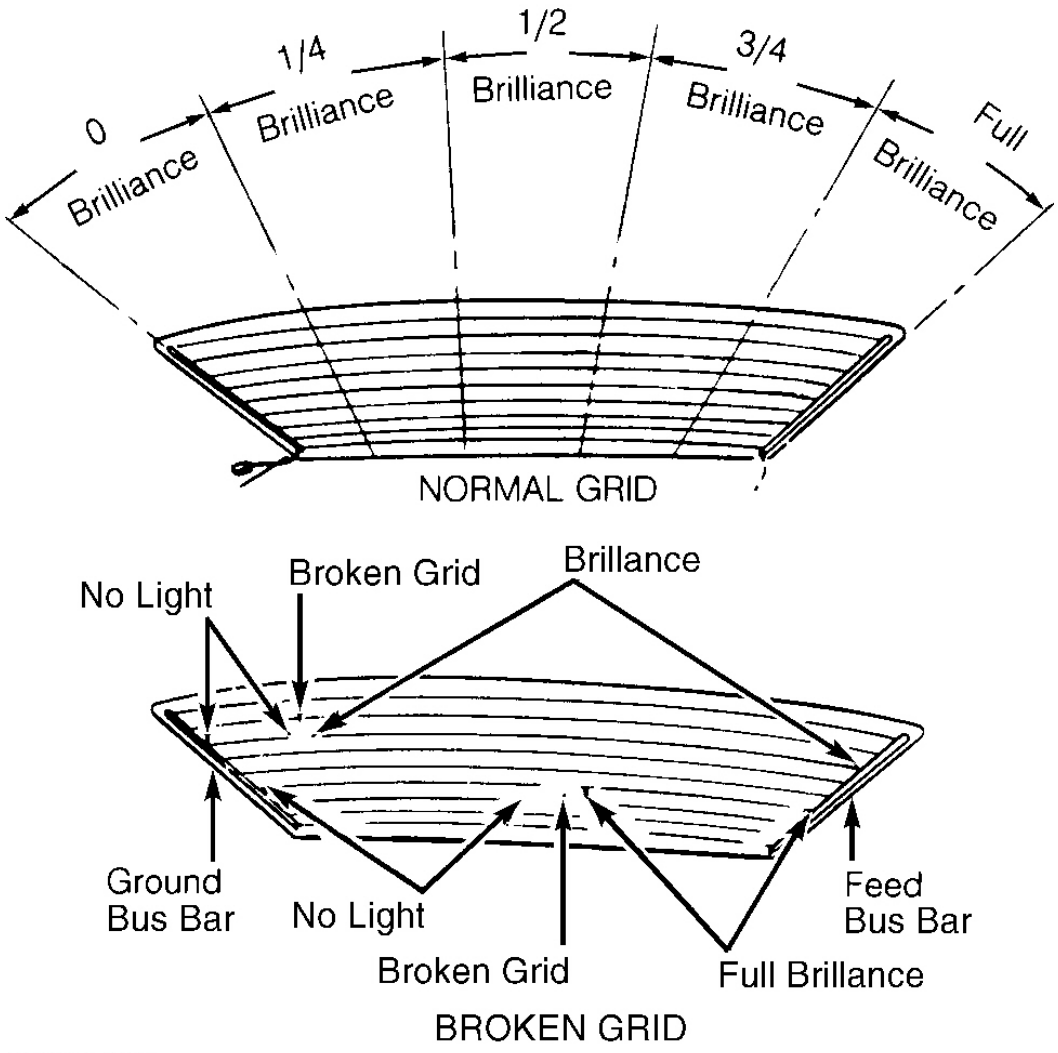

Fig. 1: Examining Grid Brilliance Test Patterns
Courtesy of GENERAL MOTORS CORP.

REAR DEFOGGER TESTS

NOTE: Check for presence of DTCs U1153, U1255, B0432 or B0433. If these DTCs exist, see BODY CONTROL MODULES article.

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. Depress rear defogger switch and immediately depress switch again. System should come on and remain on until switch button is pressed the second time.

Rear Defogger/Heated Side Mirror Inoperative Indicator Is Okay (Auto. A/C)

1. Place transmission is Park. Start and operate engine at idle. Depress rear defogger switch. If defogger indicator illuminates, go to next step. If defogger indicator does not illuminate, go to step 3).
2. Turn ignition off. Install scan tool. Place transmission in Park. Start and operate engine at idle. Turn rear defogger switch on, then off. Using scan tool, select SWITCH INPUTS. Check if scan tool display shows that defogger switch input toggles on, then off. If input toggles on, then off, go to step 4). If input does not toggle on, then off, go to next step.
3. Replace A/C-heater control head. After replacing control head, recheck system operation.
4. Replace BCM. See **BODY CONTROL MODULES** article. After replacing BCM, recheck system operation.

Rear Defogger/Heated Side Mirrors Inoperative Indicator Is Okay (Man. A/C)

1. If grid filament test was performed, go to next step. If grid filament test was not performed, go to **GRID FILAMENT TEST** .
2. Place transmission in Park. Start and operate engine at idle. Depress rear defogger switch. If rear defogger indicator light illuminates, go to next step. If rear defogger indicator light does not illuminate, go to step 5).
3. Turn ignition off. Disconnect A/C-heater control head assembly harness connector. Using a DVOM, check continuity between A/C-heater control head harness connector terminal "D" and Body Control Module (BCM) harness connector terminal C10. If continuity is present, go to step 6). If continuity is not present, go to next step.
4. Repair open in Purple wire between A/C-heater control head and BCM. After repairs, recheck system operation.
5. Replace A/C-heater control head. After replacing control head, recheck system operation.
6. Replace BCM. See **BODY CONTROL MODULES** article. After replacing BCM, recheck system operation.

Rear Defogger Inoperative Heated Side Mirrors & Indicator Okay (Auto. A/C)

1. Check if all rear window defogger grid lines are inoperative. If all grid lines are inoperative, go to next step. If not all of grid lines are inoperative, see **GRID FILAMENT REPAIR** under ON-VEHICLE SERVICE.
2. Check RR DEFOG Maxifuse(R) No. 48, located in passenger compartment electrical center. If fuse is open, go to next step. If fuse is okay, go to step 6).
3. Remove RR DEFOG mini relay No. 44, located in passenger compartment electrical center. Check continuity between relay terminals No. 30 and 87. If continuity is present, go to step 12). If continuity is

not present, go to next step.

4. Disconnect rear defogger grid connector leading to battery/power side of RR DEFOG mini relay No. 44. See **WIRING DIAGRAMS** . Check resistance between grid connector terminal "A" (battery side) and ground. If resistance is infinite, see BCM DTC B0432. See **BODY CONTROL MODULES** article. If resistance is not infinite, go to next step.
5. Repair short to ground in Purple wire between defogger grid and passenger compartment electrical center. After repairs, recheck system operation.
6. Disconnect RR DEFOG mini relay No. 44. Disconnect rear defogger grid connector leading to relay. See **WIRING DIAGRAMS** . Connect fused jumper wire between relay connector terminals No. 30 and 87. Check voltage between defogger grid connector terminal "A" (battery side) and ground. If 10-14 volts are present, go to step 8). If 10-14 volts are not present, go to next step.
7. Repair open or high resistance in Purple wire between defogger grid and passenger compartment electrical center. After repairs, recheck system operation.
8. Disconnect rear defogger grid connector to ground. Check continuity between grid connector terminal "A" and ground. If continuity is present, go to step 10). If continuity is not present, go to next step.
9. Repair open or high resistance in Black wire between defogger grid connector and ground. After repairs, recheck system operation.
10. Disconnect BCM harness connector. Reinstall RR DEFOG mini relay No. 44. Connect a fused jumper wire between BCM harness connector terminals C2 and C3, and ground. Turn ignition to RUN position. Check voltage between defogger grid connector terminal "A" (battery side) and ground. If voltage is 10-14 volts, go to next step. If voltage reading is not 10-14 volts, go to step 12).
11. Replace BCM. See **BODY CONTROL MODULES** article. After replacing BCM, recheck system operation.
12. Replace RR DEFOG mini relay No. 44. After replacing relay, recheck system operation.

Rear Defogger Inoperative Heated Side Mirrors & Indicator Okay (Man. A/C)

1. Check if all rear window defogger grid lines are inoperative. If all grid lines are inoperative, go to next step. If not all of grid lines are inoperative, see **GRID FILAMENT REPAIR** under ON-VEHICLE SERVICE.
2. Check RR DEFOG Maxifuse(R) No. 48, located in passenger compartment electrical center. If fuse is open, go to next step. If fuse is okay, go to step 6).
3. Remove RR DEFOG mini relay No. 44, located in passenger compartment electrical center. Check continuity between relay terminals No. 30 and 87. If continuity is present, go to step 16). If continuity is not present, go to next step.
4. Disconnect rear defogger grid connector leading to battery/power side of RR DEFOG mini relay No. 44. See **WIRING DIAGRAMS** . Check resistance between grid connector terminal "A" (battery side) and ground. If resistance is infinite, see BCM DTC B0432. See **BODY CONTROL MODULES** article. If resistance is not infinite, go to next step.
5. Repair short to ground in Purple wire between defogger grid and passenger compartment electrical center. After repairs, recheck system operation.
6. Disconnect RR DEFOG mini relay No. 44. Disconnect rear defogger grid connector leading to relay. See **WIRING DIAGRAMS** . Connect fused jumper wire between relay connector terminals No. 30 and 87. Check voltage between defogger grid connector terminal "A" (battery side) and ground. If 10-14 volts are

present, go to step 8). If 10-14 volts are not present, go to next step.

7. Repair open or high resistance in Purple wire between defogger grid and passenger compartment electrical center. After repairs, recheck system operation.
8. Disconnect rear defogger grid connector to ground. Check continuity between grid connector terminal "A" and ground. If continuity is present, go to step 10). If continuity is not present, go to next step.
9. Repair open or high resistance in Black wire between defogger grid connector and ground. After repairs, recheck system operation.
10. Disconnect BCM harness connector. Reinstall RR DEFOG mini relay No. 44. Connect a fused jumper wire between BCM harness connector terminals C2 and C3, and ground. Turn ignition to RUN position. Check voltage between defogger grid connector terminal "A" (battery side) and ground. If voltage is 10-14 volts, go to next step. If voltage reading is not 10-14 volts, go to step 16).
11. Turn ignition switch to RUN position. Depress rear defogger switch. If indicator light illuminates, go to step 13). If indicator light does not illuminate, go to next step.
12. Replace A/C-heater control head. After replacing control head, recheck system operation.
13. Turn ignition off. Disconnect A/C-heater control head harness connector. Check continuity between A/C-heater control head harness connector terminal "D" and BCM harness connector terminal C10. If continuity is present, go to step 15). If continuity is not present, go to next step.
14. Repair open or high resistance in Purple wire between A/C-heater control head and BCM. After repairs, recheck system operation.
15. Replace BCM. See **BODY CONTROL MODULES** article. After replacing BCM, recheck system operation.
16. Replace RR DEFOG mini relay No. 44. After replacing relay, 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.

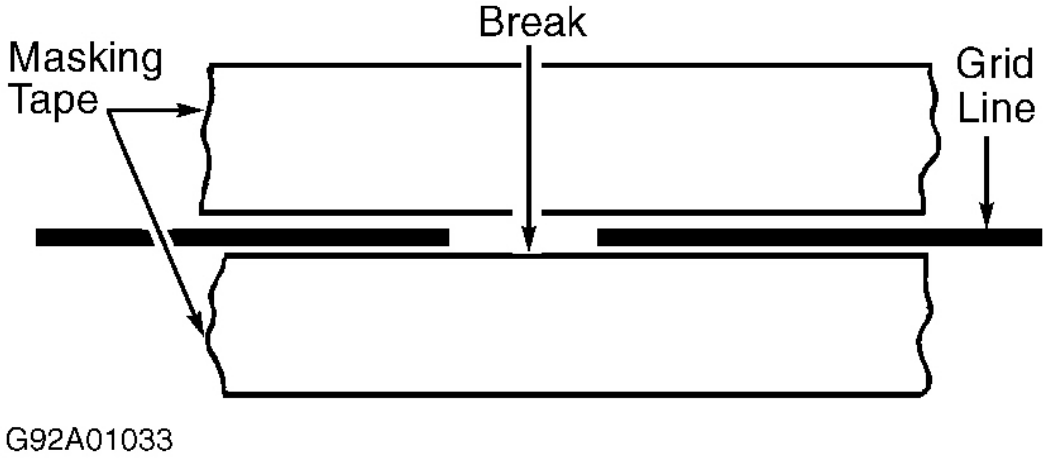

Fig. 2: Repairing Grid Line
Courtesy of GENERAL MOTORS CORP.

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 AIR BAG RESTRAINT SYSTEMS article.

NOTE: For removal and installation procedures for mirrors, see MIRRORS - POWER article.

A/C-HEATER CONTROL HEAD

Removal & Installation

Disconnect negative battery cable. Remove instrument panel trim panel. Remove A/C-heater control head mounting screws. Disconnect electrical and vacuum harnesses. Remove A/C-heater control head from vehicle. To install, reverse removal procedure. Tighten A/C-heater control head mounting screws to 17 INCH lbs. (1.9 N.m).

WIRING DIAGRAMS

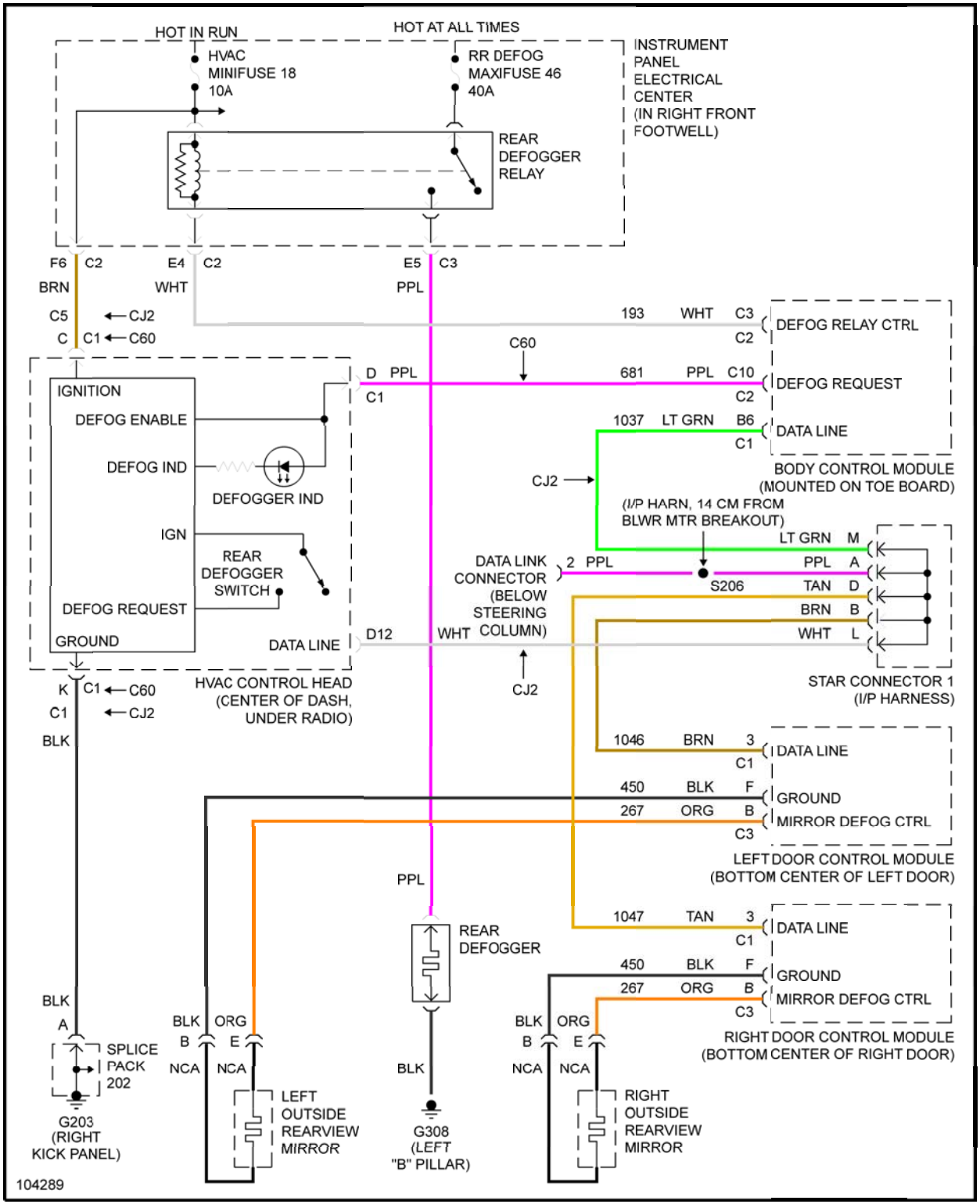
HOT IN RUN
HOT AT ALL TIMES
HVAC
MINIFUSE 18
10A
RR DEFOG
MAXIFUSE 46
40A
INSTRUMENT
PANEL
ELECTRICAL
CENTER
(IN RIGHT FRONT
FOOTWELL)
REAR
DEFOGGER
RELAY
F6 C2
BRN
C5
C
E4 C2
WHT
E5 C3
PPL
CJ2
C1 C60
193 WHT C3
C2
DEFOG RELAY CTRL
C60
D PPL
C1
681 PPL C10
C2
DEFOG REQUEST
1037 LT GRN B6
C1
DATA LINE
BODY CONTROL MODULE
(MOUNTED ON TOE BOARD)
CJ2
(I/P HARN, 14 CM FROM
BLWR MTR BREAKOUT)
IGNITION
DEFOG ENABLE
DEFOG IND
DEFOGGER IND
IGN
REAR
DEFOGGER
SWITCH
DEFOG REQUEST
GROUND
DATA LINE
LT GRN M
DATA LINK
CONNECTOR
(BELOW
STEERING
COLUMN)
2 PPL
PPL A
S206
TAN D
BRN B
WHT L
D12
WHT
CJ2
STAR CONNECTOR 1
(I/P HARNESS)
K C1 C60
C1 CJ2
BLK
HVAC CONTROL HEAD
(CENTER OF DASH,
UNDER RADIO)
1046 BRN 3
C1
DATA LINE
450 BLK F
GROUND
267 ORG B
MIRROR DEFOG CTRL
C3
LEFT DOOR CONTROL MODULE
(BOTTOM CENTER OF LEFT DOOR)
PPL
REAR
DEFOGGER
1047 TAN 3
C1
DATA LINE
450 BLK F
GROUND
267 ORG B
MIRROR DEFOG CTRL
C3
RIGHT DOOR CONTROL MODULE
(BOTTOM CENTER OF RIGHT DOOR)
BLK
A
SPLICE
PACK
202
G203
(RIGHT
KICK PANEL)
BLK ORG
B E
NCA NCA
LEFT
OUTSIDE
REARVIEW
MIRROR
BLK
G308
(LEFT
"B" PILLAR)
BLK ORG
B E
NCA NCA
RIGHT
OUTSIDE
REARVIEW
MIRROR
104289

Fig. 3: Defogger System Wiring Diagram